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IDENTIFICATION KEYS OF THE PTYCHOID MIXONOMATA OF THE NEOTROPICAL REGION (ACARI: ORIBATEI)

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Identification keys if the ptychoid Mixonomata (Oribatei) are given for the species of the Neotropical Region. The keys serve a practical purpose by disregarding supraspecific categories. With 141 figures.

The ptychoid Mixonomata comprises two superfamilies: Phthiracaroidea and Euphthiracaroidea. These two superfamilies contain about 72 known species in the Neotropical Region. The majority of the species has been described rather recently, as seen in the following list (the number of species described between):

1888—1957 is 6,
1958—1967 19,
1968—1977 3,
1978—1985 39.

It is evident from these data that more species have become known from this region during the last eight years than in the course of the preceding 70 years. It appears that both the diversity of the whole group — and especially that of the superfamily Phthiracaroidea — is remarkable, and the taxonomical survey of the whole group are still very much at its beginning. In the present situation — we think — priority should be given to the description of the species relegable to this group, since numerous unknown species are yet to be described from the Nearctic Region, particularly from Central America, from the Andes region and from the southernmost parts of the continent. In order to promote this work we present identification keys for the known species of this region based on their differential characteristics.

It appears from studies carried out so far that the two superfamilies are different as regards their species diversity. The diversity in Euphthiracaroidea is lower but as a rule the range of the species is wider. The diversity in Phthiracaroidea is high and, on the other hand, the range of the species is smaller. So e.g. Niedbała described recently 9 new species each of the genera *Phthiracarus* and *Steganacarus* from the Caucasus. In this superfamily in particular a significant increase in the number of known species is to be expected.

In the course of the compilation of identification keys the establishment

of supraspecific categories raised difficulties. It is well known, and in zoology there has been long-lasting debate, whether the species-groups based on phylogenetic standpoints truly cover the so-called "artificial" species-groups (based on purely taxonomical aspects). These two aspects are often interchanged in zoological practice: this is why the category termed "genus" means extremely heterogenous species-groups. The hierarchic (Linnaean) nomenclature with its rigorously fixed rules makes all these perplexed to the extremes. There is a superfluous debate over these issues.

There are similar problems also with the ptychoid Mixonomata. There is no problem with the supraspecific division of the superfamily Euphthiracaroidea, but all the more with that of the superfamily Phthiracaroidea. There are usually 5 pairs ano-adanal setae arranged in a lateral and a medial row on the ano-adanal plate of the Phthiracaroidea. In the fenus *Phthiracarus* and in related genera the medial setae are two in number, they have three lateral hairs. In some genera there is a tendency to have 3 or 4 setae in the medial row, while there is also a tendency for a reduction of the setae in the lateral rows. The medial setae are usually closely situated to each other. The number of medial setae combined with other characteristics is a proper feature for making supraspecific groups, which are termed as genera or subgenera.

The other group of phthiracaroid species has more than 5 pairs of ano-adanal setae (6—13 pairs). These species with a so-called ano-adanal neotrichy are distributed mostly on the southern part of the Southern Hemisphere. There are forms with 2, 3 or 4 pairs of medial setae among them. The various combinations of the above-mentioned features provide a good opportunity for the delimitation of the species-groups and for a construction of identification keys.

Recently W. NIEDBAŁA (1986) published a paper entitled "Systeme des Phthiracaroidea (Oribatida, Euptyctima)" which includes remarkable statements on the phylogeny of the whole group; he set up a new family, two new subfamilies and numerous tribes, he proposed synonymy for some previously known genera or he ranked them as subgenera. This work is more or less demonstrative as regards the phylogenetic conception of the author, but the system proposed is less suitable for identification, i.e. instead of facilitating it makes identification of the species more difficult. We think that the present situation of an inadequate knowledge of the world fauna the most urge task is to collect and describe the hitherto unknown species.

The process of deforestation is very rapid all over the World (and especially so in the Neotropical Region), which threatens the hitherto unknown soil fauna with complete extinction. Therefore we give preference to the description of species and to publications which promote the descriptions by trustworthy identifications. Rapid and accurate identification of the Neotropical species may be done quite idependently from our views or decisions

on the inclusion of the species in any of the genera or supraspecific categories. This is why the supraspecific categories are disregarded in our identification keys and the key leads directly to the species. Whereas the names of the species are regarded merely as codes in the point of view of their identification, all the species names are given with their original generic names for the sake of an easier overview. We aimed at a construction of identification keys of a merely practical character and we do not want to interpret any phylogenetic concepts.

PHTHIRACAROIDEA PERTY, 1841

Key to species

1 (44) Ano-adanal plates each with 6 to 13 pairs of setae.
2 (3) Three pairs of lateral setae near each other, on the anterior part of ano-adana plate. Four pairs of medial setae near each other. Interlamellar setae long, with dilated and ciliated tip. Sensillus long, with dilated and cliated head. Lamellar and exobothridial setae short, setiform, smooth; rostral setae setiform, smooth twice longer than lamellar setae. 17 pairs of rigid, bacilliform, apically dilated and ciliated notogastral setae. A: 156 μm; NL: 318 μm; NH: 185 μm. — Brazil (Figs 1—3) **Rafacarus rafalski** NIEDBAŁA, 1982
3 (2) 4 to 7 pairs of lateral setae arranged in a longitudinal row.
4 (5) Ano-adanal plates with 9 pairs of setae. 5 pairs of medial setae spread over the whole length of ano-adanal plates; 4 pairs of lateral setae near lateral margin of plates. Interlamellar setae setiform, longer than lamellar setae. Sensillus short, club-shaped, in closed state almost covered by notogastral margin. 17 pairs of thin, moderately long notogastral setae. NL: 417—484 μm; HN: 290—313 μm. — Argentina (Figs 5—6) **Neophthiracarus insignis** BALOGH et CSISZÁR, 1963
5 (4) 2 to 4 pairs of medial setae near each other mostly in the middle thirs of plates.
6 (17) 3 to 4 pairs of medial setae; 4 to 7 pairs of lateral setae present.
7 (12) Interlamellar setae long, longer than sensillus, ciliate.
8 (9) Notogastral heterotrichy: the 17 pairs of setae are of two different types: 6 pairs (c_3, cp, h_3, h_4, p_3, p_4) setiform, smooth, shorter than the rest and curved posteriorly; 11 pairs rigid, erect and ciliated on the distal half. Interlamellar setae directed anteriorly, rigid, finely ciliate, much longer than lamellar setae. A: 228—240 μm; NL: 384—420 μm. — Brazil (Fig. 4) **Protophthiracarus brasiliensis** PÉREZ-IÑIGO et BAGGIO, 1980
9 (8) Notogastral homotrichy: the 17—21 pairs of setae are all similar; setiform, smooth or finely ciliate.
10 (11) Sensillus spatulate, distal half finely ciliate, a little shorter than distance between interlamellar setae. 21 pairs of long, erect, ciliate notogastral setae. A: 269—293 μm; NL: 525—575 μm; NH: 412—450 μm. — Chile (Figs 7—8) **Notophthiracarus chilensis** BALOGH et MAHUNKA, 1967
11 (10) Sensillus filiform, apical part finely ciliate; directed first laterally and posteriorly, longer than distance between interlamellar setae. A: 231 μm; NL: 434 μm; NH: 283 μm. — Peru (Figs 9—10) **Neophthiracarus incredibilis** NIEDBAŁA, 1982
12 (7) Interlamellar setae short, not longer than lamellar setae.
13 (14) Sensillus long, setiform, much longer than the aspidial setae; apidal part finely ciliate. 17 pairs of medium long notogastral setae, distally ciliate. A: 303 μm; NL: 632 μm. — Peru (Fig. 11) **Steganacarus ventosus** HAMMER, 1961
14 (13) Sensillus short with fusiform or capitate head.
15 (16) Notogastral heterotrichy: 6—8 pairs of setae shorter (c_3, cp, d_2, e_2, h_2, h_3, h_4, p_2), the rest of notogastral setae longer. Conspicuous neotrichy on the posterior part of notogaster: setae of this region long, flagellate. 23—28 (exceptionally 21) pairs of notogastral setae. 4 (exceptionally 3) pairs of median, 7—9 (exceptionally 6) pairs of lateral setae on the ano-adanal plates. A: 363 μm; NL: 660 μm; NH: 439 μm. — Peru (Figs 12—13) **Neophthiracarus helluonis** NIEDBAŁA, 1982

16 (15) Notogastral homotrichy: all notogastral setae short and fine. 21—22 pairs of notogastral setae. 3 (exceptionally 2) pairs of median, 5—6 pairs of lateral setae on the ano-adanal plates. A: 399 μm; NL: 781 μm; NH: 567 μm. — Peru (Figs 14—15)
Neophthiracarus excellens NIEDBAŁA, 1982

17 (6) 2 pairs of medial setae; 4—7 pairs of lateral setae on the ano-adanal plate.

18 (21) Sensillus long, setiform.

19 (20) Interlamellar setae with slightly fusiform tip; lamellar setae much shorter than interlamellar setae. 1st and 2nd lateral setae shorter than the 3rd and 4th pairs. 15 pairs of notogastral setae. Surface of notogaster with vanishing foveolae. A: 230—262 μm; NL: 442—472 μm; NH: 340—352 μm. — Costa Rica (Figs 16—17)
Phthirarica ridicula MAHUNKA, 1982

20 (19) Interlamellar setae with pointed tip; lamellar setae long, setiform, about as long as sensillus. Lateral setae of the same length. 16—17 pairs of medium length, erect notogastral setae. Surface of notogaster not foveolate. A: 315—349 μm; NL: 582—754 μm; NH: 467—480 μm. — Columbia (Figs 18—19)
Phthirarica andina P. BALOGH, 1984

21 (18) Sensillus short, fusiform.

22 (23) Interlamellar setae reduced, represented only by their alveoli. Exobothridial setae long, bristle-shaped. Lamellar and rostral setae short. 23 pairs of notogastral setae. A: 399 μm; NL: 758 μm; NH: 521 μm. — Argentina (Figs 20—21)
Neophthiracarus strigosus NIEDBAŁA, 1984

23 (22) Interlamellar setae present. Exobothridial setae short, fine.

24 (33) 5—7 pairs of lateral setae on the ano-adanal plates.

25 (26) 6—7 pairs of lateral setae. An oblique line present in the posterior half of anal plates; surface of plates with foveolae. 22 pairs of short notogastral setae. A: 408—489 μm; NL: 884—1038 μm; NH: 629—740 μm. — Argentina) Figs 22—23)
Antarctoplophora darwini MAHUNKA, 1980

26 (25) 5 pairs of lateral setae.

27 (30) Notogaster with a polygonal pattern. Notogastral setae short: distance $c_1—d_1$ thrice or more longer than setae c_1. 23—26 pairs of notogastral setae present.

28 (29) 25—26 pairs of notogastral setae present. Notogaster with a polygonal pattern, consisting of foveolae. A: 368—480 μm; NL: 656—1080 μm; NH: 464—728 μm. — Argentina (Figs 24—25) **Fuegoplophora foveoreticulata** MAHUNKA, 1980

29 (28) 23 pairs of notogastral setae present. Notogaster with a polygonal pattern, consisting of irregular, punctate fields. A: 313 μm; NL: 586 μm; NH: 323 μm. — Argentina (Figs 26—27) **Neophthiracarus incrassatus** NIEDBAŁA, 1984

30 (27) Notogaster without polygonal pattern. Notogastral setae longer: distance $c_1—d_1$ as long as, or only a little longer than setae c_1. 19—20 pairs of notogastral setae present.

31 (32) 20 pairs of notogastral setae present. Notogastral setae thin, distally flagellate. The two last pairs of lateral setae not longer than the rest of lateral setae. A: 248—280 μm; NL: 456—528 μm; NH: 316—336 μm. — Argentina (Figs 28—29)
Neoprotophthiracarus flagellatus MAHUNKA, 1980

32 (31) 19 pairs of notogastral setae present. Notogastral setae setiform, distally ciliate. The two last pairs of lateral setae much longer than the rest of lateral setae. A: 323 μm; NL: 595 μm; NH: 381 μm. — Costa Rica (Figs 30—32)
Neophthiracarus admirabilis NIEDBAŁA, 1982

33 (34) 4 pairs of lateral setae on the ano-adanal plates.

34 (35) 21—22 pairs of very short and fine notogastral setae present. Distance $c_1—d_1$ more than thrice longer than setae c_1. A: 313 μm; NL: 600 μm; NH: 379 μm. — Costa Rica (Figs 33—35) **Neophthiracarus phaleratus** NIEDBAŁA, 1982

35 (34) 18—20 pairs of medium long notogastral setae present. Distance $c_1—d_1$ at most twice longer than setae c_1. Three very similar species.

36 (39) Aspidial setae short: distance *in—in* twice longer than interlamellar setae.

37 (38) Notogastral heterotrichy: 6 pairs of notogastral setae (c_3, *cp*, e_2, h_2, h_3, h_4) shorter than the rest of notogastral setae. A: 250—346 μm; NL: 432—605 μm; NH: 288—432 μm. — Venezuela (Figs 36—38) **Protophthiracarus diazae** OJEDA, 1985

38 (37) Notogastral heterotrichy absent. A: 217—291 μm; NL: 430—533 μm; NH: 295—385 μm. — Columbia (Figs 39—40) **Sturmacarus espeletiae** P. BALOGH, 1984

39 (36) Aspidial setae longer: distance *in—in* only a little longer than interlamellar setae.

40 (41) Notogastral setae rodlike, on the distal part sparsely ciliate. A: 248—264 μm; NL: 448—520 μm; NH: 300—344 μm. — Argentina (Figs 41—42)
Neoprotophthiracarus equisetosus MAHUNKA, 1980

41 (40) Notogastral setae setiform, smooth.

42 (43) Notogastral setae long, fine, almost flagelliform. Surface of notogaster with a very fine structure composing dense, short, longitudinal lines. A: 349 μm; NL: 590 μm; NH: 431 μm. — Columbia (Figs 43—44) **Sturmacarus hirtus** P. BALOGH, 1984

43 (42) Notogastral setae medium long, setiform. Surface of notogaster without fine structure composing dense, short, longitudinal lines. A: 219—290 μm; NL: 415—605 μm. — Chile (Figs 45—47)
Neophthiracarus shiptoni SHEALS et MACFARLANE, 1966

44 (1) Ano-adanal plates each with 5 pairs of setae or alveoli.

45 (64) Interlamellar setae erect and usually much longer and thicker than lamellar setae.

46 (55) Two posterior pairs of lateral setae reduced, minute or absent.

47 (50) Notogastral setae heterotrichous: setae c_3, cp, d_2, e_2, h_3, p_2 and p_3 much shorter; remaining setae long, sometimes flagellate.

48 (49) The longer notogastral setae flagellate, very long. Sensillus with short stalk. Prodorsum laterally foveolate. Yellowish brown with patches of bluish gray. A: 338 μm. — South Argentina (Figs 49—50)
Phthiracarus feideri BALOGH et CSISZÁR, 1963

49 (48) The longer notogastral setae long, curved but not flagellate. Sensillus with longer stalk. Prodorsum laterally smooth. Yellowish brown. A: 700 μm. — Juan Fernandez Isl. (Fig. 48) **Phthiracarus maculatus** TRÄGARDH, 1931

50 (47) Notogastral heterotrichy absent: no difference in the length of notogastral setae.

51 (52) Interlamellar and lamellar setae strongly curved, forming a semicircle, with their tips bent medially. Sensillus short, clavate, rounded at the tip. Notogastral setae sickle-shaped, ciliated in the distal half of posterior side. Notogaster densely punctate. Colour black to dark gray. A: 350 μm. — South Chile (Figs 51—52)
Phthiracarus sicilicoma HAMMER, 1962

52 (51) Interlamellar and lamellar setae slightly curved, with their tips bent laterally.

53 (54) Notogaster densely foveolate. Genital and anal plates pitted. Notogaster elongated: A: 400 μm. — Chile (Tierra de Fuego) (Figs 53—54)
Steganacarus schizocoma HAMMER, 1962

54 (53) Notogaster mostly smooth, only the part adjacent to anogenital region foveolated. Genital plates foveolated. Notogaster less elongated: ratio between length and height 2: 1.6. Notogaster black. A: 302—344 μm. — Argentina (Tierra del Fuego) (Figs 55—56) **Notophthiracarus niger** MAHUNKA, 1980

55 (46) All setae on the ano-adanal plate well developed.

56 (57) Lamellar setae very long; almost as long as interlamellar setae. Sensillus setiform, long: interlamellar setae about twice longer than sensillus. Notogastral heterotrichy present: setae cp, d_2, e_2 and h_3 much shorter than the rest of setae. A: 333 μm; NL: 707 μm; NH: 460 μm. — Mexico (Figs 57—59)
Hoplophthiracarus eximius NIEDBAŁA, 1982

57 (56) Lamellar setae short and fine, much shorter than interlamellar setae.

58 (59) Notogastral heterotrichy: setae c_2, c_3, cp, d_2, e_2, h_3, p_3 and p_4 hooked, with spinules on their tip; setae c_1, d_1, e_1, h_2 and p_2 setiform but not hooked; setae h_1 and p_1 thicker than the rest of notogastral setae. A: 263 μm; NL: 493 μm; NH: 348 μm. — Jamaica (Figs 60—62) **Hoplophthiracarus pervicax** NIEDBAŁA, 1984

59 (58) Notogastral homotrichy: notogastral setae the same type.

60 (61) Sensillus setiform or bacilliform; their apical part not dilated. Notogaster finely punctulate. A: 343 μm; NL: 632 μm; NH: 465 μm. — Mexico (Figs 63—65)
Hoplophthiracarus sororius NIEDBAŁA, 1982

61 (60) Sensillus with dilated head. Notogaster with stellated or rounded foveolae.

62 (63) Setae c_2 and c_3 near each other. Notogaster with scattered, round foveolae: distance between foveolae longer than the their diameter. Notogastral setae pointed distally with fine cilia. A: 389 μm; NL: 753 μm; NH: 512 μm. — Panama (Figs 66—68)
Hoplophthiracarus latebrosus NIEDBAŁA, 1982

63 (62) Setae c_2 and c_3 not near each other. Notogaster with stellated foveolae: distance between foveolae not longer than their diameter. Notogastral setae distally slightly spatulated; with small spines. A: 194 μm; NL: 338 μm; NH: 222 μm. — Brazil (Figs 69—71) **Hoplophthiracarus dubius** NIEDBAŁA, 1982

64 (45) Interlamellar setae decumbent, similar in shape to lamellar setae, or only slightly different.

65 (78) Two pairs of medial setae on inner margin of ano-adanal plates.

66 (69) At least two pairs of lateral setae reduced; only their alveoli visible.

67 (68) Sensillus short with capitate head. Interlamellar setae setiform, smooth, with medially curved tip. Notogastral setae setiform, homotrichous, erect, with poste-

riorly curved, ciliate tip. Notogaster with pits. Two pairs of very long medial setae. Setae ad_3 very short, fine, but setiform; ad_2 and ad_1 represented only by alveoli. A: 343 μm; NL: 609 μm; NH: 395 μm. — Peru (Figs 72—73)
Phthiracarus improvisus NIEDBAŁA, 1982

68 (67) Sensillus sigmoid, resembling the neck of a swan; smooth, with pointed tip. Notogastral setae heterotrichous: setae c_1, d_1, e_1, h_1, p_1, h_2, p_2 long, erect; setae c_2, c_3, d_2, sp, e_2, h_2, h_3, p_3, p_4 short; all setae finely ciliate. Notogaster with mosaic-like sculpture. Two pairs of very long medial setae; three pairs of lateral setae short, equal in length, distinct. A: 338 μm; NL: 679 μm; NH: 484 μm. — Peru (Figs 74—76)
Phthiracarus inauditus NIEDBAŁA, 1982

69 (66) Ano-adanal setae all developed.

70 (71) Sensillus falcata, distal half lanceolate with long, pointed tip. Interlamellar setae much longer than lamellar setae. Notogastral setae curved slightly anteriorad; their distal half weakly ciliate. Surface of aspis and notogaster covered with strong foveolae bearing a central puncture. Medial setae short, lateral setae 3 to 4 times longer than anal setae. A: 178 μm; NL: 306 μm; NH: 214 μm. — Bolivia (Figs 77—78) **Phthiracarus caudatus** BALOGH et MAHUNKA, 1977

71 (70) Sensillus either very short, fusiform, or extremely long, slightly curved and distally slightly incrassate; never lanceolate with long, pointed tip.

72 (73) Sensillus short, fusiform, with obtuse tip. Notogastral setae erect, sparsely ciliate. Notogaster densely punctulate. Lateral setae close to medial setae: setae ad_1 shorter than ad_2 and ad_3; medial setae longer than ad_2 and ad_3. A: 313 μm; NL: 609 μm; NH: 429 μm. — Peru (Figs 79—81) **Phthiracarus fornicarus** NIEDBAŁA, 1982

73 (72) Sensillus long, setiform, or on the apical half slightly thickened.

74 (75) Sensillus apically slightly dilated. Very small species. Aspis and notogaster with scattered punctulation. Aspidial and notogastral setae short, fine; genital and ano-adanal setae similar. A: 90—126 μm; NL: 90—126 μm; NH: 183—236 μm_3 — Cuba
Archiphthiracarus minutissimus BALOGH et MAHUNKA, 1980

75 (74) Sensillus setiform or bacilliform, apically never dilated. Larger species. A: 163—313 μm; NL: 302—609 μm.

76 (77) Ano-adanal plates broader than the genital plates. Medial setae originating far behind on the posterior part of ano-adanal plates. Sensillus straight. Notogastral setae short and robust. A: 209 μm; NL: 379 μm; NH: 227 μm. — Chile (Figs 84—86)
Phthiracarus globifer HAMMER, 1962

77 (76) Ano-adanal plates not broader than genital plates. Medial setae originating on the medial part of ano-adanal plates. Sensillus curved. Notogastral setae medium long and setiform. A: 163 μm; NL: 302 μm; NH: 194 μm. — Bolivia (Figs 87—88)
Phthiracarus serrula BALOGH et MAHUNKA, 1977

78 (65) Three pairs of median setae on inner margin of ano-adanal plates.

79 (82) The two pairs of lateral setae dilated; the three pairs of medial setae setiform, fine.

80 (81) Sensillus setiform, slightly sigmoid. Aspis in lateral view with a semicircular, high crest. Lamellar and interlamellar setae short, simple; rostral setae phylliform and longer. Anterior part of notogaster projecting far anteriorad, bearing setae c_1 and c_2. Notogastral setae phylliform with pointed tip. Notogaster with large foveolae. A: 189 μm; NL: 426 μm; NH: 250 μm. — Brazil (Figs 89—90)
Steganacarus galeatus BALOGH et MAHUNKA, 1978*

81 (80) Sensillus long, their distal half thickened, resembling a narrow spatula. Aspis with a somewhat rectangular, high crest. Interlamellar setae setiform, much longer than the setiform lamellar setae; rostral setae longer. Anterior part of notogaster with an obtuse projection. Notogaster foveolate, with granular surface. Notogastral setae large, resembling peach leaves though obtuse at the end. A: 120—150 μm; NL: 350—410 μm; NH: 180—260 μm. — Brazil (Figs 91—92)
Hoplophorella subsellata BALOGH et MAHUNKA, 1977

82 (79) At least one pair of the lateral setae setiform.

83 (84) Body peculiar: anterior part of notogaster with a large projection; lateral part with 5 large tubercles, each bearing one notogastral seta. Sensillus long, smooth. All aspidial setae short, fine, setiform. Surface of prodorsum with two pairs of obtuse carinae; surface of notogaster with two parallel ridges. Notogastral setae

* Species with four pairs of medial setae (*Steganacarus*, *Atropacarus*) not yet reported from the Neotropical Region.

setiform, fine. A: 131—152 μm; NL: 271—369 μm; NH: 161—213 μm. — Brazil (Figs 93—95) **Steganacarus ephippiger** BALOGH et MAHUNKA, 1977

84 (83) Body normal, without large projection or large notogastral tubercles.

85 (88) Notogastral setae heterotrichous: at least setae h_1, h_2, p_1 and p_2 long and finely ciliate, setae c_2, c_3, sp, d_2 and h_3 short, fine and smooth.

86 (87) Setae d_1 short fine, smooth. Ano-adanal plates with small, irregular, scattered foveolae. The second pair of lateral setae more than thrice longer than the first pair. A: 343 μm; NL: 603 μm; NH: 374 μm. — Brazil (Figs 96—98) **Hoplophorella kulczynski** NIEDBAŁA, 1982

87 (86) Setae d_1 long and finely ciliate. Ano-adanal plates with large, circular foveolae. The second pair of lateral setae less than twice longer than the first pair. A: 390—485 μm. — Brazil (Fig. 99) **Steganacarus fonseciai** PÉREZ-IÑIGO et BAGGIO, 1980

88 (85) Notogastral setae homotrichous.

89 (90) Sensillus short with very short stalk and dilated head. Interlamellar and lamellar setae fine, short, smooth. Notogastral setae short, bacilliform, rigid. Notogaster with polygonal structure. A: 278 μm; NL: 510 μm; NH: 303 μm. — Brazil (Figs 100—101) **Hoplophorella grandjeani** NIEDBAŁA, 1982

90 (89) Sensillus long, sigmoid.

91 (92) Rostral setae extremely long, four or five times longer than interlamellar setae. Notogastral setae lanceolate; the second pair of lateral setae on the ano-adanal plates of the same type. A: 173—180 μm; NL: 333—364 μm; NH: 207—216 μm. — Antilles (Figs 102—103) **Hoplophorella lanceosetoides** MAHUNKA, 1985

92 (91) Rostral setae not extremely long.

93 (94) Rostral setae strongly curved inward. Interlamellar setae long, spatulated. A: 213—244 μm; NL: 383—477 μm; NH: 278—298 μm. — Antilles, Thailand, Oceania (Tahiti, Tonga) (Fig. 105) **Hoplophorella scapellata** AOKI, 1965

94 (93) Rostral setae never curving inward.

95 (96) Notogastral setae medium long, broadened distally, spoon-shaped; the widest part at most 1/3 the length of setae. Notogaster foveolate, but the foveolae are indistinct, small. A: 172—209 μm; NL: 336—426 μm; NH: 172—252 μm. — Antilles, Florida (Fig. 106) **Hoplophorella floridae** JACOT, 1933

96 (95) Notogastral setae lanceolate or blade-shaped, never spoon-shaped.

97 (98) Interlamellar setae blade-shgped. Notogastral setae short, rigid, blade-shaped. A: 175 μm; NL: 406 μm; NH: 288 μm. — Peru (Figs 107—108) **Steganacarus stilifer** HAMMER, 1961

98 (97) Interlamellar setae setiform.

99 (100) Sensillus slightly widening at the distal part. Notogastral setae blade-shaped. A: 197—205 μm; NL: 388—410 μm; NH: 250—259 μm. — Paraguay (Figs 109—110) **Steganacarus lanceoseta** BALOGH et MAHUNKA, 1981

100 (99) Sensillus slightly narrower at the distal part. Notogastral setae setiform with gradually pointed distal part. A: 212 μm; NL: 404 μm; NH: 257 μm. — Peru (Figs 111—113) **Hoplophorella neglecta** NIEDBAŁA, 1984

ORIBOTRITIIDAE

Key to genera

1 (2) Genito-aggenital suture not developed beyond middle of plates; genital and aggenital plates fused anteriorly **Indotritia** JACOT, 1925

2 (1) Genito-aggenital suture present over the entire length of plates, therefore, genital and aggenital plates completely separated.

3 (4) Bothridial squama situated above bothridium. An incision present between anal and genital plates **Oribotritia** JACOT, 1924

4 (3) Bothridial squama situated below bothridium. No incision between anal and genital plates.

5 (6) Aspis with one lateral carina. Body posteriorly with a terminal fissure **Mesotritia** FORSSLUND, 1963

6 (5) Aspis with two lateral carinae. Body posteriorly with terminal sinus **Perutritia** MÄRKEL, 1964

Indotritia JACOT, 1925

Bothridial squama situated above bothridium. Aspis with two latera carinae. Lamellar setae originating very far posteriorly, thereby nearly forming a transverse row with interlamellar setae. Exobothridial setae reduced; only their alveoli observable. Notogaster with 14 pairs of setae. Genito-aggenital suture not developed beyond middle of plates; genital and aggenital plates fused anteriorly. Anal and adanal plates separated. Body posteriorly with sinus terminalis. 9 pairs of genital, 2 or 3 pairs of aggenital, 2 pairs of anal, and 2 pairs of adanal setae present. Palps 5-segmented. Trochenters of legs III and IV with 3 setae each, genu of leg IV with solenidion.

Type-species: *Tritia krakatauensis* SELLNICK, 1923

About 8, mostly tropical and subtropical species, one in the Neotropical Region.

— — Sensillus setiform, pointed. Anterior margin of aspis with short longitudinal lines. Notogastral setae c_3 longer than the others. 9 genital, 3 aggenital, 2 anal and 2 adanal setae. A: 412 μm; NL: 710 μm; NH: 640 μm. — Peru (Figs 114—116)
acanthophora MÄRKEL, 1964

Oribotritia JACOT, 1924

Bothridial squama situated above bothridium. Aspis with one lateral carina. Lamellar setae originating in basal half of aspis, nearly forming a transverse row with interlamellar setae. Exobothridial setae long. Notogaster with 14 pairs of setae. Both genital and aggenital, anal and adanal plates well separated. An incision between anal and genital plates present. Body posteriorly with sinus terminalis. 5—10 pairs of genital, 2—3 pairs of aggenital, 1—3 pairs of anal and 3—4 pairs of adanal setae present. Palps 5-segmented. Trochanters of legs III and IV with 3 setae each, genu of leg IV with developed solenidion.

Type-species: *Hoplophora decumana* auct., non C. L. KOCH, 1836 = *Phthiracarus berlesei* MICHAEL, 1898

More than 15 described species; partly incompletely known. One incompletely known species in the Neotropical Region.

— — Sensillus long, setiform, with flagellate tip. Lamellar setae much longer and originating far anteriorad of interlamellar setae. A: 375 μm; NL: 705 μm; NH: 550 μm. — Brazil (Fig. 117)
exilis (SELLNICK, 1923)

Perutritia MÄRKEL, 1964

Bothridial squama situated below bothridium. Aspis with two lateral carinae. Lamellae setae originating anteriorad of interlamellar setae. Distance between lamellar setae about the same as that between interlamellar setae. Exobothridial setae of medium length. Notogaster with 14 pairs of setae. Both

genital and aggenital, anal and adanal plates well separated. Incision between anal and genital plates absent. Body posteriorly with sinus terminalis. 5 pairs of genital, 2 pairs of aggenital, 1 pair of anal, 3 pairs of adanal setae present. Palps 3-segmented. Trochanters of legs III and IV with 2 setae each; genu of leg IV without solenidion.

Type-species: *P. amazonensis* MÄRKEL, 1964

Two species from South America.

Key to species

1 (2) Lateral carinae parallel. Notogastral setae of rows *e*—*p* (that os the posterior notogastral setae) shorter than setae of rows *c*—*d*. Aggenital setae extremely short or only represented by alveoli. A: 205—255 μm; NL: 325—400 μm; NH: 270—370 μm. — Peru (Figs 118—119) **amazonensis** MÄRKEL, 1964

2 (1) Lateral carinae diverging. All notogastral setae about the same length. Aggenital setae long. A: 170 μm; NL: 380 μm. — Peru (Fig. 120) **curviseta** (HAMMER, 1961)

Mesotritia FORSSLUND, 1963

Bothridial squama situated below bothridium. Aspis with one lateral carina. Lamellar setae originating anteriorad of interlamellar setae. Distance between lamellar setae about the same as that between interlamellae setae. Exobothridial setae long. Notogaster with 14 pairs of setae. Both genital and aggenital, anal and adanal plates separated. An incision between anal and genital plates absent. Body posteriorly with fissura terminalis. 6 pairs of genital, 2 pairs of aggenital, 1—2 pairs of anal and 2—3 pairs of adanal setae present. Palps 3-segmented. Trochanters of legs III and IV with 2 setae each; genu of leg IV without solenidion.

Type-species: *Mesotritia testacea* FORSSLUND, 1963

About 12 species; one in South America.

— — Sensillus short, phylliform with flattened tip. Rostral setae originating far from anterior margin of rostrum, extraordinarily long. 6 pairs of genital, 2 pairs of aggenital, 1 pair of anal and 3 pairs of adanal setae. A: 365 μm; NL: 800 μm. — Brazil (Fig. 121) **brasiliensis** (SELLNICK, 1923)

EUPHTHIRACARIDAE

Key to genera

1 (4) Genito-anal region with two interlocking triangles: one midway, one at the posterior end. Bothridial squama situated below bothridium.

2 (3) Surface of notogaster smooth. Lateral margin of aggenital-adanal region without structure. Aggenital setae originating obliquely one behind the other. Anal setae a_1 short and smooth, a_2 not longer than setae ad_1 and ad_3 **Brasiliotritia** MÄRKEL, 1964

3 (2) Surface of notogaster punctate. Lateral margin of aggenital-adanal region with undulating structure. Aggenital setae almost beside each other. Anal setae a_1 long, ciliate, as long as adanal setae. Anal setae a_2 and a_3 smooth, thin and longer than the adanal setae. Lyrifissure *iad* punctiform, behind the first triangle
Euphthiracarus EWING, 1917

4 (1) Genito-anal region only with one interlocking triangle, situated on midway. Bothridial squama situated above bothridium.

5 (6) Interlamellar setae extremely short and fine, indistinct, originating over the bothridium. Genito-aggenital plate with 4—5 genital setae. Trochanter of legs III and IV with one seta **Microtritia** MÄRKEL, 1964

6 (5) Interlamellar setae long, rigid, far from bothridium. Genito-aggenital plate with 8—9 genital setae. Trochanter of legs III and IV with 2 setae
Rhysotritia MÄRKEL and MEYER, 1959

Euphthiracarus EWING, 1917

Bothridial squama situated below bothridium. Aspis with one or two lateral carinae. Exobothridial setae of medium length or minute. Notogaster with 14 pairs of setae. Genital and aggenital, anal and adanal plates completely fused. Ventral plates with two interlocking triangles, one in the middle, one at the posterior end. Ventral incision ending in terminal fissure. 8—9 pairs of genital, 2 pairs of aggenital, 3(—5) pairs of anal and 3 pairs of adanal setae present. Anal setae a_1 long, ciliate, as long as adanal setae. Anal setae a_2 and a_3 smooth, thin and longer than adanal setae. Palps 3-segmented. Legs tridactylous. Trochanters of legs III and IV with two setae; genu of leg IV with developed solenidion.

Type-species: *Phthiracarus flavus* EWING, 1908

About 17 species; one in the Neotropical Region.

— — Sensillus setiform, finely ciliate. Aspis with two lateral carinae, upper carina stronger. All setae of aspis relatively short (unique in the genus), shorter than sensillus. Interlamellar setae curved, rostral and lamellar setae straight. Exobothridial setae minute. Setae a_2 and a_3 long, with flagellate tip. A: 368—389 μm; NL: 710—756 μm; NH: 340—352 μm. — Costa Rica (Figs 122—124)
comteae MAHUNKA, 1982

Brasiliotritia MÄRKEL, 1964

Bothridial squama situated below bothridium. Aspis with two lateral carinae. Exobothridial setae of medium length. Notogaster with 14 pairs of setae. Genital and aggenital, anal and adanal plates completely fused. Ventral plates with two interlocking triangles. Ventral incision ending in terminal fissure. 9 pairs of genital, 2 pairs of aggenital, 3 pairs of anal and 3 pairs of adanal setae present. Legs monodactylous. Palps 3-segmented. Trochanters of legs III and IV with two setae; genu of leg IV with developed solenidion. Anal setae a_1 and smooth, a_2 and a_3 not longer than setae ad_2 and ad_3. Lyrifissure *iad* absent.

Type-species: *Euphthiracarus* (*Brasiliotritia*) *brasiliensis* MÄRKEL, 1964

Three very similar species in the Neotropical Region.

Key to species

1 (2) Sensillus long, with fusiform, ciliate head, distance between rostral setae much greater than between lamellar setae. Surface of notogaster finely punctulate. One pairs of aggenital setae. A: 155—184 μm; NL: 291—320 μm; NH: 203—285 μm. — Paraguay (Figs 125—126) **dlouhyorum** MAHUNKA, 1984

2 (1) Sensillus long, setiform, with ciliate tip.

3 (4) Sensillus with pointed tip. Rostral setae much longer than interlamellar setae. Distance between rostral setae only slightly greater than that between lamellar setae. Anterior interlocking triangle of ventral plate very long. A: 210—230 μm; NL: 380—420 μm; NH: 280—320 μm. — Brazil (Figs 127—128) **brasiliensis** MÄRKEL, 1964

4 (3) Sensillus with blunt tip. Rostral setae only. Distance between rostral setae greater than between lamellar setae. Number of aggenital setae unknown. Anterior triangle of ventral plate not elongated. A: 240 μm; NL: 505 μm; NH: 375 μm. (The species needs redescription.) — Brazil **similis** (SELLNICK, 1925)

Microtritia MÄRKEL, 1964

Bothridial squama situated above bothridium. Aspis with one lateral carina. Interlamellar setae extremely fine and short, hardly visible, originating over the bothridium. Exobothridial setae very small or completely reduced. Notogaster with 14 pairs of setae. Ventral plates with one interlocking triangle situated in the middle. Ventral incision ending either in a sinus terminalis or in a terminal fissure. 4—5 pairs of genital, 0—2 pairs of aggenital, 2—3 pairs of anal and, 3 pairs of adanal setae present. Palps 3-segmented. Legs monodactylous. Trochanters of legs III and IV with one seta; genu of leg IV without solenidion.

Type-species: *Phthiracarus minimus* BERLESE, 1904

Six known species, three in the Neotropical Region.

Key to species

1 (2) Notogaster in dorsal view convex at the level of triangle. Ventral incision with a short terminal fissure. Exobothridial setae represented only by their alveoli. Sensillus setiform, smooth, very slightly dilated at tip. Aspidial setae very fine and short; mutual distance of rostral setae shorter than that of lamellar setae. 4—5 pairs of genital setae; aggenital setae absent, 2 pairs of anal alveoli (setae reduced); 3 pairs of fine adanal setae present. Lyrifissure *iad* large, rounded, situated at the level of anterior margin of triangle. A: 280 μm; NL: 520 μm; NH: 365 μm. — Brazil (Figs 130—131) **incisa** MÄRKEL, 1964

2 (1) Notogaster in dorsal view constricted at the level of triangle. Ventral incision with sinus terminalis.

3 (4) Sensillus with pointed tip and very short cilia. Distance beteen rostral setae longer than between lamellar setae. Interlamellar setae extremely short and fine situated above bothridium and hardly visible. 14 pairs of very fine, erect, somewhat curved notogastral setae. 4—5 pairs genital setae present (exemplars from tropical rainforest have 5, those from moss forest, at cca 2000 m, have 4 pairs of genital setae). Aggenital setae not visible. A: 175—215 μm; NL: 255—345 μm; NH: 220—285 μm. — Peru (Figs 132—134) **tropica** MÄRKEL, 1964

4 (3) Sensillus setiform; tip dilated with a pointed, long, transparent cap. Distance between rostral setae shorter than between lamellar setae. Interlamellar setae extremely short. 4 pairs of genital setae. Aggenital setae not visible. A: 260 μm; NL: 330 μm; NH: 245 μm. — Brazil (Fig. 135) **schusteri** MÄRKEL, 1964

Rhysotritia MÄRKEL et MEYER, 1959

Bothridial squama situated above bothridium. Aspis with 1 or 2 lateral carina. Aspidial setae long, erect, interlamellar setae the longest. Exobothridial setae of medium length or very small. Notogaster with 14 pairs of setae. Ventral incision with terminal fissure. Ventral plates with one interlocking triangle situated in the middle, 8—9 pairs of genital, 2 pairs of aggenital, 3(—5) pairs of anal and 3 pairs of adanal setae present. Lyrifissure *iad* rounded, far posteriorad of interlocking triangle. Legs monodactylous or tridactylous. Palps 3-segmented. Trochanters of legs III and IV with two setae; genu of legs IV without solenidion.

Type-species: *Hoplophora ardua* C. L. KOCH, 1841

About 8 species, but some needing redescription. 3 or 4 species in the Neotropical Region.

Key to species

1 (2) Aspis with two lateral carinae. Aspidial setae erect, distal half finely ciliate. Interlamellar setae less than half length of aspis (lateral view). Lamellar setae shorter than distance between lamellar and rostral setae. Notogastral setae short, erect apically finely ciliate. A: 170 μm; NL: 480 μm; NH: 380 μm. — Peru (Fig. 136) **peruensis** (HAMMER, 1961)

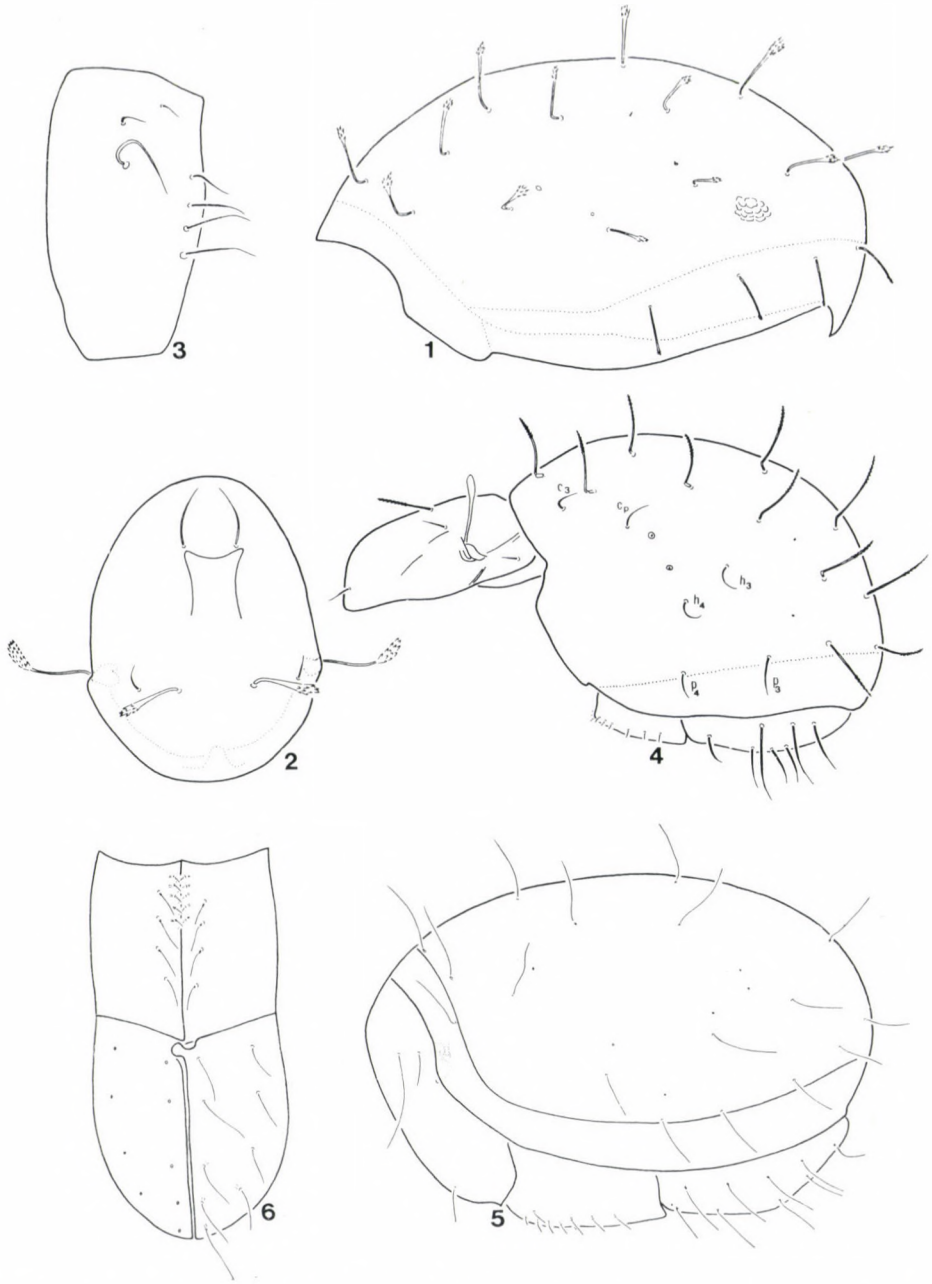
2 (1) Aspis with one lateral carina (my be bifurcate at the rostral end).

3 (4) Lateral carina simple. Sensillus short, clavate, with dilated tip. Interlamellar setae half as long as aspis, or longer. Aspidial setae erect, fine, smooth. Lamellar setae shorter than distance between lamellar and rostral setae. Notogastral setae short, fine, erect, slightly curved posteriorly. A: 205 μm; NL: 300 μm; NH: 245 μm. — Peru (Figs 137—138) **clavata** MÄRKEL, 1964

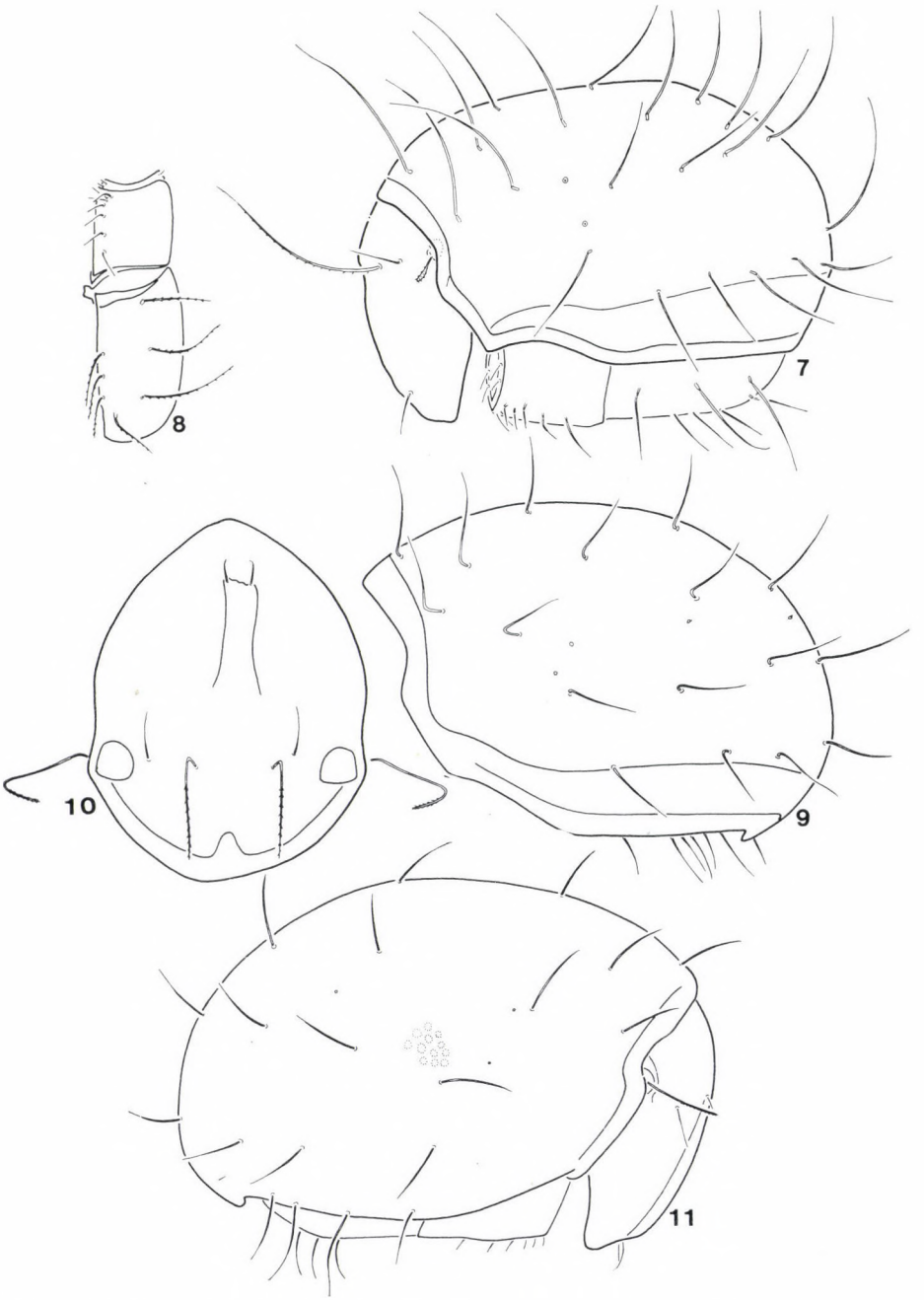
4 (3) Lateral carina bifurcate at the rostral end. Sensillus of medium length, setiform or very slightly dilated, and finely ciliate in apical half. Aspidial setae erect, finely ciliate in the apical half. Two similar species.

5 (6) Sensillus bacilliform, not dilated in apical half. Distance between interlamellar setae only a little longer than distance between rostral setae. Notogaster in lateral view high. Smaller species. A: 229—254 μm; NL: 467—516 μm; NH: 385—410 μm. — Surinam (Fig. 139) **brasiliana** MAHUNKA, 1983

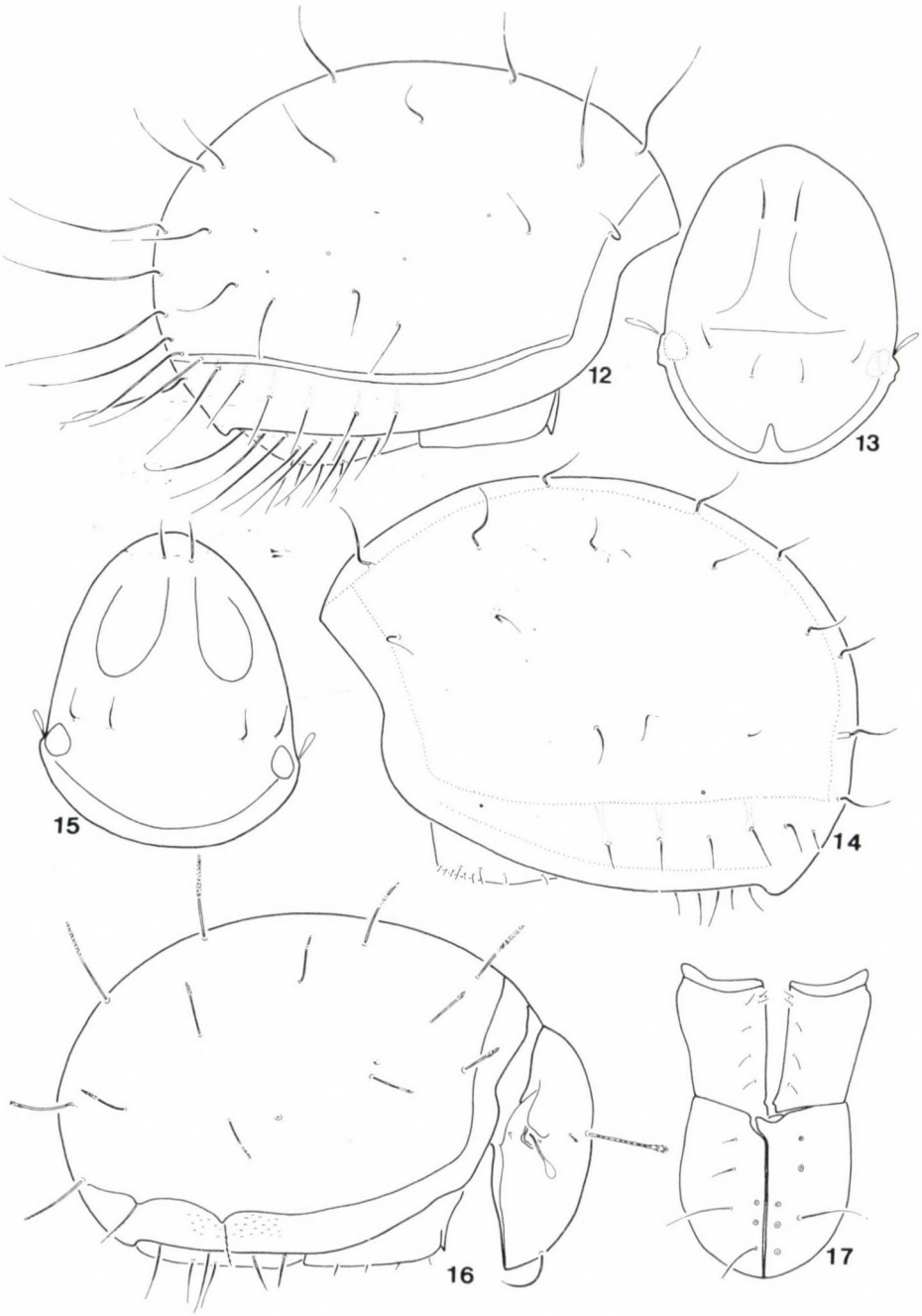
6 (5) Sensillus slightly dilated in apical half. Distance between interlamellars setae much longer than distance between rostral setae (ratio *in—in* : *ro—ro*: 62 : 40). Notogaster in lateral view relatively low. Larger species. A: 257—281 μm; NL: 548—597 μm; NH: 368—437 μm. — Mexico (Figs 140—141) **comteae** MAHUNKA, 1983



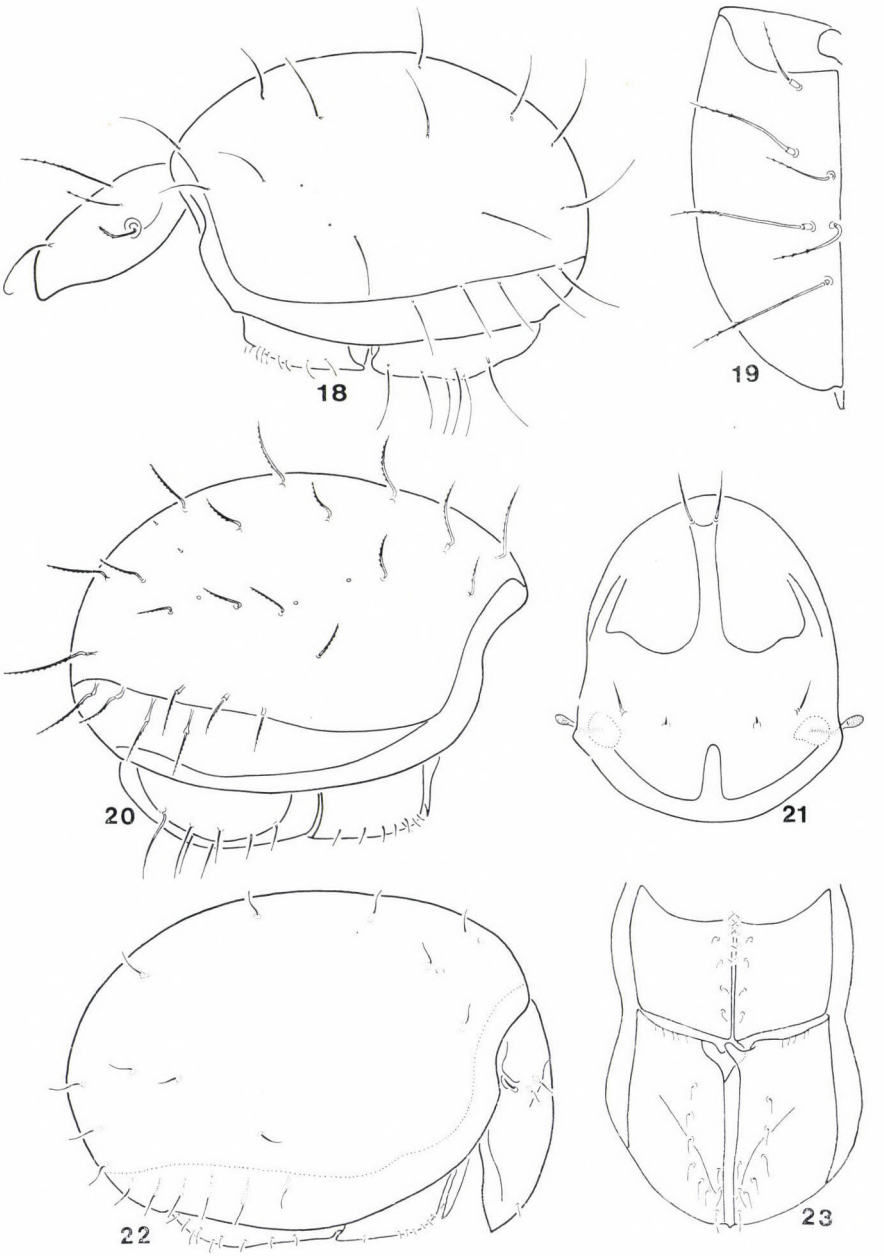
Figs 1—3. *Rafacarus rafalski* NIEDBAŁA, 1982. 1 = notogaster, 2 = aspis, 3 = ano-adanal plate. — Fig. 4 = *Protophthiracarus brasiliensis* PÉREZ-IÑIGO et BAGGIO, 1980, aspis + notogaster. — Figs 5—6. *Neophthiracarus insignis* BALOGH et CSISZÁR, 1963. 5 = aspis + notogaster, 6 = anogenital region



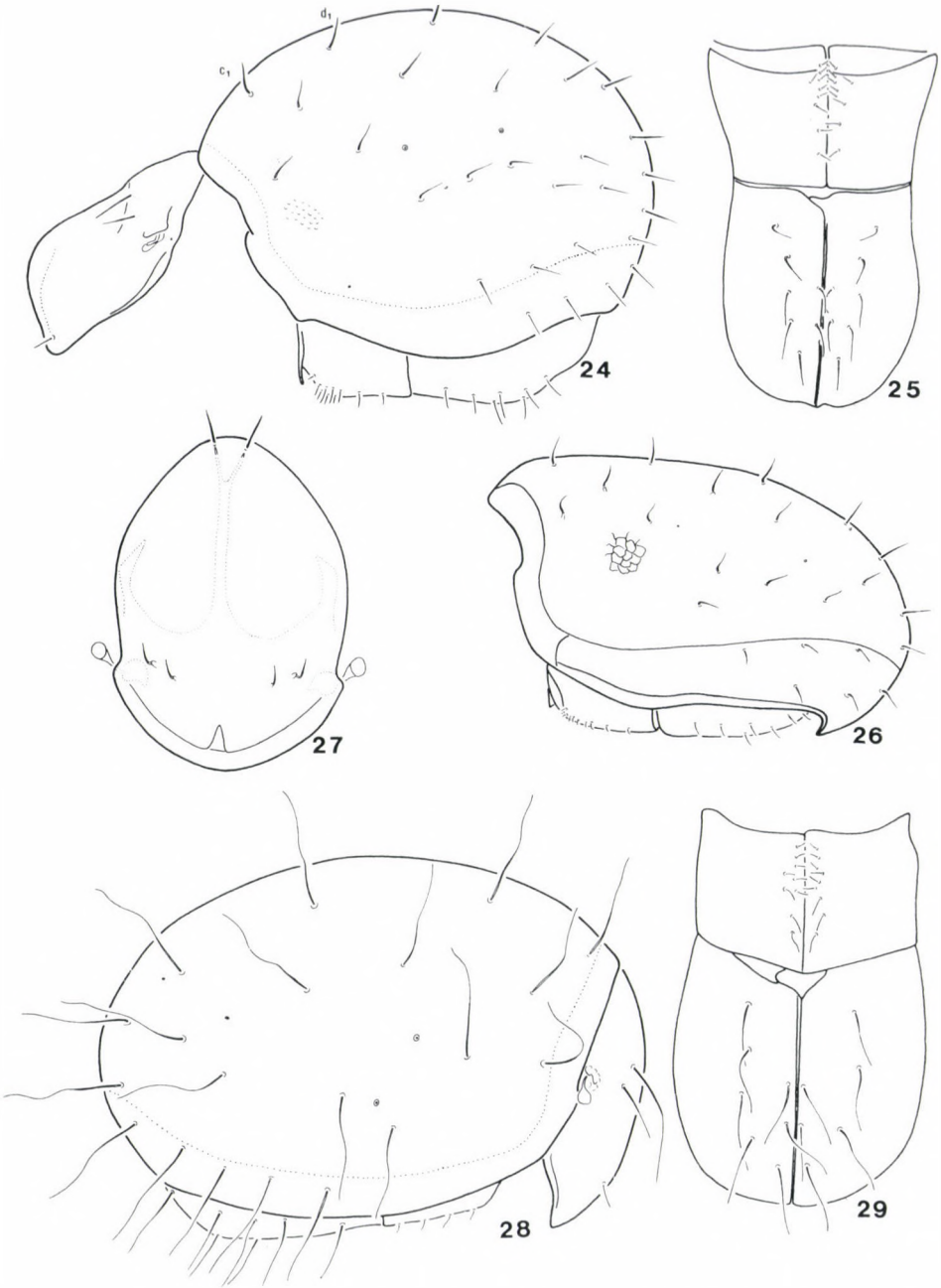
Figs 7—8. *Notophthiracarus chilensis* BALOGH et MAHUNKA, 1967. 7 = aspis + notogaster, 8 = anogenital region. — Figs 9—10. *Neophthiracarus incredibilis* NIEDBAŁA, 1982. 9 = notogaster, 10 = aspis. — Fig. 11 = *Steganacarus ventosus* HAMMER, 1961: aspis + notogaster



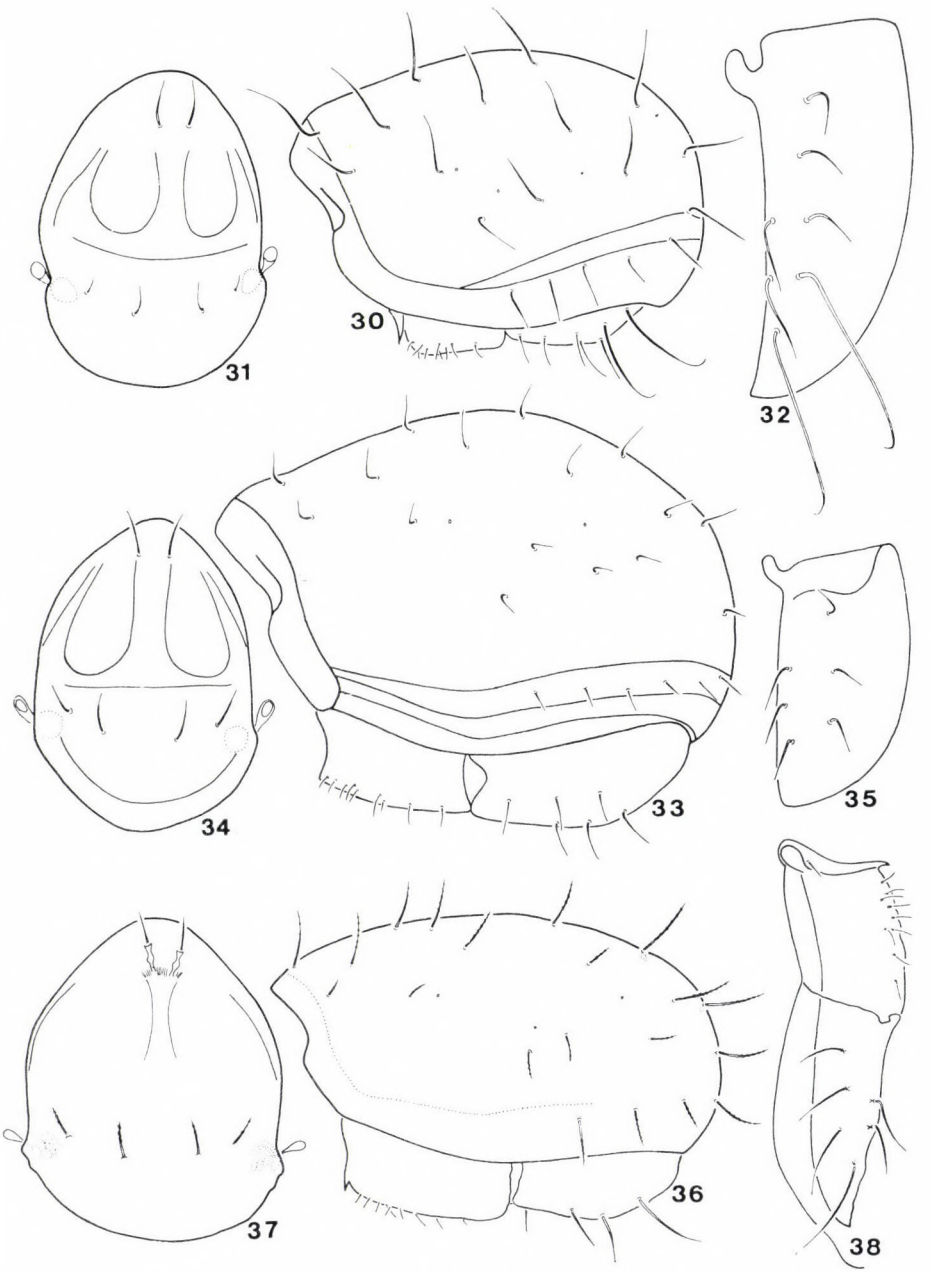
Figs 12—13. *Neophthiracarus helluonis* NIEDBAŁA, 1982. 12 = notogaster, 13 = aspis. — Figs 14—15. *Neophthiracarus excellens* NIEDBAŁA, 1982. 14 = notogaster, 15 = aspis. — Figs 16—17. *Phthirarica ridicula* MAHUNKA, 1982. 16 = aspis + notogaster, 17 = anogenital region



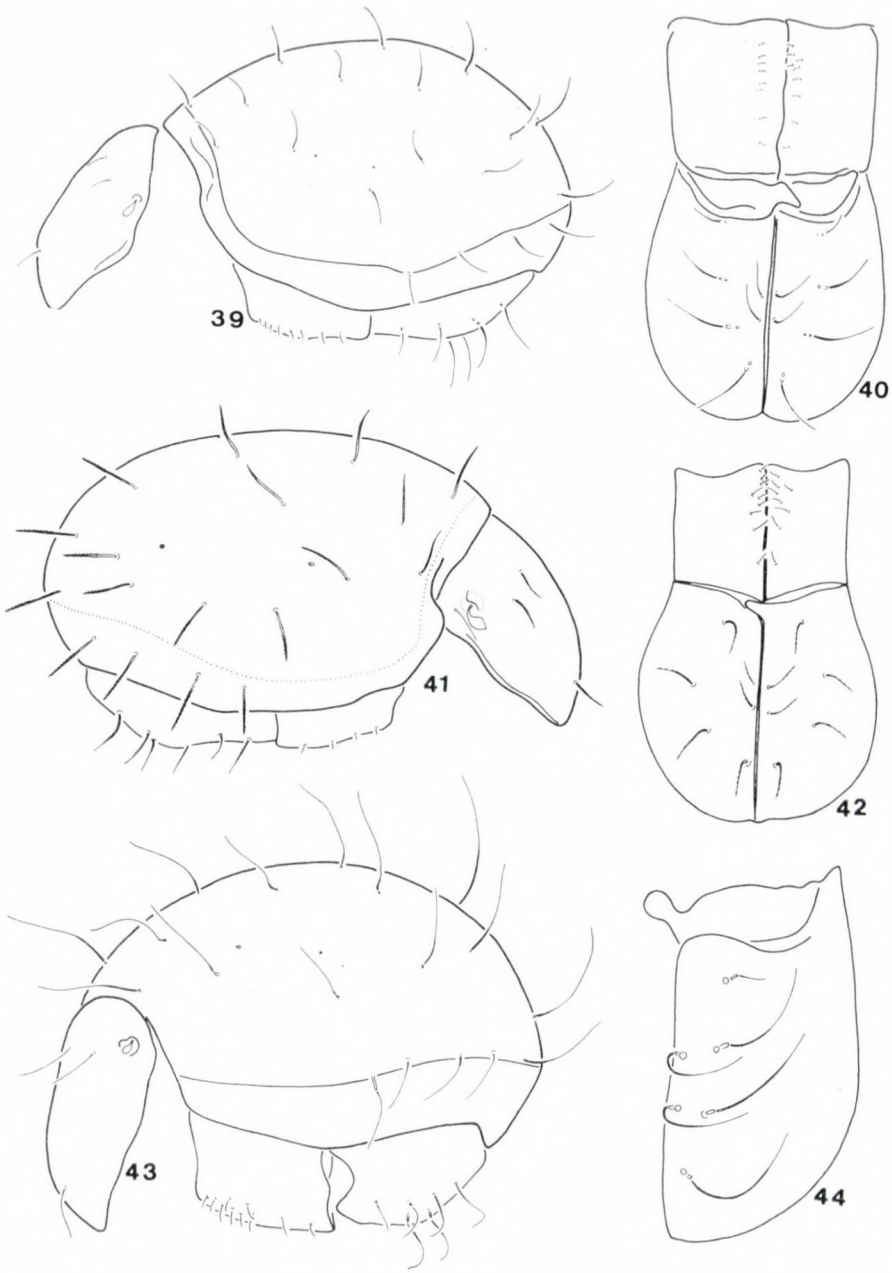
Figs 18—19. *Phthirarica andina* P. BALOGH, 1984. 18 = aspis + notogaster, 19 = ano-adanal plate. — Figs 20—21. *Neophthiracarus strigosus* NIEDBAŁA, 1984. 20 = notogaster, 21 = aspis. — Figs 22—23. *Antarctoplophora darwini* MAHUNKA, 1980. 22 = aspis + notogaster, 23 = anogenital region



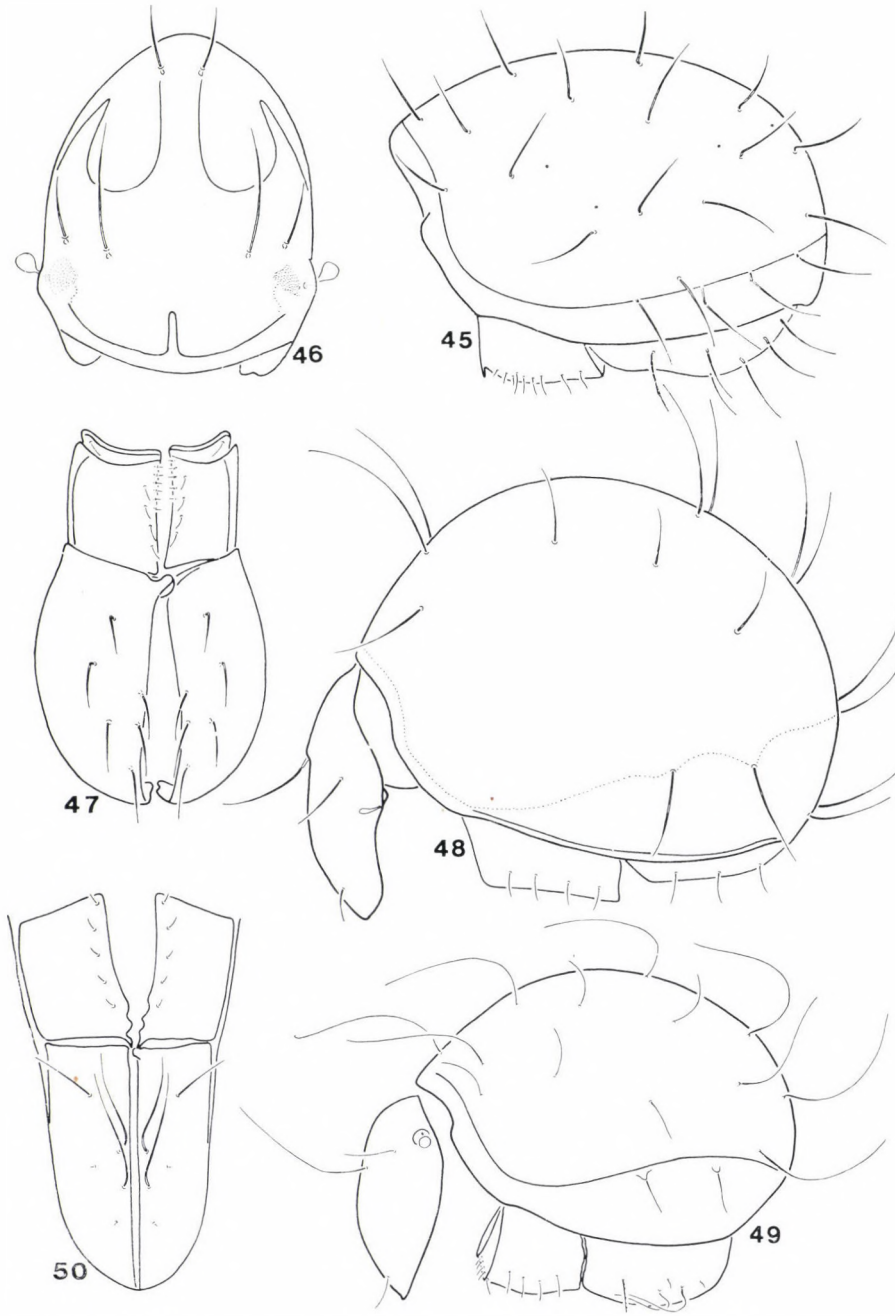
Figs 24—25. *Fuegoplophora foveoreticulata* MAHUNKA, 1980. — 24 = aspis + notogaster, 25 = anogenital region. — Figs 26—27. *Neophthiracarus incrassatus* NIEDBAŁA, 1984. 26 = notogaster, 27 = aspis. — Figs 28—29. *Neoprotophthiracarus flagellatus* MAHUNKA, 1980. 28 = aspis + notogaster, 29 = anogenital region



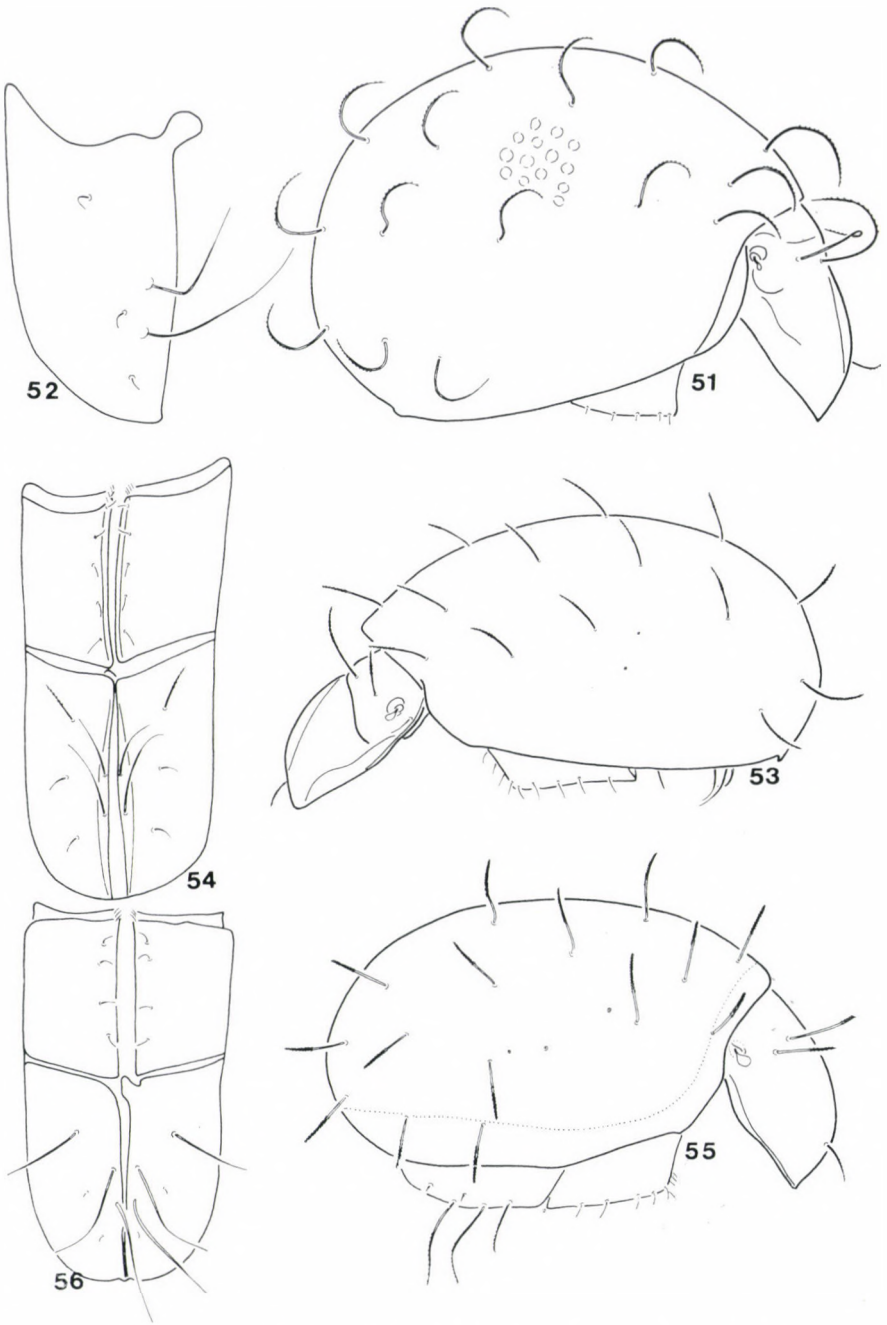
Figs 30—32. *Neophthiracarus admirabilis* NIEDBAŁA, 1982. 30 = notogaster, 31 = aspis, 32 = ano-adanal plate. — Figs 33—35. *Neophthiracarus phaleratus* NIEDBAŁA, 1982. 33 = notogaster, 34 = aspis, 35 = ano-adanal plate. — Figs 36—38. *Protophthiracarus diazae* OJEDA, 1985. 36 = notogaster, 37 = aspis, 38 = genital and anal plates



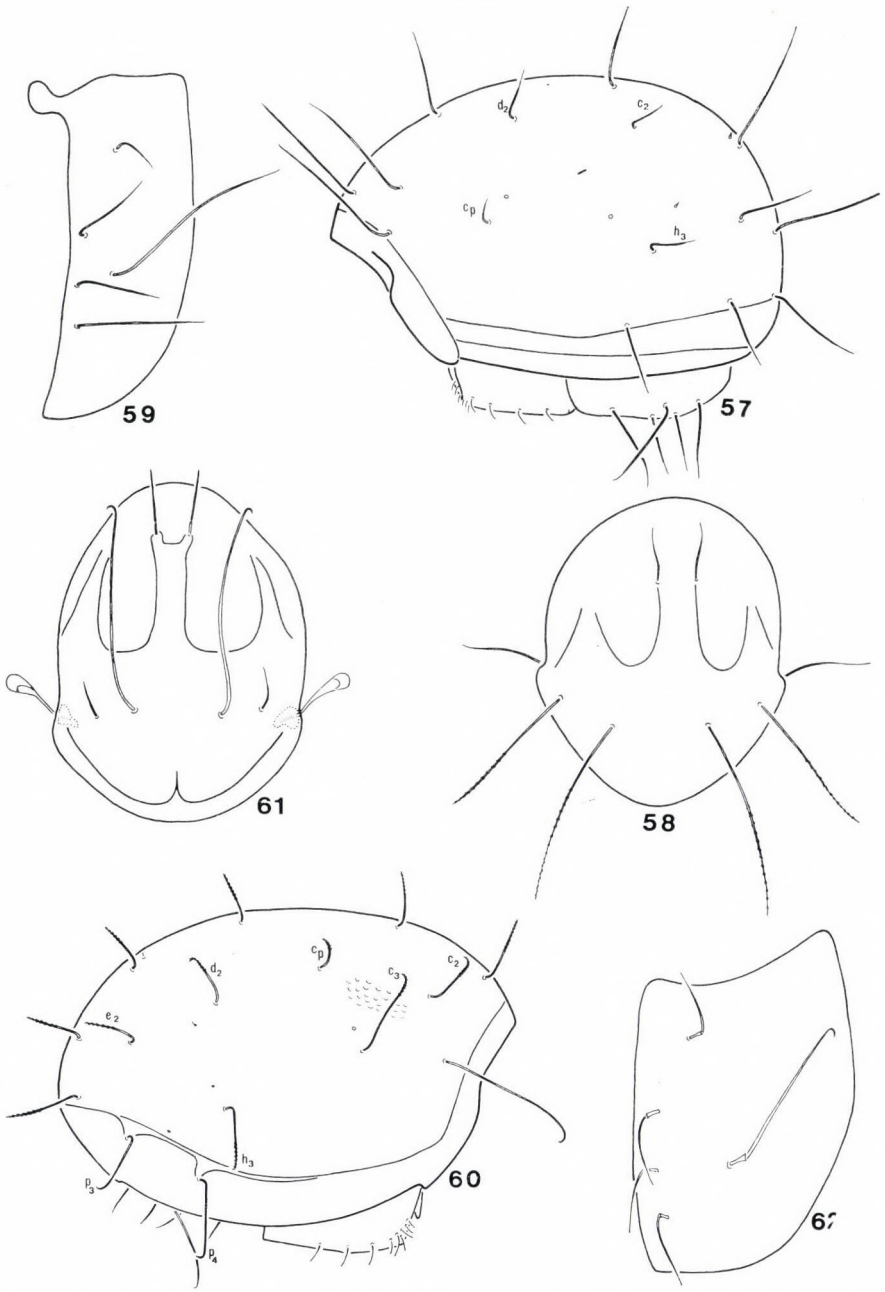
Figs 39—40. *Sturmacarus espeletiae* P. BALOGH, 1984. 39 = aspis + notogaster, 40 = anogenital region. — Figs 41—42. *Neoprotophthiracarus equisetosus* MAHUNKA, 1980. 41 = aspis + notogaster, 42 = anogenital region. — Figs 43—44. *Sturmacarus hirtus* P. BALOGH, 1984. 43 = aspis + notogaster, 44 = ano-adanal plate



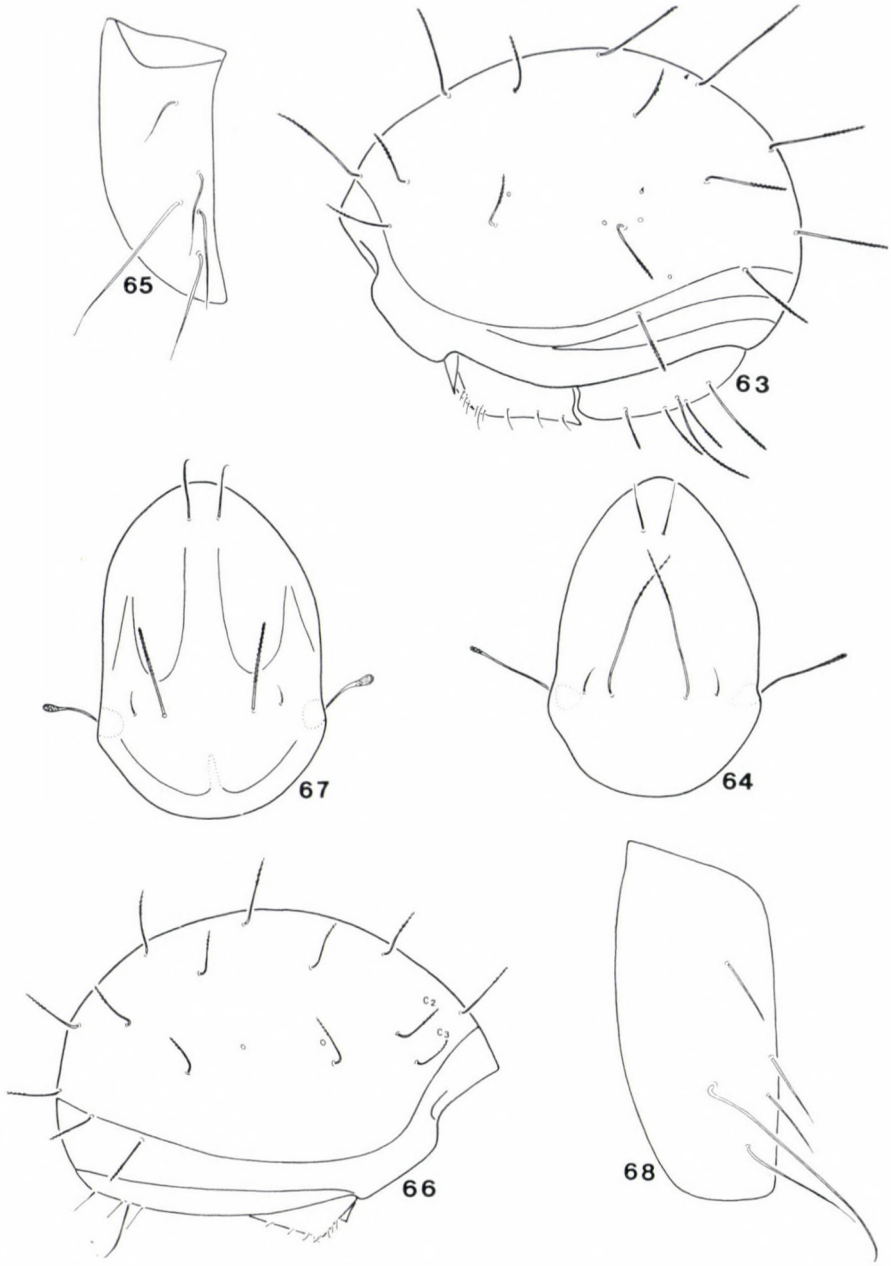
Figs 45—47. *Neophthiracarus shiptoni* SHEALS et MACFARLANE, 1966. 45 = notogaster, 46 = aspis, 47 = anogenital region. — Fig. 48 = *Phthiracarus maculatus* TRÄGARDH, 1931, aspis + notogaster. — Figs 49—50. *Phthiracarus feideri* BALOGH et CSISZÁR, 1963. 49 = aspis + notogaster, 50 = anogenital region



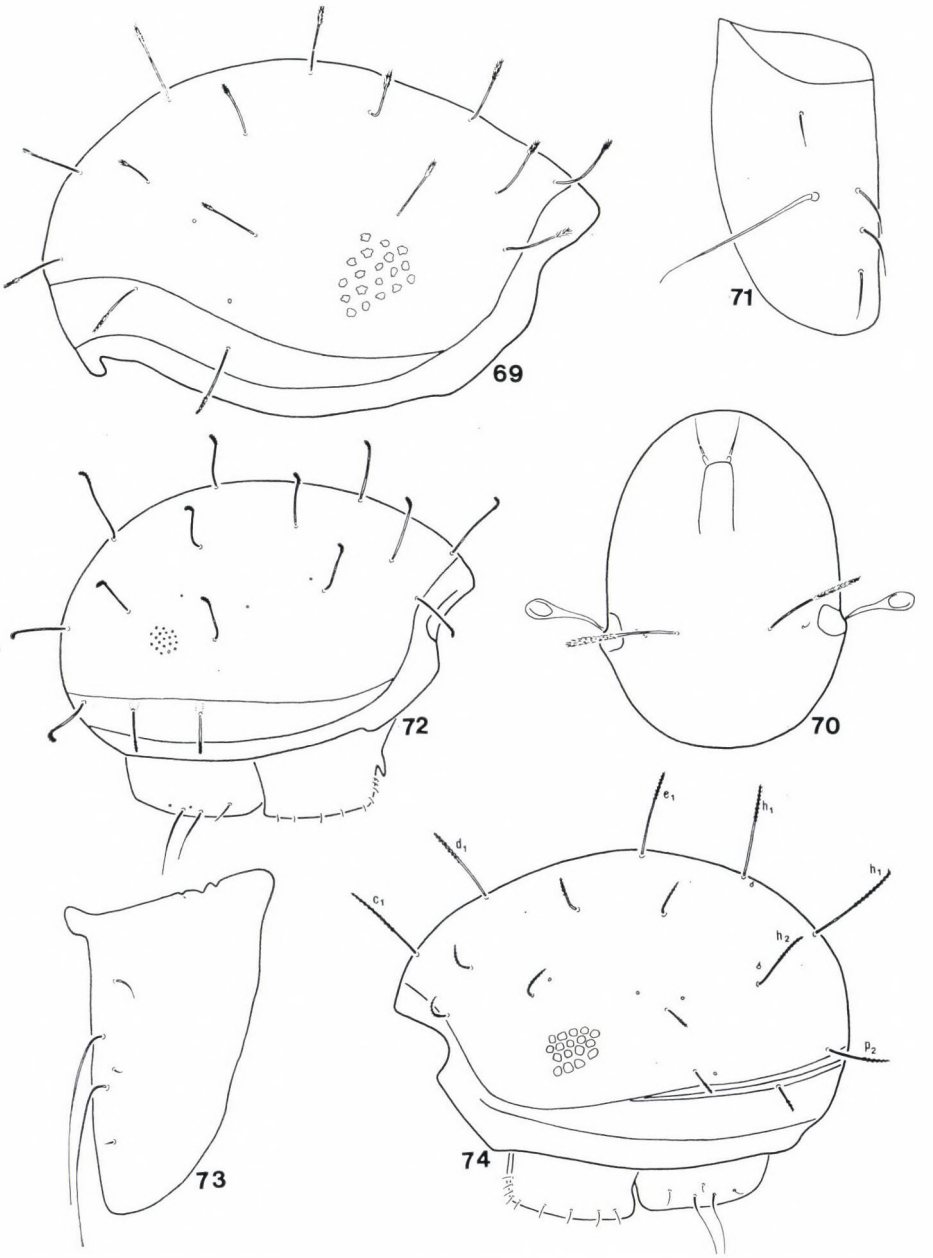
Figs 51—52. *Phthiracarus sicilicoma* HAMMER, 1962. 51 = aspis + notogaster, 52 = anoadanal plate. — Figs 53—54. *Steganacarus schizocoma* HAMMER, 1962. 53 = aspis + notogaster, 54 = anogenital region. — Figs 55—56. *Notophthiracarus niger* MAHUNKA, 1980. 55 = aspis + notogaster, 56 = anogenital region



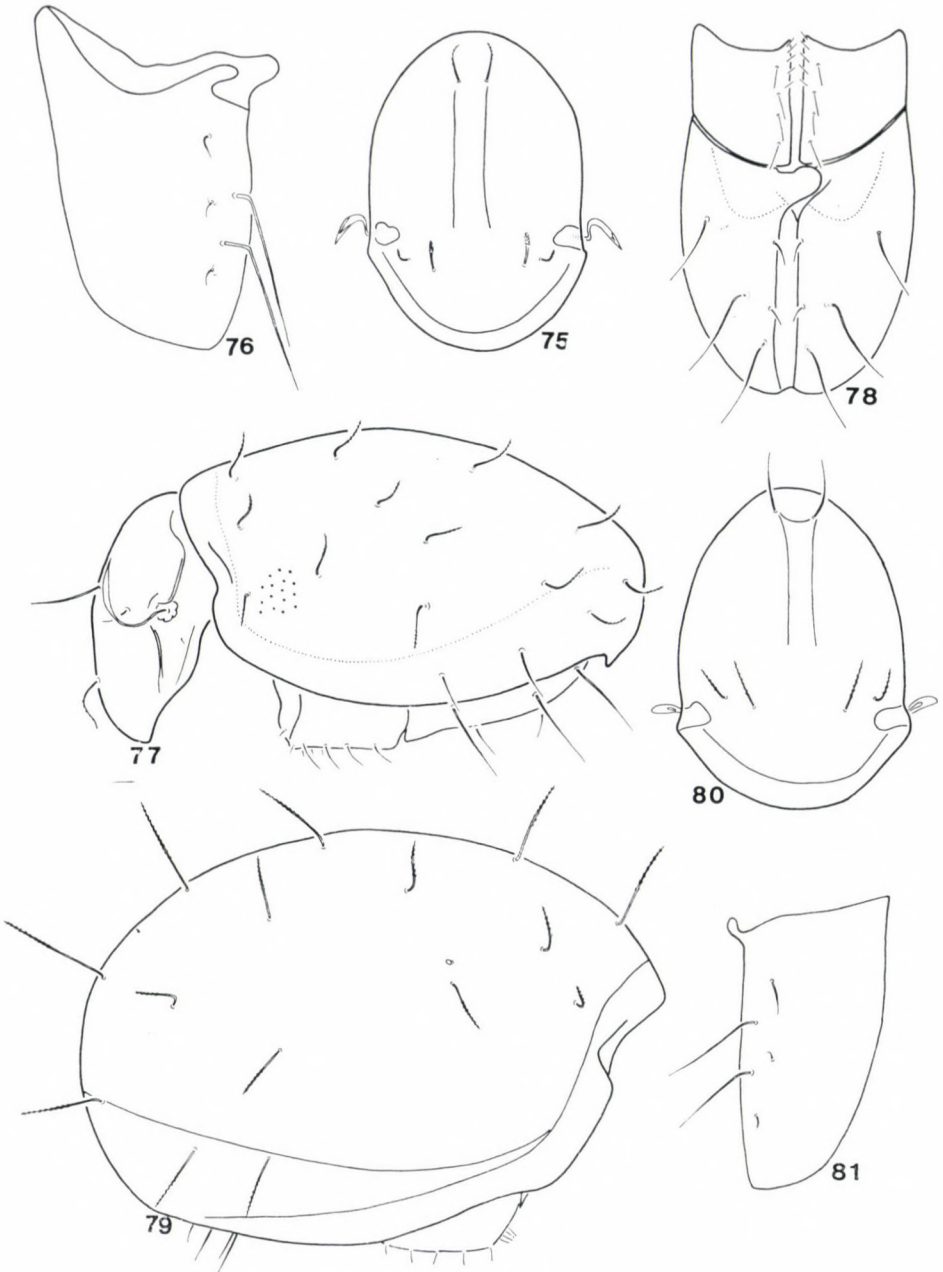
Figs 57—59. *Hoplophthiracarus eximius* NIEDBAŁA, 1982. 57 = notogaster, 58 = aspis, 59 = ano-adanal plate. — Figs 60—62. *H. pervicax* NIEDBAŁA, 1984. 60 = notogaster, 61 = aspis, 62 = ano-adanal plate



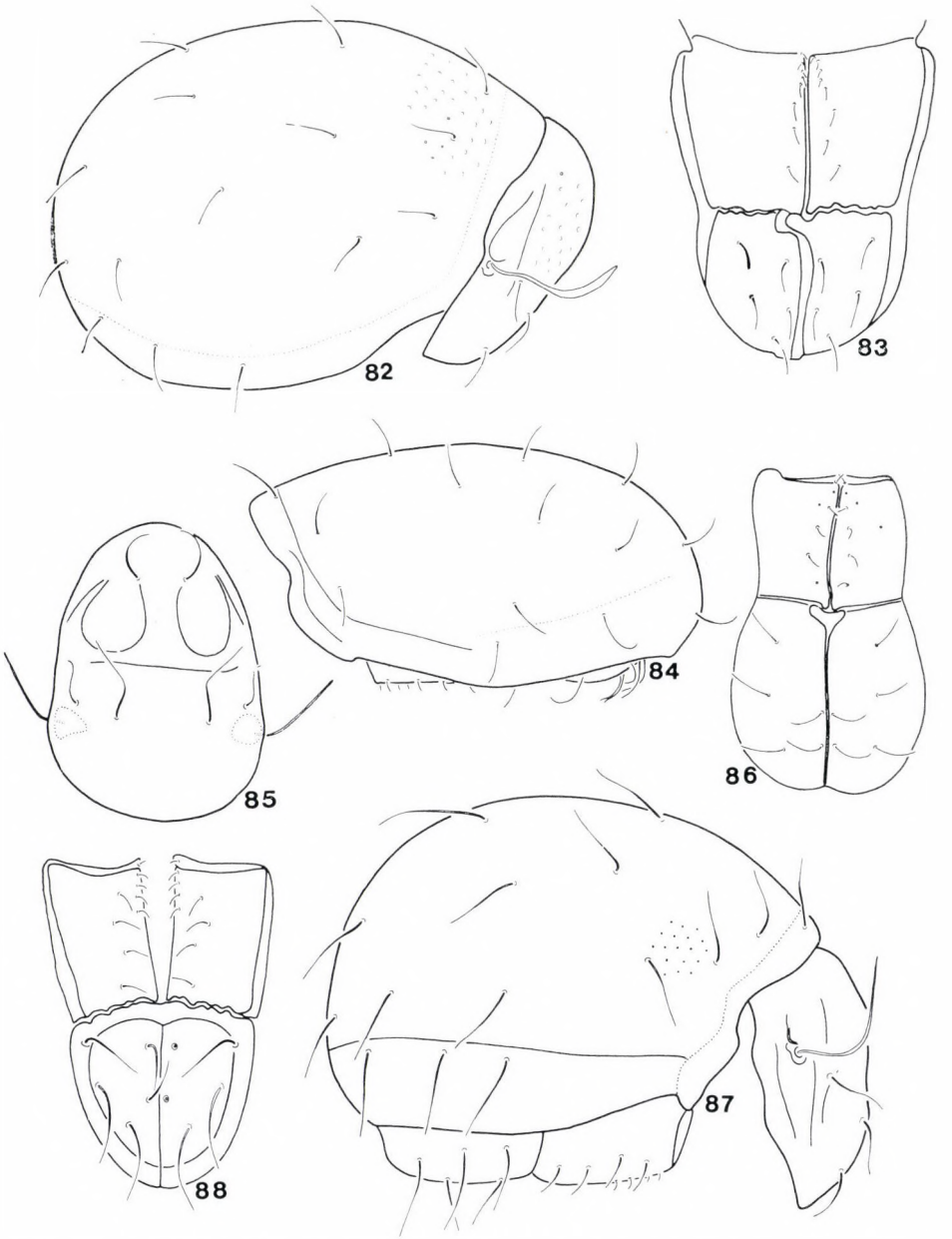
Figs 63—65. *Hoplophthiracarus sororius* NIEDBAŁA, 1982. 63 = notogaster, 64 = aspis, 65 = ano-adanal plate. — Figs 66—68. *H. latebrosus* NIEDBAŁA, 1982. 66 = notogaster, 67 = aspis, 68 = ano-adanal plate



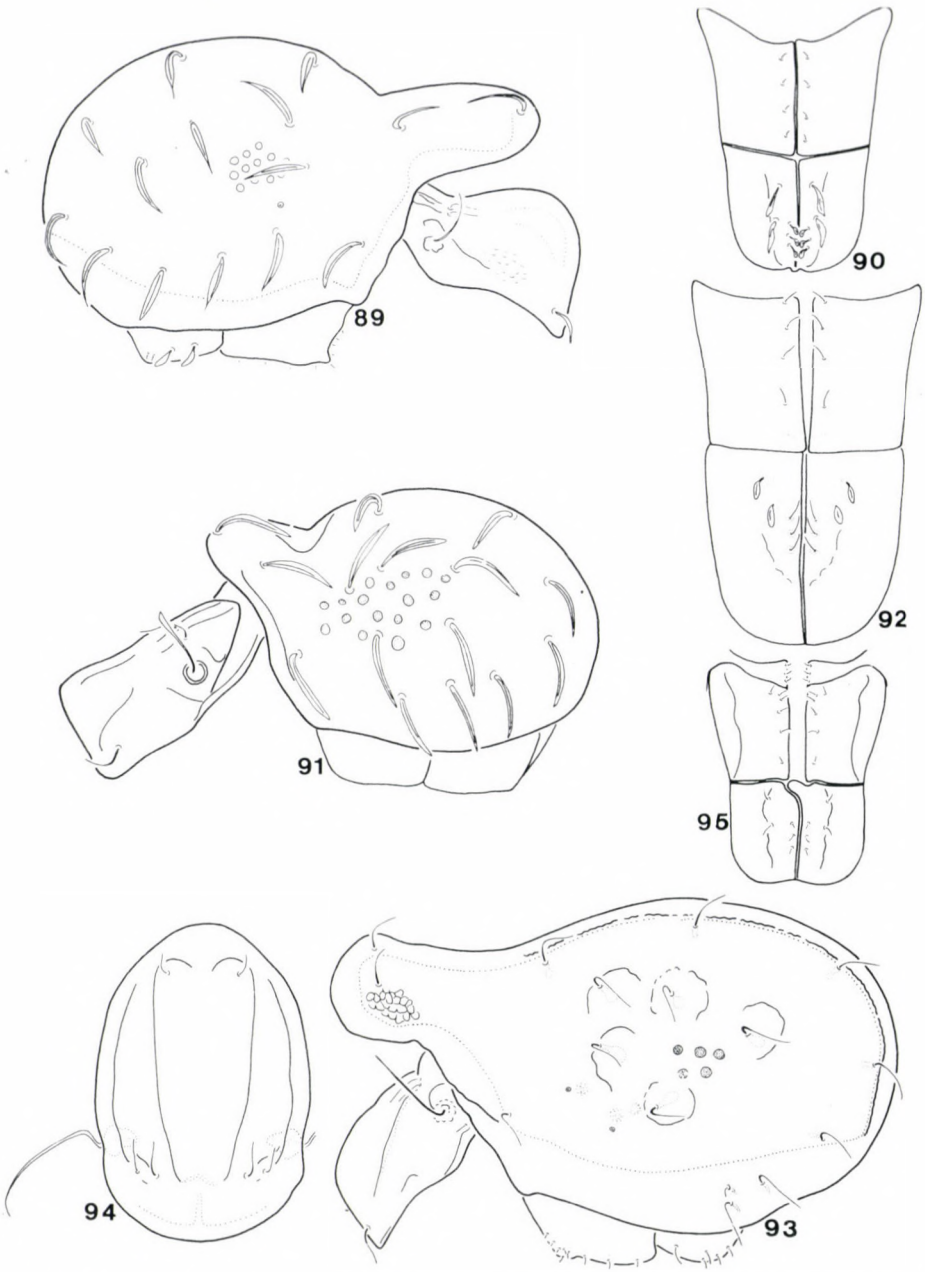
Figs 69—71. *Hoplophthiracarus dubius* NIEDBAŁA, 1982. 69 = notogaster, 70 = aspis, 71 = ano-adanal plate. — Figs 72—73. *Phthiracarus improvisus* NIEDBAŁA, 1982. 72 = notogaster, 73 = ano-adanal plate. — Fig. 74. *P. inauditus* NIEDBAŁA, 1982, notogaster



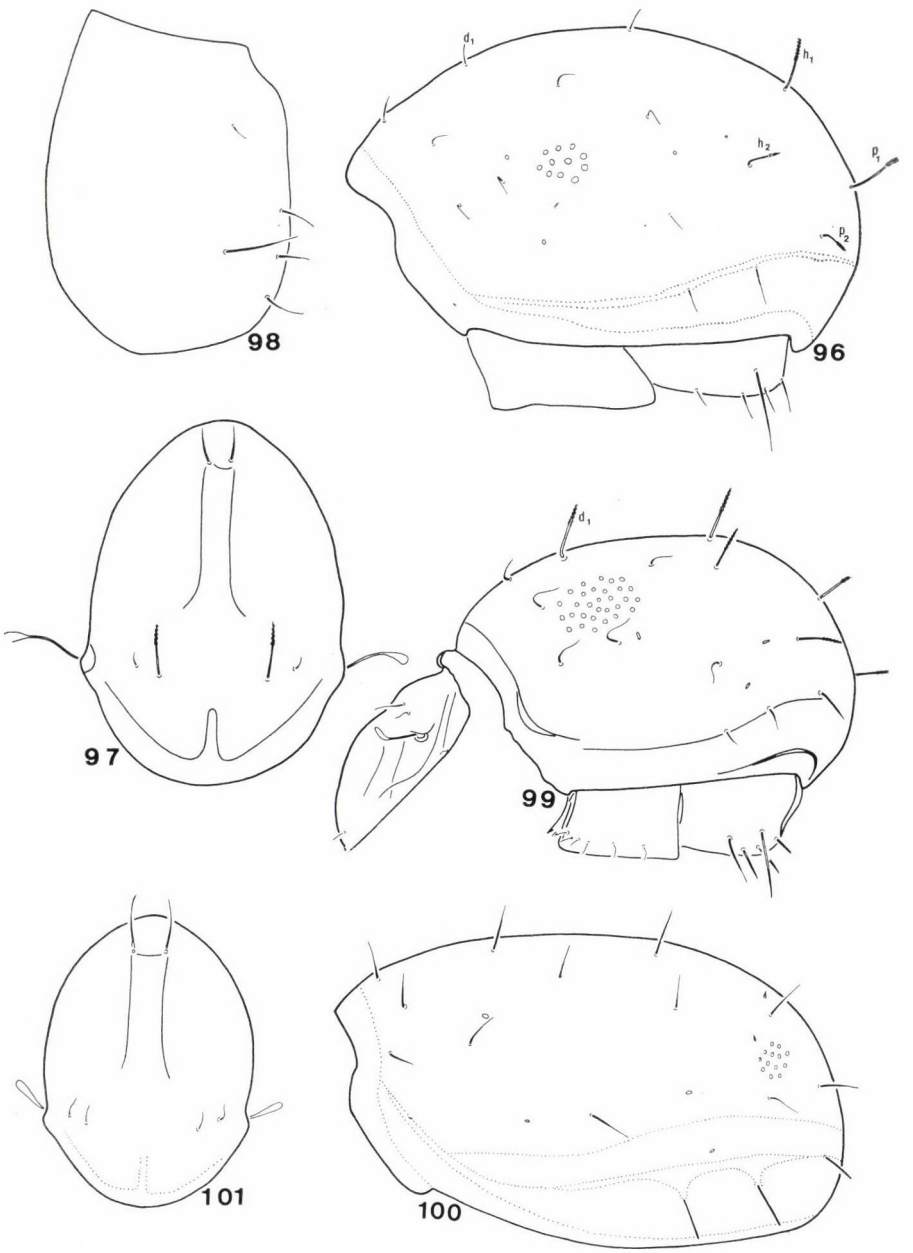
Figs 75—76. *Phthiracarus inauditus* NIEDBAŁA, 1982. 75 = aspis, 76 = ano-adanal plate. — Figs 77—78. *P. caudatus* BALOGH et MAHUNKA, 1977. 77 = aspis + notogaster, 78 = ano-genital region. — Figs 79—81. *P. fornicarius* NIEDBAŁA, 1982. 79 = notogaster, 80 = aspis, 81 = ano-adanal plate



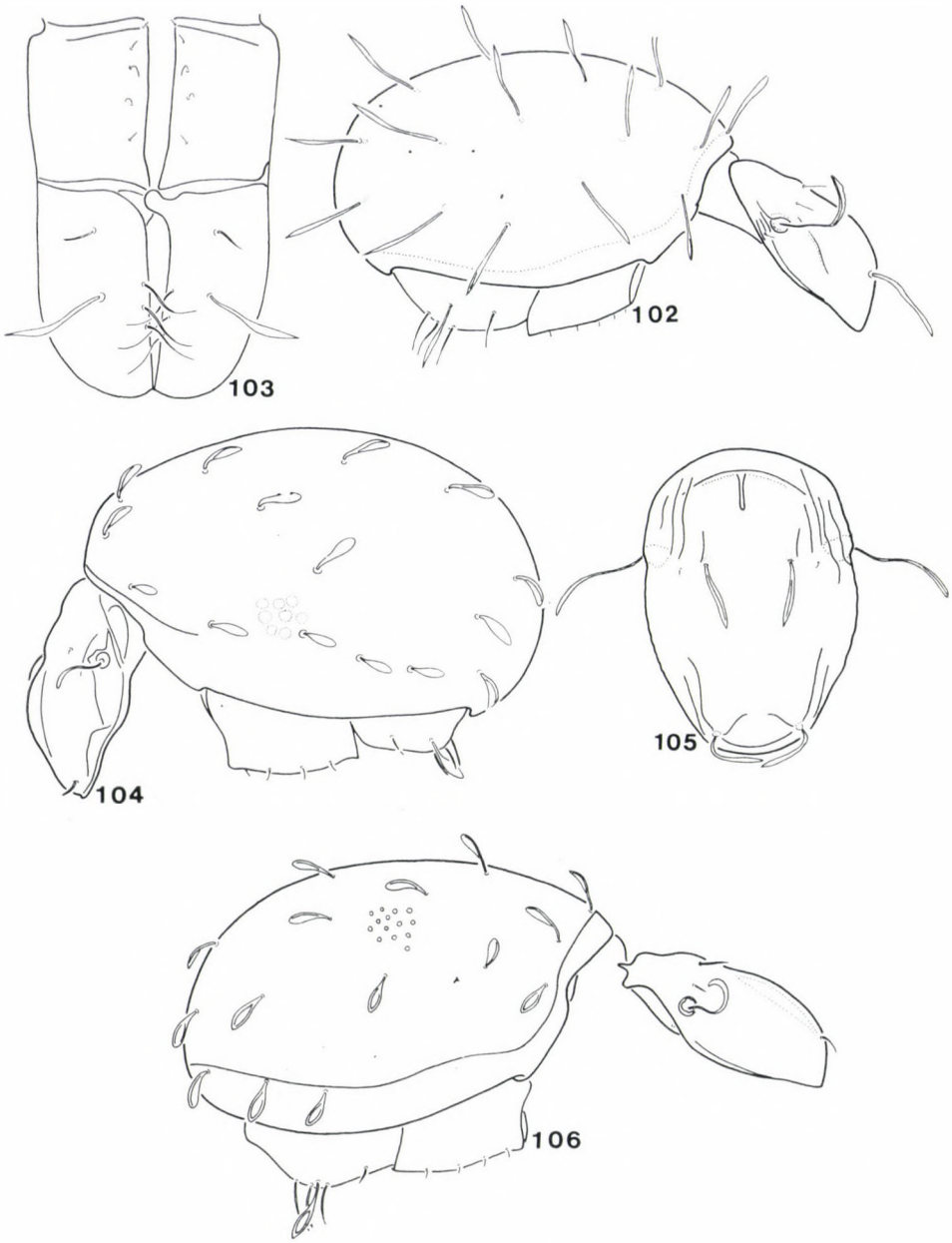
Figs 82—83. *Archiphthiracarus minutissimus* BALOGH et MAHUNKA, 1980. 82 = aspis + notogaster, 83 = anogenital region. — Figs 84—86. *Phthiracarus globifer* HAMMER, 1962. 84 = notogaster, 85 = aspis, 86 = anogenital region. — Figs 87—88. *P. serrula* BALOGH et MAHUNKA, 1977. 87 = aspis + notogaster, 88 = anogenital region



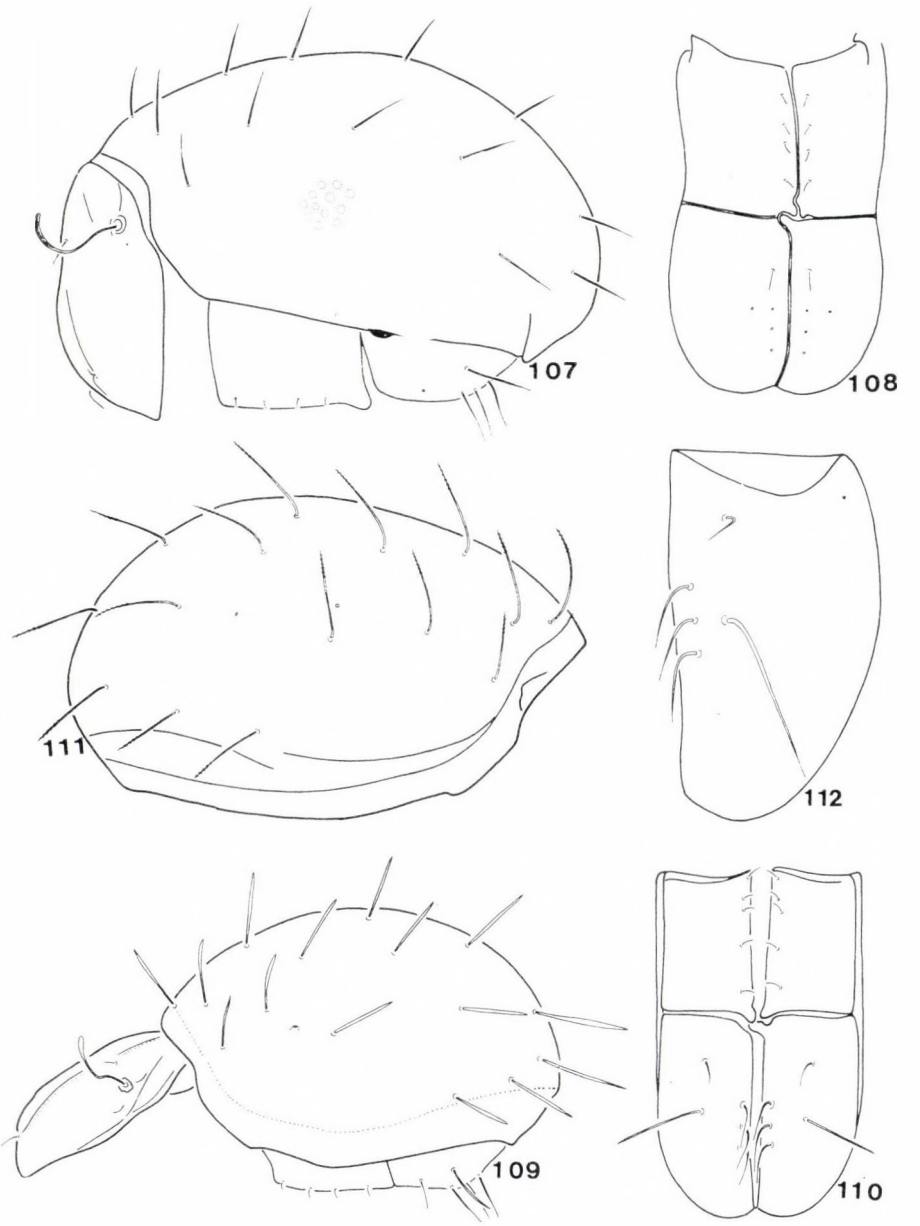
Figs 89—90. *Steganacarus galeatus* BALOGH et MAHUNKA, 1978. 89 = aspis + notogaster, 90 = anogenital region. — Figs 91—92. *Hoplophorella subsellata* BALOGH et MAHUNKA, 1977. 91 = aspis + notogaster, 92 = anogenital region. — Figs 93—95. *Steganacarus ephippiger* BALOGH et MAHUNKA, 1978. 93 = aspis + notogaster, 94 = aspis, 95 = anogenital region



Figs 96—98. *Hoplophorella kulczynski* Niedbała, 1982. 96 = notogaster, 97 = aspis, 98 = ano-adanal plate. — Fig. 99 = *Steganacarus fonseciai* Pérez-Iñigo et Baggio, 1980, aspis + notogaster. — Figs 100—101. *Hoplophorella grandjeani* Niedbała, 1982. 100 = notogaster, 101 = aspis



Figs 102—103. *Hoplophorella lanceosetoides* MAHUNKA, 1985. 102 = aspis + notogaster, 103 = anogenital region. — Figs 104—105. *H. scapellata* AOKI, 1965. 104 = aspis + notogaster, 105 = aspis. Fig. 106 = *H. floridae* JACOT, 1933, aspis + notogaster



Figs 107—108. *Steganacarus stilifer* HAMMER, 1961. 107 = aspis + notogaster, 108 = anogenital region. — Figs 109—110. *S. lanceoseta* BALOGH et MAHUNKA, 1981. 109 = aspis + notogaster, 110 = anogenital region. — Figs 111—112. *Hoplophorella neglecta* NIEDBAŁA, 1984. 111 = notogaster, 112 = ano-adanal plate

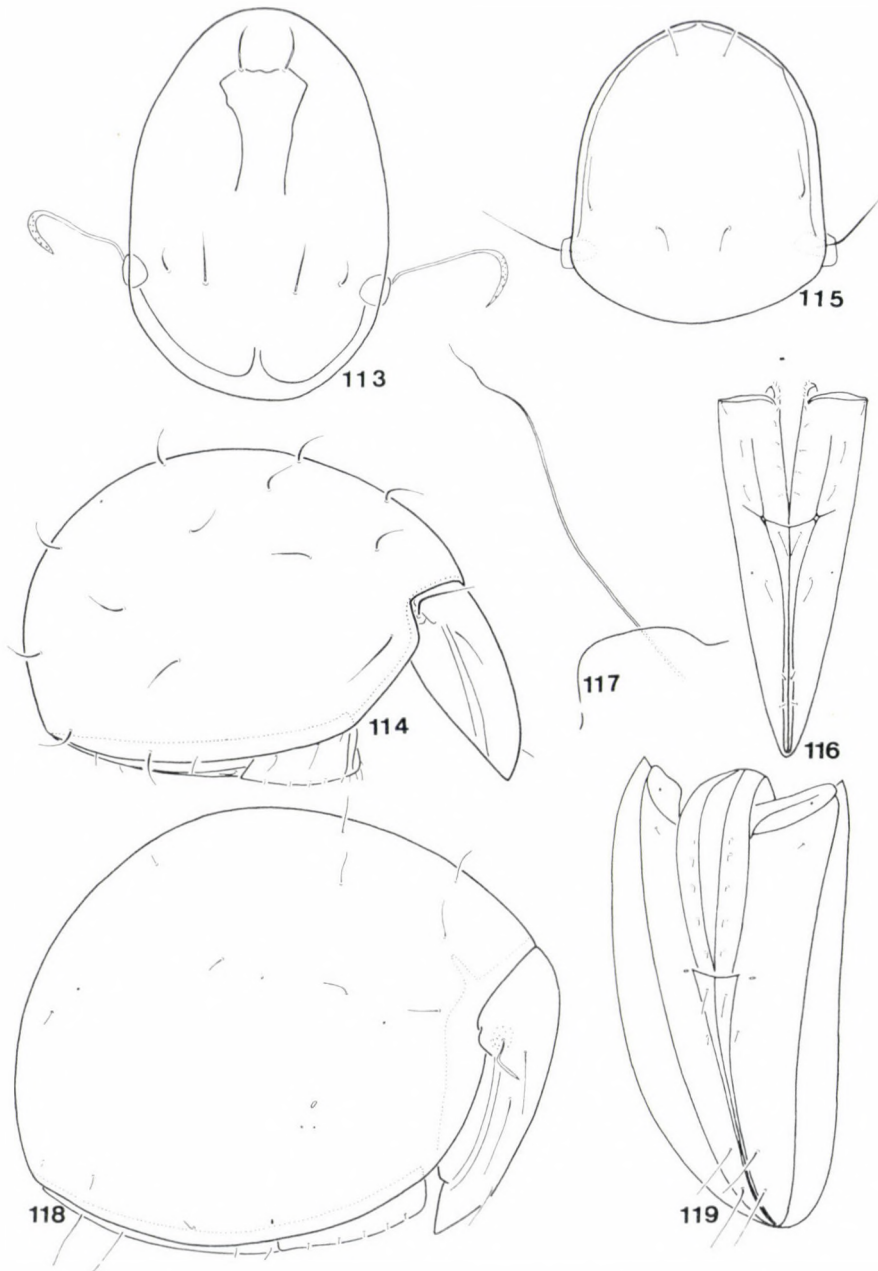


Fig. 113 = *Hoplophorella neglecta* NIEDBAŁA, 1984, aspis. — Figs 114—116. *Indotritia acanthophora* MÄRKEL, 1964. 114 = aspis + notogaster, 115 = aspis, 116 = anogenital region. — Fig. 117 = *Oribotritia exilis* SELLNICK, 1923, sensillus. — Figs 118—119. *Perutritia amazonensis* MÄRKEL, 1964. 118 = aspis + notogaster, 119 = anogenital region

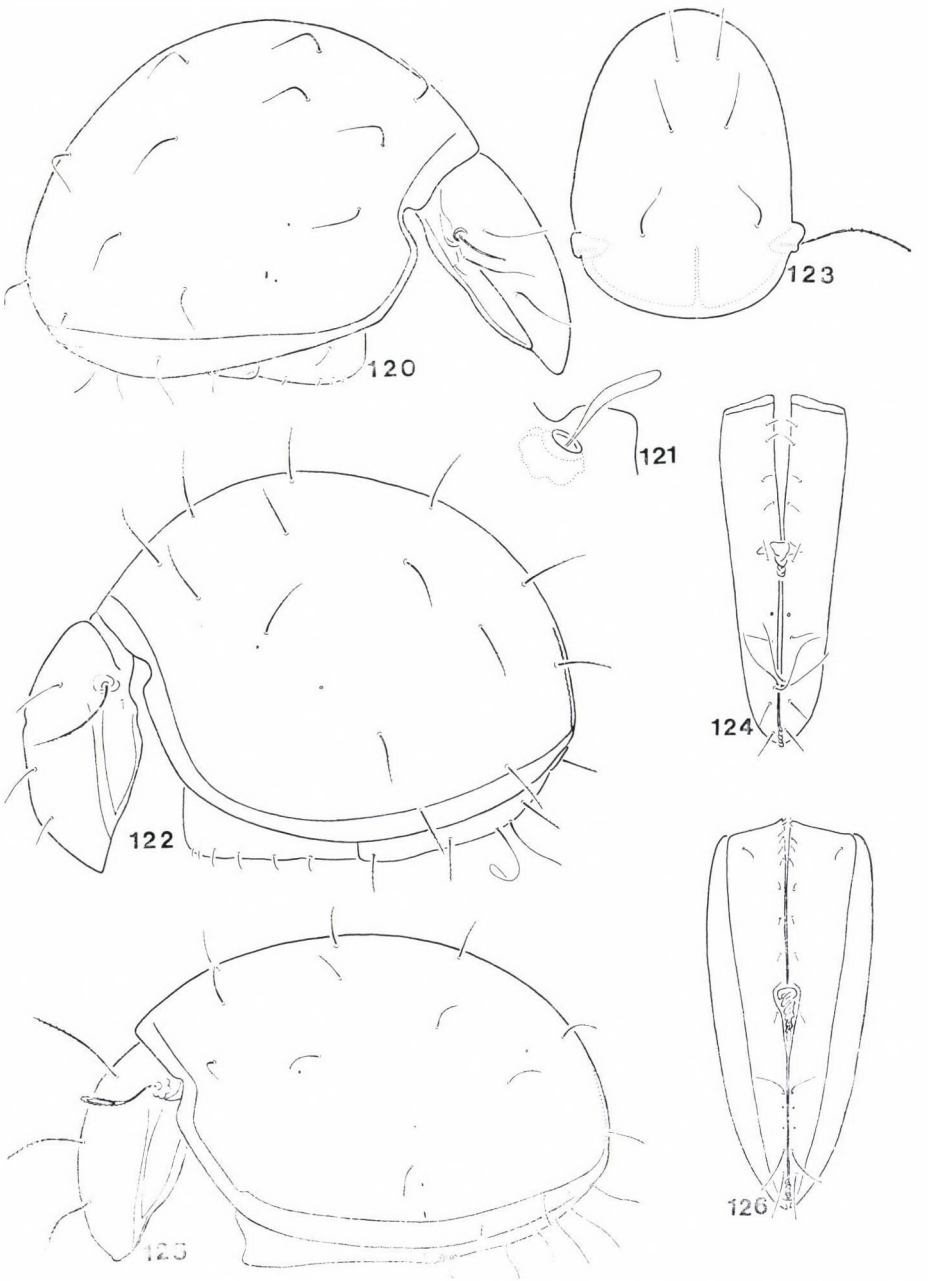
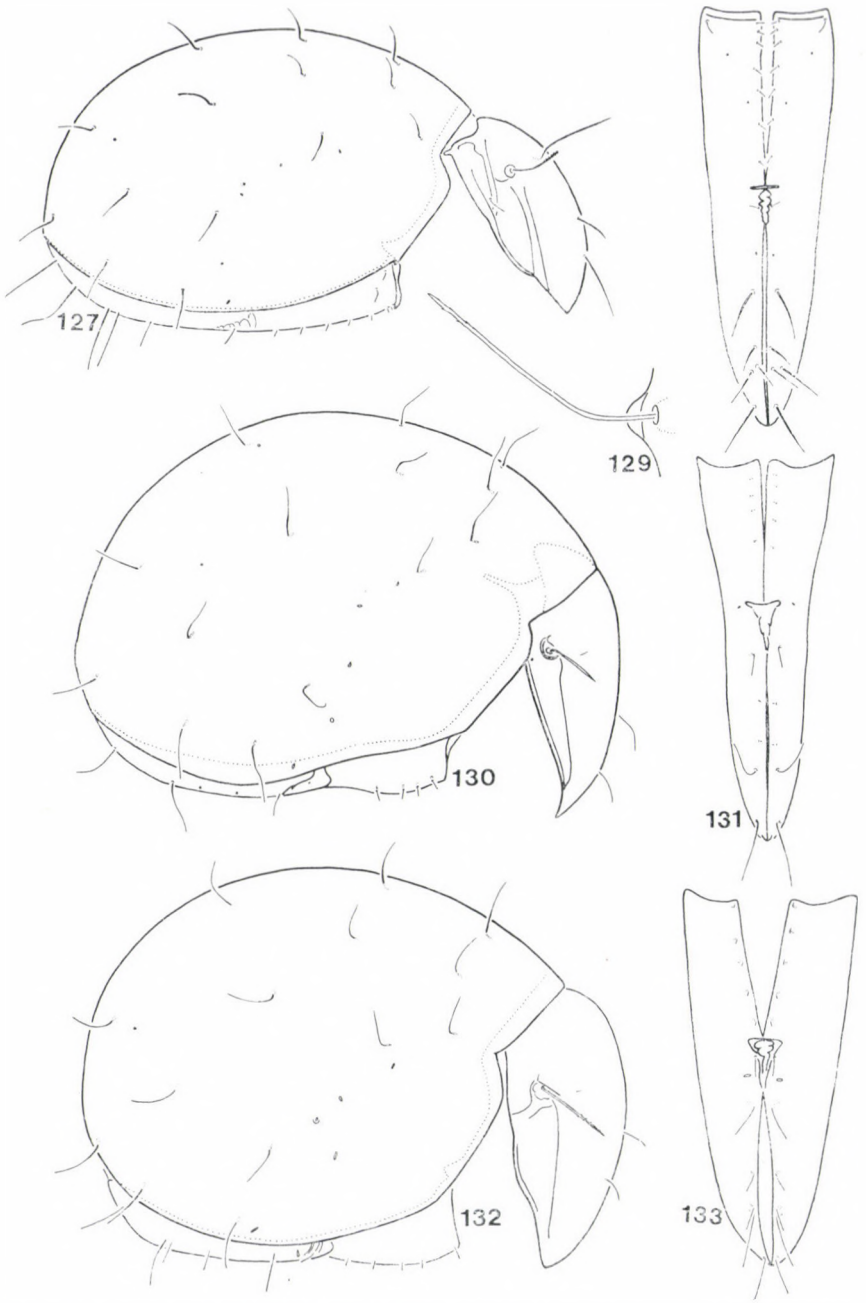


Fig. 120 = *Perutritia curviseta* (HAMMER, 1961), aspis + notogaster. — Fig. 121 = *Mesotritia brasiliensis* (SELLNICK, 1923), sensillus. — Figs 122—124. *Euphthiracarus comteae* MAHUNKA, 1982. 122 = aspis + notogaster, 123 = aspis, 124 = anogenital region. — Figs 125—126. *Brasiliotriria dlouhyorum* MAHUNKA, 1984. 125 = aspis + notogaster, 126 = anogenital region



Figs 127—128. *Brasiliotritia brasiliensis* MÄRKEL, 1964. 127 = aspis + notogaster, 128 = anogenital region, 129 = sensillus. — Figs 130—131. *Microtritia incisa* MÄRKEL, 1964. 130 = aspis + notogaster, 131 = anogenital region. — Figs 132—133. *M. tropica* MÄRKEL, 1964. 132 = aspis + notogaster, 133 = anogenital region

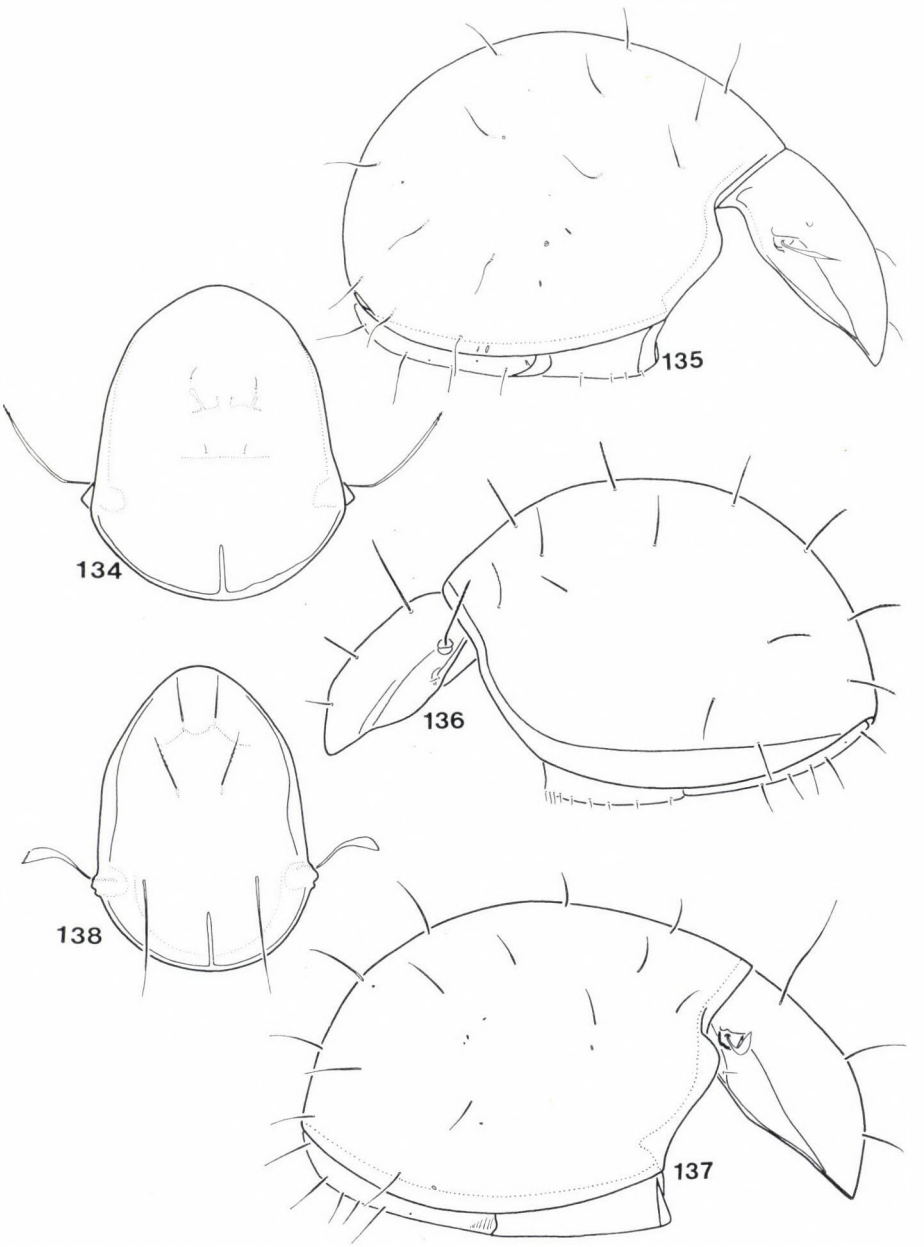


Fig. 134 = *Mesotritia tropica* MÄRKEL, 1964, aspis. — Fig. 135 = *M. schusteri* MÄRKEL, 1964, aspis + notogaster. — Fig. 136 = *Rhysotritia peruensis* (HAMMER, 1961), aspis + notogaster. — Figs 137—138. *R. clavata* MÄRKEL, 1964. 137 = aspis + notogaster, 138 = aspis

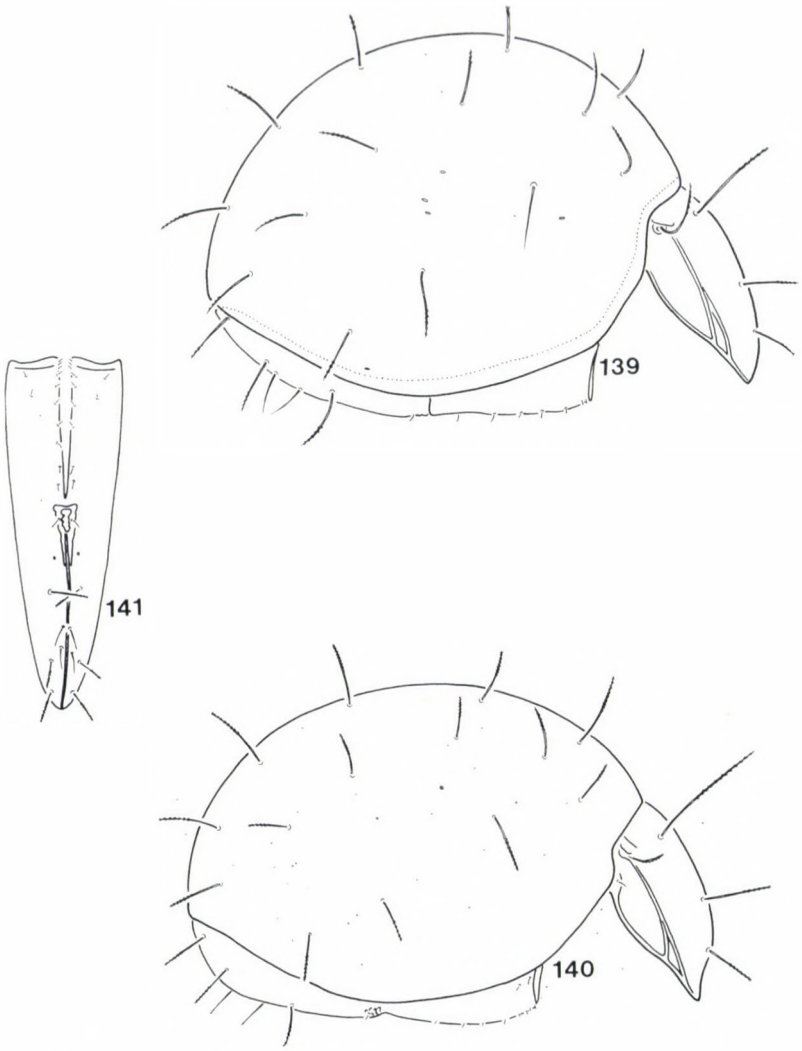


Fig. 139 = *Rhysotritia brasiliana* MAHUNKA, 1983, aspis + notogaster. — Figs 140—141. *R. comteae* MAHUNKA, 1983. 140 = aspis + notogaster, 141 = anogenital region

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DESCRIPTION DE DEUX COLÉOPTÈRES CARABIDES NOUVEAUX DE LA RÉPUBLIQUE POPULAIRE DU CONGO (COLEOPTERA: CARABIDAE)

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(Reçu le 26 Mars, 1986)

Two new species of Carabid beetles collected by the Soil-Zoological Expedition to Congo-Brazzaville are described: *Cyclicus kaszabi* n. sp. and *Mastax congoensis* n. sp.

Parmi l'importante collection de Carabides recueillie par la Soil-Zoological Expedition dans la République populaire du Congo, organisée en 1963—1964 par l'Université de Budapest, se trouvaient les deux espèces nouvelles décrites dans les pages suivantes. Je remercie très vivement mon cher ami le Dr. Zoltán Kaszab d'avoir bien voulu me communiquer ce matériel.

CYCLOSOMINAE

Cyclicus kaszabi n. sp.

Long. 5 à 5,3 mm. — Tête d'un testacé vaguement ferrugineux, généralement un peu rembrunie en arrière. Pronotum à peine plus clair, encore un peu éclairci sur les côtés. Elytres d'un testacé ferrugineux présentant un dessin constitué de taches ou bandes d'un jaune très clair ou brunes très foncées, presque noires; sur les intervalles 3 à 9, dans le premier tiers, se trouvent des bandes longitudinales claires, de longueur assez inégale et formant une bande transversale jusque sur la bordure, celles sur 3 à 6 plus courtes que les externes qui s'étendent plus loin en arrière et atteignent presque la mi-longueur; dans le tiers postérieur on observe également une bande transversale claire très irrégulière et dentelée formée de bandes longitudinales très inégales sur les intervalles 2 à 9, les trois premières bien plus courtes que les externes, celle sur l'intervalle 2 située plus en arrière que les deux autres, celles sur 5 à 9 plus longues; ces bandes claires sont bordées en avant et en arrière par des macules d'un brun très foncé qui forment donc également des bandes foncées transversales très irrégulières, avec une grande tache foncée près de l'épaule et une tache médiane sur 7 et 8 et sur tout le dernier quart; enfin, chez beaucoup d'exemplaires on voit une petite macule sur l'intervalle 2, un

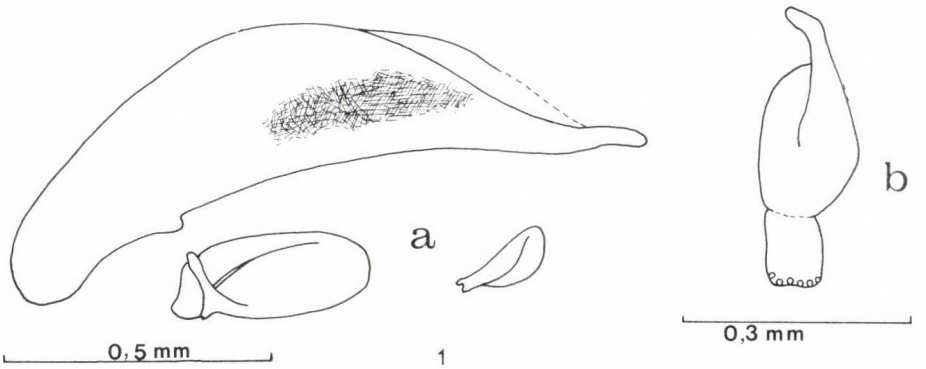

Fig. 1. *Cyclicus kaszabi* n. sp. — a = édéage; b = stylomères ♀

peu en avant de la mi-longueur; ce dessin, tout en étant quelque peu variable individuellement comme chez tous les *Cyclicus* et *Cyclosomus*, présente dans son ensemble une assez grande constance. Aucune trace métallique sur toute la surface. Pièces buccales, pattes et antennes d'un testacé clair.

Tête assez large, à peine convexe, imponctuée, à microsculpture isodiamétrale très serrée, rendant toute la surface mate. Yeux très gros et très saillants, les tempes très courtes, presque perpendiculaires au cou. Bord antérieur du labre bien sinué. Dent labiale large et assez grande, arrondie au sommet. Antennes longues, dépassant la base du pronotum de 3 articles.

Pronotum très transverse et peu convexe, 1,60 à 1,69 fois plus large que long, à largeur maximale située en avant du milieu; bord antérieur subdroit, les angles antérieurs quelque peu avancés mais arrondis au sommet; côtés régulièrement arrondis dans la première moitié, ensuite rectilignes, rétrécis mais non sinués jusqu'aux angles postérieurs qui sont bien marqués mais largement obtus; base faiblement convexe, pas plus large que le bord antérieur; gouttière marginale peu large et à peine explanée; sillon longitudinal médian court mais bien marqué, le transversal antérieur assez profond, le postérieur marqué seulement sur les côtés; dépressions basilaires peu indiquées; surface imponctuée, à microsculpture semblable à celle de la tête, avec une série de brèves carinules longitudinales au milieu de la partie médiane de la base et du sommet. Les deux soies prothoraciques latérales habituelles présentes.

Elytres convexes, légèrement ovoides, 1,38 à 1,43 fois plus longs que larges ensemble, à largeur maximale au milieu, à peine plus rétrécis en arrière qu'en avant; repli basilaire régulier jusqu'à l'épaule qui est largement arrondie; gouttière latérale assez large au milieu, plus étroite en avant et en arrière; troncature apicale oblique et à peine distinctement sinuée, les angles postérieur et sutural bien arrondis; striole scutellaire longue; stries profondes et étroites, régulières et imponctuées; intervalles internes bien convexes, 8 et 9 presque

plans, tous à microsculpture formée de petites strioles transversales très rapprochées mais peu profondes, toute la surface étant mate, le 3e avec 3 pores dorsaux peu apparents. Série ombiliquée de 12 pores, bien séparés au milieu.

Dessous brun ferrugineux clair, fortement rembruni sur le méso- et le métasternum, glabre et imponctué. Métépisternes longs, très fortement élargis en avant. Deux soies anales chez le ♂ et la ♀. Pattes longues; tarses fins et longs, le 1er article des postérieurs deux fois plus long que le 2e; éperon terminal très long et finement serrulé; griffes à peine pectinées à la base. Protarses des ♂ nettement dilatés, les 3 premiers articles avec de grandes phanères adhésives.

Edéage fig. 1a; stylomères fig. 1b.

CONGO: Kindamba, Meya, Louolo River, singled on riverside, from moulding trunk (S. ENDRŐDY-YOUNGA, XI. 1963, holotype ♂ au Musée de Budapest, 18 paratypes dans la même institution et au Musée de Tervuren). Sibiti, IRHD rain forest, netted along border of forest (id., XII. 1963, 1 paratype au Musée de Budapest).

Cette espèce se rapproche de *C. aericollis* QUEDENFELDT, mais en diffère bien nettement par la coloration de l'avant-corps, le dessin des élytres, le pronotum à côtés plus faiblement rétrécis vers l'arrière et non sinués, à angles postérieurs obtus, à gouttière marginale plus étroite et non explanée, par les intervalles des élytres bien plus convexes, à microsculpture non réticulaire mais en petites strioles transversales.

BRACHININAE

Mastax congoensis n. sp.

Long. 2,6 à 3 mm. — Tête d'un roux ferrugineux, souvent un peu rembrunie en arrière. Pronotum de même couleur, un peu plus clair. Elytres noirs, le disque souvent très légèrement éclairci, pourvu de deux grandes taches d'un blanc sale, parfois faiblement jaunâtre surtout sur le pourtour: l'antérieure, bien séparée de celle de l'autre élytre, consiste en une bande subscutellaire sur les intervalles 2, 3 et 4, assez courte, confondue ensuite avec la posthumérale transversale bien plus grande et s'étendant du 5e intervalle jusqu'à la bordure, ne touchant pas l'épaule, à bord antérieur presque droit le postérieur remontant en oblique jusqu'à la subscutellaire, sans jamais présenter d'interruption; la postérieure, située dans le dernier tiers de l'élytre, forme une grande macule subarrondie sur les intervalles 5 à 9, ne touchant pas le bord extérieur et assez éloignée de la troncature apicale; pas de bande suturale claire. Dessous d'un ferrugineux clair sur l'avant-corps, brunâtre sur l'abdomen et les méso- et métathorax. Pattes et pièces buccales d'un testacé clair, les antennes brunes avec les 4 premiers articles testacés.

Tête pourvue de quelques carinules longitudinales assez développées entre les yeux, sans autre ponctuation, l'arrière et le cou lisses. Yeux très gros et assez saillants, les tempes très courtes, microsculpture réticulaire bien marquée. Antennes assez longues.

Pronotum très cordiforme, 1,06 à 1,11 fois plus large que long, à largeur maximale située un peu en arrière du bord antérieur qui est droit, les angles antérieurs bien marqués et assez saillants vers l'avant, les côtés bien plus arrondis dans leur moitié antérieure bien que plus rétrécis en arrière, ensuite fortement rétrécis et quelque peu rectilignes jusqu'au début du dernier quart où ils sont fortement sinués, puis redressés jusqu'aux angles postérieurs qui sont subobtus et arrondis à l'extrême sommet; base subdroite; de chaque côté du profond sillon longitudinal médian on observe une forte carène longitudinale allant du sommet jusque près de la base, la surface faiblement sculptée.

Elytres larges et quelque peu convexes, l'épaule très marquée mais arrondie, la troncature apicale oblique vers l'arrière et nettement sinuée, le bord postérieur sans cils apparents; 7 côtes légèrement soulevées mais non vraiment saillantes, s'affaiblissant nettement en arrière, pourvues d'une microsculpture réticulaire assez forte, les stries larges et pareillement sculptées.

CONGO: Riverside of Congo, 25 km SW Brazzaville, floated shoresand, floating along sandy banks of river, covered sparsely with detritus (S. ENDRŐDY-YOUNGA, XII. 1963, holotype au Musée de Budapest, 64 paratypes dans la même institution et au Musée de Tervuren). Riverside of Congo, 20 km W Brazzaville, floated shore-sand, sandy riverside covered sparsely with detritus (id., XII. 1963, 33 paratypes aux Musées de Budapest et de Tervuren).

Cette nouvelle espèce se rapproche de *M. kulti* BASILEWSKY, d'Ethiopie et du Kenya, par la taille, la sculpture de la tête, la conformation du pronotum et la présence d'une forte carène longitudinale de chaque côté du sillon longitudinal médian. Elle en diffère par le dessin élytral différent et bien constant chez la centaine d'individus examinés, notamment par la bande subscutellaire toujours réunie à la posthumérale et concolore et cette dernière bien plus grande et aussi par l'absence d'une bande juxtasuturale brune, par le pronotum à angles antérieurs bien moins pointés vers l'avant, à sculpture nettement moins forte, par la troncature apicale bien sinuée, par les pattes unicolores et non tachées de noir aux genoux et à l'extrémité des tibias et les tarses de même couleur que ces derniers.

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DIE PAPUANISCH-AUSTRALISCHEN ARTEN DER GATTUNG DEROSPHAERUS THOMSON, 1858 (COLEOPTERA: TENEBRIONIDAE)

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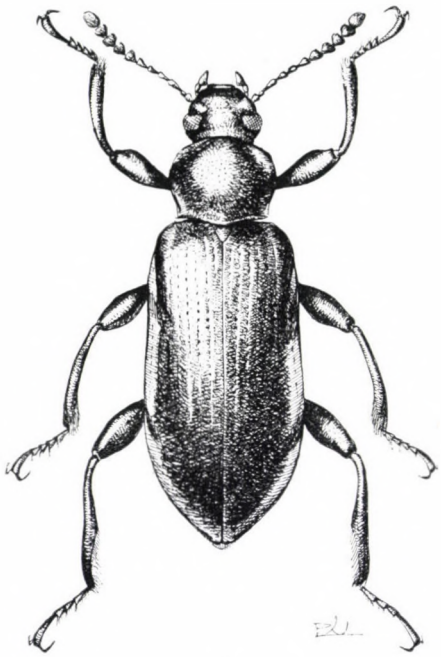
(Eingegangen am 17. Februar 1986)

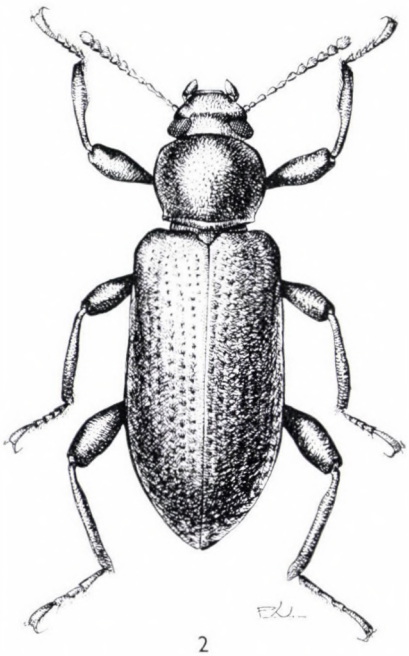
The Afro-Asian tropical genus *Derosphaerus* THOMSON, 1858 includes 23 species in the Papua-Australian region, of which 11 are new to science: *D. lawrencei* sp. n. (Australia), *D. bornemisszai* sp. n. (Australia), *D. dentipes* sp. n. (New Guinea), *D. hirtipenis* sp. n. (New Guinea), *D. szentivanyi* sp. n. (New Guinea), *D. hirtipes* sp. n. (New Guinea) with ssp. *acutipenis* ssp. n. (New Guinea), *D. matthewsi* sp. n. (Australia), *D. trochantericus* sp. n. (Australia), *D. latipes* sp. n. (New Guinea), *D. longipes* sp. n. (New Guinea) and *D. burgersi* sp. n. (New Guinea). *Encyalesthus* MOTSCHULSKY, 1860 is a junior synonym of *Derosphaerus* THOMSON, 1858; the species described in the genera *Encyalesthus* MOTSCHULSKY, 1860, *Cholipus* PASCOE, 1866 and *Pachyurgus* LECONTE, 1862 now all belong in a new combination with the genus *Derosphaerus*. The species *Neandrosus singularipes* PIC, 1921 is a synonym of *Derosphaerus iridipennis* (FAIRMAIRE, 1897). Further synonyms are: *Encyalesthus wegneri* KASZAB, 1964 = *Derosphaerus laevistriatus* (GEBIEN, 1920); *Encyalesthus coerulescens* GUÉRIN-MÉNEVILLE var. *ceramensis* GEBIEN, 1920 = *Derosphaerus coerulescens* (GUÉRIN-MÉNEVILLE, 1830); *Encyalesthus iridipennis* FAIRMAIRE, 1897 = bona species; *Encyalesthus speciosus* GEBIEN, 1920 = *Derosphaerus variicolor* (FAIRMAIRE, 1897). *Encyalesthus klapperichi* KASZAB, 1954 = *Rhopalobates villardi* FAIRMAIRE, 1896. *Derosphaerus pici* nom. n. is a homonym of *Encyalesthus laosensis* PIC, 1922. *Encyalesthus tuberculiceps* CARTER, 1914 = *Toxicum* sp.

Die Gattung *Derosphaerus* hat THOMSON aufgrund tropisch-afrikanischer Arten beschrieben (1858). Nachher wurden aus Afrika und Madagaskar noch zahlreiche Arten bekannt, so daß man heutzutage 26 valide Arten aus dem äthiopisch-madagassischen Gebiet kennt.

Fast gleichzeitig wurde von MOTSCHULSKY im Jahre 1860 die Gattung *Encyalesthus* aufgestellt, welche aufgrund einer Art aus dem Amurgebiet beschrieben ist. Von diesem Zeitpunkt an — abgesehen von den Gattungen *Cholipus* PASCOE, 1866 und *Pachyurgus* LECONTE, 1862, welche zur Gattung *Encyalesthus* einbezogen worden sind, weiters von der Gattung *Notiolesthus* MOTSCHULSKY, 1872, welche man für ein Synonym der Gattung *Derosphaerus* hält — sind die afrikanischen Arten stets als *Derosphaerus*, die indomalayisch-australischen Arten teils als *Derosphaerus* und in der Mehrzahl als *Encyalesthus* beschrieben worden. Bei der Untersuchung der Mehrzahl der hierher gehörenden Arten ergibt sich aber das Resultat, daß *Derosphaerus* und *Encyalesthus* voneinander generisch nicht trennbar sind. Es gibt kein einziges Merkmal, wodurch beide Gattungen voneinander unterschieden werden könnten. Deshalb beziehe ich den Gattungsnamen *Encyalesthus* MOTSCHULSKY, 1860 als Junior-Synonym in die Gattung *Derosphaerus* THOMSON, 1858 ein.



1



2

Abb. 1—2. *Derosphaerus hirtipes* sp. n. (1) und *D. trochantericus* sp. n. (2)

Die Synonymisierung der Gattungen *Pachyurgus* LECONTE, 1862, *Cholipus* PASCOE, 1866, weiters *Notiolesthus* MOTSCHULSKY, 1872 wurde schon im Katalog GEBIEN (1941) durchgeführt. Ebenfalls wurde eine Gattung einbezogen, welche PIC unter dem Nanem *Falsoencyalesthus* PIC, 1921 beschrieben hat (ARDOIN, 1969). Eine weitere Gattung von PIC ist noch synonym, namentlich *Neandrosus* PIC, 1921; seine monotypische Art: *Neandrosus singularipes* PIC, 1921 ist mit *Encyalesthus* (= *Derosphaerus* !) *iridipennis* MACLEAY, 1888 synonym.

Im Folgenden beschäftige ich mich eingehend mit den papuanisch-australischen Arten der Gattung, gebe eine Bestimmungstabelle sowie die Beschreibungen und Daten ihrer Vorkommen. Bevor ich auf das Obengenannte eingehe, möchte ich einige synonymische Bemerkungen vornehmen, welche mit diesem Thema zusammenhängen.

Als *Encyalesthus klapperichi* KASZAB, 1954 wurde von mir eine Art aus Fukien beschrieben, welche keine andere ist als *Rhopalobates villardi* FAIRMAIRE, 1896.

Necrobioides gibbicolis FLEUTIAUX, 1887 aus Annam gehört in die Gattung *Derosphaerus*, obwohl der Seitenrand des Halsschildes ungerandet ist. Es fehlt aber bei dieser Art die tiefe seitliche Basalfurche.

Encyalesthus speciosus GEBIEN, 1920 aus Neuguinea ist synonym mit *Derosphaerus variicolor* (FAIRMAIRE, 1897) ebenfalls aus Neuguinea.

Encyalesthus wegneri KASZAB, 1964 aus Ambon Is. ist dieselbe Art, welche GEBIEN unter dem Namen *Encyalesthus* (= *Derosphaerus* !) *laevistriatus* GEBIEN, 1920 aus Ceram und den Kei Inseln beschrieben hat, deshalb synonym.

Encyalesthus tuberculiceps CARTER, 1914 gehört in die Gattung *Toxicum* LATREILLE, 1802 und ist aufgrund des irisierenden, leicht metallisch glänzenden Körpers gekennzeichnet.

Derosphaerus laosensis PIC, 1922 und *Encyalesthus laosensis* PIC, 1923 sind verschiedene Arten, aber wegen der Synonymisierung der Gattungsnamen muß die Art *Encyalesthus laosensis* PIC, 1923 umbenannt werden: **pici** nom. n.

Zur leichteren Orientierung stelle ich im Folgenden die Synonymie und die Original-Literaturzitate der 64 indomalayisch-papuanisch-australischen Arten zusammen.

Derosphaerus THOMSON, 1858

THOMSON, 1858: Archs Entom., **2:** 374 (Gattungstypus: *D. globicollis* THOMSON, 1858) (des. GEBIEN, 1941)

= *Encyalesthus* MOTSCHUSKY, 1860: Schrenck's Reisen, **2:** 139 (Gattungstypus: *E. subviolaceus* MOTSCHULSKY, 1860) (mon.) **syn. n.**

= *Pachyurgus* LECONTE, 1862: Class. Col. Amer.: 230 (Gattungstypus: *Iphthinus aereus* MELSHEIMER, 1846) (mon.)

= *Cholipus* PASCOE, 1866: J. Ent., **2:** 471 (Gattungstypus: *Ch. brevicornis* PASCOE, 1866) (des. KASZAB, 1986)

= *Notiolesthus* MOTSCHULSKY, 1872: Bull. Soc. Imp. nat. Mosc., **45** (3): 25 (Gattungstypus: *N. natalensis* MOTSCHULSKY, 1872) (orig. des.)
= *Neandrosus* PIC, 1921: Échange, **37:** 12 (Gattungstypus: *N. singularipes* PIC, 1921) (mon.) **syn. n.**
= *Falsoencyalesthus* PIC, 1923: Mélang. exot.-ent., **38:** 29 (Gattungstypus: *F. latipennis* PIC, 1923) (mon.)

aereus (MELSHEIMER, 1846): Proc. Acad. nat. Sci. Philad., **3:** 65 (Locus typicus: Ind. or.) (?)
= *brevipennis* (MOTSCHUSKY, 1872): Bull. Soc. Imp. nat. Mosc., **45** (2): 33 (Locus typicus: Ind. or.) (*Notiolesthus*)

aeruginosus (FABRICIUS, 1787): Mantissa Insectorum **I:** 213 (Locus typicus: Cap. Bon. Spei.) (*Helops*)
= *aeneus* (PIC, 1929): Mélang. exot.-ent., **54:** 30 (Locus typicus: Bornéo) (*Encyalesthus*)

alutaceus FAIRMAIRE, 1882: Notes Leyden Mus., **4:** 225 (Locus typicus: Sumatra)

andamanus (FAIRMAIRE, 1893): Notes Leyden Mus., **15:** 26 (Locus typicus: Ins. Andaman) (*Encyalesthus*)

asperipennis ALLARD, 1896: Bull. Soc. ent. Fr.: 320 (Locus typicus: Sikkim)

ater (PIC, 1923): Mélang. exot.-ent., **38:** 30 (Locus typicus: Java) (*Encyalesthus*)

atroviridis (MACLEAY, 1888): Proc. Linn. Soc. N.S.W., **2** (2): 311 (Locus typicus: Cairns) (*Cholipus*)

aureomicans (GEBIEN, 1920): Nova Guinea XIII, Zool., **8:** 298 (Locus typicus: Deutsch-Neu-Guinea: Sissanu) (*Encyalesthus*)

binhanus PIC, 1922: Mélang. exot.-ent., **37:** 26 (Locus typicus: Tonkin)

bisinuatus GEBIEN, 1921: Philipp. J. Sci., **19** (4): 456, Taf. 1, Fig. 6 (Locus typicus: Mindanao, Butuan)

brevicornis (MÄKLIN, 1863): Acta Soc. Sci. fenn., **1863:** 553, nota.

cancellatus FAIRMAIRE, 1896: Annls Soc. ent. Belg., **40:** 27 (Locus typicus: Maduré)

celebensis (PIC, 1923): Mélang. exot.-ent., **38:** 30 (Locus typicus: Célèbes) (*Encyalesthus*)

coerulescens (GUÉRIN-MÉNEVILLE, 1830): Voy. Coquin, **2:** 102, Pl. 5, Fig. 3 (Locus typicus: Buru) (*Helops*)
= *transversicollis* (FAIRMAIRE, 1893): Notes Leyden Mus., **15:** 27 (Locus typicus: Bornéo) (*Encyalesthus*)
= *coelestinus* (FAIRMAIRE, 1896): Notes Leyden Mus., **18:** 102 (Locus typicus: Insula Bourou) (*Encyalesthus*)
= *ceramensis* (GEBIEN, 1920): Nova Guinea XIII, Zool., **8:** 303 (Locus typicus: Insel Ceram: Piru und Illo) (*Encyalesthus coerulescens* var.)
= *robustus* (PIC, 1923): Mélang. exot.-ent., **38:** 30 (Locus typicus: Boeroe) (*Encyalesthus*)

coerulescens latipennis (PIC, 1923): Mélang. exot.-ent., **38:** 29 (Locus typicus: Célèbes) (*Encyalesthus*) comb. n., **stat. n.**

crassicrus FAIRMAIRE, 1903: Annls Soc. ent. Belg., **47:** 14 (Locus typicus: Phuc Son, Annam)

crenipennis (MOTSCHULSKY, 1872): Bull. Soc. Imp. nat. Mosc., **45** (3): 32 (Locus typicus: Ind. or.) (*Upis*)

cribripennis (FAIRMAIRE, 1891): C. r. Soc. ent. Belg.: CCXI (Locus typicus: Tchang-Yang) (*Encyalesthus*)

cribrum FAIRMAIRE, 1896: Notes Leyden Mus., **18:** 231 (Locus typicus: Calcutta)

curtipennis (PIC, 1923): Mélang. exot.-ent., **38:** 30 (Locus typicus: Célèbes) (*Encyalesthus*)

epistomaticus (GEBIEN, 1920): Nova Guinea XIII, Zool., **8:** 301, Fig. 59 (Locus typicus: D. Neu-Guinea: Hauptlager beim Malu; Hall. N. Guinea: Taua; Neu-Pommern: Herbertshöhe) (*Encyalesthus*)

excisipes (CARTER, 1914): Proc. Linn. Soc. N.S.W., **39** (1): 49, 63 (Locus typicus: Kuranda, North Queensland) (*Encyalesthus*)

exularis (GEBIEN, 1913): Arch. Naturgesch., **79** A (9): 31 (Locus typicus: Kosempo) (*Encyalesthus*)

foveolatus (MARSEUL, 1876): Annls Soc. ent. Fr., (5) **6:** 119 (Locus typicus: Kiu-Siu) (*Upis*)
= *inaequalis* (FAIRMAIRE, 1888): Annls Soc. ent. Fr., (6) **8:** 357 (Locus typicus: Tonkin) (*Nyctobates*)
= *foveolatus* (PIC, 1923): Mélang. exot.-ent., **38:** 31 (Locus typicus: Chine) (*Encyalesthus*) nec MARSEUL, 1876

foveoseriatus (FAIRMAIRE, 1888): Annls Soc. ent. Fr., (6) **8:** 358 (Locus typicus: Cambodge) (*Encyalesthus*)

furvus (GEBIEN, 1920): Nova Guinea XIII, Zool., **8:** 299, Fig. 55 (Locus typicus: Deutsch-Neu-Guinea: Hunsteinspitze ferner beim Hauptlager am Malu) (*Encyalesthus*)

fuscatus (FAIRMAIRE, 1893): Notes Leyden Mus., **15:** 25 (Locus typicus: Sumatra) (*Encyalesthus*)
= *impunctatus* PIC, 1923: Mélang. exot.-ent., **38:** 32 (Locus typicus: Sumatra)
grandipes FAIRMAIRE, 1893: Annls Soc. ent. Belg., **37:** 297 (Locus typicus: Lang-Song)
= *Coomani* PIC, 1926: Mélang. exot.-ent., **47:** 26 (Locus typicus: Tonkin)
= *Leseleuci* PIC, 1923: Mélang. exot.-ent., **38:** 32 (Locus typicus: Cochinchine)
hauschildi (GEBIEN, 1914): Sarawak Mus. J., **2** (5): 40 (Locus typicus: Kinabalu) (*Encyalesthus*)
impressus (WALKER, 1858): Ann. Mag. nat. Hist., (3) **2:** 283 (Locus typicus: Ceylon) (*Upis*)
instriatus PIC, 1922: Mélang. exot.-ent., **37:** 27 (Locus typicus: Chine)
interstitialis FAIRMAIRE, 1883: Notes Leyden Mus., **5:** 35 (Locus typicus: Île de Saleyer)
iridipennis (FAIRMAIRE, 1897): Notes Leyden Mus., **19:** 220 (Locus typicus: Nouvelle Guinée) (*Encyalesthus*)
= *singularipes* (PIC, 1921): Échange, **37:** 12 (Locus typicus: Nouvelle Guinée) (*Neandrosus*) **syn. n.**
laevistriatus (GEBIEN, 1920): Nova Guinea XIII, Zool., **8:** 303 (Locus typicus: Ceram und den Kei Inseln) (*Encyalesthus*)
= *wegneri* (KASZAB, 1964): Tijdschr. Ent., **107** (5): 287 (Locus typicus: Amboina) (*Encyalesthus*) **syn. n.**
laosensis PIC, 1922: Mélang. exot.-ent., **37:** 27 (Locus typicus: Laos)
= *Jeanvoinei* PIC, 1927): Mélang. exot.-ent., **49:** 20 (Locus typicus: Than-Moi)
madurensis (PIC, 1923): Mélang. exot.-ent., **38:** 31 (Locus typicus: Madura) (*Encyalesthus*)
minutus (PIC, 1923): Mélang. exot.-ent., **38:** 31 (Locus typicus: Île Jolo) (*Encyalesthus*)
morio (GEBIEN, 1914): Sarawak Mus. J., **2** (5): 42 (Locus typicus: Njabang, Borneo) (*Encyalesthus*)
multipunctatus PIC, 1926: Mélang. exot.-ent., **47:** 27 (Locus typicus: Annam)
niasensis (PIC, 1923): Mélang. exot.-ent., **38:** 31 (Locus typicus: Île Nias) (*Encyalesthus*)
niger (WIEDEMANN, 1819): Zool. Mag., **1** (3): 164 (Locus typicus: Bengal) (*Upis*)
nitidipennis FAIRMAIRE, 1898: Annals Soc. ent. Fr., **67:** 394 [Locus typicus: Philippines: Île Samar (Mindanao)] (*Encyalesthus*)
= *samarensis* (PIC, 1929): Mélang. exot.-ent., **54:** 30 (Locus typicus: Île Samar) (*Encyalesthus*)
nitidus PIC, 1922: Mélang. exot.-ent., **37:** 27 (Locus typicus: Formose)
pici nom. n.
= *laosensis* (PIC, 1923): Mélang. exot.-ent., **38:** 31 (Locus typicus: Laos) (*Encyalesthus*), nom praeoccup, nec *Derosphaerus laosensis* PIC, 1922
punctipennis (PASCOE, 1866): J. Ent., **2:** 472 (Locus typicus: Queensland) (*Cholipus*)
rotundicollis (CASTELNAU, 1840): Hist. Nat. Ins., **2:** 213 (Locus typicus: Manille) (*Upis*)
= *simillimus* FAIRMAIRE, 1886: Annls Soc. ent. Fr., (6) **6:** 188 (Locus typicus: Manille)
ruficornis (PIC, 1923): Mélang. exot.-ent., **38:** 31 (Locus typicus: Java) (*Encyalesthus*)
rugosus GRAVELY, 1915: Rec. Indian Mus., **8:** 528, Pl. 43, Fig. 7 (Locus typicus: Sibsagar; Dejov, North Lakhimpur; Rotung, Abor Country)
semirugosus PIC, 1923: Mélang. exot.-ent., **38:** 32 (Locus typicus: Sumbawa)
sinensis HOPE, 1842: Proc. ent. Soc. Lond., **1842:** 63 (Locus typicus: Canton) (*Upis*)
sinuatipes (GEBIEN, 1920): Nova Guinea XIII, Zool., **8:** 300 (Locus typicus: Neu-Pommern Herbertshöhe und Neu-Lauenburg) (*Encyalesthus*)
stevensi (GRAVELY, 1915): Rec. Indian Mus., **8:** 527, Pl. 43, Fig. 5 (Locus typicus: Dejoo, North Lakhimpur) (*Encyalesthus*)
striatus (GEBIEN, 1913): Philipp. J. Sci., **8** (5—6) D: 404 (Locus typicus: Negros Occidental, Mt Caulaon; Ins. Philippinae) (*Encyalesthus*)
subcostulatus FAIRMAIRE, 1888: Annls Soc. ent. Fr., (6) **8:** 356 (Locus typicus: Cochinchine)
subelongatus PIC, 1926: Mélang. exot.-ent., **47:** 27 (Locus typicus: Cambodge)
subsulcatus (FAIRMAIRE, 1893): Annls Soc. ent. Belg., **37:** 318 (Locus typicus: Haut Tonkin) (*Encyalesthus*)
subviolaceus (MOTSCHULSKY, 1860): Schrenck's Reise, **2**. 139, Taf. 9, Fig. 13 (Locus typicus: sur les bordes du fl. Oussouri; Daourie méridionale) (*Encyalesthus*)
= *violaceipennis* (MARSEUL, 1876): Annls Soc. ent. Fr., (5) **6:** 118 (Locus typicus: Nagasaki) (*Upis*)
tenuestriatus (FAIRMAIRE, 1893): Annls Soc. ent. Fr., **62:** 31 (Locus typicus: Saigon) (*Encyalesthus*)
thibetanus PIC, 1922: Mélang. exot.-ent., **37:** 26 (Locus typicus: Thibet)
variicolor (FAIRMAIRE, 1897): Notes Leyden Mus., **19:** 220 (Locus typicus: Nouvelle Guinée) (*Encyalesthus*)

= *speciosus* (GEBIEN, 1920): Nova Guinea XIII, Zool., **8:** 301, Fig. 56–58 (Locus typicus: Deutsch-Neu-Guinea) (*Encyalesthus*) **syn. n.**

vicinus PIC, 1923: Mélang. exot.-ent., **38:** 32 (Locus typicus: Java)

viridiapicalis (PIC, 1929): Mélang. exot.-ent., **54:** 31 (Locus typicus: ? Cambodge) (*Encyalesthus*)

viridicinctus (FAIRMAIRE, 1882): Notes Leyden Mus., **4:** 234 (Locus typicus: Boenga mas Palembang) (*Encyalesthus*)

viridistriatus (FAIRMAIRE, 1893): Annls Soc. ent. Belg., **37:** 319 (Locus typicus: Haut Tonkin) (*Encyalesthus*)

= *Dohertyi* (PIC, 1923): Mélang. exot.-ent., **38:** 30 (Locus typicus: Malacca) (*Encyalesthus*)

= *sumatrensis* (PIC, 1923): Mélang. exot.-ent., **38:** 29 (Locus typicus: Sumatra) (*Encyalesthus*)

DIE PAPUANISCH-AUSTRALISCHEN DEROSPHAERUS-ARTEN

Die erste Art aus diesem Gebiet wurde von GUÉRIN-MÉNEVILLE unter dem Namen *Helops coerulescens* (1830) aus Buru beschrieben. Ihr folgte im Jahre 1866 einer von PASCOE unter dem Namen *Cholipus punctipennis* aus Australien: Queensland beschriebene Art. Nachher gibt MACLEAY eine weitere Art im Jahre 1888 unter dem Namen *Cholipus atroviridis* ebenfalls aus Queensland bekannt. FAIRMAIRE hat aus den malayisch-papuanischen Territorien 5 Arten beschrieben, und zwar im Jahre 1893 die Art *Encyalesthus andamanus* aus Andamanen, welche aber auch in West-Irian vorkommt, weiters *Encyalesthus transversicollis* aus Borneo, welche in die *D. coerulescens* (GUÉRIN-MÉNEVILLE, 1830) einbezogen wurde; im Jahre 1896 beschrieb FAIRMAIRE *Encyalesthus* (?) *coelestinus* aus Buru, welche ebenfalls mit der vorigen Art identisch ist; weitere zwei Arten von FAIRMAIRE sind noch aus dem Jahre 1897: *iridipennis* und *variipennis*, beide aus Neuguinea. CARTER beschrieb in seiner Revision der australischen Tenebrioninae (1914) eine Art unter dem Namen *Encyalesthus excisipes*, welche bona species ist, und er gibt eine Tabelle für die 3 vor ihm bekannten Arten; seine zweite Art aus demselben Jahr (1914): *Encyalesthus tuberculiceps* gehört zur Gattung *Toxicum*. In der Zeitfolge ist im Jahre 1920 die Arbeit von GEBIEN (1920) eine der wichtigsten, in der er im Rahmen der Monographie der papuanischen Tenebrioniden 6 neue Arten und eine Unterart beschrieben hat. Von diesen fällt *Derosphaerus speciosus* sowie die Varietät *Derosphaerus coerulescens* var. *ceramensis* im Synonym, 5 Arten sind aber richtig beschrieben. Nachher hat noch PIC eine Gattung und Art im Jahre 1921 unter dem Namen *Neandrosus singularipes* aus Neuguinea beschrieben, welche aber mit *D. iridipennis* (FAIRMAIRE, 1897) Synonym ist. Schließlich beschrieb ich eine Art im Jahre 1964 unter dem Namen *Encyalesthus wegneri* aus Amboina, welche ich in dieser Arbeit in die Art *D. laevistriatus* GEBIEN einbezogen habe.

Es gibt bis jetzt aus dem papuanisch-australischen Gebiet 12 valide Arten. In dem von mir untersuchten, sehr reichen Material kommen noch 11 neue Arten und eine neue Unterart dazu, so daß momentan 23 Arten und

1 Unterart in Neuguinea sowie den nächstliegenden kleinen Inseln und in Australien (von North Territory und von Nordost-Queensland bis Victoria) vorkommen.

Untersuchungsmaterial

Es lag mir ein reiches Material aus folgenden Museen und Sammlungen vor, welche bei den faunistischen Daten folgenderweise abgekürzt wurden:

AMSA = Australian Museum, Sydney
ANIC = Australian National Insect Collection, Canberra
BMNH = British Museum (Natural History), London
BPBM = Bernice P. Bishop Museum, Honolulu
BR = Prof. Dr. H.-J. Bremer, Düsseldorf
DAFS = Department of Agriculture, Stock und Fisheries, Konebodu, PNG.
IFPE = Institut für Pflanzenschutzforschung, DEI, Eberswalde
HNHM = Ungarisches Naturwissenschaftliches Museum, Budapest
MCZC = Museum of Comparative Zoology, Harward University, Cambridge
MHNG = Museum d'Histoire Naturelle, Genève
MNHN = Museum National d'Histoire Naturelle, Paris
NZAK = Department of Scientific and Industrial Research, Auckland
QMBA = Queensland Museum, Brisbane
RMNH = Rijksmuseum van Natuurlijke Historie, Leyden
SAMA = South Australian Museum, Adelaide
SMTD = Staatliches Museum für Tierkunde, Dresden
TMPA = Transvaal Museum, Pretoria
ZIAK = Zoologisches Forschungsinstitut und »Alexander Koenig« Museum, Bonn
ZIUH = Zoological Institute, University, Helsinki
ZMHU = Zoologisches Museum der Humboldt-Universität, Berlin

Für die Zusendung des wertvollen Typen- und Untersuchungsmaterials möchte ich folgenden Herren meinen Dank aussprechen: M. E. Bacchus (London), Dr. C. Besuchet (Genève), Dr. M. Brancucci (Basel), Dr. H.-J. Bremer (Düsseldorf), Dr. L. Dieckmann (Eberswalde), † Dr. P. J. Darlington, Jr. (Cambridge), Dr. S. Endrődy-Younga (Pretoria), † Dr. J. L. Gressitt (Honolulu), C. Girard (Paris), Dr. R. Hertel (Dresden), Dr. F. Hieke (Berlin), J. Krikken (Leyden), Dr. J. F. Lawrence (Canberra), Dr. I. Löbl (Genève), Dr. E. G. Matthews (Adelaide), Dr. D. McAlpine (Sydney), G. Monteith (Brisbane), Dr. H. Roer (Bonn), G. A. Samuelson (Honolulu), H. Silfverberg (Helsinki), Dr. J. J. H. Szent-Ivany (Adelaide), Dr. W. Wittmer (Basel) und L. Zerche (Eberswalde).

CHARAKTERISTIKA DER GATTUNG DEROSPHAERUS THOMSON, 1858

Körper schwarz (bei einigen afrikanischen Arten mit rotgelben Flecken) oder metallisch, manchmal prächtig irisierend und hochglänzend, scheint meist parallel, der Halsschild im allgemeinen nicht viel schmaler als die Flügeldecken. K o p f mit großen, seitenständigen Augen; Augenfurchen fein und seicht oder tief und breit. Clypealsutur entweder gebogen und von den Augen

weit entfernt oder im Niveau des Augenrandes gerade, nimmt seitlich die Augenfurchen ein. Stirn gewölbt oder flach, neben dem Innenrand entweder nicht die Augen überragend oder manchmal liegt die Stirn höher. Epistom gerade abgestutzt oder mehr oder weniger ausgebuchtet, die Gelenkshaut zwischen Clypeus und Oberlippe meist mehr oder weniger frei sichtbar. M e n t u m in der Mitte schwach gekielt und vorn stumpf ausgezogen. M a x i l l a r p a l p e n mit breitem, beilförmigem Endglied. F ü h l e r meist normal lang, hintergelegt die Basis des Halsschildes nicht überragend, vom 6. Glied an sind die Glieder dicker, das Endglied oval, die Keulenglieder mit Porenpunkten. H a l s s c h i l d meist rundlich und zur Basis verengt, vorn meist breit abgerundet, die Scheibe fällt seitlich steil ab. Basis scharf gerandet, nur in der Mitte selten erloschen, sonst mit einer Furche. Seitenrand meist vollständig, fehlt selten vollkommen. S c h i l d c h e n dreieckig, flach. F l ü g e l d e c k e n meist parallel, mit oder ohne Längsstreifen, mit oder ohne Punktreihen, letztere können sehr verschiedenartig ausgebildet sein. Meist ist die Skulptur am Absturz vollkommen erloschen. Die Epipleuren sind schmal, innen ungerandet; 9 Punktreihen vorhanden. P r o s t e r n u m zwischen den Hüften breit, nach vorn und hinten fast gleich mehr oder weniger geneigt, das Ende meist abgeflacht und gerundet sowie dick gerandet. Mittelbrust in der Mitte eingedrückt, seitlich sind nur selten stumpfe Ecken. Hinterbrust lang. Abdomen einfach, das Analsegment am Ende ungerandet. B e i n e kräftig, Schenkel stark gekeult, Schienen meist einfach, aber bei vielen Arten mit ausgesprochenen sekundären Geschlechtsmerkmalen. A e d o e a g u s bei den meisten Arten einfach, normal chitinisiert, mit scharf spitzwinkligen Parameren, oder die Parameren sind vollkommen abgeflacht, durchscheinend, fein chitinisiert, fast quadratisch bis langoval und mit ausgezogenem Ende.

Nächstverwandte Gattungen sind *Necrobioides* FAIRMAIRE, 1882 und *Leprocaulus* FAIRMAIRE, 1896. *Necrobioides* ist sehr ähnlich, sie hat aber ungerandeten Halsschild, dagegen befindet sich an Stelle der Hinterecken eine tiefe kurze Furche, und die Halsschildbasis ist stark eingeschnürt. *Leprocaulus* enthält ganz fremde Skulpturelemente, vor allem verschiedenartig gebildete Körnelung der Decken und abweichende Halsschildform mit charakteristischer Skulptur.

Bestimmungstabelle der papuanisch-australischen Arten der Gattung Derosphaerus Thomson, 1858

1 (2) Halsschildbasis in der Mitte ungerandet, Seiten fein gerandet, die Scheibe seitlich steil geneigt, die Mitte sehr fein, seitlich ganz erloschen punktiert. Flügeldecken scharf bis zum Ende gefurcht, die feinen Punkte der Reihen die Streifen kaum übergreifend, die Zwischenräume bis zum Ende gleichmäßig gewölbt, glatt, unpunktiert. Augenfurchen tief, Stirn flach und höher gelegen als die Augen (bei Seitenansicht gut sichtbar!), Clypealsutur der Quere nach gerade (Abb. 3), liegt an dem

Vorderrand der Augen und nimmt seitlich auch die Augenfurchen ein, die Seitenäste weniger eingedrückt. Stirn und Clypeus weniger als die Halsschildmitte punktiert. Beine beim ♂ und ♀ gleich, einfach, beim ♂ ist innen am Ende ein Haarstreifen. — Länge: 13—16 mm. Neuguinea, Kei-Insel, Amboina, Ceram (= *wegneri* KASZAB, 1964) 1. **laevistriatus** (GEBIEN, 1920)

2 (1) Halsschildbasis auch in der Mitte scharf gerandet.

3 (12) Hinterschienen beim ♂ innen abgeflacht, im basalen Drittel oder nahe der Mitte bedeutend erweitert, die Unterseite kielförmig (Abb. 73—74, 77, 90, 91). Körper lebhaft metallisch. Schenkel unten behaart. Parameren vollkommen abgeflacht, breitoval oder sogar rundlich, durchscheinend, sehr wenig chitinisiert (Abb. 65—67, 78—89).

4 (5) Die breiteste Stelle der Hinterschienen liegt kaum vor der Mitte und ist stumpfwinklig (Abb. 73), das Ende innen granuliert, Unterrand mit äußerst fein gekerbtem Kiel, daneben innen etwas eingedrückt. Vorderschienen unten vom apikalen Ende bis zur Mitte konkav. Mittelschenkel lang behaart. Kopf und Halsschild blauschwarz. Augenfurchen schmal, Vorderkörper äußerst fein punktiert, glatt. Flügeldecken mit feinen Punktreihen, welche am Absturz erloschen sind, die Zwischenräume ganz glatt, flach, blau bis grün mit Bronzeschimmer. — Länge: 11,3—13 mm. Papua New Guinea 15. **latipes** sp. n.

5 (4) Hinterschienen des ♂ etwa in dem basalen Viertel am breitesten (Abb. 74, 77, 90, 91).

6 (11) Schienen ziemlich dick (Abb. 74, 76), Schenkel dick gekeult. Körper schmal.

7 (8) Hinterschienen des ♂ im basalen Viertel innen stark und fast winklig erweitert (Abb. 74), die Oberfläche innen gekörnt, unten mit einem fein gekörnten Kiel; das Ende der Vorderschienen unten abgeflacht und anliegend fein gelb behaart. Wenn man die Hinterschiene des ♂ an der schmalsten Stelle betrachtet, so sieht man innen auch die innere basale Erweiterung. Die Punktreihen sind am Absturz erloschen, die Zwischenräume flach, glatt und glänzend, meist blau oder violett, manchmal bronzefarbig. — Länge: 10—13,5 mm. Papua New Guinea, Irian, Amboina (= *singularipes* PIC, 1921) 16. **iridipennis** (FAIRMAIRE, 1897)

8 (7) Hinterschienen des ♂ im basalen Drittel weniger erweitert und leichter gebogen (Abb. 77, 90), Innenrand gekerbt und unten mit einem gekerbten Kiel. Vorderschienen des ♂ am Ende flach und glatt oder etwas konkav und anliegend behaart.

9 (10) Punktreihen der Flügeldecken am Absturz erloschen, die Zwischenräume flach und glatt. Vorderschienen unten flach und glatt, innen am Ende mit einer sehr kleinen Spitze, nur das äußerste Ende behaart. Epistom mehr oder weniger, manchmal tief winklig ausgeschnitten. Vorderkörper schwarz, Flügeldecken sehr verschiedenartig metallisch und glänzend. — Länge: 10,5—13 mm. Papua New Guinea, Irian, New Britain 17. **epistomaticus** (GEBIEN, 1920)

10 (9) Punktreihen der Flügeldecken mehr oder weniger scharf bis zur Spitze entwickelt. Epistom fast ganz gerade. Die Punktreihen der Flügeldecken am Absturz meist erloschener, höchstens an der Spitze ganz erloschen. Vorderschienen des ♂ unten am Ende flach, anliegend fein, gelb behaart, nachher zur Mitte allmählich verschmälernd leicht eingedrückt und nackt. Vorderkörper schwarz, Flügeldecken stark metallisch, meist blau oder blaugrün. — Länge: 11—13 mm. Australien (Queensland), New Britain 18. **atroviridis** (MACLEAY, 1888)

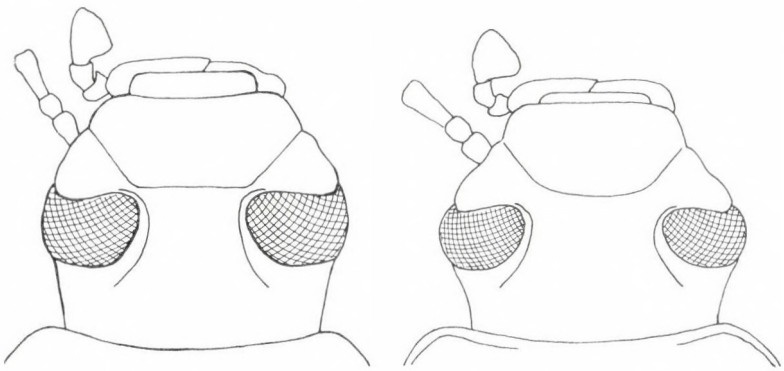
11 (6) Schienen dünn, besonders Vorder- und Mittelschienen (Abb. 92) auffallend lang. Körper schmal. Vorderkörper fein punktiert. Die Punktreihen der Flügeldecken am Absturz erloschen. Mittel- und Hinterschenkel wenig gekeult. Hinterschienen des ♂ innen breit gebogen erweitert (Abb. 91), die innere Oberfläche fein gekörnt, unten mit krenuliertem Kiel. Schenkel unten kaum behaart oder nackt. Vorderkörper, Unterseite und Beine schwarz, Flügeldecken lebhaft metallisch. — Länge: 11—12 mm. Papua New Guinea, Irian 19. **longipes** sp. n.

12 (3) Hinterschienen des ♂ innen nicht breit abgeflacht und basal oder gegen die Mitte nicht stark erweitert, gerade oder gebogen.

13 (20) Schenkel des ♂ unten behaart. Vorder- und Hinterschienen des ♂ stark gebogen. Schenkel stark gekeult, dick, Schienen des ♀ dick. Körper lebhaft metallisch. Parameren des ♂ fein chitinisiert, sehr flach, breitoval, durchscheinend.

14 (15) Vorderkörper stahlblau, Flügeldecken von der Basis an blau, purpurn, golden, grünlich, blau, violett, blaugrün, purpurn und die Spitze außen blau. Vorderkörper ziemlich grob punktiert, Punktreihen der Flügeldecken am Absturz erloschen, die Zwischenräume glatt und hochglänzend. Glieder der Fühlerkeule 6—10 kurz und breit. Augenfurche tief. — Länge: 11 mm. Papua New Guinea

20. **burgersi** sp. n. (♀)



3 4

Abb. 3—4. Kopf von *Derosphaerus laevistriatus* (GEBIEN) (3) und *D. coerulescens* (GUÉRIN-MÉNEVILLE) (4)

15 (14) Vorderkörper schwarz. Flügeldecken metallisch, basal grünlichblau, nachher etwas purpurn und das Ende bläulich.

16 (17) Flügeldecken bis zum Ende gestreift punktiert, die Zwischenräume bis zum Ende gewölbt. Die Reihenpunkte sind ziemlich erloschen, die Streifen aber vorn stärker, hinten am Absturz weniger übergreifend. Die Zwischenräume sind äußerst fein, erloschen punktiert. Halsschild und Kopf gut erkennbar, dicht punktiert. Augenfurche schmal und kaum eingedrückt. Vorderschienen des ♂ (Abb. 104) innen basal leicht gebogen erweitert. Hinterschienen (Abb. 105) unten apikal bis zur Mitte abgeflacht, die obere Randleiste in der Mitte kaum merklich gebogen. — Länge: 14,5 mm. Papua New Guinea 22. **sinuatipes** (GEBIEN, 1920)

17 (16) Die Punktreihen und die Längsstreifen der Flügeldecken am Absturz erloschen.

18 (19) Hinterschienen des ♂ einfach gebogen (Abb. 107), Unterseite kaum abgeflacht, innen und unten gekerbt, Außenrand unten mit einem feinen gekerbten Kiel. Vorderschienen des ♂ (Abb. 106) stark gebogen, innen basal leicht gebogen erweitert. Vorderkörper fein und gleichmäßig punktiert, Flügeldecken glatt, die Zwischenräume kaum erkennbar erloschen punktiert. — Länge: 12,8—14 mm. Papua New Guinea, Amboina 23. **aureomicans** (GEBIEN, 1920)

19 (18) Hinterschienen des ♂ (Abb. 94) gebogen, unten flach, der untere Außenrand von der Basis bis über die Mitte scharf, Innenrand hinter der Mitte leicht gebogen erweitert, das Endviertel wieder parallel, innen und unten nicht gekerbt. Vorderschienen (Abb. 93) stark gebogen, basal stärker erweitert, unten flach und gegen das Ende leicht verdickt. Vorderkörper fein punktiert, Flügeldecken glatt, hochglänzend. — Länge: 12,8—16,2 mm. Papua New Guinea, Irian (= *speciosus* GEBIEN, 1920) 21. **variicolor** (FAIRMAIRE, 1897)

20 (13) Schenkel des ♂ unten bei beiden Geschlechtern unbehaart. Körper schwarz, matt oder glänzend, manchmal blau bis kupferig oder bronzefarbig, in diesem Fall sind aber die Flügeldecken bis zur Spitze gestreift und die Beine des ♂ einfach.

21 (42) Seitenrand des Halsschildes fein oder scharf, aber nicht erloschen.

22 (25) Augenfurchen tief und weit von dem Innenrand der Augen gebogen entfernt (Abb. 4). Körper groß, robust, über 14 mm. Flügeldecken mit bis zur Spitze reichenden Längsstreifen. Der ganze Körper einfarbig blau, leicht kupferig oder blauschwarz, glänzend.

23 (24) Körper glänzend, besonders der Vorderkörper. Kopf fein und gleichmäßig punktiert, Stirn der Quere nach leicht gewölbt, Halsschild in der Mitte stärker, seitlich allmählich feiner punktiert, der Grund nur neben den Seiten fein chagriniert. Flügeldecken mit tiefen Längsstreifen, die Zwischenräume stark gewölbt, glatt. Die Reihenpunkte sind tief, übergreifen die Streifen, sie stehen weit voneinander, in der 4. Reihe etwa 35 Punkte. Meist blau oder blauschwarz, die Exemplare aus Ceram sind meist leichter bronzefarbig bis kupferig. — Länge: 14—18 mm. Insel Buru, Ceram, Mangola, Papua New Guinea (?), Borneo (= *transversicollis* FAIR-

MAIRE, 1893; *coelestinus* FAIRMAIRE, 1896; *ceramensis* GEBIEN, 1920; *latipennis* PIC, 1923) 2. **coerulescens** (GUÉRIN-MÉNEVILLE, 1830)

24 (23) Körper wenig glänzend, der Grund des Kopfes und Halsschildes fein chagriniert, Kopf dicht punktiert, Stirn flach, Halsschildpunktierung ungleich und grob, die ganze Oberseite fein chagriniert. Streifen der Flügeldecken feiner eingeschnitten, die Reihenpunkte sind klein, dicht stehend, in der 4. Reihe befinden sich etwa 40—50 Punkte. Die Zwischenräume gewölbt. Körper mit schwachem metallischem Schimmer. — Länge: 16—18,6 mm. Irian (Roon Ins.), Sumatra (Banka Ins.), Andamanen 3. **andamanus** (FAIRMAIRE, 1893)

25 (22) Augenfurchen fein und schmal, manchmal tief, aber gleich neben dem Innenrand der Augen gelegen. Körper meist kleiner, Flügeldecken parallel, statt Längsstreifen und Punktreihen nur mehr oder minder gut ausgeprägte Punktreihen oder die Punktreihen und Längsstreifen am Absturz erloschen. Körper schwarz, ohne Metallschimmer.

26 (31) Halsschild und Flügeldecken grob chagriniert und einfarbig vollkommen mattschwarz. Flügeldecken mit gleichmäßig groben Punktreihen bis zur Spitze, ohne Längsstreifen. Trochanteren beim ♂, vor allem die vorderen, mit einem kleinen Körnchen oder scharfer Ecke (Abb. 57, 61). Parameren des ♂ vollkommen abgeflacht, breit oder schmaler oval (Abb. 48—56).

27 (30) Vorderschienen des ♂ am Ende gebogen, Unterseite apikal flach, am Innenrand mit einem scharf gekanteten leicht gebogenen Lappen, unten mit einem ebensolchen, aber niedriger, dazwischen ist das Ende unten kurz konkav (Abb. 60).

28 (29) Hinterschienen des ♂ bei seitlicher Ansicht am Enddrittel leicht verdickt, innen ausgerandet, unten mit einem Kiel, und der Eindruck im apikalen Drittel lateral mit einem breiten, kaum abstehenden gelben Haarspinsel besetzt; dieser Haarpinsel auch bei Ansicht von oben gut sichtbar (Abb. 58—59). Mittelschienen des ♂ einfach, Flügeldecken mit groben Punktreihen. Die Zwischenräume sind leicht gewölbt, die 4. Reihe mit 17—20 Punkten. Parameren sehr breitoval. — Länge: 11—14 mm. Australien (Queensland, New South Wales, Victoria) 11. **punctipennis** (PASCOE, 1866)

29 (28) Hinterschienen einfach, gerade, im Querschnitt oval, innen am Ende ohne Ausschnitt, ohne Haarpinsel. Mittelschienen ebenfalls einfach. Flügeldecken mit feineren Punkten, die 4. Reihe mit 18 Punkten, die Zwischenräume sind flach. Parameren sind schmaloval, stark zugespitzt (Abb. 51—53). — Länge: 13 mm. Australien (Queensland) 12. **matthewsi** sp. n

30 (27) Vorderschienen des ♂ (Abb. 61) am Ende im Querschnitt oval, unten nicht abgeflacht und am Ende unten nicht konkav; dagegen ist der Innenrand in der Mitte kurz stumpf gebogen erweitert und der erweiterte Teil mit stumpfem Kiel versehen. Mittel- und Hinterschienen des ♂ einfach, Hinterschienen am Ende unten abgeflacht und kahl. Flügeldecken mit feineren Punktreihen, die 4. Reihe mit etwa 20—25 Punkten. Parameren sehr schmal langoval, stark zugespitzt, kaum durchscheinend (Abb. 54—56). — Länge: 12—16 mm. Australien (Queensland, New South Wales) 13. **trochantericus** sp. n.

31 (26) Halsschild und Flügeldecken sind glänzend schwarz oder braunschwarz, manchmal mit Metallschimmer, höchstens sehr fein und spärlich chagriniert. Alle Trochanteren des ♂ einfach, ohne Körnchen oder Ecke (wie Abb. 104).

32 (33) Vorderschienen des ♂ (Abb. 71) am Ende unten stark konkav, außen und innen mit einer fast gleichstarken Ecke versehen, Innenrand durch einen schwachen Kiel begrenzt. Mittelschienen des ♂ unten breit abgeflacht, gegen die Mitte ist die leicht konkave und nackte, beiderseits behaarte Vertiefung verschmälert und weit über die Mitte erloschen. Bei den Hinterschienen des ♂ (Abb. 72) die apikale Hälfte unten breit abgeflacht, der äußere Unterrand wenig, aber länger, der innere vor dem Ende tiefer ausgeschnitten, außen kurz, innen in dem Ausschnitt lang und dicht behaart. Mitte der Hinterbrust und die Abdominalsegmente des ♂ fein behaart. Kopf und Halsschild dicht und gleichmäßig punktiert, Flügeldecken mit groben Punktreihen, die Zwischenräume, vor allem am Absturz, leicht gewölbt. Parameren breitoval, abgeflacht und durchscheinend (Abb. 62—64). — Länge: 11—13 mm. Australien (Queensland) 14. **excisipes** (CARTER, 1914)

33 (32) Vorderschienen des ♂ am Ende unten einfach, im Querschnitt oval, Mittelschienen ebenfalls einfach. Parameren schmal zugespitzt, normal chitinisiert (wie Abb. 14—16, 20—22, 29—34, 38—44).

34 (35) Hinterschienen des ♂ (Abb. 24) innen im apikalen Drittel mit einer scharfen Ecke, nachher ist das Ende schmaler und parallel, die Ecke trägt einen Haarpinsel, das

parallele Ende innen lang und spärlich, schräg abstehend behaart, die Schiene im Querschnitt oval. Vorder- und Mittelschienen einfach, unten am Enddrittel mit Haarstreifen, im Querschnitt ebenfalls oval. Halsschild vor der Basis eingeschnürt, Oberfläche ziemlich dicht und grob punktiert. Flügeldecken mit bis zur Spitze reichenden Punktreihen, ohne Längsstreifen, der Grund glänzend. — Länge: 11 mm. Papua New Guinea 6. **dentipes** sp. n.

35 (34) Hinterschienen einfach gerade, ohne Ecke im Enddrittel an der Innenseite, höchstens ein leichter Ausschnitt vorhanden und das Ende innen oder unten kurz oder lang behaart (Abb. 25—28).

36 (41) Hinterschienen innen am Ende leicht ausgeschnitten und kurz anliegend behaart, im Querschnitt oval oder ebenfalls leicht ausgeschnitten, unten flach und dicht, abstehend gelb behaart, manchmal am Enddrittel mit Haarpinsel. Augenfurchen seicht.

37 (38) Hinterschienen des ♂ (Abb. 25) innen vor dem Ende leicht ausgeschnitten und spärlich kurz anliegend behaart. Vorder- und Mittelschienen einfach, unten am Ende mit Haarstreifen, im Querschnitt oval. Kopf und Halsschild dicht punktiert, Flügeldecken mit feinen Punktreihen, welche am Absturz erloschen sind, die Zwischenräume sehr fein und spärlich punktiert, der Grund ganz erloschen chagriniert. — Länge: 12—16,2 mm. Irian 7. **hirtipenis** sp. n.

38 (37) Hinterschienen innen am apikalen Drittel mit einem lang behaarten Haarpinsel oder sehr dicht abstehend behaart (Abb. 26, 27).

39 (40) Hinterschienen des ♂ (Abb. 26) innen am Ende leicht ausgeschnitten, im apikalen Drittel innen mit einer schräg nach oben gerichteten stumpfen Leiste, welche mit einem breiten, lang und etwas schräg nach außen gerichteten Haarpinsel versehen ist, das Ende innen spärlich, weniger abstehend behaart. Vorder- und Hinterschienen einfach. Kopf und Halsschild fein punktiert. Die Punktreihen der Flügeldecken bis zum Ende entwickelt, die inneren Reihen und die Reihen am Absturz feiner, die äußeren, vor allem die 7. und 8., deutlich gröber punktiert, vor allem an der Mitte. Zwischenräume glatt, ein wenig gewölbt, mit schwachem Erzschein. — Länge: 10,5 mm. Papua New Guinea 8. **szentivanyi** sp. n.

40 (39) Hinterschienen des ♂ (Abb. 27) innen und unten lang abstehend gelb behaart, die Behaarung reicht bis über die Mitte. Vorder- und Mittelschienen einfach. Kopf und Halsschild dicht und fein punktiert, Halsschild vor der Basis etwas ausgeschweift. Flügeldecken mit Punktreihen, welche innen und am Ende feiner sind, der Grund glänzend, die Zwischenräume leicht gewölbt. — Länge: 10,5—12 mm. Papua New Guinea 9. **furvus** (GEBIEN, 1920)

41 (36) Hinterschienen des ♂ einfach gerade, innen am Ende nicht ausgerandet und ohne Haarpinsel oder auffallend lange Behaarung. Vorderkörper grob punktiert. Flügeldecken mit groben, bis zum Ende reichenden, gleichmäßigen Punktreihen, die Zwischenräume leicht gewölbt und der Grund erloschen chagriniert. Augenfurchen tief. Körper schwarz. — Länge: 8—11,5 mm. Australien (North Territory, Queensland) 4. **lawrencei** sp. n.

42 (21) Seitenrand des Halsschildes teils oder ganz erloschen. Parameren scharf zugespitzt.

43 (44) Halsschild und Flügeldecken sehr grob chagriniert und matt. Clypealsutur scharf eingeschnitten, zwischen Augenvorderrand und Clypealsutur ist der Raum nicht breiter als das 2. Fühlerglied. Stirn schmal, grob und dicht punktiert. Scheibe des Halsschildes flach, grob punktiert, die Punkte seitlich vollkommen erloschen. Flügeldecken mit bis zur Spitze reichenden, gleichmäßigen, ziemlich feinen Punktreihen, die Zwischenräume flach, in der 4. Punktreihe befinden sich etwa 25 Punkte. Mittel- und Hinterschienen (Abb. 23) unten lang abstehend gelb behaart, die Schienen sind am Ende im Querschnitt oval. — Länge: 12—13,2 mm. Australien (Queensland) 5. **bornemisszai** sp. n.

44 (43) Körper nicht chagriniert, glänzend. Clypealsutur fein, der Raum zwischen Augenvorderrand und Clypealsutur breiter als das 1. Fühlerglied. Stirn breit. Die feinen Punktreihen sind am Ende der Flügeldecken erloschen. Hinterschienen des ♂ (Abb. 28) am Ende innen leicht ausgebogen, unten abgeflacht und dicht gelb behaart. Körper glänzend schwarz.

45 (46) Punktreihen der Flügeldecken fein, am Absturz erloschen, die Zwischenräume flach, äußerst fein und spärlich punktiert. — Länge: 10,5—13 mm. Papua New Guinea 10. **hirtipes** sp. n. f. typ.

46 (45) Punktreihen der Flügeldecken grob, am Absturz feiner, aber nicht vollkommen erloschen, die Zwischenräume leicht gewölbt, auch am Absturz. — Länge: 12—12,5 mm. Papua New Guinea 10/A. **hirtipes acutipenis** ssp. n.

1. *Derosphaerus laevistriatus* (GEBIEN, 1920) **comb. n.**

Encyalesthus laevistriatus GEBIEN, 1920: Nova Guinea XIII, Zool., 8: 303 (Locus typicus: »Ceram und den Kei-Inseln«).
Encyalesthus wegneri KASZAB, 1964: Tijdschr. Ent., **107** (5): 287 (Locus typicus: »Amboina«), **syn. n.**

Syntypen von *Encyalesthus laevistriatus* GEBIEN, 1920 befinden sich im Museum G. Frey Tutzing und der Holotypus ♂ der *Encyalesthus wegneri* KASZAB, 1964 im Ungarischen Naturwissenschaftlichen Museum in Budapest.

Untersuchungsmaterial: **Neuguinea** (1 ♂ ZMHU). — **Kei-Insel** (1 ♂ ZMHU). — **Ambon Isl.**, 70 m, 18. IX. 1960, A. M. R. WEGNER (1 ♂ HNHM: *Encyalesthus wegneri* KASZAB, 1964, HT); Amboina, Malay, V. 1908, F. MUIR (1 ♂ 1 ♀ BPBM).

GEBIEN (1920) lieferte eine ausführliche Beschreibung, welche die wichtigsten Merkmale dieser leicht kenntlichen Art enthält. Sie ist aufgrund der Form der Clypealsutur (Abb. 3) und der starken Längsstreifen sowie gewölbten Zwischenräume der Flügeldecken charakteristisch, außerdem ist die Basalfurche des Halsschildes in der Mitte erloschen. An den Beinen sind keine auffallenden sekundären Geschlechtsmerkmale vorhanden. Aedoeagus 2,03 mm lang, einfach, normal chitinisiert, die Parameren von der Basis an verschmälert und zugespitzt, bei Seitenansicht ist das Ende leicht nach unten gebogen (Abb. 5—7). — Länge: 13—16 mm.

Sie ist nächstverwandt mit *D. coerulescens* (GUÉRIN-MÉNEVILLE, 1830) und *D. andamanus* (FAIRMAIRE, 1893). Beide Arten sind ebenso robust wie *D. laevistriatus* (GEBIEN, 1920), die Halsschildbasis ist aber auch in der Mitte scharf gefurcht, außerdem die Flügeldeckenzwischenräume wenig gewölbt und in den Längsstreifen sitzen ziemlich grobe Punkte. Bei allen drei Arten sind die Beine des Männchens einfach.

2. *Derosphaerus coerulescens* (GUÉRIN-MÉNEVILLE, 1830) **comb. n.**

Helops coerulescens GUÉRIN-MÉNEVILLE, 1830: Voy. Coquin, **2:** 102, Taf. 5, Fig. 3 (Locus typicus: »Ins. Buru«).
Encyalesthus transversicollis FAIRMAIRE, 1893: Notes Leyden Mus., **15:** 27 (Locus typicus: »Bornéo«).
Encyalesthus coelestinus FAIRMAIRE, 1896: Notes Leyden Mus., **18:** 102 (Locus typicus: »Insula Bourou«).
Encyalesthus coerulescens var. *ceramensis* GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 303 (Locus typicus: »Insel Ceram: Piru und Illo«).
Encyalesthus robustus PIC, 1923: Mélang. exot.-ent., **38:** 30 (Locus typicus: »Boeroe«).
Encyalesthus coerulescens, ARDOIN, 1969: Bull. Soc. ent. Fr., **1969:** 125.

Synonymie ist nach ARDOIN, 1969 angegeben. Lectotypus ♂ (pres. des.) von *Encyalesthus coerulescens* v. *ceramensis* GEBIEN, 1920 befindet sich im Zoologischen Museum der Humboldt-Universität, Berlin; Paralectotypus ebendort und je 1 PLT auch im Ungarischen Naturwissenschaftlichen Museum sowie im Transvaal Museum. Die übrigen Typen hat ARDOIN im Museum Paris untersucht.

Untersuchungsmaterial: N.[eu] Guinea (4 Ex. ZMHU). — **Papua New Guinea:** Sattelberg (2 Ex. ZMHU); Wareo (1 Ex. ZMHU). — **Buru Ins.** (3 Ex. HNHM; 16 Ex. ZMHU); Insel Buru W. (4 Ex. ZMHU); Bourou, D'URVILLE (1 Ex. MNHN); Buru, Station 1, III—VIII., IV—IX., VI., IX. 1921, L. J. TOXOPEUS (5 Ex. HNHM), id., I—III. 1922, L. J. TOXOPEUS (1 Ex. TMPA), Station 9, 10. V.—1. VI. 1921, L. J. TOXOPEUS (1 Ex. TMPA), id., 20. VI.—10. VII. 1921, L. J. TOXOPEUS (1 Ex. HNHM). — **Gorom Ins.** (1 Ex. ZMHU). — **Ceram** (7 Ex. ZIAK), id., 1861, DEYROLLE (1 Ex. MNHN), id., Wahain (1 Ex. ZIAK); Ostceram (1 Ex. ZMHU); Ceram, Piroe, I. 1909, F. MUIR (1 Ex. BPBM), id., Illo, 1884, C. RIBBE (1 ♂ 1 ♀ ZMHU, Lectotypus ♂ und Paralectotypus der *Encyalesthus coerulescens* v. *ceramensis* GEBIEN, 1920; 1 ♂ HNHM, 1 ♂ TMPA, Paralectotypen dieselben) id., Mausela, C. Ceram, 2500 ft, 1919, PRATT (5 Ex. BMNH). — **Ambon** (4 Ex. ZIAK); Amboina (2 Ex. ZIUH). — Sula Inseln: Mangole, VII—XII. 1977, V. & G. WEGENER (2 Ex. NHMB).

Sehr groß und robust. Der ganze Körper schwarzblau oder mehr oder weniger schwarz messingfarbig, selten kupferig-grünlich schwarz. Kopf (Abb. 4) mit breiten und tiefen Augenfurchen, welche von dem Innenrand der Augen entfernt und vor dem Hinterrand der Augen erloschen sind. Clypealsutur gebogen, von den Augen weit entfernt. Vorderrand des Clypeus gerade abgestutzt. Stirn leicht gewölbt, gleichmäßig fein punktiert, der Grund glatt. Fühler kurz, mit gut abgesetzter 6-gliedriger Keule, die Keulenglieder 6—10 quer, das Endglied unregelmäßig länglich oval. Halsschild quer, von der Mitte an zur Basis leicht verengt und kaum merklich eingeschnürt, vorn dagegen breit rundlich gebogen. Basalrand tief gefurcht. Scheibe wenig gewölbt, Seiten abfallend, der scharf abgesetzte Rand von oben übersehbar. Ungleich verteilt, spärlich, ziemlich grob punktiert, an den geneigten Seiten unpunktiert und der Grund erloschen chagriniert, die Scheibe glatt. Flügeldecken breit, tief bis zur Spitze gefurcht, in den Streifen mit ziemlich groben Punkten, welche am Absturz feiner sind; die Zwischenräume innen weniger, außen stärker gewölbt, wegen der vollkommen erloschenen feinen Chagrinierung nicht hochglänzend. Unterseite fettglänzend, Prosternum zwischen den Hüften breit und flach, das Ende abgerundet und dick gerandet, nach vorn stärker geneigt. Mittelbrust tief eingedrückt. Abdomen beim ♂ und ♀ gleich, die Basalsegmente nicht verflacht. Beine robust, bei beiden Geschlechtern ähnlich, Vorderschienen gebogen, Mittel- und Hinterschienen gerade, die Schienen sind im Querschnitt kaum oval. Aedoeagus 2,77 mm lang, normal stark chitinisiert und das Ende scharf zugespitzt (Abb. 8—10). — Länge: 14—18 mm.

Unter den papuanischen Arten steht sie *D. andamanus* (FAIRMAIRE, 1893) und *D. laevistriatus* (GEBIEN, 1920) am nächsten. Die letztere Art besitzt unterbrochenen Basalrand des Halsschildes und die Längsstreifen der Flügeldecken sind nur mit sehr feinen Punktreihen versehen. Die andere Art, *D. andamanus* (FAIRMAIRE, 1893) hat viel gröberen und ungleich punktierten Halsschild, dessen Grund fein chagriniert ist, deshalb fettglänzend, die Stirn ist flach und dicht punktiert, die Clypealsutur feiner eingedrückt, das Prosternum nach vorn und hinten leicht gleichmäßig geneigt, weiters die Reihenpunkte der Flügeldecken in den Streifen fein, tiefer und schärfer.

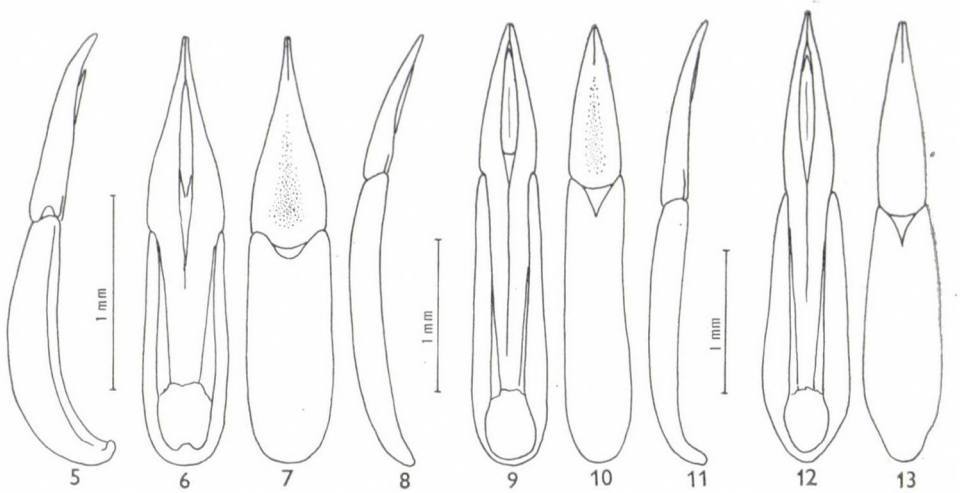


Abb. 5—13. Aedoeagus. 5—7 = *Derosphaerus laevistriatus* (GEBIEN); 8—10 = *D. coerulescens* (GUÉRIN-MÉNEVILLE) und 11—13 = *D. andamanus* (FAIRMAIRE) (Abb. 5, 8 und 11 bei Seitenansicht, Abb. 6, 9, 11 ventral und 7, 10, 13 dorsal)

Die Art ist vor allem in der Inselgruppe Buru, Ceram und Amboina häufig. Das Vorkommen in Neuguinea muß noch bestätigt werden, weil sie in neuerer Zeit nicht wiedergefunden wurde und die bisherigen Angaben auf sehr alten, vielleicht falsch etikettierten Stücken beruhen. Aufgrund der Untersuchungen von ARDOIN (1969) gehören hierher mehrere Arten als Synonyme, sogar noch eine Art aus Borneo, so scheint die Art in Malaysia weit verbreitet zu sein.

3. *Derosphaerus andamanus* (FAIRMAIRE, 1893) **comb. n.**

Encyalesthus andamanus FAIRMAIRE, 1893: Notes Leyden Mus., **15:** 26 (Locus typicus: »Ins. Andaman«).

Syntype befindet sich im Museum National d'Historie Naturelle, Paris.

Untersuchungsmaterial: **Andaman** (1 ♂ HNHM, cum typo comparavit). — **Banka Ins.** (1 ♀ ZIAK). — **Irian:** Roon Ins. (1 ♀ HNHM).

Große, robuste Art, schwarz mit metallisch messingfarbiger Oberseite. Kopf mit tiefen Augenfurchen, welche von dem Innenrand der Augen weit entfernt sind und hinten nicht über dem Hinterrand der Augen reichen. Clypealsutur gebogen, von den Augen entfernt. Vorderrand des Clypeus gerade abgestutzt. Stirn ziemlich flach, dicht und ungleich punktiert. Fühler mit gut abgesetzter 6-gliedriger Keule, das 1. Keulenglied weniger, die Glieder 7—10 deutlich quer, das Endglied kurzoval. Halsschild quadratisch,

Seiten leicht gebogen, zur Basis wenig verengt und vor den Hinterecken etwas ausgeschweift, die Vorderecken abgerundet stumpfwinklig, jedoch nicht mit dem Vorderrand verrundet. Seitenrand scharf, von oben gut übersehbar, die Scheibe nicht stark quer gewölbt. Oberseite grob und dicht, ungleich punktiert, der Grund erloschen chagriniert, deshalb fettglänzend. Basalrand scharf gefurcht. Flügeldecken mit vortretenden Schulterbeulen und Längsstreifen, welche bis zum Ende entwickelt sind, die kleinen und scharf vertieften Punkte der Streifen in den inneren Reihen am Absturz deutlich feiner. Die Zwischenräume vorn und innen kaum, von den 4. an, besonders am Ende, gewölbt, erloschen mikroskopisch fein chagriniert und deshalb nicht hochglänzend. Unterseite fettglänzend; Prosternum breit, nach vorn und hinten gleich und wenig geneigt, das Ende abgerundet und dick gerandet. Mittelbrust wenig vertieft. Abdomen bei beiden Geschlechtern einfach. Das 8. Urosternit des ♂: Abb. 35. Beine robust, bei beiden Geschlechtern einfach, Vorderschienen leicht gebogen, Mittel- und Hinterschienen gerade, im Querschnitt kaum oval. Aedoeagus 3,14 mm lang, stark chitinisiert, Parameren schmal zugespitzt (Abb. 11—13). — Länge: 16—18,6 mm.

Nächstverwandt mit *D. aeruginosus* (Fabricius, 1787), welche in Indochine und auf den malayischen Inseln weit verbreitet ist; bei dieser Art sind aber die Zwischenräume der Flügeldecken flach, nur am Absturz sind die seitlichen Zwischenräume stärker, die übrigen weniger gewölbt, außerdem der Halsschild mehr zur Basis verengt, die Stirn breiter. Vielleicht ist *D. andamanus* (Fairmaire, 1893) nur eine Subspecies von *D. aeruginosus* (Fabricius, 1787).

Die Verbreitung erstreckt sich von den Andamanen über Sumatra (Banka I.) bis Neuguinea (Roon I.), deshalb muß sie mit den papuanischen Arten verglichen werden. Es kommen nur zwei Arten in Frage: *D. laevistriatus* (Gebien, 1920) und *D. coerulescens* (Guérin-Méneville, 1830). Die erste Art besitzt in der Mitte einen erloschenen Basalrand der Flügeldecken, außerdem die Flügeldecken tief gefurcht und die Zwischenräume stark gewölbt, in den Längsstreifen sind die Punkte sehr klein, außerdem der Halsschild vorn breit verrundet. Die zweite Art ist mehr robust, tief gefurcht, die Reihenpunkte sind vorn grob und stehen weit voneinander, außerdem das Prosternum nach vorn stärker geneigt als nach hinten, die Mittelbrust tief eingedrückt, die Halsschildscheibe glänzend und bedeutend feiner und spärlicher punktiert.

4. **Derosphaerus lawrencei** sp. n.

Holotypus ♂: [**Australia**] North Territory, Birraduk Creek, 18 km E by N of Oenpelli (12°17′ S—133°13′ E), 4. VI. 1973, Upton & Feehan (ANIC). — Paratypen: wie HT ♂ (1 ♂ ANIC); North Territory, Rimbija I., Wessel (11°01′ S—136°45′ E), 14—21. II. 1977, Barrett & Bakker (1 ♀ ANIC); 18 km E by N of Oenpelli (12°17′ S—133°13′ E), 1. VI. 1973, Matthews & Upton (1 ♂ ANIC; Queensland, Cape York (2 ♂ SAMA); Mary Creek (16°33′ S—145°12′ E), 4. XII. 1968, Britten & Misko (3 ♂ ANIC); Coen, 18. I. 1906

(1 ♀ ANIC); Iron Ra., V. 1911, J. G. Brooks (1 ♀ ANIC); Palm Is., 30. IX. 1926 (1 ♀ QMBA); nr. The Craters 18 km N of Ravenshoe, 28—29. XI. 1981, J. Balderson (1 ♂ ANIC); Palmerston N. P., 26 km E by N of Ravenshoe, 14. XI. 1981, J. Balderson (1 ♂ ANIC); Finch Hatton Corgs., via Finch Hatton, 19. IV. 1968, G. Monteith (1 ♂ QMBA).

Einfarbig schwarz, ziemlich glänzend. Kopf mit hochgewölbten Augen, Augenfurchen sehr schmal und tief, Clypealsutur gebogen, kaum eingedrückt, der Raum zwischen den Augen und der Clypealsutur nicht breiter als das 2. Fühlerglied. Stirn gewölbt, sehr dicht und kräftig punktiert, der Grund glänzend. Fühler hintergelegt die Basis des Halsschildes nicht erreichend, vom 6. Glied an breiter, das Endglied oval. Halsschild quer, rundlich, an der Basis leicht, kaum eingeschnürt. Seitenrand scharf. Die Scheibe kräftig und dicht punktiert, gegen die Seiten, besonders an den abfallenden Teil aber erloschen. Flügeldecken mit gleichmäßig groben Punktreihen, welche bis zur Spitze reichen, die Zwischenräume leicht gewölbt, der Grund fein chagriniert, meist erloschen, mehr oder weniger glänzend. Unterseite, besonders das Abdomen, grob und dicht punktiert. Prosternum breit und flach, nach vorn und hinten leicht geneigt, das Ende abgestutzt. Abdominalsegmente in der Mitte nicht abgeflacht, fein und spärlich punktiert. Beine kräftig, Schenkel gekeult, mit äußerst feiner, mikroskopischer Behaarung. Schienen des ♂ einfach, Vorderschienen leicht gebogen, Mittel- und Hinterschienen gerade, unten schräg abstehend oder anliegend gelb behaart. Aedoeagus 1,22 mm lang, normal sklerotisiert. Parameren lang, schmal zugespitzt (Abb. 14—16). — Länge: 8—11,5 mm.

Diese Art ist durch die groben und gleichmäßigen Reihenpunkte der Flügeldecken, die grobe Punktierung des Abdomens und durch die einfachen Schienen der Männchen gekennzeichnet. Nächstverwandt mit *D. bornemisszai* sp. n., welche oben vollkommen matt ist, der Seitenrand des Halsschildes in der Mitte erloschen, das Abdomen nur in der Mitte sehr fein punktiert, die Reihenpunkte der Flügeldecken deutlich feiner und die Mittel-, besonders aber die Hinterschienen, dichter und länger behaart.

Die Art sei zu Ehren von Herrn Dr. J. F. Lawrence (Canberra) benannt.

5. **Derosphaerus bornemisszai** sp. n.

Holotypus ♂: [**Australia**], Queensland, Yeppoon, 14. XII. 1964, I. F. B. Common (ANIC). — Paratypen: Queensland, Gayndah, 7. I. 1963, R. J. Elder (1 ♂ QMBA); Milmeran, XI. 1950, J. G. Brooks (1 ♂ ANIC); Inglewood, 28. XII. 1971, B. Cantrell (1 ♂ QMBA).

Gestalt robust, parallel, vollkommen mattschwarz. Kopf mit schmalen Augenfurchen. Clypealsutur gebogen, der Raum zwischen Augen und Clypealsutur etwa so breit wie das 2. Fühlerglied. Vorderrand des Clypeus gerade abgestutzt. Stirn und Clypeus der Quere nach leicht gewölbt, dicht und grob, aber seicht punktiert, der Grund erloschen chagriniert. Fühler

hintergelegt die Basis des Halsschildes nicht erreichend, vom 6. Glied an breiter, die Keulenglieder 6—10 dreieckig, das Endglied langoval. Halsschild auffallend breit und Seiten in einem breiten Bogen gerundet, auch zur Basis stark verengt, vor den Hinterecken kaum ausgeschweift; von der Mitte an nach vorn mit dem Vorderrand in einem breiten Bogen abgerundet, Vorderrand in der Mitte nach vorn gebogen und beiderseits ausgeschweift. Die Scheibe flach, gröber und weit spärlicher punktiert als der Kopf, seitlich ist die Punktierung allmählich feiner, an dem abfallenden Teil der Seiten vollkommen erloschen. Der Grund grob chagriniert und matt. Seitenrand in der Mitte mehr oder weniger breit erloschen, sonst fein. Flügeldecken mit vortretenden Schulterbeulen und gleichmäßigen, bis zur Spitze reichenden Punktreihen; in der 4. Punktreihe befinden sich etwa 25 Punkte, die alle klein sind, und scharf eingestochen, die Zwischenräume vollkommen flach, der Grund grob chagriniert und matt. Unterseite fettglänzend, Propleuren, Seiten der Brust und Seiten des Abdomens chagriniert; Prosternum breit und flach, auch das leicht abgerundete Ende kaum gerandet. Mittelbrust wenig eingedrückt. Die 2 ersten Abdominalsegmente des ♂ kaum verflacht. Beine kräftig, glänzend schwarz, Schenkel stark gekeult, beim ♂ unten kahl. Vorderschienen des ♂ stärker, Mittelschienen kaum gebogen, Hinterschienen (Abb. 23) gerade; alle Schienen unten von dem apikalen Ende bis weit über die Mitte abstehend lang gelb behaart. Aedoeagus 1,59 mm lang, normal sklerotisiert, Parameren von der Basis an nach vorn verengt und spitzwinklig ausgezogen (Abb. 17—19). — Länge: 12—13,2 mm.

Eine durch die mattschwarze Oberseite, die Schienen des ♂ und den Aedoeagus gekennzeichnete Art, welche bei flüchtiger Ansicht *D. punctipennis* (Pascoe, 1866), *D. trochantericus* sp. n. und *D. matthewsi* sp. n. sehr ähnlich sieht. Sie sind aber aufgrund der männlichen sekundären Geschlechtsmerkmale und der Form des Aedoeagus grundverschieden.

Ich benenne diese neue Art zu Ehren meines lieben Freundes, Herrn Dr. G. Bornemissza (Hobart).

6. **Derosphaerus dentipes** sp. n.

Holotypus ♂: **Papua New Guinea,** Owen Stanley Range, Goilala: Loloipa, 16—30. I. 1958, W. W. Brandt (BPBM). — Paratypus: wie HT ♂, 1—15. II. 1958, W. W. Brandt (1 ♀ BPBM).

Gestalt schmal, parallel, einfarbig glänzend schwarz, Fühlerbasis heller, die Keule pechschwarz. Kopf mit flachen Augen. Augenfurchen sehr schmal und seicht, Clypealsutur gebogen, von den Augen weit entfernt. Vorderrand des Clypeus nicht vollkommen gerade abgestutzt. Clypeus und Stirn der Quere nach leicht gewölbt, gleichmäßig und sehr spärlich punktiert. Fühler

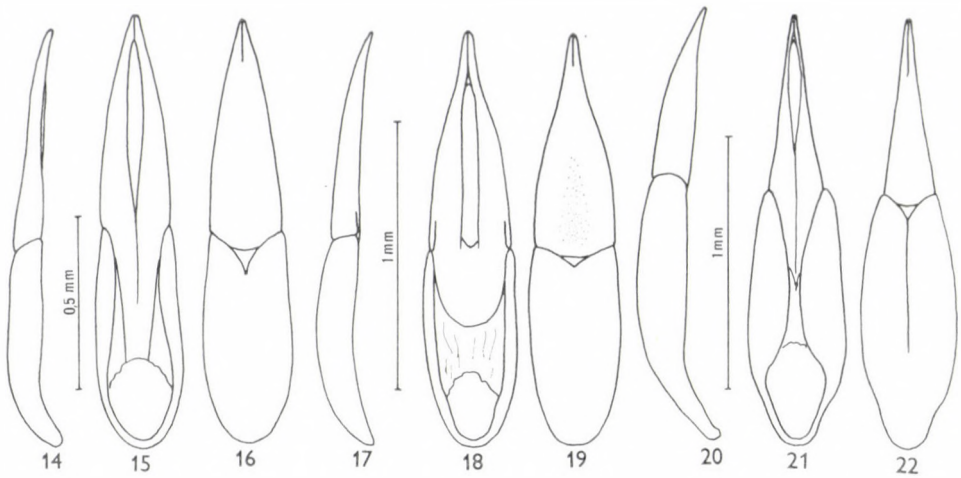


Abb. 14—22. Aedoeagus. 14—16 = *Derosphaerus lawrencei* sp. n.; 17—19 = *D. bornemisszai* sp. n. und 20—22 = *D. dentipes* sp. n. (Abb. 14, 17, 20 bei Seitenansicht, Abb. 15, 18, 21 ventral und Abb. 16, 19, 22 dorsal)

hintergelegt, die Basis des Halsschildes nicht erreichend, mit abgesetzter 6-gliedriger Keule, die Keulenglieder 6—10 quer, das Endglied kurzoval. Halsschild vor der Mitte am breitesten, nach hinten gebogen stark verengt und vor der Basis auffallend ausgeschweift, vorn mit dem Vorderrand gemeinsam verrundet. Seitenrand scharf, von oben aber nur vor der Basis übersehbar. Scheibe stark gewölbt, die Mitte grob und spärlich, seitlich allmählich feiner und an den geneigten Seiten unpunktiert. Flügeldecken schmal, die inneren Punktreihen sind fein, von der 4. an allmählich gröber, in der 4. Reihe etwa 16—17 Punkte, die seitlichen Punkte sind länglich, die inneren Zwischenräume sind flach, außen und am Ende leicht gewölbt, die 1. Punktreihe mit einem Streifen reicht bis zur Spitze. Der Grund glatt und unpunktiert. Unterseite chagriniert, äußerst fein und erloschen spärlich punktiert. Prosternum nach vorn und hinten nur wenig geneigt, das Ende abgerundet und dick gerandet, Mittelbrust tief eingedrückt, der Eindruck beiderseits mit je einer ganz stumpfen Ecke. 1. Abdominalsegment des ♂ in der Mitte nur kaum abgeflacht. Das 8. Urosternit des ♂: Abb. 36. Beine lang, Schenkel stark gekeult, Unterseite des ♂ kahl. Vorderschienen des ♂ gebogen, Innenrand am Ende gelb behaart, Mittelschienen des ♂ fast gerade, unten am apikalen Drittel gelb behaart. Hinterschienen des ♂ (Abb. 24) gerade, innen am apikalen Drittel mit einer scharfen Ecke, welche einen gelben Haarpinsel trägt, das parallele Ende innen schräg abstehend, lang gelb, spärlich behaart. Aedoeagus 1,7 mm lang, normal chitinisiert, Parameren sind schmal und lang zugespitzt, Basalplatte dorsal der ganzen Länge

nach tief gefurcht, die Teile sind aber eng aneinanderstoßend (Abb. 20—22). — L ä n g e : 11 mm.

Sie ist aufgrund der sekundären Geschlechtsmerkmale der Beine gut gekennzeichnet, und eine ähnliche Beinform kommt bei keiner weiteren Art vor. Ein Haarpinsel an den Hinterschienen tritt noch bei *D. punctipennis* (PASCOE, 1860) und *D. szentivanyi* sp. n. auf, es gibt aber bei beiden Arten keine vorspringende Ecke, welche den Haarpinsel tragen würde. Sie gehört systematisch zu den Arten *D. hirtipenis* sp. n., *D. szentivanyi* sp. n. und *D. furvus* (GEBIEN, 1920), welche aber abweichende Beinform haben.

7. **Derosphaerus hirtipenis** sp. n.

H o l o t y p u s ♂: [**Irian**] New Guinea (NW), Wisselmeren, Enarotadi, 1800—1900 m, 2—3. VIII. 1962, J. SEDLACEK (BPBM). — P a r a t y p e n : New Guinea (Neth.), Wisselmeren, Waghete, Tigi L., 16. VIII. 1955, J. L. GRESSITT (1 ♂ BPBM); Paniai, 23. VIII. 1939, K. N. A. G. (2 ♀ RMNH).

Der vorigen Art sehr ähnlich, schmal, vollständig schwarz. K o p f mit schmalen, mäßig tiefen Augenfurchen. Clypealsutur leicht eingeschnitten, der Raum zwischen Augen und Clypealsutur deutlich breiter als das 1. Fühlerglied. Vorderrand des Clypeus gerade abgeschnitten. Stirn und Clypeus der Quere nach gebogen, gleichmäßig und dicht punktiert, der Grund glänzend. F ü h l e r lang, hintergelegt die Basis fast erreichend, mit gut abgesetzter 6-gliedriger Keule. H a l s s c h i l d quer, Seiten von der Mitte an nach hinten leicht verengt und vor der Basis wenig ausgeschweift, vorn breit verrundet. Seiten fein und scharf, in der Mitte manchmal fast erloschen, Oberseite kräftig punktiert, die Punkte seitlich feiner und neben dem Rand erloschen. Der Grund wenig glänzend. F l ü g e l d e c k e n mit stark vortretenden Schulterbeulen. Die Punktreihen sind fein und am Absturz erloschen, es sind auch Spuren von Längsstreifen vorhanden, welche am Ende ebenfalls verschwunden sind. Die Zwischenräume zwischen den Reihenpunkten sehr leicht gewölbt. Am Ende ist der seitliche Zwischenraum vertikal abfallend, deshalb erscheint das Ende beider Flügeldecken an der Naht etwas stumpfwinklig und nicht gemeinsam abgerundet. U n t e r s e i t e fettglänzend, Prosternum zwischen den Hüften sehr breit, kaum gerandet, hinten abgerundet mit schwacher Randung. Mittelbrust eingedrückt, seitlich keine Ecke. Erste Segmente des Abdomens kaum verflacht. B e i n e lang, Schenkel dick gekeult, Vorderschienen des ♂ leicht gebogen, unten am Ende behaart, Mittelschienen gerade, im apikalen Drittel unten fein gelb behaart, Hinterschienen (Abb. 25) gerade, im apikalen Drittel innen gebogen ausgebuchtet und kurz, schräg abstehend, spärlich, gelb behaart, ohne lange, dichte Behaarung. A e d o e a g u s 1,81 mm lang, normal stark chitinisiert. Parameren von der Basis an nach vorn gerade verschmälert und spitzwinklig ausgezogen, Oberseite in der Mitte mit einem scharfen Längskiel, deshalb ist die Oberseite dachförmig, seitlich vollkommen flach,

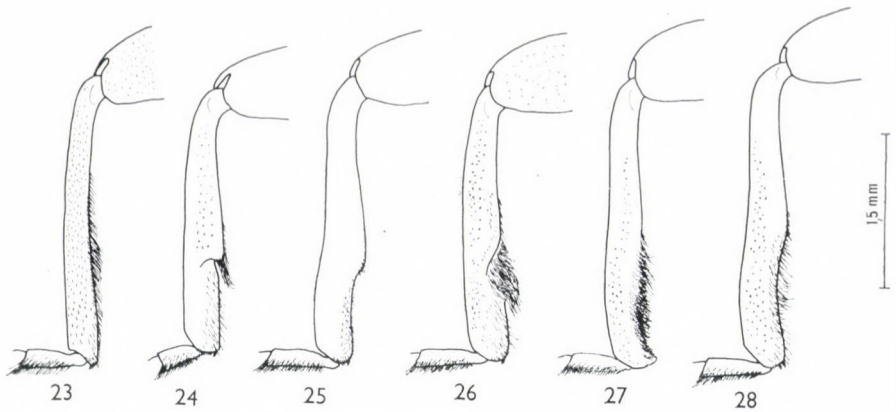


Abb. 23—28. Rechte Hinterschiene des ♂ von *Derosphaerus bornemisszai* sp. n. (23), *D. dentipes* sp. n. (24), *D. hirtipenis* sp. n. (25), *D. szentivanyi* sp. n. (26), *D. furvus* (GEBIEN) (27) und *D. hirtipes* sp. n. (28)

von der Basis bis über die Mitte lang abstehend, dicht behaart. Basalplatte dorsal in der Mitte durch eine sehr breite Furche geteilt (Abb. 29—31). — L ä n g e : 12—13,2 mm.

Die neue Art ist durch den ganz eigenartig gebildeten Aedoeagus sowie die Form der Hinterschienen des ♂ ausgezeichnet. Nächstverwandt mit *D. dentipes* sp. n., *D. szentivanyi* sp. n. und *D. furvus* (GEBIEN, 1920). Bei diesen Arten sind die Parameren nicht dachförmig und dorsal ohne Längskiel, und alle diese Arten haben an den Hinterschienen am apikalen Drittel entweder einen Haarpinsel oder sind innen sehr dicht, lang abstehend behaart.

8. **Derosphaerus szentivanyi** sp. n.

H o l o t y p u s ♂: **[Papua] New Guinea:** Mt Missim, 2000 m, 2. II. 1970, J. SEDLACEK (HNHM).

Körper glänzend schwarzbraun, Flügeldecken mit schwachem metallischem Schimmer. K o p f mit sehr schmalen und mäßig tiefen Augenfurchen, Clypealsutur gebogen, von den Augen weit entfernt. Vorderrand des Clypeus nicht ganz gerade abgeschnitten. Stirn ziemlich flach, fein und dicht punktiert. F ü h l e r dünn, hintergelegt die Basis des Halsschildes erreichend, mit abgesetzter 6-gliedriger Keule, die Keulenglieder sind länglich, das Endglied auffallend kurz. H a l s s c h i l d quer, stark gebogen, Seiten breit gerundet, nach hinten verengt und vor der Basis eingeschnürt, Seitenrand scharf, Vorderecken breit abgerundet. Die Scheibe etwas gröber, aber sehr spärlich punktiert, seitlich allmählich feiner, der Grund vollkommen erloschen fein chagriniert, nicht hochglänzend. F l ü g e l d e c k e n mit vortretenden Schulterbeulen, die Punktierung ähnlich wie bei *D. dentipes* sp. n., die inneren Punkt-

reihen sind fein, von der 4. an gröber, besonders die seitliche 6.—8. Reihe, am Absturz sind alle Reihen feiner und in der Spitze erloschen. Die seitlichen Zwischenräume leicht gewölbt, sehr fein und spärlich punktiert, der Grund glatt. Unterseite fein chagriniert, Prosternum hinter den Hüften seitlich mit scharfer Kante und verschmälert, das Ende kurz gebogen, dick gerandet, die Mitte zwischen den Hüften außerdem noch mit einer sehr seichten Längsfurche. Mittelbrust tief eingedrückt, seitlich ohne Ecke. 1. Abdominalsegment in der Mitte abgeflacht. Beine lang, Schenkel stark gekeult, unten auch beim ♂ kahl; Vorderschienen des ♂ gebogen, die Spitze unten gelb behaart, Mittelschienen des ♂ weniger gebogen, gleich vor dem Ende innen etwas erweitert und unten behaart, Hinterschienen des ♂ (Abb. 26) gerade, innen hinter der Mitte ausgeschweift und von der Mitte bis zum apikalen Viertel sehr lang abstehend und dicht gelb behaart, das Ende selbst unabhängig von dieser Behaarung anliegend feiner und spärlicher gelb behaart. Aedoeagus 1,77 mm lang, einfach, normal sklerotisiert, die Parameren lang zugespitzt, die Mitte dorsal leicht der Länge nach eingedrückt. — Länge: 10,5 mm.

Durch die Beinform des ♂, weiters die Form des Aedoeagus, die schmale Gestalt und Skulptur der Flügeldecken gekennzeichnet. Nächstverwandt mit *D. furvus* (GEBIEN, 1920), bei welcher aber die Hinterschiene des ♂ unten am Ende breit abgeflacht ist. Vom Ende bis über die Mitte sehr dicht, abstehend, gelb behaart, ohne abgesonderten Haarpinsel hinter der Mitte, und innen ist die Schiene nicht ausgerandet.

Ich benenne diese neue Art zu Ehren meines lieben Freundes und ehemaligen Kollegen im Museum Budapest, Dr. J. J. H. SZENT-IVÁNY (Adelaide) zum Gedenken an seinen 75. Geburtstag.

9. *Derosphaerus furvus* (GEBIEN, 1920) **comb. n.**

Encyalesthus furvus GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 299, Abb. 55 (Locus typicus: »Deutsch-Neu-Guinea: Hunsteinspitze, ferner beim Hauptlager am Malu«).
Encyalesthus furvus, KASZAB, 1939: Nova Guinea (N. S.), **3:** 224.

Lectotypus ♂ und Paralectotypen ♂, ♀ (pres. des.) befinden sich im Zoologischen Museum der Humboldt-Universität, Berlin.

Untersuchungsmaterial: **Papua New Guinea,** 23., 24., 27. II. 1913, BÜRGERS (2 ♂ 2 ♀ ZMHU, Lectotypus und Paralectotypen); Hauptlager b. Malu, 21—22. I. 1913, BÜRGERS (1 ♂ 1 ♀ ZMHU); Huon Golf, Sattelberg, 1899, L. BIRÓ (1 ♀ HNHM).

Diese Art hat GEBIEN (1920) ausführlich und richtig beschrieben, und hier will ich nur die wichtigsten Charakteristika der Art angeben. Kopf mit schmalen Augenfurchen. Der Raum zwischen Augen und Clypealsutur breiter als das 1. Fühlerglied. Stirn breit, fein und spärlich punktiert, der Grund glänzend. Fühler hintergelegt die Basis des Halsschildes bei wei-

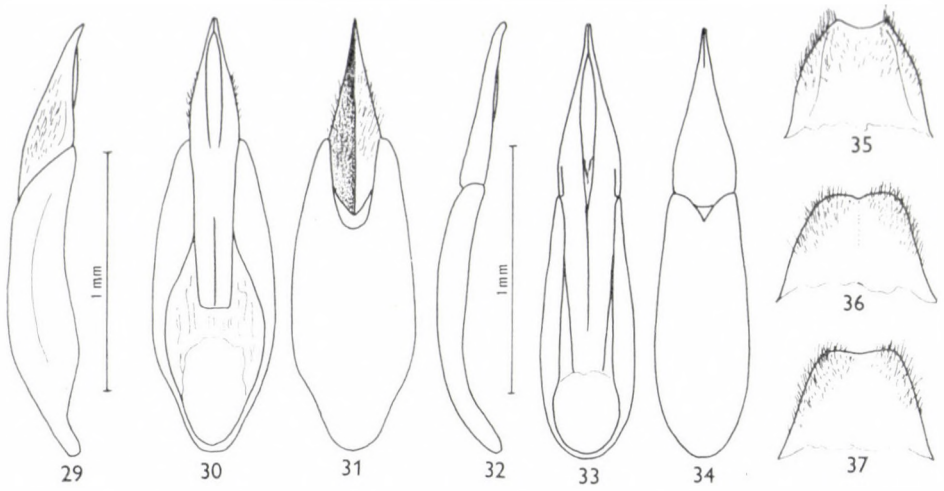


Abb. 29—34. Aedoeagus. 29—31 = *Derosphaerus hirtipenis* sp. n. und 32—34 = *D. szentivanyi* sp. n. (Abb. 29, 32 bei Seitenansicht, Abb. 30, 33 ventral, Abb. 31, 34 dorsal) — Abb. 35—37. Das 8. Urosternit des ♂ bei *D. andamanus* (FAIRMAIRE) (35), *D. dentipes* sp. n. (36) und *D. furvus* (GEBIEN) (37)

tem nicht erreichend, vom 6. Glied an allmählich breiter, das Endglied dick-oval. Halsschild vor der Basis ausgeschweift, vor der Mitte am breitesten. Seitenrand scharf. Die Punktierung der Scheibe in der Mitte bedeutend kräftiger als am Kopf, seitlich ist die Punktierung vollkommen erloschen, Seiten steil abfallend. Flügeldecken mit Punktreihen, in der 4. Reihe etwa 28—30 Punkte. Die seitlichen Reihen sind gröber, aber gleichmäßig, am Absturz erloschen. Die Zwischenräume sehr leicht gewölbt. Das 8. Urosternit des ♂: Abb. 37. Beine lang, Schenkel stark gekeult; Vorder- und Mittelschienen einfach, beide am Ende unten kurz, gelb behaart, Hinterschienen des ♂ (Abb. 27) gerade, innen die apikale Hälfte sehr leicht verschmälert, unten breit verflacht und von der Spitze bis über die Mitte lang und dicht, gelb behaart. Aedoeagus 1,8 mm lang, stark sklerotisiert, Parameren schmal und lang, zugespitzt, Basalplatte dorsal in der Mitte der Länge nach durch eine tiefe Furche geteilt (Abb. 38—40). — Länge: 10,5—12 mm.

Es scheint eine sehr seltene Art zu sein, weil außer der Typenserie bis jetzt nur ein weiteres ♀ bekannt ist. Nächstverwandt mit *D. dentipes* sp. n., *D. hirtipenis* sp. n. und *D. szentivanyi* sp. n. Jede Art besitzt abweichende Genitalarmatur des ♂ und abweichende sekundäre Geschlechtsmerkmale.

10. **Derosphaerus hirtipes** sp. n. (Abb. 1)

Holotypus ♂: **Papua New Guinea**, 11 km S of Mt Hagen (town), 2000—2300 m, 20. V. 1963, J. SEDLACEK (BPBM). — Paratypen: wie HT ♂ (1 ♂ 2 ♀ BPBM); Purosa, 1900 m, 25. VIII, 1964, J. & M. SEDLACEK (1 ♀ BPBM); Finisterre Range, Saidor: Kiambavi

vill., 1—28. VIII. 1958, W. W. Brandt (1 ♀ BPBM); Umg. Kainantu, Onerunka, 9. IV. 1979, W. G. Ullrich (2 ♂ BR), id., V. 1979, W. G. Ullrich (1 ♀ BR), id., 12. IX. 1979, W. G. Ullrich (1 ♀ BR), id., VI. 1979, W. G. Ullrich (1 ♀ BR), id., 5. X. 1979 (1 ♂ BR), id., 18. XI. 1979, W. G. Ullrich (1 ♀ BR), id., 9. II. 1980, W. G. Ullrich (1 ♀ BR); Okapa, 10 mi S Kainantu, 17. VIII. 1974, R. H. Hornabrook (1 ♀ NZAK), id., Okapa, 18. VIII. 1965, R. Hornabrook (1 ♀ NZAK); Ialibu, S. H. D., X. 1972, G. Padma (6 ♂ MNHN); Dimita, SE Mt Giluve, 2200 m, 9. X. 1958, J. L. Gressitt (1 ♀ BPBM).

Körper schmal, parallel, glänzend schwarz. Kopf mit feinen und schmalen Augenfurchen. Clypealsutur gebogen, der Raum zwischen Augen und Clypealsutur breiter als das 1. Fühlerglied. Vorderrand des Clypeus gerade abgestutzt. Stirn leicht gewölbt, fein und dicht punktiert. Fühler hintergelegt die Basis des Halsschildes erreichend, das 3. Glied dünn, vom 6. Glied an dicker, das Endglied unregelmäßig langoval. Halsschild in der Mitte am breitesten, nach vorn mit dem Vorderrand gemeinsam breit abgerundet, nach hinten leicht ausgeschweift verengt. Seitenrand vollkommen erloschen. Die Scheibe in der Mitte spärlich und kräftig, seitlich feiner und am Rand erloschen punktiert. Der Grund glänzend. Flügeldecken mit vortretenden Schulterbeulen. Die Punktreihen sind fein, am Absturz erloschen, die Zwischenräume abgeflacht, äußerst fein, mikroskopisch punktiert und der Grund glatt. Unterseite ziemlich glänzend. Prosternum am Ende gerundet, das Ende und die Seiten der geneigten Teile dick gerandet. Mittelbrust mäßig tief eingedrückt. Abdominalsegmente auch beim ♂ nicht verflacht. Das 8. Urosternit des ♂: Abb. 45. Beine lang, Schenkel sehr stark gekeult, unten auch beim ♂ kahl, Vorderschienen des ♂ stärker, Mittelschienen kaum gebogen, Hinterschienen gerade. Vorder- und Mittelschienen einfach, unten am Ende nicht abgeflacht, nur die Spitze kurz behaart, Hinterschiene des ♂ (Abb. 28) innen am apikalen Drittel leicht ausgeschweift und unten das Ende abgeflacht, fast bis zur Mitte gelb behaart, die Behaarung am apikalen Drittel und innen am Ende sehr dicht. Aedoeagus 1,85 mm lang, stark chitinisiert, Parameren sehr schmal und das Ende zugespitzt, Basalplatte dorsal der ganzen Länge nach breit gefurcht (Abb. 41—43). — Länge: 10,5—13 mm.

Diese Art ist vor allem durch den vollkommen erloschenen Seitenrand des Halsschildes, die Beinform und dem Aedoeagus des ♂, weiters durch den schmalen, glänzend schwarzen Körper gekennzeichnet. Systematisch steht sie *D. furvus* (Gebien, 1920) am nächsten, bei welcher aber der Halsschild normal scharf gerandet und die Hinterschiene unten breiter abgeflacht und viel dichter, länger behaart sind.

10/A. **Derosphaerus hirtipes acutipenis** ssp. n.

Holotypus ♂: **Papua New Guinea,** Mt Missim, 2000 m, 2. II. 1970, J. Sedlacek (HNHM). — Paratypen: Mt Kaindi, III. 1933, Zwick (1 ♀ MHNG), id., 1700 m, 2. VIII. 1968, J. Sedlacek (1 ♀ BPBM), id., 2350 m, 13. III. 1967, P. Colman (1 ♂ BPBM); Morobe Distr., Mt Kaindi, Nami Cr., 1700 m, 22—30. VI. 1968, J. Sedlacek (1 ♀ BPBM); Dauelo Pass, 22. IX. 1973, R. Hornabrook (1 ♀ NZAK); Ialibu, S. H. D., VII. 1972, G.

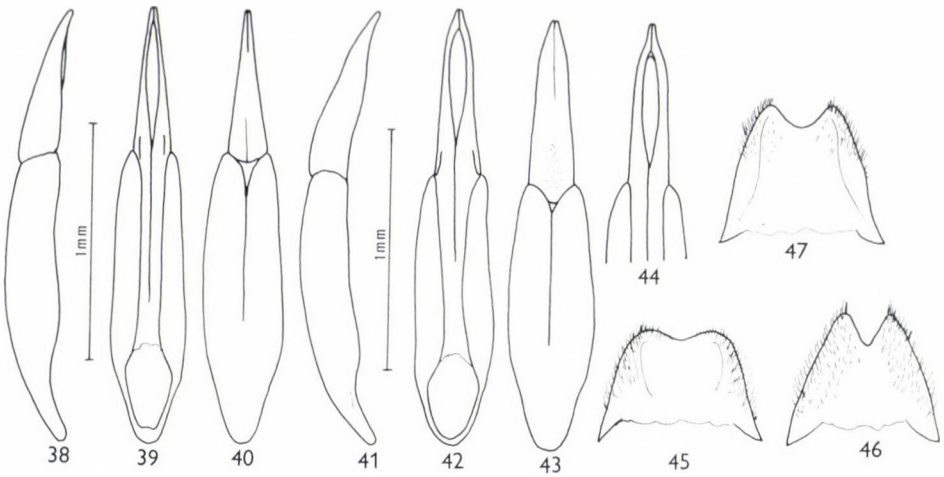


Abb. 38—44. Aedoeagus. 38—40 = *Derosphaerus furvus* (GEBIEN); 41—43 = *D. hirtipes* sp. n. und 44 = *D. hirtipes acutipenis* ssp. n. (Abb. 38, 41 bei Seitenansicht, Abb. 39, 42 und 44 ventral, Abb. 40, 43 dorsal) — Abb. 45—47. Das 8. Urosternit des ♂ bei *D. hirtipes* sp. n. (45), *D. punctipennis* (PASCOE) (46) und *D. matthewsi* sp. n. (47)

PADMA (1 ♀ MNHN); Mt Giluwe, 2500 m, 1. V. 1963, J. SEDLACEK (1 ♂ 1 ♀ BPBM); Own Stanley Range, Gorlala, Boma, 1950 m, 24. II.—7. III. 1958, W. W. BRANDT (1 ♀ BPBM); Milne Bay Distr., Nowata, ca 1800 m, VII. 1969, R. PULLEM (1 ♂ ANIC).

Sie unterscheidet sich von der Stammform dadurch, daß die Punktreihen der Flügeldecken grob, außerdem die Zwischenräume mehr oder weniger gewölbt, die Skulpturformen am Absturz der Flügeldecken erloschen oder fast bis zur Spitze entwickelt sind. Spitze der Parameren etwas ausgeschweift, schärfer (Abb. 44). — L ä n g e : 12—12,5 mm.

11. *Derosphaerus punctipennis* (PASCOE, 1866) **comb. n.**

Cholipus punctipennis PASCOE, 1866: J. Ent., (14): 472 (Locus typicus: »Queensland«).
Encyalesthus punctipennis CARTER, 1914: Proc. Linn. Soc. N. S. W., 39 (1): 49, 64.

Lectotypus ♀ befindet sich im British Museum (Natural History), London (pres. des.).

U n t e r s u c h u n g s m a t e r i a l : **Australia,** DEYROLLE (1 ♀ HNHM); Queensland, Strandbrok Is., IX. 1917, H. J. C.[ARTER] (1 ♂ ANIC); Nth. Strandbroke I., 15—16. III. 1975, G. B. MONTEITH (1 ♂ 1 ♀ QMBA); Pistol Gap, Byfield (22°50′ S—150°40′ E), 10. I. 1970, BRITTON, HOLLOWAY & MISKO (1 ♀ ANIC); Byfield (Yeppoon), X. 1924, H. J. C. C.[ARTER] (1 ♀ ANIC); Broken River, 50 mi W of Mackay, 29. XI. 1968, BRITTON & MISKO (1 ♀ ANIC); Bulburin State Forest, Forest Station, via Many Peeks, 2000 ft, 2—5. IV. 1972, G. B. MONTEITH (1 ♀ QMBA); Blackall Range, HACKER (1 ♂ IFPE); Bundaberg, 29. X. 1972, H. FRAUCA (1 ♀ ANIC); Cabramatta, 27. XII. 1960, M. NIKITIN (1 ♀ HNHM); Mt Beerwah, via Glasshouse, 1800 ft, 5. XII. 1965, B. CANTRELL (1 ♂ QMBA); Brisbane, ILLIDGE (2 ♀ QMBA), id., 15. III. 1962, J. W. TURNER (1 ♂ QMBA); Macpherson's Range, 22. X.—5. XI. 1926, DEANE (1 ♀ QMBA); Maryborough, E. W. FISCHER (1 ♀ SAMA); Mt Tambourine, A. M. LEA (1 ♂ 1 ♀ SAMA), id., X. 1924, C. GEISSMANN (1 ♂ TMPA); N. S. Wales (1 ♀ IFPE); Byron B.[ay], IX. 1909, DEANE (1 ♀ QMBA); Lismore, DENGUET (1 ♂ AMSA); Swansea, X. 1950, SEDLACEK (1 ♂ HNHM); Victoria (1 ♀ HNHM), id., 1886, B. F. MÜLLER (2 ♀ HNHM).

Vollkommen mattschwarz, parallel, robust. Mit den nächsten zwei Arten sehr ähnlich, es sind aber grundlegende Unterschiede bei der Flügeldeckenskulptur, den sekundären Geschlechtsmerkmalen und bei dem Aedoeagus vorhanden. Die wichtigsten Charakteristika sind folgende:

K o p f mit sehr feinen Augenfurchen. Clypealsutur gebogen, von den Augen etwa so weit entfernt wie die Breite des 2. Fühlergliedes. Vorderrand des Clypeus gerade. Stirn gewölbt, dicht punktiert. F ü h l e r mit abgesetzter 6-gliedriger Keule, das Endglied oval. H a l s s c h i l d wie bei der vorigen Art, Seiten fein und durchwegs scharf. F l ü g e l d e c k e n mit groben Punkten in den Reihen, deshalb sind die Zwischenräume merklich gewölbt. U n t e r s e i t e wie bei der vorigen Art, das 1. Abdominalsegment des ♂ in der Mitte sehr leicht eingedrückt. Das 8. Urosternit des ♂: Abb. 46. B e i n e robust, Vorder- und Hinterschienen des ♂ mit speziellen sekundären Geschlechtsmerkmalen, und zwar ist die Vorderschiene gebogen, das Ende innen am Unterrand etwas eckig, außen stumpf, dazwischen konkav, nachher unten abgeflacht (Abb. 57), Hinterschiene gerade, das apikale Drittel mehr abgeflacht und breiter, Unterrand gekielt, Innenrand lang eingedrückt und am apikalen Drittel erstreckt sich innen ein breiter, flacher, gelber Haarpinsel (Abb. 58—59). A e d o e a g u s 1,7 mm lang, ganz abgeplattet, die Parameren sind aber nur mäßig durchscheinend, breitoval und zugespitzt (Abb. 48—50). — L ä n g e : 11—14 mm.

Eine von Ost-Queensland bis Victoria verbreitete Art. Zu dieser Art zählte man früher noch weitere drei Arten, welche ebenfalls vollkommen mattschwarz sind: *D. matthewsi* sp. n., *D. trochantericus* sp. n. und *D. bornemisszai* sp. n. Bei diesen Arten sind die Flügeldecken feiner punktiert und die Zwischenräume flach. Die weiteren Unterschiede der Arten siehe bei den betreffenden Beschreibungen.

12. **Derosphaerus matthewsi** sp. n.

H o l o t y p u s ♂: [**Australia**] Queensland, Bowen, A. SIMSON (SAMA).

Gestalt robust, Kopf und die Beine glänzend schwarz, Halsschild fettglänzend, Flügeldecken vollkommen mattschwarz. K o p f mit feinen und seichten Augenfurchen, Clypealsutur gebogen, der Raum zwischen Augen und Clypealsutur nicht breiter als das 2. Fühlerglied. Vorderrand des Clypeus gerade abgestutzt. Stirn leicht gewölbt, dicht und gleichmäßig punktiert. F ü h l e r hintergelegt die Basis des Halsschildes nicht erreichend, vom 6. Glied an dicker, das Endglied oval. H a l s s c h i l d quer, Seitenrand scharf, Seiten nach vorn breit abgerundet, nach hinten weniger gebogen, vor den stumpfwinkligen Hinterecken nicht ausgeschweift. Die Scheibe ziemlich grob, aber seicht und erloschen punktiert, seitlich ist die Punktierung allmählich feiner und der abfallende Teil unpunktiert, nur grob chagriniert, die Mitte

fettglänzend. Flügeldecken mit vortretenden Schulterbeulen und spärlich stehenden Punkten in den Reihen, ohne Längsstreifen; in der 4. Reihe 18 Punkte; die inneren Punktreihen etwas feiner. Die Zwischenräume sind flach. Unterseite fettglänzend. Prosternum am Ende breit abgerundet und schmal gerandet, die Randung seitlich neben den Hüften erloschen. Mittelbrust tief eingedrückt, seitlich ohne Ecken. 1. Abdominalsegment des ♂ kaum verflacht. Das 8. Urosternit des ♂: Abb. 47. Beine robust, Schenkel dick gekeult, unten nackt; Vorderschiene des ♂ (Abb. 60) am Ende etwas gebogen, unten am Ende konkav, innen mit einem größeren, außen mit einem kleineren Lappen begrenzt, Mittel- und Hinterschienen des ♂ einfach, ohne besondere Kennzeichen. Aedoeagus 2,07 mm lang, abgeflacht, Parameren vollkommen flach, sehr schmaloval und scharf zugespitzt (Abb. 51—53). — Länge: 13 mm.

Sie ist die nächstverwandte Art der *D. punctipennis* (Pascoe, 1866), der man vier verschiedene Arten untermischt hatte. Die neue Art besitzt ähnliche Vorderschiene wie *D. punctipennis* (Pascoe, 1866), die Hinterschienen aber bei der neuen Art einfach, dagegen besitzt die schon beschriebenen Art in der Innenseite am apikalen Drittel einen Haarpinsel, das Ende innen ausgeschnitten.

Die neue Art sei nach meinem Kollegen, Herrn Dr. E. G. Matthews (Adelaide) benannt.

13. **Derosphaerus trochantericus** sp. n. (Abb. 2)

Holotypus ♂: [**Australia**], Queensland, H. Peters (HNHM). — Paratypen: wie HT ♂ (1 ♀ TMPA); Queensland, Mt Tambourine, A. M. Lea (1 ♀ SAMA), id. X. 1924, A. Musgrave & C. Geissmann (1 ♂ AMSA); Mt Glorious, 25. IX. 1930, J. G. Brooks (1 ♂ AMSA), id., 23. X. 1971, B. Cantrell (3 ♀ QMBA), id., 24., 31. X. 1971, G. Monteith (1 ♂ 1 ♀ QMBA), id., 17. XI. 1971, G. Monteith (1 ♂ QMBA); Upper Canungra Ck., Via Canungra, 25. XII. 1971, G. Monteith (1 ♀ QMBA); Bald Mtn. area, Via Emu Vale, 3000—4000 ft, 26—30. I. 1973, G. Monteith (2 ♀ QMBA); Bunya Mts, 3000 ft, 28. XII. 1937, N. Geary (1 ♂ AMSA), id., 11. XII. 1982, Endrődy-Younga (1 ♀ TMPA); National Park Queensland, R. Illidge (1 ♂ 1 ♀ QMBA), id., I. 1928, H. J. Carter (2 ♂ 1 ♀ AMSA), id., 20. V. 1964, D. F. O'Sullivan (1 ♂ QMBA), id., 1. VI. 1929 (2 ♀ QMBA), id., Macpherson Rge., 1928, H. J. Carter (1 ♀ AMSA); New South Wales (1 ♀ SAMA); Dorrigo, 7. XI. 1911, R. J. T. (1 ♀ AMSA); Illawara (2 ♂ 2 ♀ AMSA); Graftan, 1925, W. W. Frogatt (1 ♂ ANIC); Sidney, A. M. Lea (1 ♀ SAMA); Richmond R. (1 ♂ 1 ♀ SAMA); Pilliga, Sidney, 1925, W. W. Frogatt (1 ♂ ANIC); Whian Whian S. F., via Dunoon, 700 ft, 25—26. X. 1972, G. B. Monteith (1 ♀ QMBA); Tooloom Plateau, via Urbenville, 11. XI. 1973, G. B. Monteith (1 ♀ QMBA). — Ohne Fundort (1 ♂ QMBA; 1 ♀ SAMA).

Körper parallel, vollkommen schwarz und matt, Beine glänzend schwarz, Fühler rot bis pechschwarz. Kopf mit feinen und seichten Augenfurchen, welche gleich neben dem Innenrand der Augen liegen. Clypealsutur gebogen, der Raum zwischen Augen und Clypealsutur weit breiter als das 1. Fühlerglied. Vorderrand des Clypeus gerade abgestutzt. Stirn breit und der Quere nach gewölbt, gleichmäßig fein, aber gut erkennbar punktiert, fettglänzend. Fühler dünn, mit abgesetzter 6-gliedriger Keule, die Keulenglieder, vor allem

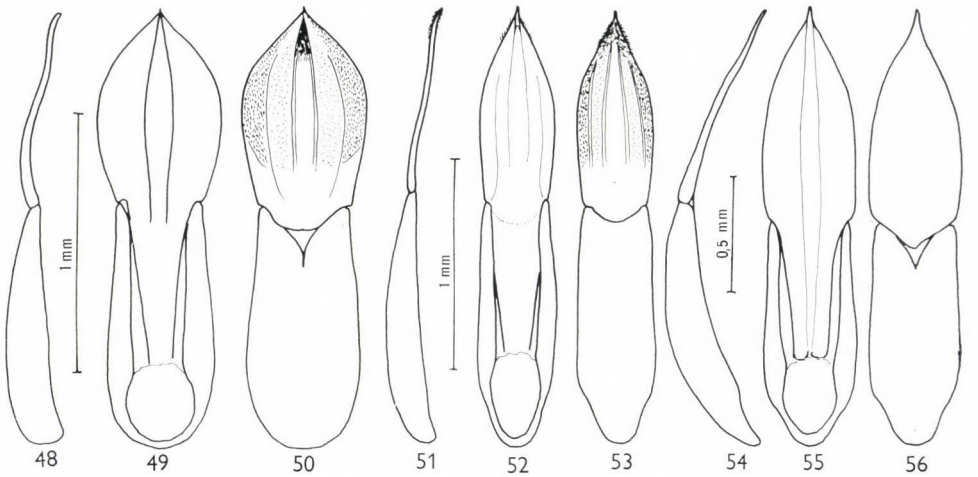


Abb. 48—58. Aedoeagus. 48—50 = *Derosphaerus punctipennis* (PASCOE): 51—53 = *D. matthewsi* sp n. und 54—56 = *D. trochantericus* sp. n. (Abb. 48, 51, 54 bei Seitenansicht, Abb. 49, 52, 55 ventral und Abb. 50, 53, 56 dorsal)

das 6. Glied länglich, das Endglied lang eiförmig. Halsschild quer, Seiten vorn mit dem Vorderrand in einem Bogen abgerundet, nach hinten gerade verengt, Seitenrand sehr fein, aber vollständig, Basalrand tief gefurcht. Die Scheibe seitlich geneigt und der Rand von oben nicht übersehbar. Die Mitte erloschen grob punktiert, im äußeren Drittel, vorn und hinten aber ist die Punktierung vollkommen erloschen, der Grund fein chagriniert und matt. Flügeldecken nicht bedeutend breiter als der Halsschild, mit vortretenden Schulterbeulen und gleichmäßig groben, bis zum Ende reichenden Punktreihen, ohne Streifen. In der 4. Reihe etwa 20 Punkte. Die Punkte sind ziemlich tief, etwas länglich, die Zwischenräume vollkommen flach, der Grund chagriniert und matt. Unterseite chagriniert und matt, Propleuren und Brust unpunktiert. Prosternum vorn bis zum Vorderrand gerade geneigt, das Ende hinter den Hüften abgeflacht, gerundet und dick gerandet. Die 3 ersten Segmente des Abdomens in der Mitte längsgerunzelt, das 1. Segment beim ♂ leicht abgeflacht. Das 8. Urosternit der ♂: Abb. 68. Beine kräftig, Schenkel stark gekeult, unten beim ♂ kahl. Alle Trochanteren des ♂ in einem kleinen, spitzigen Dorn ausgezogen. Schienen ziemlich gerade, Vorderschienen des ♂ (Abb. 61) innen vor dem apikalen Drittel etwas winklig erweitert und mit einem unteren Kiel, Mittelschienen innen an derselben Stelle nur wenig bemerkbar etwas erweitert und nur mit einer kurzen und stumpfen Kante, Hinterschienen des ♂ unten abgeflacht und kahl. Aedoeagus 1,96 mm lang, obzwar stark abgeflacht und die Parameren breitoval mit spitz ausgezogenem Ende, jedoch ziemlich stark sklerotisiert (Abb. 54—56). — Länge: 12—16 mm.

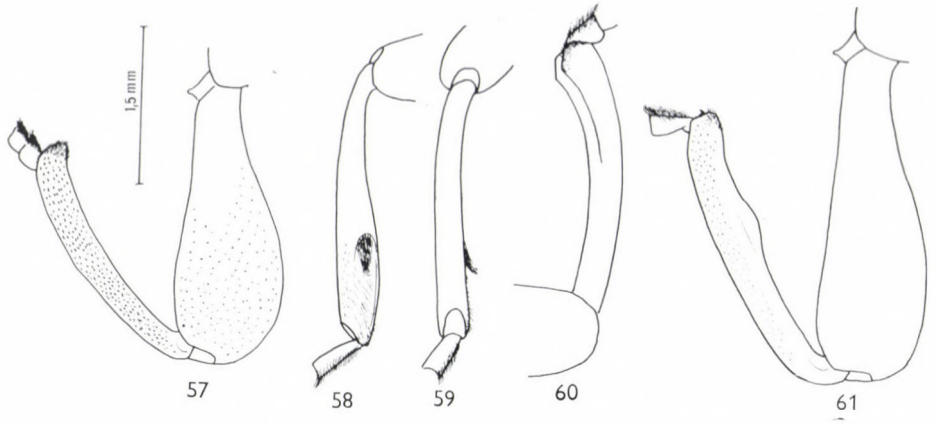


Abb. 57—59. Vorderbein des ♂ von *Derosphaerus punctipennis* (PASCOE) (57), Hinterschiene des ♂ bei Innenansicht (58) und Obenansicht (59) — Abb. 60. Vorderschiene des ♂ von *D. matthewsi* sp. n. bei Innenansicht — Abb. 61. Vorderbein des ♂ von *D. trochantericus* sp. n.

Diese Art kommt in SO Queensland vor und hat drei sehr ähnlich aussehene Verwandte, welche beide auch im gleichen Gebiet vorkommen, alle drei Arten wurden bis jetzt sogar für *D. punctipennis* (PASCOE, 1866) gehalten: *D. matthewsi* sp. n., *D. bornemisszai* sp. n. und *D. punctipennis* (PASCOE, 1866). Sie sind voneinander durch die vollkommen abweichenden sekundären Geschlechtsmerkmale der Beine und auch durch die Genitalien des ♂ verschieden. Bei *D. bornemisszai* sp. n. ist außerdem der Seitenrand des Halsschildes wenigstens in der Mitte, manchmal bis zur Basis erloschen. Bei *D. punctipennis* (PASCOE, 1866) sind die Punkte der Flügeldecken deutlich gröber, der Raum zwischen Augen und Clypealsutur nicht breiter als das 2. Fühlerglied, Vorderschienen des ♂ ebenso bei *D. matthewsi* sp. n. gebogen, unten am Ende konkav, außen und innen in einer Ecke endend, die Mitte innen nicht erweitert, weiters die Hinterschienen im hinteren Drittel seitlich abgeflacht, breiter, innen das Ende lang eingedrückt und am Innenrand im apikalen Drittel mit einem Haarpinsel, dagegen ist die Hinterschiene des ♂ von *D. matthewsi* sp. n. einfach. Bei *D. bornemisszai* sp. n. sind alle Schienen des ♂ innen gelb behaart und die Reihenpunkte der Decken von allen Arten am feinsten.

14. *Derosphaerus excisipes* (CARTER, 1914) **comb. n.**

Encyalesthus excisipes CARTER, 1914: Proc. Linn. Soc. N. S. W., **39** (1): 49, 63 (Locus typicus: »Kuranda, North Queensland«).

Lectotypus ♂ und Paralectotypus ♀ (pres. des.) befinden sich im South Australian Museum, Adelaide.

Untersuchungsmaterial: [**Australia**] Queensland, H. PETERS (1 ♂ HNHM); Coen Distr. Cape York, H. HACKER (1 ♀ IFPE); Cape Tribulation, 24—29. XII. 1980, N. I.

STOREY & N. GOUGH (1 ♂ ANIC); Kuranda, HACKER (1 ♀ IFPE), id., 1951, J. SEDLACEK (1 ♂ 1 ♀ HNHM); Crater Nat. Park, Atherton Tbld., 25. IV. 1970, G. B. MONTEITH (1 ♀ QMBA); Cairns, ALLEN (1 ♂ SAMA); Cairns dist. A. M. LEA (1 ♂ 1 ♀ SAMA, Lectotypus ♂ und Paralectotypus ♀); Malanda, G. F. HILL (1 ♀ SAMA); Cairns, 20 km up Whitfield Rd. (16°55′ S—145°46′ E), 395 m, 2. XII. 1971, J. G. & J. A. S. BROOKS (2 ♀ ANIC); Tully Falls, 100 m, 31. I. 1982, J. SEDLACEK (1 ♀ HNHM); Julatten, 18—22. VIII. 1982, J. F. LAWRENCE (1 ♀ ANIC); Mt Lewis, X. 1970, J. G. BROOKS (1 ♀ ANIC); Longlands Gap., 5. 1959, J. G. BROOKS (2 ♂ ANIC); Mt Spec., 7. I. 1965, 5. I. 1966, J. G. BROOKS (2 ♂ ANIC); Ravenshoe, I. 1953, J. G. BROOKS (1 ♀ ANIC).

Einfarbig glänzend schwarz, ohne Metallschein. Gestalt robust, parallel. K o p f mit feinen und seichten Augenfurchen. Clypealsutur gebogen, von den Augen weit entfernt. Vorderrand des Clypeus nicht ganz gerade abgeschnitten, Clypeus spärlicher, Stirn dichter, gut erkennbar punktiert. F ü h l e r dünn, hintergelegt die Basis des Halsschildes erreichend, mit gut abgesetzter 6-gliedriger Keule, das 6. Glied merklich schmaler als die übrigen, mit lang dreieckigen Keulengliedern, das Endglied langoval. H a l s s c h i l d quadratisch, zur Basis kaum verengt, vorn breit abgerundet, der Seitenrand scharf, die Scheibe spärlicher und gröber punktiert als die des Kopfes, seitlich ist die Punktierung allmählich feiner und an den geneigten Seiten vollkommen erloschen, der Grund erloschen fein chagriniert, die Scheibe dagegen glatt. F l ü g e l d e c k e n mit scharfen Punktreihen, ohne oder nur mit Spuren von Längsstreifen, die 3 inneren Reihen mit feinen Punkten, die Punkte von der 4. Reihe an und am Absturz deutlich gröber, deshalb sind die Zwischenräume seitlich und am Absturz leicht gewölbt; in der 4. Punktreihe etwa 20—25 Punkte. Der Grund sehr fein und erloschen, spärlich punktiert, vollkommen erloschen chagriniert, aber glänzend. U n t e r s e i t e chagriniert und fettglänzend. Prosternum am Ende abgerundet und nicht scharf gerandet, 1. Abdominalsegment des ♂ leicht eingedrückt, die Mitte der Hinterbrust und die Analsegmente sehr fein behaart. B e i n e kräftig, Schenkel dick gekeult, unten auch beim ♂ kahl, Schienen des ♂ mit sekundären Geschlechtsmerkmalen. Vorderschienen des ♂ (Abb. 71) am Ende gebogen, unten am Ende innen und außen mit einer Ecke, dazwischen tief konkav; Mittelschienen ziemlich gerade, Unterseite von dem Ende bis über die Mitte abgeflacht und beiderseits durch einen Haarstreifen begrenzt; Hinterschienen (Abb. 72) am Außenrand leicht gebogen, unten die apikale Hälfte breit abgeflacht, innen hinter der Mitte leicht ausgerandet und dicht behaart, Außenrand scharf und mit einem Haarstreifen begrenzt. A e d o e a g u s 1,7 mm lang, abgeplattet, die Parameren sind durchscheinend, breitoval und zugespitzt (Abb. 62—64). — L ä n g e : 11—13 mm.

Aufgrund der Genitalien des ♂ gehört sie systematisch zur Artengruppe *D. atroviridis* (MACLEAY, 1888) und *D. variicolor* (FAIRMAIRE, 1897). Wegen der eigenartigen Beinform des ♂, weiters der Flügeldeckenskulptur ist diese Art sehr charakteristisch und von allen anderen Arten verschieden.

Die Art kommt bis jetzt nur in NO Queensland vor.

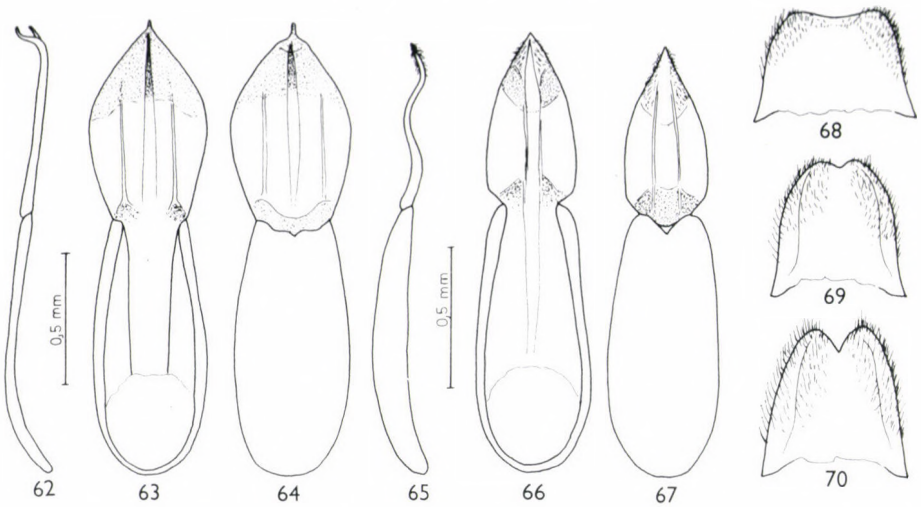


Abb. 62—67. Aedoeagus. 62—64 = *Derosphaerus excisipes* (CARTER); 65—67 = *D. latipes* sp. n. (Abb. 62, 65 lateral, Abb. 63, 66 ventral und Abb. 64, 67 dorsal) — Abb. 68—70. Das 8. Urosternit des ♂ von *D. trochantericus* sp. n. (68), *D. variicolor* (FAIRMAIRE) (69) und *D. sinuatipes* (GEBIEN) (70)

15. **Derosphaerus latipes** sp. n.

H o l o t y p u s ♂: **Papua New Guinea,** Morobe Distr., Wau, 1150 m, 16. X. 1961, J. SEDLACEK (BPBM). — P a r a t y p e n: Morobe Distr., Mt. Missim, STEVENS (1 ♂ 1 ♀ MCZC); Laloki [bei Port Moresby], 1909, F. MUIR (1 ♀ BPBM).

Vorderkörper glänzend schwarz mit schwachem metallischem Schimmer, Unterseite und Beine pechschwarz, Flügeldecken hochglänzend und metallisch, vorn und hinten messingfarbig, die Mitte leicht grünlich oder vorn und hinten mehr bläulich, die Mitte dunkler. K o p f mit großen, gewölbten Augen, Augenfurchen liegen gleich neben dem Innenrand, schmal und niedrig, sie reichen bis zum Hinterrand der Augen. Clypealsutur ziemlich scharf, die Seitenäste erloschen, die Querfurche nimmt die Augenfurche seitlich nicht an. Stirn und Clypeus leicht gewölbt, fein punktiert, der Grund glänzend. F ü h l e r mit schwach abgesetzter 6-gliedriger Keule, die Keulenglieder sind länglich dreieckig, das Endglied lang eiförmig. H a l s s c h i l d stark der Quere nach gewölbt, Seiten gebogen, mit feinem, aber scharfem Rand, vor der Basis sehr leicht geschweift, in der Mitte am breitesten, nach vorn breit gebogen, Vorderecken abgerundet. Die Scheibe seitlich geneigt, so daß die feine Seitenrandung von oben her kaum erkennbar ist. Oberseite äußerst fein, kaum merklich punktiert, der Grund glatt. F l ü g e l d e c k e n mit deutlichen Schulterbeulen. Die feinen Punktreihen sind am Absturz erloschen, von den Längsstreifen sind nur Spuren vorhanden, welche am Absturz ebenfalls vollkommen erloschen sind. Die Zwischenräume sind flach, glänzend, ohne erkennbare

Skulptur. Unterseite sehr fein skulptiert, der Grund erloschen chagriniert, Prosternum hinter den Hüften leicht geneigt, Seitenrand und das Ende dick gerandet, manchmal die Mitte fein gefurcht. 1. Abdominalsegment des ♂ kaum abgeflacht, Seiten der Segmente glatt. Beine robust, Schenkel stark gekeult, Unterseite beim ♂ behaart, Schienen beim ♂ mit speziellen sekundären Geschlechtsmerkmalen. Vorderschiene des ♂ leicht gebogen, innen vor der Mitte kaum merklich ausgeschnitten, unten am Ende mit einem kurzen, gebogenen, schwachen Kiel, die äußere Spitze innen fein und anliegend behaart. Mittelschienen des ♂ unten am Ende schwach eingedrückt und kahl, das Ende beiderseits fein behaart. Hinterschienen des ♂ (Abb. 73) innen in der Mitte erweitert, stumpfwinklig und flach, gegen das Ende ausgeschweift verengt, innen fein gekerbt, das Ende im Querschnitt rundlich. Tarsen ohne besondere Kennzeichen. Aedoeagus 1,5 mm lang, sehr charakteristisch, die Parameren sind vollkommen abgeflacht, dünn sklerotisiert, der Basalteil durchscheinend, seitlich parallel, das Ende zugespitzt und ebenfalls flach, das Ende oben und unten behaart (Abb. 65—67). — Länge: 11,3—13 mm.

Nächstverwandt mit *D. iridipennis* (FAIRMAIRE, 1897), *D. epistomaticus* (GEBIEN, 1920), *D. atroviridis* (MACLEAY, 1888) und *D. longipes* sp. n.; bei diesen Arten sind aber die Hinterschienen des ♂ nicht in der Mitte, sondern im basalen Drittel am breitesten, außerdem die Genitalien des ♂ bei allen Arten verschieden.

16. *Derosphaerus iridipennis* (FAIRMAIRE, 1897) **comb. n.**

Encyalesthus iridipennis FAIRMAIRE, 1897: Notes Leyden Mus., **19:** 220 (Locus typicus: »Nouvelle Guinée«).
Encyalesthus atroviridis GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 302, Abb. 60, nec *Cholipus atroviridis* MACLEAY, 1888.
Neandrosus singularipes PIC, 1921: Échange, **37:** 12 (Locus typicus: »Nouvelle Guinée«) **syn. n.**
Encyalesthus atroviridis KASZAB, 1939: Nova Guinea (N. S.), **3:** 224, nec *Cholipus atroviridis* MACLEAY, 1888.

Die Syntypen von *Encyalesthus iridipennis* FAIRMAIRE, 1897 und *Neandrosus singularipes* PIC, 1921 befinden sich im Museum National d'Histoire Naturelle, Paris.

Untersuchungsmaterial: **Aru Is.,** H. EKGNER (1 ♀ ANIC). — **Neuguinea** (2 ♀ ZMHU). — **Irian:** Amberbaki (1 ♀ ZIAK); Arfak (1 ♂ ZIAK), Arfak Gebirge, Siwi, 800 m, IV—V. 1928, E. MAYR (1 ♂ 2 ♀ HNHM); Anday (4 ♂ 4 ♀ ZIAK); Baie de Gelvink, 1878, RAFFRAY & MAINDRON (2 ♂ 2 ♀ MNHN); S. Gelvink Bay, Nabire, 0—30 m, 2—9. VII. 1962, J. L. GRESSITT & J. SEDLACEK (2 ♀ BPBM); Cyclops Mts, Ifar. 300—500 m, 23—25. VI. 1962, J. SEDLACEK (1 ♂ 1 ♀ BPBM); Waris, S of Hollandia, 450—500 m, 1—2. VIII. 1959, T. C. MAA (3 ♀ BPBM); Baie de Humboldt et Dorei, J.-D. PASTEUR (1 ♂ 2 ♀ MNHN). — **Papua New Guinea:** D.[eutsch] N.[eu] Guinea (2 ♀ IFPE); Sepik, Karawari River, Amboin, VI. 1974, R. HORNABROOK (1 ♂ NZAK); Ramu Exped., RODATZ & KLING (1 ♂ ZMHU); Stephansort, FENICHEL (1 ♂ 1 ♀ HNHM; 1 ♂ 1 ♀ TMPA); Madang, XI. 1968, V., 26. VI. 1969 (1 ♂ 2 ♀ NZAK); Madang, Gogol River, 28. III., 17. VI. 1970, R. HORNABROOK (1 ♂ 1 ♀ NZAK); Umg. Madang, III. 1979, W. G. ULLRICH (1 ♂ BR); Wareo, Finsch Haven, L. WAGNER (1 ♀ SAMA); Astrobale Bay, Erima, 1897, L. BIRÓ (4 ♂ 4 ♀ HNHM); Sattelberg (2 ♀ ZMHU);

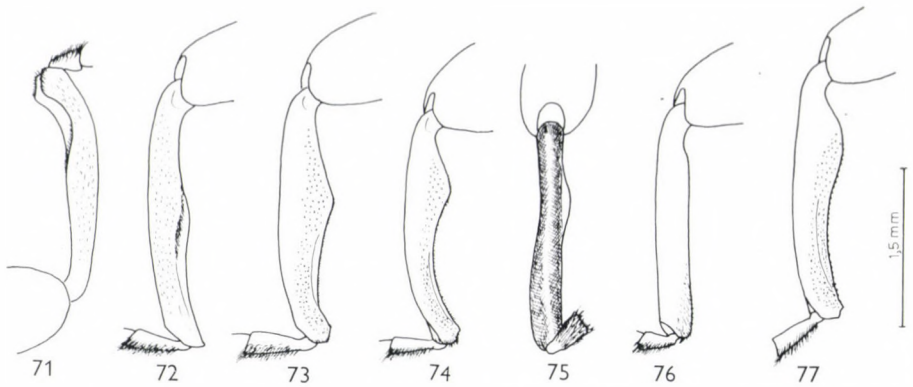


Abb. 71—77. Vorderschiene (71) und Hinterschiene (72) des ♂ von *Derosphaerus excisipes* (CARTER), Hinterschiene des ♂ von *D. latipes* sp. n. (73) und *D. iridipennis* (FAIRMAIRE) bei Innenansicht (74) und von oben (75) sowie die Mittelschiene des ♂ (76) und Hinterschiene bei Innenansicht (77) bei *D. epistomaticus* (GEBIEN)

Bulldog Road, 680 m, 9. III. 1962, J. SEDLACEK (1 ♀ BPBM); Bulolo, 885 m, 18. VIII. 1956, E. J. FORD, Jr. (1 ♂ BPBM); Morobe Distr., STEVENS (1 ♀ MCZC); Fly River, Kiunga, 35 m, VIII. 1969, J. & M. SEDLACEK (2 ♂ 1 ♀ BPBM); Bosavi, XI. 1973, H. OHLMUS (3 ♂ ANIC); Oriomo River, 6 m, 25. II. 1964, H. CLISSOLD (1 ♀ BPBM); Mt Lamington, 1300—1500 ft, T. C. MCNAMARA (1 ♂ SAMA); Oro Bay, XII. 1943—I. 1944, DARLINGTON (1 ♀ MCZC); Yule Ins. (1 ♀ TMPA).

D. iridipennis (FAIRMAIRE, 1897) wurde von GEBIEN (1920) als Synonym der *D. atroviridis* (MACLEAY, 1888) betrachtet, aber zu Unrecht, weil es zwischen beiden zwei wichtige Unterschiede gibt, und zwar die Form der Hinterschienen des ♂ und des Aedoeagus, außerdem die Punktreihen bei *D. atroviridis* (MACLEAY, 1888) bis zum Ende kaum etwas erloschen, während sie bei *D. iridipennis* (FAIRMAIRE, 1897) am Absturz erloschen sind. So gebe ich dieser Art das Artrecht wieder zurück. Statt einer ausführlichen Beschreibung gebe ich hier die Charakterisierung der wichtigsten Merkmale.

Farbe und Form wie die nächstverwandten Arten [*D. epistomaticus* (GEBIEN, 1920) und *D. atroviridis* (MACLEAY, 1888)]. K o p f mit tiefer Augenfurche, Clypealsutur fein eingedrückt und von den Augenfurchen weit entfernt. Vorderrand des Clypeus leicht ausgerandet. Stirn breit und quer gewölbt, gleichmäßig fein und spärlich punktiert. F ü h l e r mit abgesetzter 6-gliedriger Keule, die Keulenglieder sind länglich und das Endglied langoval. H a l s s c h i l d stark gewölbt, Seiten gebogen, scharf gerandet, so fein punktiert wie die Stirn. F l ü g e l d e c k e n mit feinen Punktreihen, ohne Längsstreifen, die Punkte am Absturz erloschen. Die Zwischenräume sind flach, manchmal so fein wie der Halsschild punktiert. U n t e r s e i t e erloschen chagriniert. Prosternum hinter den Hüften ziemlich schmal und das Ende zugespitzt, seitlich gerandet, ohne Mittellinie. 1. Abdominalsegment des ♂ in der Mitte leicht eingedrückt und das 2. Segment verflacht, mit Spuren von

feiner Behaarung, welche bei etwa 50facher Vergrößerung sichtbar ist. Beine robust, Schenkel stark gekeult. Mittelschenkel dicht abstehend, Vorderschenkel sehr spärlich und fein behaart, Hinterschenkel meist kahl. Vorderschienen des ♂ kaum gebogen, unten am Ende flach und anliegend dicht behaart. Mittelschienen des ♂ (Abb. 76) einfach, im Querschnitt fast rundlich, das Ende unten fein behaart. Hinterschienen (Abb. 74—75) am basalen Drittel innen sehr breit winklig erweitert, nachher ausgeschweift verengt, unten mit einer sehr fein gekerbten Kante. Wenn man die Hinterschiene von oben betrachtet, ist der Oberrand nicht ganz gerade und der untere basale Winkel noch ein wenig sichtbar (Abb. 75), der ganze Innenrand der Hinterschienen fein gekerbt. Aedoeagus 1,56 mm lang, vollkommen abgeflacht, die Parameren sind sehr breit quadratisch, durchscheinend, kaum zugespitzt, das Ende seitlich breit gebogen (Abb. 78—80). — Länge: 10—13,5 mm.

Die Parameren bei beiden nächstverwandten Arten *D. epistomaticus* (GEBIEN, 1920) und *D. atroviridis* (MACLEAY, 1888) bedeutend schmaler und das Ende zugespitzt. Die Hinterschienen des ♂ basal weniger erweitert und die Erweiterung nicht winklig, außerdem die Schiene bei Ansicht von oben gerade und die basale Erweiterung nicht sichtbar. Die Flügeldeckenskulptur bei *D. epistomaticus* (GEBIEN, 1920) sehr ähnlich, dagegen bei *D. atroviridis* (MACLEAY, 1888) auch am Absturz gut entwickelt, obwohl am Ende feiner.

17. *Derosphaerus epistomaticus* (GEBIEN, 1920) **comb. n.**

Encyalesthus epistomaticus GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 301, Abb. 59 (Locus typicus: »D. Neu-Guinea: Meist von dieser Insel ohne genaueren Fundort. Hauptlager beim Malu«, »Holl. N. Guinea: Taua«, »Neu-Pommern: Herbertshöhe«).
Encyalesthus epistomaticus, KASZAB, 1939: Nova Guinea (N. S.), **3:** 224.
Encyalesthus atroviridis KASZAB, 1970: Annls hist.-nat. Mus. natn. hung., **62:** 258, nec *Cholipus atroviridis* MACLEAY, 1888.

Lectotypus ♂: Holl. N. Guinea, Taua, 14—17. VII. 1910, MOSZKOWSKI (ZMHU) (pres. des.).

Untersuchungsmaterial: **Neuguinea,** v. BENNINGSEN (4 ♂ 3 ♀ IFPE). — **Irian:** Arfak (2 ♀ ZIAK); Anday (1 ♂ 1 ♀ ZIAK); Baie de Gelwink, 1878, RAFFRAY & MAINDRON (1 ♂ 3 ♀ MNHN); Taua, 14—17. VII. 1910, MOSZKOVSZKI (1 ♂ ZMHU, Lectotypus); Baie de Humboldt et Dorey, J.-D. PASTEUR (1 ♂ MNHN); Mamberano Riv., Pionierbivak, XII. 1920, W. C. VON HEURN (2 ♀ IFPE); Waris, S of Hollandia, 450—500 m, 8—15. VIII. 1959, T. C. MAA (5 ♂ 2 ♀ BPBM); Star Mts, Sibil val., 1245 m, 18. X.—8. XI. 1961, S. & L. QUATE (2 ♂ 1 ♀ BPBM); Lake Murray, 11. XI. 1974, R. HORNABROOK (1 ♀ NZAK); Nomad, 25. X. 1974, R. HORNABROOK (2 ♂ 3 ♀ NZAK). — **Papua New Guinea:** D.[eutsch] N.[eu] Guinea (6 ♂ 6 ♀ IFPE), D.[eutsch] Neuguinea, WAHNES (5 ♂ 3 ♀ IFPE); Torricelli Mts, 17. XI. 1963, H. M. (1 ♀ MHNG); Torricelli Mts, Mokai vill., 750 m, 8—15. XII. 1958, W. W. BRANDT (1 ♂ 1 ♀ BPBM); Torricelli Mts, Mobitei, 750 m, 28. II.—4. III., 1—15. IV. 1959, W. W. BRANDT (1 ♂ 1 ♀ BPBM); Torricelli Mts, Koiniri vill., 26—29. XI. 1958, W. W. BRANDT (1 ♀ BPBM); Wum, Upper Jimmi V., 840 m, 16., 18. VII. 1955, J. L. GRESSITT (3 ♀ BPBM); Singaropa, Jimi Valley, 24. IV. 1970, R. HORNABROOK (1 ♀ NZAK); Tsanga, Upper Jimmi V., 15. VII. 1955, J. L. GRESSITT (1 ♂ BPBM); Baiyer Riv., 18. X. 1958, J. L. GRESSITT (1 ♂ 2 ♀ BPBM), id., 27. VII. 1968, P. JOLIVET (2 ♀ MNHN), id., près Mt Hagen, 9., 11. IV. 1969, P. JOLIVET (2 ♂ 2 ♀ MNHN); Hauptlager b. Malu, 2. XI. 1913, BÜRGERS (1 ♂ 1 ♀ ZMHU,

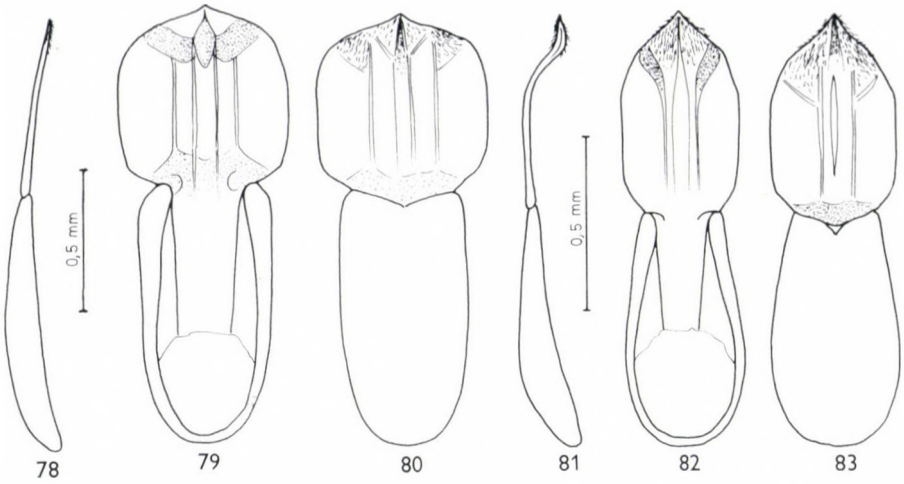


Abb. 78—83. Aedoeagus. 78—80 = *Derosphaerus iridipennis* (FAIRMAIRE) und 81—83 = *D. epistomaticus* (GEBIEN) (Abb. 78, 81 lateral, Abb. 79, 82 ventral und Abb. 80, 83 dorsal)

Paralectotypen); Komba Bezirk, STICHEL (1 ♂ 1 ♀ ZMHU); Aiyura, 1900 m, 7. I. 1965, J. SEDLACEK (1 ♀ BPBM); Kassem Pass, X. 1971, 1., 29. IV. 1972, I. 1973, R. HORNABROOK (1 ♂ 6 ♀ NZAK); Karimui, III. 1973, R. HORNABROOK (2 ♂ 2 ♀ NZAK), id., 1000 m, V. 1969, H. OHLMUS (1 ♂ HNHM), id., 24. IV. 1974, H. OHLMUS (1 ♀ ANIC); Adelberts, III. 1974, H. OHLMUS (1 ♂ 1 ♀ ANIC); Stephansort, FENICHEL (1 ♂ HNHM); Madang, Manumbo (1 ♂ SAMA); Astolabe Bay, Erima, 1897, L. BIRÓ (1 ♀ HNHM; 1 ♀ TMPA); Sattelberg (1 ♂ 2 ♀ IFPE; 6 ♂ 7 ♀ ZMHU), id., v. Bennigsen (1 ♀ IFPE), id., 1899, 1900, L. BIRÓ (1 ♂ 1 ♀ HNHM), id., XII.-1908, NEUHAUSS (2 ♀ ZMHU), id., 1. II. 1910, WIEDENFELD (3 ♀ ZMHU); Finisterre Range, Saidor: Gabumi, 24—30. VI., 1—21. VII. 1958, W. W. BRANDT (1 ♂ 2 ♀ BPBM); Okapa, 8. I. 1965, 8. III. 1966, R. HORNABROOK (1 ♂ 1 ♀ NZAK); Finsch Haven (1 ♂ SAMA), id., L. WAGNER (1 ♂ 1 ♀ SAMA); Hinterland v. Finschhafen, I. 1930, L. WAGNER (1 ♀ HNHM); Wareo, L. WAGNER (1 ♂ 1 ♀ IFPE; 4 ♂ SAMA); Huon Pen., Boana Mission, 900 m, 4—5. IX. 1956, E. J. FORD, Jr. (1 ♀ BPBM); Busu Riv., E of Lae, 1000 m, 13., 15. IX. 1955, J. L. GRESSITT (4 ♂ 2 ♀ BPBM), id., 10. II. 1969, J. & M. SEDLACEK (1 ♂ BPBM); Bulolo, 700 m, II. 1974, J. SEDLACEK (1 ♀ HNHM); Kaindi-Nami, 1700 m, 2. VIII. 1968, J. SEDLACEK (1 ♀ BPBM); Wau, 21. II. 1971, H. OHLMUS (1 ♀ ANIC), id., 15—25. IV. 1965, J. BALOGH & J. J. SZENT-IVÁNY (1 ♂ HNHM), id., 1050 m, 16. XI., 22. XII. 1961, J. & J. H. SEDLACEK (1 ♂ 2 ♀ BPBM), id., 1100 m, 29. VIII. 1961, J. & J. H. SEDLACEK (1 ♂ 2 ♀), id., 1150 m, 16. X. 1961, J. SEDLACEK (1 ♀ BPBM), id., 1150—1600 m, 9. II. 1969, J. SEDLACEK (1 ♂ BPBM), id., 1200 m, 1. V., 7. VI., 2., 26. VII., 7., 14. IX., 2., 26. X., 2—10. XI. 1961, J. & J. H. SEDLACEK (8 ♂ 11 ♀ BPBM), id., 1700 m, 8. VIII. 1968, J. & J. H. SEDLACEK (1 ♀ BPBM); Morobe Distr., Mit. Missim, STEVENS (1 ♂ MCZC), id., 600—1500 m, II. 1974, J. SEDLACEK (1 ♂ HNHM), id., 1100 m, 4. X. 1962, J. & J. H. SEDLACEK (1 ♂ BPBM); Umg. Gurakor, XII. 1979, W. G. ULLRICH (2 ♂ 3 ♀ BR); Watut Riv., 900—1900 m, X. 1969, A. B. MIRZA (2 ♂ 1 ♀ BPBM); Garaira, R. HORNABROOK (1 ♀ NZAK), id., 20. II.—17. XII. 1969, A. B. MIRZA & W. M. HUTTON (1 ♂ 2 ♀ BPBM), id., 800 m, 16. I. 1968, J. & J. H. SEDLACEK (1 ♂ BPBM); Bainding vill., 3000 ft, 14. III. 1967, T. L. FENNER (1 ♀ DAFS); Fly Riv., Kiunga, 35 m, VIII. 1959, J. & J. M. SEDLACEK (19 ♂ 19 ♀ BPBM), id., 15—21., 23—25. VIII., 14—17., 28—31. VIII., 4—5. IX., 26—28. X. 1957, W. W. BRANDT (2 ♂ 11 ♀ BPBM), id., II., VIII., IX. 1976, H. OHLMUS (2 ♂ 4 ♀ ANIC); Fly Riv., Olsobip, 400—600 m, VIII. 1969, J. SEDLAECK (1 ♀ BPBM); Bosavi, X., XI. 1975, I., II., X. 1976, H. OHLMUS (3 ♂ 11 ♀ ANIC); Dobodura, III—VII. 1944, DARLINGTON (1 ♀ MCZC); Brown Riv., 21., 22. V. 1956, E. J. FORD, Jr. (1 ♂ 1 ♀ BPBM); Itikinumu, Sogeri, 5. VIII. 1963, L. SMEE (1 ♂ DAFS); Owen Stanley Range, Goilala: Loloipa, 16—30. I. 1958, W. W. BRANDT (1 ♀ BPBM); Mt Lamington, 1300—1500 ft, C. T. MCNAMARA (1 ♂ 5 ♀ SAMA); Oro Bay, XII. 1943—I. 1944, DARLINGTON (1 ♂ MCZC). — **Bismarck Archipel:** Neupommern, Herbertshöhe (1 ♀ IFPE, Paralectotypus).

GEBIEN (1920) lieferte von dieser Art eine ausführliche Beschreibung, welche aber in einem Merkmal sehr irreführend ist. GEBIEN hielt nämlich den tief winklig ausgerandeten Vorderrand des Clypeus für das wichtigsten Charakteristikum der Art. Die Untersuchung einer sehr großen Serie beweist aber, daß dieses Merkmal sehr veränderlich ist und es gibt Tiere, bei denen Variationen vom normalen Clypeus bis zum tief ausgeschnittenen Vorderrand bei vollkommen ähnlich gestaltet ausgebildeter Beinform und Aedoeagus vorkommen. Die Mehrzal der Exemplare besitzt einen tief ausgeschnittenen Vorderrand des Clypeus, bei anderen ist der Vorderrand bogig ausgeschnitten und bei wenigen ist der Clypeus genauso ausgebildet wie bei den verwandten Arten. Die wichtigsten Charakteristika sind folgende:

Hinterschienen des ♂ (Abb. 77) innen leicht gebogen erweitert, flach, nur unten am Ende gekerbt; Mittelschienen des ♂ unten am Ende flach und nackt; Vorderschienen des ♂ unten abgeflacht und nackt, innen oben fein, gelb anliegend behaart, unten am äußeren Rand mit einer feinen Ecke und kurzem Kiel. Clypealsutur gebogen, weit von den Augen entfernt, Augenfurchen schmal und tief. Vorderrand des Clypeus entweder einfach oder in der Mitte mehr oder weniger tief ausgerandet. Punktierung der Flügeldecken am Absturz erloschen. 1. Abdominalsegment des ♂ in der Mitte verflacht, nicht eingedrückt. Fühler mit gut abgesetzter 6-gliedriger Keule. A e d o e a g u s 1,25 mm lang- Abb. 81—83. — L ä n g e : 10,5—13 mm.

Die nächstverwandten *D. latipes* sp. n., *D. iridipennis* (FAIRMAIRE, 1897), *D. atroviridis* (MACLEAY, 1888) und *D. longipes* sp. n. unterscheiden sich durch folgende wichtige Charakteristika: bei *D. latipes* sp. n. hat die Hinterschiene beim ♂ etwa in der Mitte eine winklige Erweiterung; bei *D. longipes* sp. n. sind alle Schienen auffallend dünn und lang; bei *D. iridipennis* (FAIRMAIRE, 1897) ist die Erweiterung der Hinterschienen basal stark und winklig; bei *D. atroviridis* (MACLEAY, 1888) sind die Punktreihen grob und auch am Ende der Flügeldecken nicht erloschen.

18. *Derosphaerus atroviridis* (MACLEAY, 1888) **comb. n.**

Cholipus atroviridis MACLEAY, 1888: Proc. Linn. Soc. N. S. W., **2** (2): 311 (Locus typicus: »Cairns«).
Encyalesthus atro-viridis, CARTER, 1914: Proc. Linn. Soc. N.S.W., **39** (1): 49.
Encyalesthus atroviridis, GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 302, partim.

Syntypen ♂ ♀ ("Paratypen") befinden sich in Australian National Insect Collection, Canberra.

U n t e r s u c h u n g s m a t e r i a l : **Australia,** Queensland (1 ♂ ANIC; 2 ♀ SAMA); N.[orth] Queensland (3 ♀ QMBA; 1 ♂ SAMA); Cape York (1 ♂ SAMA); Coen District, Cape York, H. HACKER (1 ♂ 4 ♀ IFPE; 2 ♂ 2 ♀ SAMA); Little Mulgrave R., HACKER (1 ♂ 1 ♀ SAMA); Cairns (1 ♀ QMBA), id., HACKER (2 ♀ IFPE), id., J. SEDLACEK (1 ♂ HNHM), id., Cairns dist., F. P. DODD (2 ♂ SAMA); Eubenangee, XI. 1949 (1 ♂ ANIC); 7 town, H. HACKER (1 ♂ AMSA);

Iron Range, Cape York Pen., 11—17. V. 1968, G. MONTEITH (4 ♀ QMBA); Bamaga, XII. 1983, J. SEDLACEK (2 ♀ HNHM). — **Bismarck Archipel:** New Britain, Gazelle Pen., Upper Warangoi, Illugi, 230 m, 8—11. XII. 1962, J. SEDLACEK (1 ♀ BPBM).

Die von GEBIEN (1920) als *D. atroviridis* (MACLEAY, 1888) bestimmten Tiere aus Neuguinea gehören teils zu *D. epistomaticus* (GEBIEN, 1920) sensu KASZAB teils zu *D. iridipennis* (FAIRMAIRE, 1897); *D. atroviridis* (MACLEAY, 1888) ist eine australische Art, welche bis jetzt in NO Queensland vorhanden ist. Das Vorkommen im Bismarck-Archipel ist durch ein weibliches Exemplar bestätigt, doch muß diese Angabe auch noch mit Funden von männlichen Tieren verstärkt werden.

D. atroviridis (MACLEAY, 1888) gehört in eine Artengruppe, welche durch die sekundären Geschlechtsmerkmale der Beine und die Form des Aedoeagus sehr charakteristisch ist. Zu dieser Gruppe, welche die Form und die metallische Färbung der Flügeldecken, weiters die innen erweiterte Hinterschiene des ♂ besitzen, gehören die Arten *D. latipes* sp. n., *D. iridipennis* (FAIRMAIRE, 1897), *D. epistomaticus* (GEBIEN, 1920), *D. atroviridis* (MACLEAY, 1888), *D. longipes* sp. n. und wahrscheinlich auch noch *D. burgersi* sp. n., von welchen bis jetzt nur ein ♀ bekannt ist, deshalb ist die Zugehörigkeit nicht ganz sicher.

Unsere Art unterscheidet sich von allen hier aufgezählten Arten durch die grobe Flügeldeckenpunktierung, welche auch am Absturz nicht erloschen ist. Aufgrund der Beinbildung und des Aedoeagus steht sie noch *D. epistomaticus* (GEBIEN, 1920) am nächsten, der Vorderrand des Clypeus aber niemals tief ausgerandet, außerdem die Hinterschienen des ♂ (Abb. 90) innen, besonders seitlich gekerbt. Diffizile Unterschiede sind außerdem noch die den männlichen Mittel- und Vorderschienen vorhanden, d. h. die Mittelschienen des ♂ bei *D. atroviridis* (MACLEAY, 1888) unten am Ende leicht konkav und die Vorderschienen unten abgeflacht und breit behaart, nur am unteren Außenrand kahl. A e d o e a g u s 1,37 mm lang, sehr charakteristisch, die Parameren abgeflacht, durchscheinend, breitoval und zugespitzt (Abb. 84—86). — L ä n g e : 11—13 mm.

19. **Derosphaerus longipes** sp. n.

H o l o t y p u s ♂: **[Irian]**, Japen I., SSE Sumberbaba, Dawai R., X. 1962, N. WILSON (BPBM). — P a r a t y p e n : Irian, Nabire, S. Geelvink Bay, 10—40 m, 12. X. 1962, N. WILSON (1 ♀ BPBM); Waris, S of Hollandia, 450—500 m, 1—7. VIII. 1959, T. C. MAA (1 ♀ BPBM); Mambaramo Riv., Pionierbivak, VIII. 1920, W. C. v. HEURN (1 ♀ IFPE). — **Papua New Guinea,** Ramu Exped., RODATZ & KLING (1 ♀ ZMHU); Lae, VII. 1944, F. E. SKINNER (1 ♀ BPBM); Kassem Pass, 7. IX. 1975, R. HORNABROOK (2 ♀ NZAK).

Körper gestreckter als die nächstverwandten Arten, Kopf und Halsschild mäßig glänzend schwarz ist, weil der Grund äußerst fein erloschen chagriniert, Flügeldecken metallisch, grünlich und messingfarbig sogar bis violett, Unterseite und Beine pechschwarz, Fühlerbasis und Palpen hell. K o p f mit schmalen Augenfurchen, Clypealsutur gebogen, von den Augen

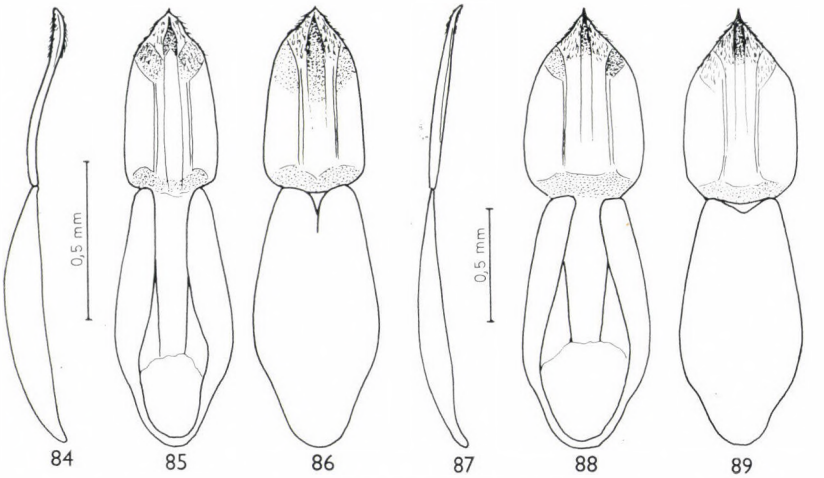


Abb. 84—89. Aedoeagus. 84—86 = *Derosphaerus atroviridis* (MACLEAY) und 87—89 = *D. longipes* sp. n. (Abb. 84, 87 lateral, Abb. 85, 88 ventral und Abb. 86, 89 dorsal)

weit entfernt, Vorderrand des Clypeus fast gerade. Stirn der Quere nach leicht gewölbt, sehr fein gleichmäßig punktiert. F ü h l e r dünn, besonders das 3. Glied, vom 6. Glied an ist der Fühler dicker. H a l s s c h i l d der Quere nach stark gewölbt, Seiten gebogen, vor der Basis etwas eingeschnürt, Seitenrand scharf, und obwohl die Scheibe seitlich steil abfällt, ist der Rand von oben gut sichtbar. Die Scheibe etwas dichter und gröber punktiert als die Stirn, seitlich aber feiner und erloschen. F l ü g e l d e c k e n mit starken Schulterbeulen, lang, parallel. Die Punktreihen sind fein und gleichmäßig, am Absturz vollkommen erloschen, die Zwischenräume flach und glatt. U n t e r s e i t e fettglänzend. Prosternum vorn und hinten geneigt, neben den Hüften dick gerandet. Mitte der Hinterbrust vor den Hüften sowie das 1. Abdominalsegment beim ♂ leicht eingedrückt, das 2. Segment in der Mitte verflacht, die Eindrücke mit äußerst feiner, spärlicher Behaarung. B e i n e lang und dünn, Schenkel nicht auffallend stark gekeult, Vorder- und Mittelschenkel beim ♂ unten behaart. Vorder- und Mittelschienen (Abb. 92) bei beiden Geschlechtern lang und dünn, gerade, Vorderschienen des ♂ am Ende unten abgeflacht und fein behaart, Mittelschienen des ♂ unten am Ende abgeflacht, kahl und am unteren Innenrand fein behaart. Hinterschienen des ♂ (Abb. 91) innen an der Basis breit verflacht und erweitert, fein gekerbt, unten mit einer fein gekerbten Kante; bei Ansicht von oben ist die Hinterschiene nicht gerade und die Erweiterung an der Basis gut sichtbar. Tarsen ohne nennenswerte Merkmale. A e d o e a g u s 1,52 mm lang, wie bei den nächstverwandten Arten vollkommen abgeflacht, die Parameren sind durchscheinend, oval und das Ende zugespitzt, unten am Ende behaart (Abb. 87—89). — L ä n g e : 11—12 mm.

Diese Art ist vor allem durch die langen, dünnen, geraden Vorder- und Mittelschienen sowie die Form der Hinterschienen des ♂ und die am Ende erloschenen Flügeldecken-Reihenpunkte gekennzeichnet. Bei allen anderen Arten der Gruppe, namentlich *D. latipes* sp. n., *D. iridipennis* (FAIRMAIRE, 1897), *D. epistomaticus* (GEBIEN, 1920) und *D. atroviridis* (MACLEAY, 1888) sind die Beine kräftig, die Vorder- und Mittelschienen bei beiden Geschlechtern dick und kurz, auch die Genitalien abweichend.

20. **Derosphaerus burgersi** sp. n.

Holotypus ♀: [**Papua New Guinea**] D.[eutsch] N.[eu] Guinea, Etappenberg, 850 m, 10—12. XI. 1912, Kaiserin Augustafluss Exp., BÜRGERS (ZMHU).

Gedrungen, metallisch, hochglänzend. Kopf und Halsschild lebhaft blau, Flügeldecken von der Basis an in Querrichtung durchziehend blau, nachher purpurn und golden, die Mitte grünlich, weiters blau und violett, am Absturz blaugrün, purpurn und die Spitze außen blau. Unterseite pechschwarz mit metallischem Schimmer. Schenkel blauschwarz, Schienen schwarz, Fühler pechschwarz, auch die Palpen dunkel. Kopf mit tiefen Augenfurchen, Clypelsutur fein eingeschnitten und von den Augen weit entfernt, gebogen, die Seitenäste erloschen. Vorderrand des Clypeus breit und leicht ausgerandet. Stirn gewölbt, mit dem Clypeus gemeinsam gleichmäßig gut erkennbar punktiert, der Grund glatt und glänzend. Fühler kurz, hintergelegt die Mitte des Halsschildes wenig überragend, mit stark abgesetzter 6-gliedrigen Keule, die Keulenglieder sind quer, das Endglied kurz eiförmig. Halsschild quer, der Quere nach stark, der Länge nach wenig gewölbt, Seiten gerundet, nach vorn breit abgerundet verengt, vor den Hinterecken leicht ausgeschweift, Seitenrand scharf, von oben aber kaum übersehbar. Die Punktierung und Grundskulptur wie die des Kopfes. Flügeldecken mit vortretenden Schulterbeulen. Die Punktreihen sind bis über die Mitte gut ausgebildet, vor dem Ende aber alle verschmolzen, ausgenommen den 1. Streifen, welcher neben der Naht eingedrückt ist und bis zur Spitze reicht. Die Zwischenräume sind flach und glatt. Unterseite ohne nennenswerte Skulptur. Beine kurz und dick, Schenkel dick gekeult, Schienen kurz, fast gerade und im Querschnitt oval. Tarsen einfach. — Länge: 11 mm.

Obwohl nur ein Weibchen bekannt ist, will ich die Art aufgrund der Beinform und der übrigen Körperteile in die Artengruppe der *D. atroviridis* (MACLEAY, 1888) einreihen. Sie unterscheidet sich von allen bekannten Arten der papuanisch-australischen Region durch die lebhaft metallische Farbe des ganzen Körpers.

Ich benenne die Art nach dem verdienstvollen Leiter der Kaiserin-Augustafluß-Expedition, Herrn BÜRGERS.

21. *Derosphaerus variicolor* (FAIRMAIRE, 1897) **comb. n.**

Encyalesthus variicolor FAIRMAIRE, 1897: Notes Leyden Mus., **19:** 220 (Locus typicus: »Nouvelle Guinée«).
Encyalesthus speciosus GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 301, Abb. 56—58 (Locus typicus »Deutsch-Neu-Guinea«), **syn. n.**
Encyalesthus aureomicans KASZAB, 1939: Nova Guinea (N. S.), **3:** 224, nec GEBIEN, 1920 (Fehldetermination).

Lectotypus ♂ (pres. des.), Paralectotypus ♀ von *Encyalesthus speciosus* GEBIEN, 1920 befindet sich im Institut für Pflanzenschutzforschung in Eberswalde. Syntype von *E. variicolor* FAIRMAIRE, 1897 untersuchte ich aus dem Museum National d'Histoire Naturelle, Paris.

Untersuchungsmaterial: **Aru Is.,** H. ELGNER (2 ♂ ANIC; 1 ♂ SAMA). — **Neuguinea:** Nov. Guin. S (1 ♂ ZIAK); Nouvelle-Guinée, 1892, LIX (1 ♂ MNHN). — **Irian:** Anday (3 ♂ 2 ♀ ZIAK); Baie de Geelvink, 1878, RAFFRAY & MAINDRON (1 ♂ MNHM); Fak Fak, 29. II. 1952, L. D. BRONGERSMA (1 ♂ RMNH); Mamberamo Riv., Pionierbivak, VII. 1920, W. C. v. HEURN (1 ♀ IFPE); Nomad, 25. X. 1974, R. HORNABROOK (1 ♂ 3 ♀ NZAK). — **Papua New Guinea:** D.[eutsch] N.[eu] Guinea (1 ♂ 1 ♀ IFPE, Lectotypus und Paralectotypus von *Encyalesthus speciosus* GEBIEN, 1920); Stephansort, FENICHEL (1 ♂ 3 ♀ HNHM; 1 ♀ TMPA); Madang, 4. II. 1965, A. MANN (1 ♂ DAFS), id., XI. 1968 (1 ♂ NZAK); Madang, Manumbo (3 ♀ SAMA); Bulldog Road, 680 m, 9. III. 1962, J. SEDLACEK (1 ♂ 1 ♀ BPBM); Fly Riv., Kiunga, 4—8. VII., 4—5. IX., 9—14. X. 1957, W. W. BRANDT (1 ♂ 2 ♀ BPBM); Brown Riv., 21., 22., 25. V. 1956, E. J. FORD, Jr. (5 ♀ BPBM); Kokoda, XI. 1957, SEDLACEK (1 ♂ ANIC); Misima I., H. K. BARTLETT (1 ♂ SAMA); Mt Lemington, 1300—1500 ft, C. T. MCNAMARA (3 ♂ SAMA).

H. GEBIEN (1920) wollte seine Art *Encyalesthus speciosus* GEBIEN, 1920 mit *Encyalesthus variicolor* FAIRMAIRE, 1897 identifizieren; weil er aber die Type von FAIRMAIRE nicht untersuchen konnte und die Beschreibung von FAIRMAIRE irreführend ist, beschrieb er seine Art als neu. FAIRMAIRE hat nämlich die Größe falsch angegeben: 18—19 mm ! Ich habe Gelegenheit gehabt, die Type von FAIRMAIRE in Paris zu untersuchen, welche ein Weibchen ist, sie stimmt mit der GEBIEN'schen Art vollkommen überein, deshalb muß sie synonymisiert werden.

D. variicolor (FAIRMAIRE, 1897) steht *D. sinuatipes* (GEBIEN, 1920) und *D. aureomicans* (GEBIEN, 1920) sehr nahe; diese 3 Arten bilden eine eng verwandte Artengruppe. Aufgrund der Genitalien und Beinstruktur des ♂ steht *D. sinuatipes* (GEBIEN, 1920) am nächsten, und er ist nicht ausgeschlossen, daß die GEBIEN'sche Art nur eine Subspezies von *D. variicolor* (FAIRMAIRE, 1897) darstellt. Der einzige wichtige Unterschied sind nämlich die bei *D. sinuatipes* (GEBIEN, 1920) stark gestreiften Flügeldecken und gewölbten Zwischenräume. Die Beinform beider Formen ist ziemlich gleich und in derselben Art aufgebaut. Die Genitalien sind auch einander sehr ähnlich.

Bei einer flüchtigen Ansicht sind *D. variicolor* (FAIRMAIRE, 1897) und *D. aureomicans* (GEBIEN, 1920) sehr ähnlich, beide haben dieselbe Gestalt und Farbe, außerdem sind bei beiden Arten die Flügeldecken mit feinen Punktreihen versehen, welche am Absturz erloschen sind. Die Zwischenräume flach. Vorderschienen des ♂ ähnlich (Abb. 93), die Hinterschienen sind aber grund-

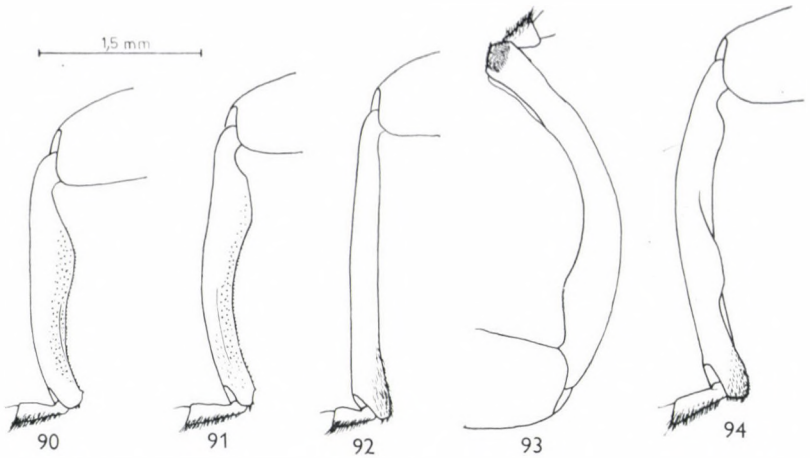


Abb. 90—94. Beine des ♂. Hinterschiene bei Innenansicht von *Derosphaerus atroviridis* (MACLEAY) (90), Hinterschiene (91) und Mittelschiene (92) bei Innenansicht von *D. longipes* sp. n. und Vorderschiene (93) und Hinterschiene (94) bei Innenansicht von *D. variicolor* (FAIRMAIRE)

verschieden. Bei *D. aureomicans* (GEBIEN, 1920) ist die Hinterschiene nur wenig gebogen und einfach, während bei *D. variicolor* (FAIRMAIRE, 1897) die Hinterschiene (Abb. 94) ähnlich wie bei *D. sinuatipes* (GEBIEN, 1920) kompliziert gebaut ist: sehr stark gebogen, von außen gesehen parallel, Außenrand unten stumpf kielartig, innen vor der Mitte ausgeschweift, hinter der Mitte stumpf erweitert und im apikalen Drittel wieder eingeschnürt und das Ende parallel. Das 8. Urosternit des ♂: Abb. 69. Aedoeagus 1,31 mm lang, abgeflacht, die Parameren durchscheinend fein chitinisiert und asymmetrisch (Abb. 95—97). — Länge: 12,8—16,2 mm.

22. *Derosphaerus sinuatipes* (GEBIEN, 1920) **comb. n.**

Encyalesthus sinuatipes GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 300 (Locus typicus: »Neu-Pommern Herbertshöhe und Neu-Lauenburg«).

Syntype ♂ und ♀ im Museum G. Frey, Tutzing, 1 ♂ ST auch im Ungarischen Naturwissenschaftlichen Museum, Budapest.

Untersuchungsmaterial: nur 1 ST aus Herbertshöhe (HNHM).

Die Originalbeschreibung von GEBIEN (1920) ist ausführlich genug, so daß ich die Beschreibung nicht wiedergeben will. Die wichtigsten Charakteristika der Art sind folgende:

Vorderrand des Clypeus breit und gebogen ausgerandet. Augenfurche fein. Clypealsutur von den Augen entfernt. Seitenrand des Halsschildes scharf und vollständig, Basis ist gefurcht. Flügeldecken mit Längsstreifen und Punkt-

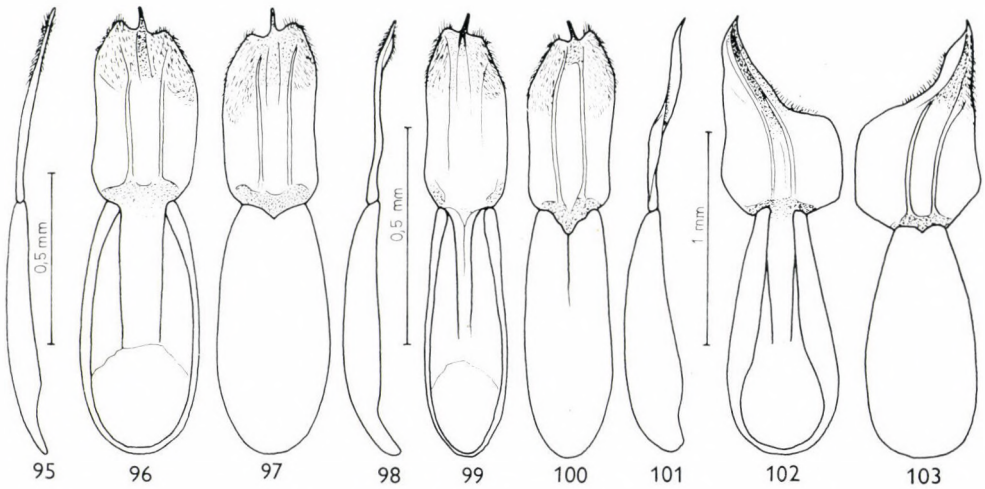


Abb. 95—103. Aedoeagus. 95—97 = *Derosphaerus variicolor* (FAIRMAIRE), 98—100 = *D. sinuatipes* (GEBIEN) und 101—103 = *D. aureomicans* (GEBIEN) (Abb. 95, 98, 101 lateral, Abb. 96, 99, 102 ventral und Abb. 97, 100, 103 dorsal)

reihen, die Punkte sind vorn grob, am Absturz feiner, die Streifen aber bis zur Spitze entwickelt und die Zwischenräume gewölbt, äußerst fein, erloschen punktiert, im 4. Streifen etwa 35 Punkte. Prosternum zwischen den Hüften breit und ganz flach, nur das abgerundete Ende und die Seiten hinter den Hüften dick gerandet. Mittelbrust tief eingedrückt. 1. Abdominalsegment des ♂ in der Mitte kaum abgeflacht. Das 8. Urosternit des ♂: Abb. 70. Alle Schenkel des ♂ unten gebogen, abgeflacht und gelb behaart. Vorderschiene (Abb. 104) des ♂ stark gebogen, innen basal mit leichter, flacher Erweiterung, unten ist das Ende flach, unbehaart. Mittelschienen fast gerade, unten ist die apikale Hälfte flach und glatt. Hinterschienen (Abb. 105) stark gebogen, im basalen Drittel innen leicht eingeschnürt und der untere Außenrand gekantet, hinter der Mitte innen leicht erweitert und das apikale Viertel verschmälert und parallel, Unterseite von der Spitze bis zur Mitte abgeflacht und nackt. Aedoeagus 1,37 mm lang, fein sklerotisiert, die Parameren sind abgeflacht, durchscheinend und asymmetrisch gebaut, das Ende oben und unten behaart (Abb. 98—100). — Länge: 13,5—14,5 mm.

Es sind 3 Arten, welche einander sehr ähnlich sind und auch ähnliche sekundäre Geschlechtsmerkmale der Beine und sehr charakteristische, asymmetrische Parameren besitzen, und zwar *D. sinuatipes* (GEBIEN, 1920), *D. aureomicans* (GEBIEN, 1920) und *D. variicolor* (FAIRMAIRE, 1897). Bei *D. aureomicans* (GEBIEN, 1920) und *D. variicolor* (FAIRMAIRE, 1897) sind die Längsstreifen und Punktreihen am Absturz oder vor dem Ende erloschen und auch die Zwischenräume fast ganz flach.

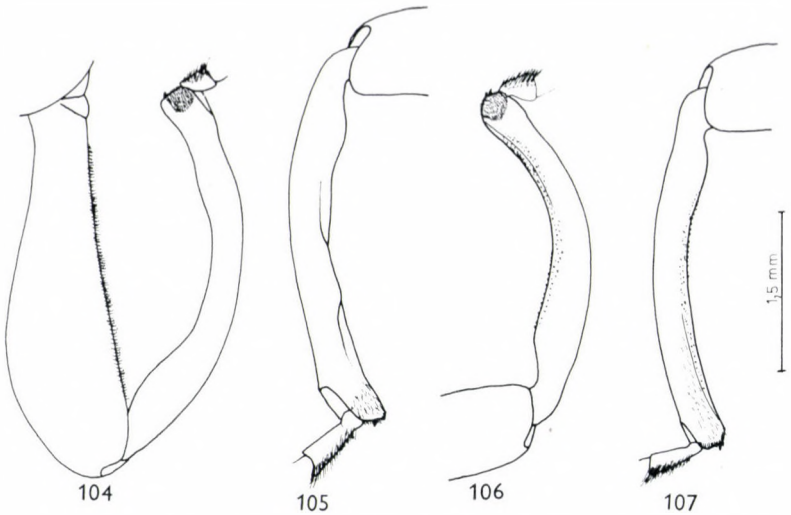


Abb. 104—105. Vorderbein (104) und Hinterschiene (105) des ♂ von *Derosphaerus sinuatipes* (GEBIEN) — Abb. 106—107. Vorderschiene (106) und Hinterschiene (107) des ♂ von *D. aureomicans* (GEBIEN)

23. *Derosphaerus aureomicans* (GEBIEN, 1920) **comb. n.**

Encyalesthus aureomicans GEBIEN, 1920: Nova Guinea XIII, Zool., **8:** 298 (Locus typicus: »Deutsch-Neu-Guinea: Sissanu«).

Holotypus ♂ befindet sich im Zoologischen Museum der Humboldt-Universität, Berlin.

Untersuchungsmaterial: **Papua New Guinea:** D.[eutsch] N.[eu]-Guinea, NEUHAUSS (HT ♂ ZMHU); Baiyer Riv., 1100 m, 26. XII. 1978—25. I. 1979, J. SEDLACEK (1 ♂ HNHM); Amboin, 16. X. 1974, H. OHLMUS (2 ♀ ANIC).

GEBIEN (1920) beschrieb diese Art als nächstverwandte seiner *D. epistomaticus* (GEBIEN, 1920), was aber nicht richtig ist. Sie gehört in die Nähe von *D. sinuatipes* (GEBIEN, 1920) und *D. variicolor* (FAIRMAIRE, 1897). Die erstere ist leicht zu unterscheiden, weil sie an den Flügeldecken bis zur Spitze reichende Längsstreifen und Punktreihen besitzt, außerdem sind die Zwischenräume gewölbt. Die Unterschiede zwischen *D. aureomicans* (GEBIEN, 1920) und *D. variicolor* (FAIRMAIRE, 1897) bestehen vor allem an den Beinen der Männchen. Bei *D. variicolor* (FAIRMAIRE, 1897) sind die Hinterschienen des ♂ wie bei *D. sinuatipes* (GEBIEN, 1920) gebildet, die Flügeldecken aber nicht gestreift und die Zwischenräume am Ende nicht gewölbt.

Die wichtigsten Charakteristika von *D. aureomicans* (GEBIEN, 1920) sind folgende:

Schenkel des ♂ stark gekeult, unten gebogen und fein behaart. Vorderschienen des ♂ (Abb. 106) stark gebogen, innen an der Basis abgeflacht und

leicht rundlich erweitert, das Ende unten konvex und kahl. Mittelschienen des ♂ (Abb. 107) fast gerade, das Ende im Querschnitt fast rundlich. Hinterschienen des ♂ wenig gebogen, Unterseite fast der ganzen Länge nach abgeflacht, im basalen Fünftel innen nur ganz leicht erweitert. Das 1. Segment des Abdomens beim ♂ in der Mitte breit abgeflacht, stärker punktiert und mikroskopisch behaart. Prosternum zwischen den Hüften sehr breit und flach, nur das abgerundete Ende dick gerandet, Mittelbrust tief eingedrückt. Vorderrand des Clypeus nur ganz leicht und gebogen ausgerandet, Clypealsutur scharf, von den Augen entfernt, Augenfurchen sehr schmal und nicht tief, Clypeus spärlicher, Stirn dichter punktiert, Halsschildscheibe wie der Clypeus punktiert, seitlich ist die Punktierung sehr fein und erloschen. Flügeldecken mit Punktreihen und mit Spuren von Längsstreifen, welche am Absturz erloschen sind, die Zwischenräume flach oder sehr leicht gewölbt, am Absturz aber stets vollkommen flach. A e d o e a g u s 2,14 mm lang, sehr charakteristisch, die Parameren vollkommen abgeflacht, durchscheinend und stark asymmetrisch, zugespitzt (Abb. 101—103). — L ä n g e : 12,8—14 mm.

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DESCRIPTION OF THE EXTERNAL FEMALE GENITALIA OF SOME NEOTROPICAL TENEBRIONIDAE (COLEOPTERA: HETEROMERA)

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The morphology of ovipositor of 51 species on Notropical Tenebrionidae (Col., Heteromera) belonging to three subfamilies, 14 tribes and 23 genera is described and illustrated. Only a few genera (*Talanus*, *Opatrinus*, *Phaleria*) had been previously described from this aspect. The morphology of ovipositor proves to be of very great importance for a differentiation of some genera inside a tribe and of some groups of species within a genus (e.g. Antillean and South American *Diastolinus*), also greater than that of phallus. Generally an agreement with what we know of geology and paleogeography of inhabited territory is very remarkable. The morphology of ovipositor seems to be suitable for phylogenetic studies of Neotropical Tenebrionids as and probably more than that of phallus. The research is still in progress.

The almost total absence of descriptions of female genitalia in Tenebrionids, if we make an allowance for the recent work by TSCHINKEL & DOYEN (1980) has advised to represent here the first results the author has had in the study of this Coleopterous family, which began in 1948, and which brought to the description of many new species and genera, coming mainly from the Caribbean area.

The first author who described the ovipositor of Nearctic Tenebrionids belonging to a tribe present also in the Neotropical Region Eleodini, is CHAMPION, followed by BLAISDELL, who in 1909 monographed Eleodini of the United States, Lower California and adjacent islands. Further students who mentioned and represented the female genital external apparatus are TRIPLEHORN (*Megasida tenuicollis*) and DOYEN (1966) who represents very clearly the ovipositor of a cosmopolite species (*Tenebrio molitor*) as well as of two American species, *Praocis penai* (Neotropical) and *Eusattus dubius* (Nearctic). The ovipositor of *Tenebrio molitor* is illustrated by WATT (1974). We should not forget the work of MEDVEDEV, who studied the female apparatus of many Palearctic Opatrinae belonging to the fauna of URSS, though he limited himself to the coxites.

The nomenclature of the ovipositor is not uniform among the various authors who have dealt with this organ in different times and with different aims (morphology, systematics, phylogeny, etc.). In this paper I have followed TSCHINKEL & DOYEN's nomenclature. Paraprocts correspond to valvifer I, coxites to valvifer II of other students. Proctiger is visible only in dorsal

view or in some instances in lateral view. Constantly between coxites the so-called "folded membrane" is visible and therefore no reference is made to it in the descriptions. The male apparatus of many Neotropical Tenebrionids has been recently illustrated by the author (MARCUZZI, 1983).

Material and technique

The material utilized in this work comes from the author's personal collection; only a part belongs to some European Museums such as British Museum (N. H.), Münchener Staats-Sammlung, Hungarian Natural History Museum (Budapest), etc. Most of the species of the Caribbean Islands have been collected by DR. P. W. HUMMELINCK of the Utrecht University and by the author (Venezuelan mainland and Venezuelan islands). All species have been determined by the author, though in some instances previously determined by other specialist (Dr. KASZAB, Mr. KULZER); many of them have also been described as new by the author.

For the extraction of female genitalia the specimens were previously kept in a humidifier for some days; then the last abdominal sterna or if necessary all the abdomen was removed and the female genitalia were extracted under a stereoscopic binocular (Galileo, Milano). Very often the abdomen was boiled for a short time in diluted alkali (10% KOH solution) in order to have all not cuticular parts destroyed. The female genitalia or ovipositor once isolated, were thoroughly washed with distilled water and were allowed to dry. All drawings have been made by using a "camera lucida" of the ABBE—APÁTHY model (Koristka, Milano), with direct illumination. The original drawings have been made by Miss Sonia Busetto during the preparation of her thesis for the Doctor's degree (Biol. Sciences); then the drawings have been inked by Mr. RENZO MAZZARO, technician in the Institute in which the research has been carried out.

It is a pleaure for me to thank here particularly DR. Z. KASZAB, formerly Director General of the Hungarian Natural History Museum, Budapest, for his help and advice he gave me over many years, and for having proposed the present paper for publication. I should also mention my visit to that Museum, in which I found the greatest liberality, since I was allowed to examine all the Tenebrionid materials and choose all the species and specimens I wished to bring with me for study. A part of the material has been already published (MARCUZZI, 1976).

DESCRIPTION OF EXAMINED MATERIAL

EPITRAGINI

Epitragus paraguanae MARCUZZI, 1961 (Fig. 1)

MARCUZZI (1961): Annalis Mus. civ. Stor. nat. Genova, **72:** 324.
Examined specimen: Encontrados, Rio Onia, Venezuela, leg. L. CROIZAT.

Total length 2.5 mm; paraprocts long 1.9 mm, coxites 0.6 mm; ratio p/c (paraprocts/coxites) 3.1. Ovipositor brownish-yellow, rather sclerotized, long and cylindrical, densely dressed with long hairs. Paraprocts rather jointed, triangular, with longitudinal baculi situated rather medially. Coxites with evident lobe I, trapezoidal, with transverse baculi. Lobe I shows at the sides a longitudinal oblique stripe, dark, ending with the gonostyli, furnished with a number of long hairs (setae).

Epitragopsis llanensis MARCUZZI, 1961 (Fig. 2)

MARCUZZI (1961): Pubbl. Ist. di Zoologia, Università di Trieste, **2:** 6.
Examined material: Caucagua, Estado Miranda (Northern Venezuela).

Total length 3.2 mm; paraprocts long 2.6 mm, coxites 0.6 mm; ratio p/c 4.3. Ovipositor reddish-dark brown, well sclerotized, with the shape of a long cylinder. Paraprocts much longer than coxites, triangular, very close, with longitudinal baculi situated rather medially. Coxites subdivided into two lobes, the first of which subrectangular, with transverse baculi; lobe II triangular, pointed, with extremely small gonostyli, furnished with short hairs.

Stictoderia subseriata GEBIEN, 1928 (Fig. 3)

GEBIEN (1928): Stettiner ent. Ztg **89:** 101 (Stictodere)
Examined specimen: Los Roques, Venezuelan Leeward Islands.

Total length 2.5 mm; paraprocts long 1.9 mm, coxites 0.6 mm; ratio p/c 3.1. Ovipositor golden yellow, medially sclerified, long, almost cylindrical. Paraprocts long, triangular, with longitudinal, slightly arcuate baculi, situated rather medially. Coxites subdivided into two lobes, with rather divergent distal ends. Lobe I almost rectangular, with longitudinal baculi; lobe II longer than lobe I, triangular. Lobe II at the top dressed with some hairs.

Hylithus kovacsi KASZAB, 1964 (Fig. 4)

KASZAB (1964): Annls hist.-nat. Mus. natn. hung., **56:** 374.
Examined specimen: Neuquen, Pilmatué.

Total length 1.2 mm; paraprocts long 0.8 mm, coxites 0.4 mm; ratio p/c 2. Ovipositor golden yellow, medially sclerified, almost cylindrical. Paraprocts almost trapezoidal, with longitudinal baculi. Coxites subdivided into two lobes. Lobe I shorter than lobe II, almost ovoidal, at the base dark coloured. Baculi of lobe I transverse, slightly oblique. Lobe II triangular, ending in a not very long point, dressed with some hairs.

STENOSINI

Rhypasma mahunkai MARCUZZI, 1976 (Fig. 5)

MARCUZZI (1976): Annls hist.-nat. Mus. natn. hung., **68**: 120.
Examined specimen: Bolivia, Guayaramerin (Beni River).

Total length 1.2 mm; paraprocts long 0.5 mm, coxites 0.6; ratio p/c 0.8. Ovipositor brownish yellow, not much sclerotized, almost cylindrical. Paraprocts triangular, with longitudinal baculi. Coxites subdivided into 4 lobes. Lobe I as long as lobe III, with transverse baculi. Lobe IV cylindrical, rather long, finger-like, with gonostyli at the extremity. The latter are dark, cylindrical, narrow, apparently with no hairs.

Rhypasma kaszabi MARCUZZI, 1976 (Fig. 6)

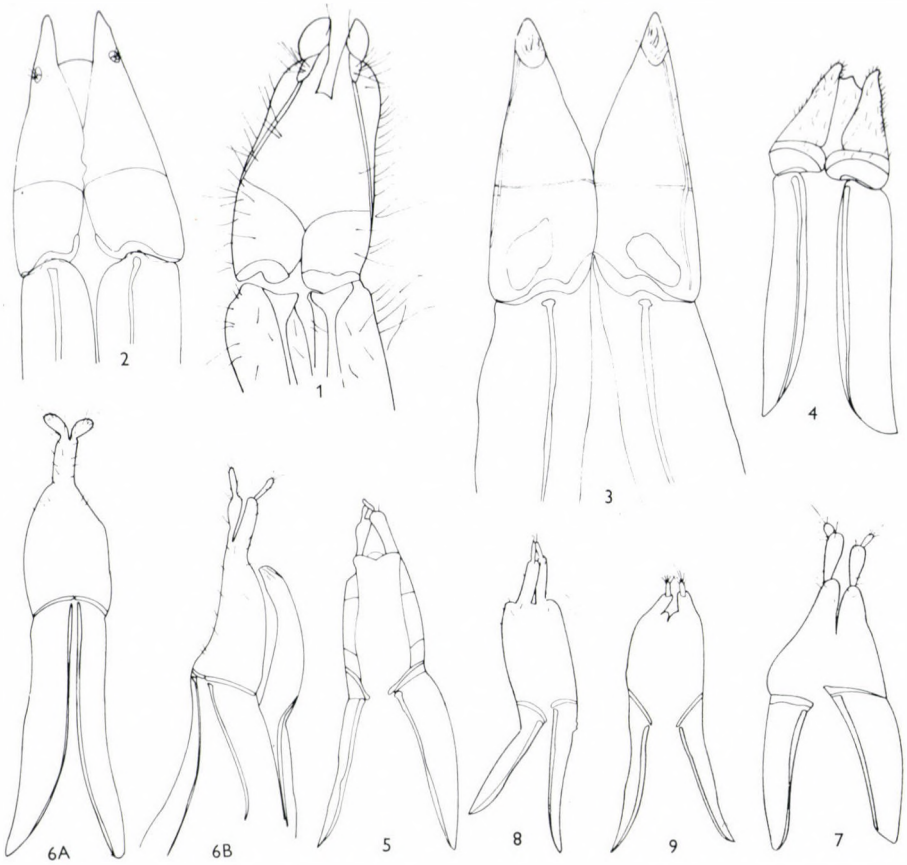
MARCUZZI (1976): Annls hist.-nat. Mus. natn. hung., **68:** 118.
Examined specimen: Caugua, Estado Aragua, Venezuela.

Total length 1.0 mm; paraprocts long 0.6 mm; coxites 0.4 mm; ratio p/c 1.3. Ovipositor whitish yellow, slightly sclerified, long, cylindrical. Paraprocts triangular, with longitudinal baculi. Coxites not subdivided, apparently only lobe IV free and long, finger-like. Coxites almost conical basally and then cylindrical towards the apex, where lobe IV is visible. This is furnished with a long, narrow gonostylus, bearing a number of setae one of which very long. This is particularly visible in lateral view, which allows to see the proctiger (Fig. 6b) dorsally.

Rhypasma costicolle MARCUZZI, 1976 (Fig. 7)

MARCUZZI (1976): Annls hist.-nat. Mus. natn. hung., **68:** 119.
Examined specimen: Bolivia, Guayaramerin, Beni River.

Total length 0.7 mm; paraprocts long 0.3 mm; coxites long 0.4 mm. Ovipositor very pale yellow, very little sclerified, almost cylindrical, narrowed



Figs 1—9. External female genitalia. 1 = *Epitragus paraguanae* MARCUZZI; 2 = *Epitragopsis llanensis* MARCUZZI; 3 = *Stictoderia subseriata* GEBIEN; 4 = *Hylithus kovacsi* KASZAB; 5 = *Rhypasma mahunkai* MARCUZZI; 6 = *Rhypasma kaszabi* MARCUZZI (a: from above, b: laterally); 7 = *Rhypasma costicolle* MARCUZZI; 8 = *Rhypasma kulzeri* MARCUZZI; 9 = *Rhypasma quadricolle* FAIRMAIRE

towards the apex. Paraprocts triangular, with longitudinal slightly oblique baculi. Coxites exhibit distinctly only lobe IV, long, cylindrical, finger-like. Baculi of coxites transverse and well visible. Gonostyli cylindrical, with several hairs at the extremity, one of which longer.

Rhypasma kulzeri MARCUZZI (Fig. 8)

MARCUZZI (in print)

Examined specimen: Bebedero, Costarica.

Total length 0.8 mm; coxites long 0.4 mm. Ovipositor very pale yellow, very slightly sclerified, cylindrical. Paraprocts triangular, with longitudinal

baculi. Coxites show distinctly only lobe IV, cylindrical, free and finger-like. At the base on each disc a transverse baculus is clearly visible. Gonostyli rather long, cylindrical, narrow, with a few hairs at the extremity.

Rhypasma quadricolle FAIRMAIRE, 1904 (Fig. 9)

FAIRMAIRE (1904): Bull. Soc. ent. Fr.: 62.
Examined specimen: Montevideo.

Total length 0.9 mm; paraprocts long 0.4 mm; coxites 0.5. Ovipositor very pale yellow, very slightly sclerified, almost cylindrical. Paraprocts triangular, with longitudinal, only slightly oblique baculi. Coxites showing only lobe IV, with transverse, slightly oblique baculi. Lobe IV cylindrical, finger-like; gonostyli cylindrical, not very long, with some not particularly long hairs.

NYCTELIINI

Gyriosomus bridgesi WATERHOUSE, 1843 (Fig. 10)

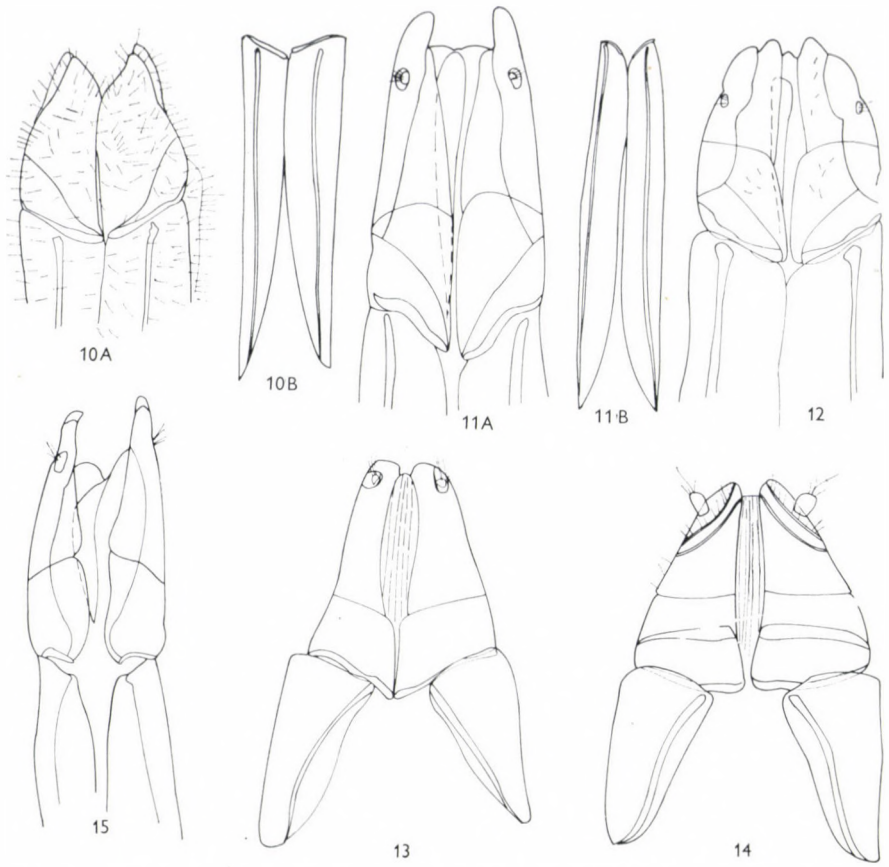
WATERHOUSE (1843): Ann. Mag. nat. Hist., **12:** 258.
Examined specimen: Neuquen.

Total length 9.9 mm; paraprocts long 7.2 mm, coxites 2.7; ratio p/c 2.5. Ovipositor reddish yellow, rather sclerotized, completely dressed with long and dense hairs; long, almost cylindrical. Paraprocts very near one another, long and triangular. Baculi longitudinal and displaced towards the sides. Coxites not subdivided into 4 lobes, but at the base on each side a dark triangular area is visible, with a narrow longitudinal median area, particularly darker (Fig. 10b). Baculi of coxites transverse, slightly oblique. At the extremity of ovipositor a darker area is present (lobe IV ?). Gonostyli not visible.

Nyctelia porcata BURMEISTER, 1877 (Fig. 11)

BURMEISTER (1877): Stettiner ent. Ztg, **38:** 69.
Examined specimen: Chubut, Argentina.

Total length 10 mm; paraprocts long 7.8 mm, coxites 2.2 mm; ratio p/c 3.4. Ovipositor brownish red, rather sclerified, long, almost cylindrical. Paraprocts near one another, triangular, baculi longitudinal, particularly displaced towards the sides. Coxites subdivided into two lobes, with a pale, median, longitudinal area, with a dark sclerite in the middle (Fig. 11b). Lobe I trapezoidal, somewhat shorter than lobe II. Baculi of lobe I transverse and a little oblique. Lobe II almost triangular, laterally and apically with a darker



Figs 10—15. External female genitalia. 10 = *Gyriosomus bridgesi* WATERHOUSE (a: from above, b: coxites); 11 = *Nytelia porcata* BURMEISTER (a: from above, b: coxites); 12 = *Epipedonota ebenina* LACORDAIRE; 13 = *Scotobius obscurus* KULZER; 14 = *Nycterinus substriatus* SOLIER; 15 = *Praocis molinari* KULZER

area. Latero-ventrally, near the apical 2/3, a pale, small area is visible, bearing in the centre a very small papilla, possibly a gonostylus, furnished at the apex with a number of short hairs.

Epipedonota ebenina LACORDAIRE, 1830 (Fig. 12)

LACORDAIRE (1830): Annls Sci. nat., **20:** 278.
Examined specimen: Chubut (Argentina).

Total length 7.2 mm; paraprocts long 5.1 mm, coxites 2.2; ratio p/c 2.2. Ovipositor brownish red, rather sclerified, long and almost cylindrical. Paraprocts triangular, baculi longitudinal and rather displaced towards the sides. Coxites divided into two lobes, medially with a longitudinal pale area, showing

in the middle a dark sclerite. Lobe I trapezoidal, with a wide dark area at the base and at the sides. Baculi transverse. Lobe II almost triangular, ending in two small points; they show laterally a small, circular, pale area, in which some short hairs emerge, probably belonging to the extremely small gonostyli, not emerging from the area.

SCOTOBIINI

Scotobius obscurus KULZER, 1955 (Fig. 13)

KULZER (1955): Ent. Arb. Mus. Georg Frey, **6**: 428.
Examined specimen: Neuquen, Argentina.

Total length 1.6 mm; paraprocts long 0.8 mm, coxites long 1 mm; ratio p/c 0.7. Ovipositor brownish red, triangular, long. Coxites only with the well-visible lobe I, the rest being probably fused together. A median, longitudinal folded zone is present. Lobe I almost rectangular. Near the extremity and in dorso-lateral position gonostyli emerge from the centre of a clearer area.

ELEODINI

Nycterinus substriatus SOLIER, 1848 (Fig. 14)

SOLIER (1848): Stud. Ent., **2**: 269.
Examined specimen: Santiago, Chile.

Total length 2.0 mm; paraprocts long 1.0 mm, coxites 1.0; ratio p/c 1. Ovipositor golden yellow, medially sclerified, triangular. Paraprocts almost triangular; baculi almost longitudinal. Coxites clearly subdivided into 4 lobes, with a longitudinal, median, folded area. Lobe I rectangular, baculi of lobe I transverse. Lobe III almost triangular; lobe IV discoidal. Gonostyli emerge from lobe IV in an unusual ventro-lateral position; they are surrounded by a lateral fovea, furnished at its edge with a ring of hairs. Gonostyli cylindrical, rather thick and short, with a number of short hairs, one of which much longer.

PRAOCINI

Praocis molinari KULZER, 1958 (Fig. 15)

KULZER (1958): Ent. Arb. Mus. Georg Frey, **9**: 67.
Examined specimen: San Martin de los Andes, Neuquen, Argentina.

Total length 4.9 mm; paraprocts long 3.8 mm; coxites long 1.1 mm; ratio p/c 3.3. Ovipositor golden yellow, medially sclerified, almost cylindrical, slightly rotated on one side (asymmetrical). Paraprocts trapezoidal, baculi

longitudinal and unusually displaced towards the sides. Coxites cylindrical, ending in a free, dark top, subdivided only into two lobes. Lobe I trapezoidal, a little shorter than lobe II, with longitudinal somewhat arcuate baculi. Lobe II triangular, towards the extremity and laterally with a small, pale, area from which a number of hairs emerge. No gonostyli visible.

PEDININI

Diastolinus perforatus C. R. SAHLBERG, 1823 (Fig. 16)

SAHLBERG, C. R. (1823): Peric. ent. spec. ins. nondum descr. propos 115 (Opatrum)
Examined specimen: unknown locality (West Indies).

Total length 1.5 mm; paraprocts long 0.8 mm; coxites 0.8; ratio p/c 1. Ovipositor golden yellow, triangular and long. Paraprocts triangular, with oblique baculi. Coxites subdivided into 4 lobes. Lobe I almost triangular, a little shorter than the others, but wider and darker; it exhibits transverse baculi. Lobe II rectangular, a little longer than lobe III, trapezoidal. Lobe IV somewhat discoidal; it shows dorsally and a little medially the gonostyli, in the centre of a paler area surrounded by a darker ring. Gonostyli small and cylindrical.

Diastolinus puertoricensis MARCUZZI, 1977 (Fig. 17)

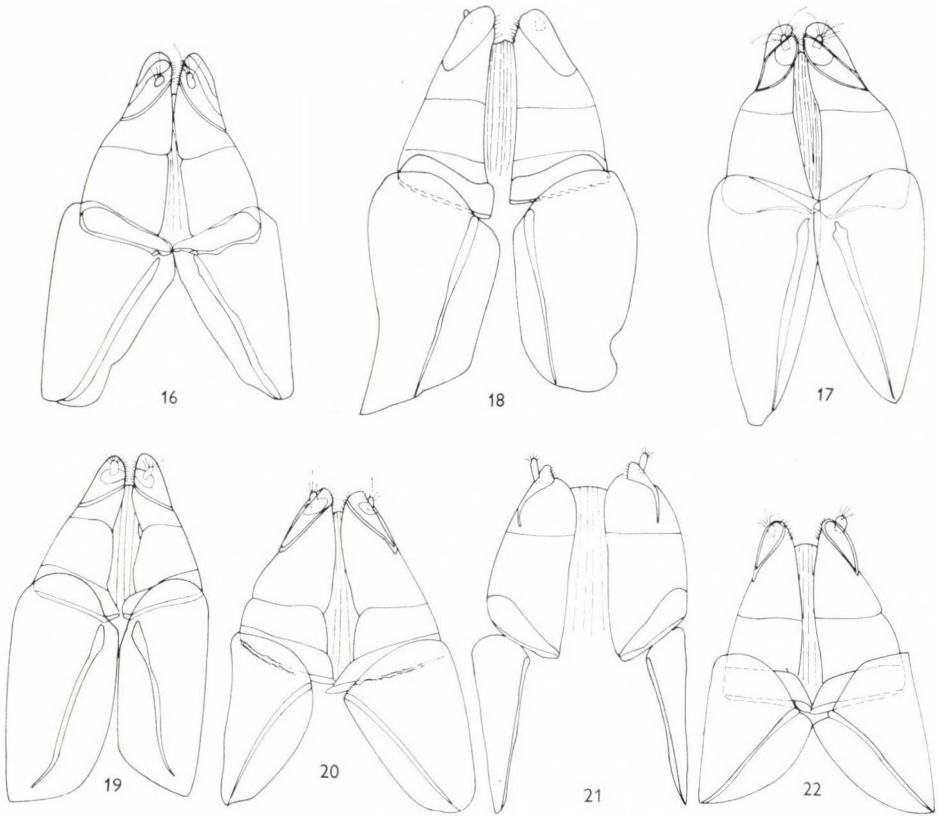
MARCUZZI (1977): Stud. Fauna Curaçao-Carib., **170:** 20.
Examined specimen: unknown locality (Greater Antilles).

Total length 1.4 mm; paraprocts long 0.8 mm; coxites long 0.6 mm; ratio p/c 1.2. Ovipositor golden yellow, normally sclerotized, long, triangular. Paraprocts triangular, contiguous, with longitudinal baculi. Coxites subdivided into 4 lobes. Lobe I almost triangular, shorter than lobe II, with transverse baculi. Lobe II trapezoidal; situated on the extremity of lobe III is lobe IV, discoidal. It bears dorsally and medially (which is an unusual feature) gonostyli. These emerge in the centre of a paler area, surrounded by a darker ring. Gonostyli small, cylindrical, with a number of hairs emerging on the top. Medially to lobe IV, near the orifice of the vulva, there are some longitudinal rows of short hairs (as in *D. clavatus*; see later).

Diastolinus clavatus MULSANT & REY, 1859 (Fig. 18)

MULSANT & REY (1859): Opusc. ent., **9:** 91.
Examined specimen: Point Blanche, Saint Martin.

Total length 1.4 mm; paraprocts long 0.8 mm, coxites 0.7; ratio p/c 1.2. Ovipositor dark, very sclerotized, triangular. Paraprocts almost trapezoidal,



Figs 16—22. External female genitalia. 16 = *Diastolinus perforatus* C. R. SAHLBERG; 17 = *D. puertoricensis* MARCUZZI; 18 = *D. clavatus* MULSANT & REY; 19 = *D. puncticollis* MULSANT & REY; 20 = *D. curtus* MULSANT & REY; 21 = *D. barbudensis barbudensis* MARCUZZI; 22 = *D. fairmairei* MARCUZZI

with longitudinal baculi. Coxites subdivided into 4 lobes. Lobes I as long as the other lobes, with transverse baculi. At the tip of lobe IV, which is discoidal, gonostyli are implanted dorso-laterally. They are small and apparently without the typical hairs on their top.

Diastolinus puncticollis MULSANT & REY, 1859 (Fig. 19)

MULSANT & REY (1859): Opusc. ent., **9:** 83.
Examined specimen: St. Kitts, Brimstone Hill.

Total length 1.5 mm; paraprocts long 1.0 mm, coxites 0.7; ratio p/c 1.4. Ovipositor golden yellow, triangular. Paraprocts long, with distal extremity not much pointed and basal extremity rather rounded. Baculi longitudinal. Coxites subdivided into 4 lobes. Lobe I shorter than the others, wider and

almost rectangular, similar to lobe II, darker than the others. Baculi of lobe I transverse. Lobe IV not very long, with an intermediate shape between cylindrical and discoidal. They show on the median side towards the opening of the vulva a longitudinal row of short hairs. Gonostyli dark, short and small; they emerge dorsally and almost centrally from lobe IV, in the centre of a pale area, corresponding maybe to a fovea. They show on the extremity a number of rather short hairs.

Diastolinus curtus MULSANT & REY, 1859 (Fig. 20)

MULSANT & REY (1859): Opusc. ent., **9:** 93.
Examined specimen: Aruba (Leeward Islands).

Total length 0.8 mm; paraprocts long 0.4 mm, coxites 0.4; ratio p/c 1. Ovipositor reddish, normally sclerified as in all congeneric species, triangular. Paraprocts rather rounded both at base and at apex. Baculi oblique. Coxites subdivided into 4 lobes; lobe I shorter but wider than other lobes and darker. Baculi transverse. Lobe IV short and discoidal, medially towards the opening of the vulva with a longitudinal row of short hairs. Gonostyli emerge dorsally and rather laterally on lobe IV; they are very long, cylindrical, and show at the extremity a tuft of short hairs, one of which much longer.

Diastolinus barbudensis barbudensis MARCUZZI, 1962 (Fig. 21)

MARCUZZI (1962): Mems Soc. Cienc. nat. "La Salle", **9:** 338, 339, 344.
Examined specimen: Barbuda (Lesser Antilles).

Total length 1.0 mm; paraprocts long 0.5 mm, coxites 0.6 mm; ratio p/c 0.8. Ovipositor pale yellow, little sclerified, almost rectangular. Paraprocts triangular, with longitudinal baculi. Coxites subdivided into 4 lobes. Lobe I almost triangular, darker and shorter than lobes II and IV, with oblique baculi. Lobe II trapezoidal, a little longer than lobe III. On the top of lobe III, laterally, lobe IV emerges, what is an unusual feature in this Tenebrionid genus. Gonostyli emerge dorso-laterally from lobe IV, cylindrical, rather long and thin, at the extremity with a number of short hairs.

Diastolinus fairmairei MARCUZZI, 1949 (Fig. 22)

MARCUZZI (1949): Mems Soc. Cienc. nat. "La Salle", **9:** 336, 338, 344.
Examined specimen: Isla de Margarita, Venezuela.

Total length 0.7 mm; paraprocts long 0.3 mm; coxites 0.4 mm; ratio p/c 0.7. Ovipositor golden yellow, normally sclerified, triangular. Paraprocts almost triangular, a little shorter than coxites, with oblique baculi. Coxites subdivided into 4 lobes. Lobe I almost trapezoidal, a little shorter than lobes

II and III, with transverse baculi. Lobes II rectangular, a little shorter than lobe III, on the top of the latter lobes IV are inserted, discoidal and surrounded by a dark circle. Gonostyli inserted dorso-laterally on lobe IV, normally long and thick; at the top they exhibit a number of hairs of normal length.

Opatrinus gemellatus OLIVIER, 1795 (Fig. 23)

OLIVIER (1795): Entomologie, **3,** N° 60: 9.
Examined specimen: unknown locality.

Total length 2 mm; paraprocts long 1.1 mm, coxites 1.1 mm; ratio p/c 1. Ovipositor golden yellow, normally sclerified (as in most species of *Diastolinus*), triangular. Paraprocts almost triangular, with longitudinal baculi. Coxites subdivided into 4 lobes (as in *Diastolinus*). Lobe I almost rectangular, a little shorter than the rest of lobes, with transverse baculi. Lobe II as long as lobe III, both trapezoidal. At the top of lobes III lobe IV emerges, with a shape intermediate between cylindrical and discoidal. Gonostyli rather thick and normally long, bearing a number of very short hairs, one of which much longer.

Opatrinus gridellii MARCUZZI, 1949 (Fig. 24)

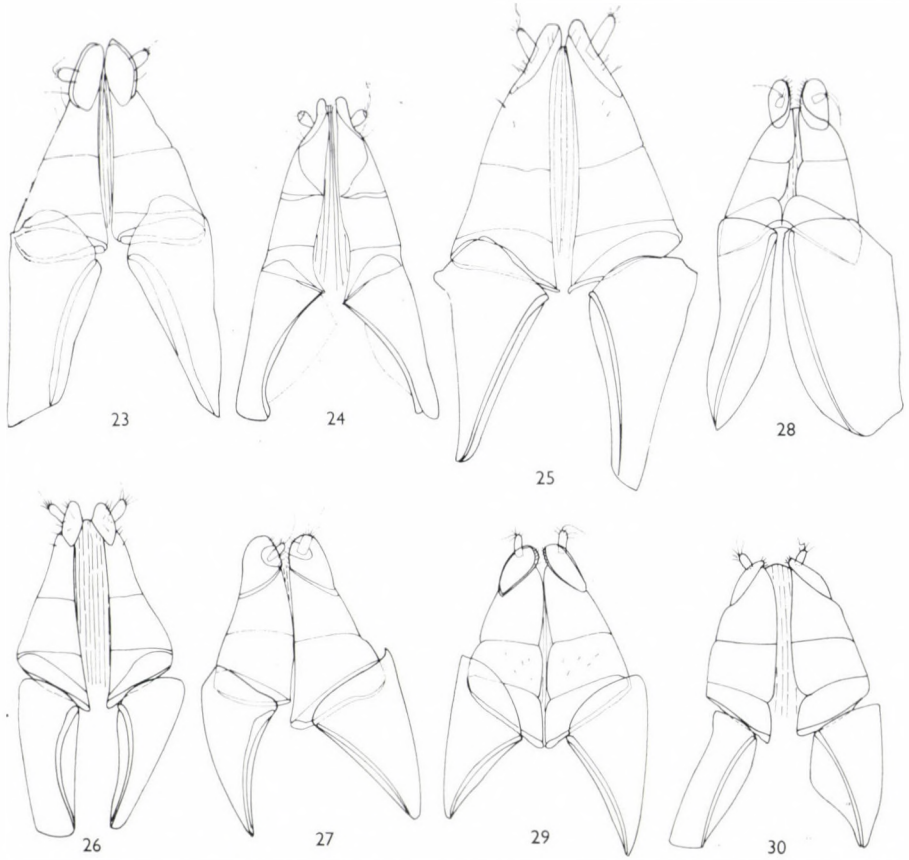
MARCUZZI (1949): Mems Soc. Cienc. nat. "La Salle", **9:** 338, 342.
Examined specimen: Puerto Nutrias, Estado Zamora, Venezuela.

Total length 1.7 mm; paraprocts long 0.9 mm, coxites long 1.0 mm; ratio p/c 0.8. Ovipositor brownish red, well sclerified, triangular. Paraprocts almost triangular, with oblique baculi. Coxites subdivided into 4 lobes, dressed with some hairs. Lobe I trapezoidal, with transverse baculi. Lobe II subrectangular, shorter than lobe III. Lobe IV, dressed with some scattered hairs, is inserted above and medially on lobes III. They are small, discoidal, flattened, with a lateral fovea from which gonostyli emerge. The latter at the extremity exhibit some very short hairs, one of which much longer.

Opatrinus puertoricensis MARCUZZI, 1977 (Fig. 25)

MARCUZZI (1977): Stud. Fauna Curaçao-Carib., **170:** 23.
Examined specimen: Mayagüez, Puerto Rico.

Total length 2.0 mm; paraprocts long 0.9 mm; coxites 1.1 mm; ratio p/c 0.8. Ovipositor brownish yellow, normally sclerified, almost triangular. Paraprocts almost triangular, with longitudinal baculi. Coxites subdivided into 4 lobes. Lobe I only a little shorter than the rest of lobes, with transverse baculi. Lobe III almost triangular, a little longer than lobe II, dressed with



Figs 23—30. External female genitalia. 23 = *Opatrinus gemellatus* OLIVIER; 24 = *O. gridellii* MARCUZZI; 25 = *O. puertoricensis* MARCUZZI; 26 = *O. validus* BURMEISTER; 27 = *Blapstinus opacus* MULSANT & REY; 28 = *B. fortis* LECONTE; 29 = *B. orchilensis occidentalis* MARCUZZI; 30 = *B. dominicus* MARCUZZI

a few hairs. Lobe IV discoidal, situated laterally to lobe III; gonostyli situated dorso-laterally to lobe IV, cylindrical, rather long and thick, with the normal set of hairs at the top.

Opatrinus validus BURMEISTER, 1875 (Fig. 26)

BURMEISTER (1875): Stettiner ent. Ztg, **36:** 499.
Examined specimen: Bahia, Argentina.

Total length 2.1 mm; paraprocts long 1.0 mm; coxites 1.3 mm; ratio p/c 0.8. Ovipositor golden yellow, normally sclerified, triangular, long. Paraprocts trapezoidal, with longitudinal baculi. Coxites subdivided into 4 lobes: lobe I as long as lobe II, triangular, darker in the middle, with oblique

baculi. Lobe III almost trapezoidal, a little longer than the other lobes. Lobe II bear at their extremity the small lobe IV, with a shape intermediate between cylindrical and discoidal. From lobe IV dorso-laterally gonostyli emerge, cylindrical, long, rather thick, with a number of hairs at the top.

Blapstinus opacus MULSANT & REY, 1859 (Fig. 27)

MULSANT & REY (1859): Opusc. ent., **9:** 122.
Examined specimen: Guadeloupe.

Total length 0.7 mm; paraprocts long 0.4 mm; coxites 0.4 mm; ratio p/c 1. Ovipositor dark, very sclerified, triangular. Coxites subdivided into 4 lobes. Baculi of lobe I transverse. The presumed lobe IV, with a shape intermediate between cylindrical and discoidal, are separated from the rest of lobes by a dark line. They show dorso-medially (what is an unusual feature) the gonostyli, cylindrical, rather long and thick, with a tuft of hairs on the top. Towards the orifice of the vulva lobe IV shows medially a longitudinal row of short hairs.

Blapstinus fortis LECONTE, 1878 (Fig. 28)

LECONTE (1878): Proc. am. phil. Soc., **17:** 420.
Examined specimen: Guatemala.

Total length 1.2 mm; paraprocts long 0.7 mm; coxites 0.6 mm; ratio p/c 1.1. Ovipositor dark, much sclerified, triangular, long. Paraprocts almost triangular, with longitudinal baculi. Coxites divided into 4 lobes. Lobes I rectangular, dark, with oblique baculi. Lobes II and III trapezoidal, equally long. Lobes IV with a shape intermediate between cylindrical and discoidal, bearing dorsally and a little laterally the gonostyli. These are cylindrical, rather small, and show on the top a number of short hairs, one of which rather long. Towards the orifice of the vulva on the inner side of lobes IV there is a row of short hairs.

Blapstinus orchilensis occidentalis MARCUZZI, 1954 (Fig. 29)

MARCUZZI (1954): Stud. Fauna Curaçao-Carib., **5:** 15.
Examined specimen: Bonaire.

Total length 0.8 mm; paraprocts long 0.4 mm; coxites 0.5 mm; ratio p/c 0.7. Ovipositor golden yellow, normally sclerified, triangular. Paraprocts at the apex pointed; baculi oblique. Coxites divided in 4 lobes dressed with some short hairs. Lobe I shorter than the other lobes, a little wider and somewhat rectangular. Lobe III triangular and longer than lobe II. Lobe IV short, with a form intermediate between cylindrical and discoidal, furnished

medially towards the orifice of the vulva with a row of short hairs. Gonostyli emerging dorso-laterally from lobe IV, cylindrical, rather long, with a tuft of hairs on the top.

Blapstinus dominicus Marcuzzi, 1962 (Fig. 30)

Marcuzzi (1962): Stud. Fauna Curaçao-Carib., **13:** 34.
Examined specimen: Puerto Rico, East-Parguera.

Total length 0.7 mm; paraprocts long 0.3 mm; coxites long 0.4 mm; ratio p/c 0.7. Ovipositor golden yellow, normally sclerified, almost traepezoidal Paraprocts almost triangular, with oblique baculi. Coxites subdivided into 4 lobes. Lobe I trapezoidal, only a little shorter than lobes II and III, with oblique baculi. Lobe III trapezoidal, only a little longer than the other lobes, bearing dorsally and laterally lobe IV, discoidal. Gonostyli emerging dorso-laterally on lobe IV, cylindrical, normally long and thick, bearing at the top a number of hairs.

Blapstinus curassavicus Marcuzzi, 1954 (Fig. 31)

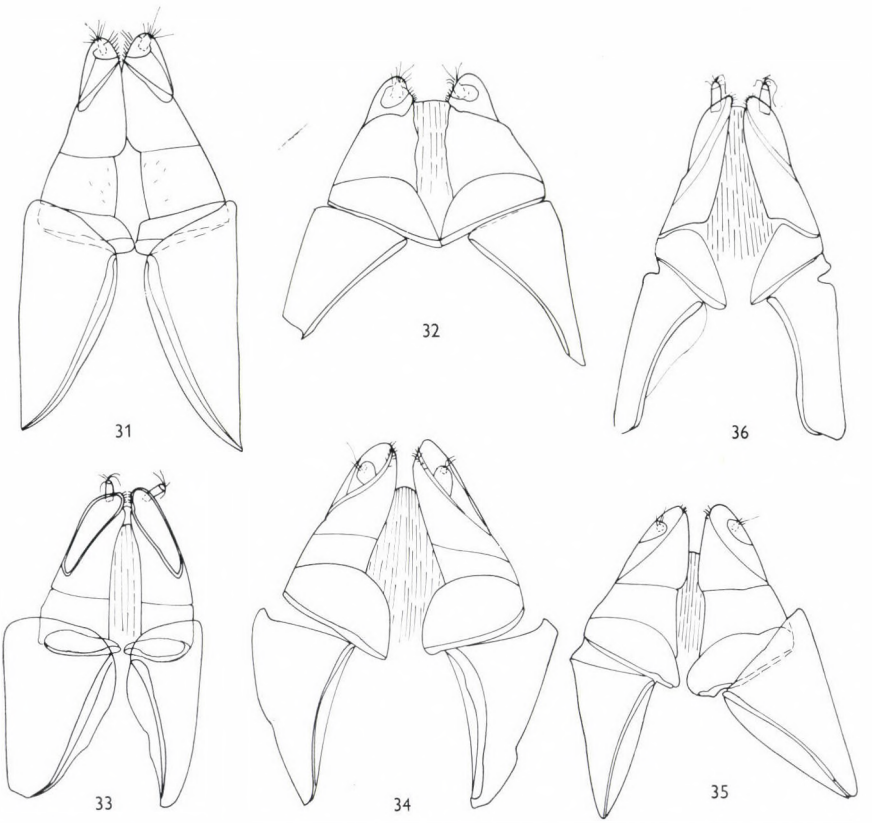
Marcuzzi (1954): Stud. Fauna Curaçao-Carib., **5:** 14.
Examined specimen: Bonaire.

Total length 1.2 mm; paraprocts long 0.7 mm; coxites long 0.6 mm; ratio p/c 1.1. Ovipositor golden yellow, normally sclerified, long, triangular (almost cylindrical). Paraprocts triangular, with longitudinal baculi. Coxites subdivided into 4 lobes. Lobe I shorter than the others but wider, rectangular, with transverse baculi. Lobe III trapezoidal, bearing laterally on the top lobe IV, discoidal. These show medially, towards the orifice of the vulva, a longitudinal row of hairs. Gonostyli emerge dorso-laterally on lobe IV; cylindrical, normally long and thick, with a tuft of hairs on the top.

Blapstinus punctulatus Solier, 1851 (Fig. 32)

Solier (1851) in Gay, Hist. fis. politica Chile, **5:** 233.
Examined specimen: Chile.

Total length 0.7 mm; paraprocts long 0.4 mm; coxites 0.4; ratio p/c 1. Ovipositor golden yellow, normally sclerified, triangular. Baculi oblique. Coxites subdivided into 4 lobes. Lobe I trapezoidal with transverse baculi. On lobe III, trapezoidal, lobe IV emerges, with a shape intermediate between cylindrical and discoidal. These bear dorsally and medially (what is an unusual feature) gonostyli, rather long and thick. The latter bear on the top a number of hairs.



Figs 31—36. External female genitalia. 31 = *Blapstinus curassavicus* MARCUZZI; 32 = *B. punctulatus* SOLIER; 33 = *Austrocaribius venezuelensis araguae* MARCUZZI; 34 = *Trichoton marcuzzii* KULZER; 35 = *T. rotundatum* CURTIS; 36 = *T. posthumum* GEBIEN

Austrocaribius venezuelensis araguae MARCUZZI (Fig. 33)

MARCUZZI, in print

Examined specimen: Loma del Medio, San Sebastian (Venezuela).

Total length 1 mm; paraprocts long 0.5 mm; coxites long 0.6 mm; ratio p/c 0.8. Ovipositor golden yellow, normally sclerified, triangular. Paraprocts almost triangular, with oblique baculi. Coxites subdivided into 4 lobes as in genus *Blapstinus*. Lobe I triangular, with transverse baculi. Lobe II as long as lobe III. On the top of lobe III, somewhat laterally, lobe IV emerges, with a shape intermediate between cylindrical and discoidal. Gonostyli emerge dorsally on the top of lobe IV, cylindrical, rather long, normally thick, with a number of hairs one of which much longer.

OPATRINI

Trichoton marcuzzii KULZER, 1961 (Fig. 34)

KULZER (1961): Ent. Arb. Mus. Georg Frey, **12:** 212—214.
Examined material: Margarita, El Valle.

Total length 1.9 mm; paraprocts long 1.0 mm; coxites 1.1 mm; ratio p/c 0.9. Ovipositor brownish yellow, normally sclerified, almost triangular. Paraprocts triangular, with longitudinal baculi. Coxites evidently subdivided into 4 lobes. Lobe I longer than lobe II and wider than all others. Baculi transverse. Lobe III trapezoidal, bearing on the extremity and laterally lobes IV. These are discoidal, delimited by some darker line from which some hairs emerge. Gonostyli emerge from lobes IV dorsally and a little laterally. They are small, resembling two papillae, bearing two long hairs on the top.

Trichoton rotundatum CURTIS, 1845 (Fig. 35)

CURTIS (1845): Trans. R. ent. Soc. Lond., **19:** 469.
Examined specimen: Brasil.

Total length 1.4 mm; paraprocts long 0.8 mm; coxites long 0.8 mm; ratio p/c 1. Ovipositor golden yellow, normally sclerified, triangular. Paraprocts triangular, baculi oblique. Coxites subdivided into 4 lobes. Lobe I almost as long as the others but wider, with transverse baculi; lobe II trapezoidal, III triangular. Lobe IV implanted laterally on lobe III, discoidal. Gonostyli emerge dorso-laterally on lobe IV, small, papillae like, with a number of hairs on their top.

Trichoton posthumum GEBIEN, 1928 (Fig. 36)

GEBIEN (1928): Stettiner ent. Ztg, **89:** 114.
Examined specimen: Maracay, Venezuela.

Total length 1.6 mm; paraprocts long 0.7 mm; coxites 1.0 mm; ratio p/c 0.7. Ovipositor brownish yellow, normally sclerified, long and almost conical. Paraprocts almost rectangular, with longitudinal baculi. Coxites subdivided into 4 lobes of which III particularly reduced. Lobe I almost triangular, with oblique baculi. Lobe II long, triangular; lobe IV discoidal, with gonostyli emerging at the extremity and laterally. These are cylindrical, rather long and thick, with a tuft of hairs of various length at the top.

Trichoton cayennense GEBIEN, 1910 (Fig. 37)

GEBIEN (1910): Col. Cat. Pars **22:** 320, nom. n. for *T. rotundatum* MULSANT & REY, 1859, nec CURTIS, 1845.
Examined specimen: Peru, Chanchamayo.

Total length 4.7 mm; paraprocts long 2.6 mm; coxites long 2.2 mm; ratio p/c 1.1. Ovipositor golden yellow, normally sclerified, long, almost cylindrical. Paraprocts almost triangular, with longitudinal baculi. Coxites well subdivided into 4 lobes. Lobe I longer than the others, with transverse baculi. Lobe III almost triangular and only a little shorter than lobe II. Lobe IV small, discoidal, bearing in a unusual ventro-lateral position the gonostyli. These are short, cylindrical, rather thick, with a number of hairs on their top.

PHALERIINI

Phaleria angustata CHEVROLAT, 1878 (Fig. 38)

CHEVROLAT (1878): Annls Soc. ent. Belg., **21**, CCXLVIII.
Examined specimen: Cumaná, Eastern Venezuela.

Total length 0.9 mm; paraprocts long 0.4 mm; coxites 0.6 mm; ratio p/c 0.6. Ovipositor white-yellow, very little sclerified, scarcely visible, long and conical. Paraprocts unusually included (as in the other species of *Phaleria* examined by the author) in the coxites. Coxites show a distinct lobe I, whereas lobes II—IV appear as fused together. Lobe I triangular, with transverse baculi. The small gonostyli are inserted at the 2/3 of the coxite, laterally and a little ventrally. They bear on the top a long hair.

Phaleria fulva FLEUTIAUX & SALLÉ, 1889 (Fig. 39)

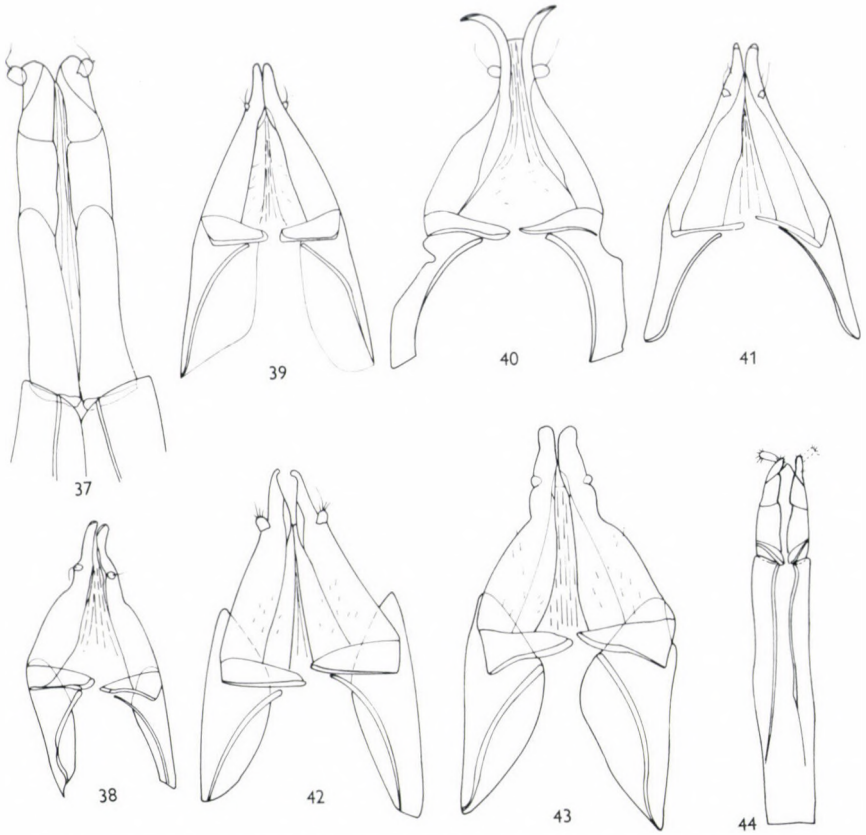
FLEUTIAUX & SALLÉ (1889): Annls Soc. ent. Fr., **9**: 423.
Examined specimen: Maiquetía, D. F., Venezuela.

Total length 1.1 mm; paraprocts long 0.5 mm; coxites 0.6 mm; ratio p/c 0.8. Ovipositor golden yellow, normally sclerified, long and conical. Paraprocts almost trapezoidal, with oblique baculi. Coxites showing only lobe I distinctly separated, triangular, with transverse baculi. Gonostyli implanted at the distal 2/3 of the ovipositor, dorsally and laterally. They are small papilla-like, and bear on the top two hairs.

Phaleria maculipennis MARCUZZI, 1962 (Fig. 40)

MARCUZZI (1962): Stud. Fauna Curaçao-Carib., **3**: 38.
Examined specimen: Isla de Margarita, Venezuela.

Total length 1.0 mm; paraprocts long 0.5 mm; coxites 0.7; ratio p/c 0.7. Ovipositor golden yellow, normally sclerified, almost conical. Paraprocts triangular with oblique baculi, partially included in the coxites. Only lobe I differentiated, oval, rather small, with transverse baculi. The points of ovipositor in some examples are a little bent, different from what is observed in the rest of the species (studied by the author). Gonostyli emerge laterally and



Figs 37—44. External female genitalia. 37 = *Trichoton cayennense* GEBIEN; 38 = *Phaleria angustata* CHEVROLAT; 39 = *P. fulva* FLEUTIAUX & SALLÉ; 40 = *P. maculipennis* MARCUZZI; 41 = *P. chevrolati* FLEUTIAUX & SALLÉ; 42 = *P. subparallela* CHEVROLAT; 43 = *P. punctipes* LECONTE; 44 = *Cosmonota bucki* KULZER

a little ventrally; they are cylindrical, rather thick and long (more so than in the rest of the examined species) and exhibit some short hairs besides one much longer.

Phaleria chevrolati FLEUTIAUX & SALLÉ, 1889 (Fig. 41)

FLEUTIAUX & SALLÉ (1889): Annls Soc. ent. Fr., **9:** 422.
Examined specimen: Maiquetía, D. F., Venezuela.

Total length 0.9 mm; paraprocts long 0.3 mm; coxites 0.6; ratio p/c 0.6. Ovipositor golden yellow, normally sclerified and triangular. Paraprocts triangular, with oblique baculi. The coxites show a differentiated, darker and triangular lobe I. Baculi transverse. Gonostyli emerge dorso-laterally at the base of the points of ovipositor. They are small, papilla-like, with no hairs.

Phaleria subparallela Chevrolat, 1878 (Fig. 42)

Chevrolat (1878): Annls Soc. ent. Belg., **21**, CCXLVIII.
Examined specimen: Huarmey, Peru.

Total length 1.2 mm; paraprocts long 0.7 mm; coxites 0.7 mm; ratio p/c 1. Ovipositor golden yellow, normally sclerified, triangular. Paraprocts almost oval, with oblique baculi. Lobe I of coxite differentiated, triangular, with transverse baculi. At the base of the points of ovipositor, i.e. in relation to its hind 2/3, gonostyli emerge latero-ventrally. They are cylindrical, rather thick (more so than in *P. maculipennis* and *P. chevrolati*), and short, with a number of hairs, one of which longer, at the top. Points of ovipositor straight (in the figure, the points have been probably bent during preparation).

Phaleria punctipes Leconte, 1878 (Fig. 43)

Leconte (1878): Proc. Acad. nat. Sci. Philad., **17:** 421.
Examined specimen: Playa de Marianao, Cuba.

Total length 1.0 mm; paraprocts long 0.5 mm; coxites 0.6 mm; ratio p/c 0.8. Ovipositor golden yellow, normally sclerified, long, almost conical. Paraprocts long as coxites, triangular, with little oblique and arcuate baculi. Paraprocts particularly included in coxites. Only lobe I distinct, darker, triangular with oblique baculi. These form at the base an unusual angle of c. 180° different from what verify the other species of *Phalwria*. Towards the base of the free points of ovipositor, dorso-laterally, gonostyli emerge, small, papilla-like and without hairs.

DIAPERINI

Cosmonota bucki Kulzer, 1961 (Fig. 44)

Kulzer (1961): Ent. Arb. Mus. Georg Frey, **12:** 536.
Examined specimen: Porto Alegre, Brasil.

Total length 2.5 mm; paraprocts long 1.7 mm; coxites 0.7 mm; ratio p/c 2.2. Ovipositor pale yellow, little sclerified, long, almost cylindrical. Paraprocts with only slightly oblique baculi, coxites subdivided into 4 lobes with a median longitudinal pale area. Lobe I trapezoidal, shorter than the rest of the lobes, with oblique baculi. Lobe II longer than III, both trapezoidal. Lobe IV dressed with some short hairs, cylindrical, finger-like. They bear gonostyli at the extremity, latter rather long and thick, with a number of short hairs on the top. The orifice of the vulva, medially to lobe IV, somewhat triangular.

ULOMINI

Uloma retusa FABRICIUS, 1801 (Fig. 45)

FABRICIUS (1801): Syst. eleuth., **1:** 148.
Examined specimen: Tacagua, Estado Miranda, Venezuela.

Total length 1.8 mm; paraprocts long 0.9 mm; coxites 1.7; ratio p/c 0.5. Ovipositor reddish yellow, normally sclerified, triangular. Paraprocts triangular, with transverse baculi (in fig. 45 they are artificially displaced in apical sense). Coxites almost rhomboidal, with 4 well-developed lobes. Lobe I larger than the others, trapezoidal. Lobe III almost triangular, with lobe IV emerging dorso-laterally, surrounded by a dark circle. Lobe IV discoidal, with gonostyli emerging from the centre. These are cylindrical, rather thick and short, at the top with a number of very short hairs, one of which much longer.

Uloma fulva GEBIEN, 1928 (Fig. 46)

GEBIEN (1928): Stettin. ent. Ztg, **89:** 151.
Examined specimen: unknown locality.

Total length 2.1 mm; paraprocts long 0.8 mm; coxites 1.3 mm; ratio p/c 0.5. Ovipositor golden yellow, normally sclerified, triangular. Paraprocts (in the figure artificially deformed) with oblique baculi. Coxites almost rhomboidal clearly, subdivided into 3 lobes, a fourth one apparently included in lobe III. Lobe I trapezoidal, a little shorter than the others, with transverse baculi. Lobe II triangular, lobe III situated dorsally and laterally to lobe II, rather pointed and furnished with some short hairs. Orifice of vulva situated medially between lobe II and III. Gonostyli emerging from the not well-differentiated lobe IV (included in lobe III), cylindrical, rather thick, normally long, with the normal tuft of hairs on the top.

BELOPINI

Neoplateia brasiliensis MARCUZZI (Fig. 47)

MARCUZZI, in print
Examined specimen: Montagnes des Orgues, Rio de Janeiro, Massif de la Tijuca, leg. E. R. WAGNER.

Total length: difficult to determine, since the drawing has been exceptionally made from the photograph, not in the extracted ovipositor of the type. The details there fore are less visible compared with all the other species. Ovipositor cylindrical, long, with not completely extroflected paraprocts. The latter are fused to constitute a kind of cone, on which lobe IV emerges laterally. These are cylindrical, long, finger-like, bearing the gonostyli at the top. These are rather long and normally thick, bearing at the top a couple of short hairs.

TENEBRIONINI

Zophobas atratus FABRICIUS, 1775 (Fig. 48)

FABRICIUS (1775): Syst. eleuth.: 256.
Examined specimen: St. Martin, Mildrum.

Total length 5.1 mm; paraprocts long 2.9 mm; coxites 2.3 mm; ratio p/c 1.2. Ovipositor brownish red, well sclerified, cylindrical, long. Paraprocts almost triangular; baculi longitudinal. Coxites subdivided into 4 lobes, long, slightly widened before apex. Lobe I darker medially, baculi transverse. Lobe III triangular, a little longer than loves II, bearing laterally lobe IV, small and discoidal. Gonostyli are implanted on lobe IV in an unusual ventro-lateral position. They are cylindrical, rather short, normally thick and bearing a number of short hairs, one of which longer.

Zophobas batavorum MARCUZZI, 1959 (Fig. 49)

MARCUZZI (1959): Stud. Fauna Curaçao, **9**: 88.
Examined specimen: Bonaire, Dutch Leeward Islands.

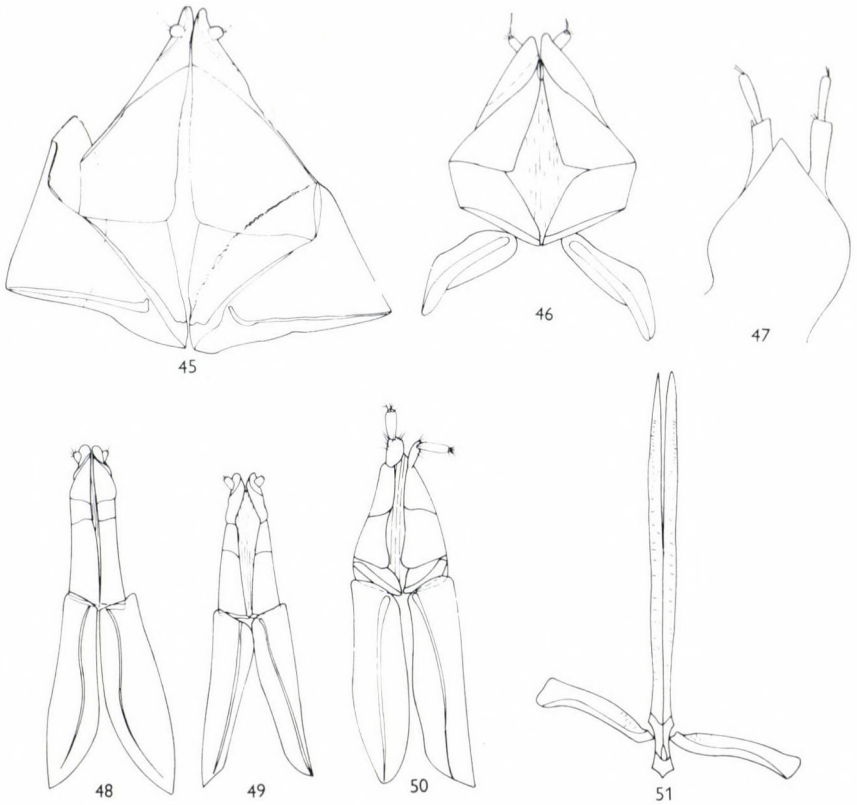
Total length 4.5 mm; paraprocts long 2.4 mm; coxites 2.0 mm; ratio p/c 1.1. Ovipositor golden yellow, normally sclerified, almost cylindrical, long. Paraprocts almost triangular with longitudinal baculi. Coxites subdivided into 4 lobes. Lobe I longer than the others, with transverse baculi. Lobe III a little longer than loves II. Lobe IV small and discoidal, implanted laterally on lobe III. They bear gonostyli in an unusual ventro-lateral position. These are cylindrical, normally long and thick, with a number of hairs at the extremity.

LUPROPINI

Phobelius lucifugus (FAIRMAIRE, 1889 (Fig. 50)

FAIRMAIRE (1889): C. R. Soc. ent. Belg., **9**, XXXIX.
Examined specimen: San Juan de los Morros, Estado Guárico, Venezuela.

Total length 1.6 mm; paraprocts long 0.9 mm; coxites 0.7 mm; ratio p/c 1.1. Ovipositor golden yellow, normally sclerified, triangular, long. Paraprocts trapezoidal, with longitudinal baculi. They constitute a sort of tube. Coxites subdivided into 4 lobes; lobe I trapezoidal, shorter than lobe II and III, with oblique baculi. Lobe II trapezoidal, as long as lobe III which is triangular, and bears at its extremity lobe IV. This is cylindrical, rather thick, somewhat finger-like, and bear at its top the gonostylus and a number of hairs. Gonostyli cylindrical, rather long and normally thick; they bear on the top a number of hairs.



Figs 45—51. External female genitalia. 45 = *Uloma retusa* FABRICIUS; 46 = *U. fulva* GEBIEN; 47 = *Neoplateia brasiliensis* MARCUZZI; 48 = *Zophobas atratus* FABRICIUS; 49 = *Z. batavorum* MARCUZZI; 50 = *Phobelius lucifugus* FAIRMAIRE; 51 = *Talanus guadeloupensis* FLEUTIAUX & SALLÉ

TALANINI

Talanus guadeloupensis FLEUTIAUX & SALLÉ, 1889 (Fig. 51)

FLEUTIAUX & SALLÉ (1889): Annls Soc. ent. Fr., **9:** 430.
Examined specimen: Guadeloupe, Neufchâteau, leg. J. BONFILS.

Total length 2.0 mm.

CHAMPION (p. 321) describes its ovipositor as "composed of two near sheaths, often extroflected after death". Ovipositor reddish yellow, rather sclerified, of quite unusual shape, resembling a cross with the proximal arm very short. This short arm ends in a point. It shows at the sides — concave inwardly — and medially a small and narrow pale area, delimited by a wider darker zone. The lateral arms (possibly corresponding to paraprocts) show some short hairs and, towards the distal extremity, some darker stripes, pos-

sibly corresponding to baculi, which should have exceptionally a transverse instead of a longitudinal position. The distal arm (coxites) is constituted by two kinds of poles dressed with a number of extremely small hairs, near one another in the proximal part and slightly divergent towards the distal part. They end in a point. This ovipositor has been described by TSCHINKEL & DOYEN (p. 347) as follows "the talanine ovipositor represents an extreme specialization of the coelometopine type. The coxites are heavily sclerotized into a pair of blade-like structures that are fused basally with the enlarged baculi of the paraprocts so that the entire ovipositor operates as a rigid unit. The lobation of the coxites is no longer apparent, though faint suture lines suggest its presence".

Comments

For 21 of the 51 species considered here the author had previously described the phallus. The results are very consistent concerning systematic status as admitted by GEBIEN (1936—44). *Tentyriinae* show very long paraprocts, reduced and simplified coxites and in some instances the disappearance of gonostyli. *Asidinae* show very long paraprocts, coxites with partially fused lobes I—III, and gonostyli generally present. No "folded membrana" is observed between coxites. *Rhypasma* shows some signs of an independent, probably very ancient, evolution. Interesting is particularly the fusion of the lobes I—III of the coxites. Within the examined *Tenebrioninae* in the frst tribes up to *Opatrini* the ovipositor shows uniformity which could perhaps point to a common and contemporaneous origin of the different tribes and genera, some of which are present both in the Old and New World (*Opatrinus*, *Trichoton*). The genus *Phaleria* stands quite apart showing (in the examined species) a complete fusion of the four lobes of coxites and well-developed gonostyli. *P. maculipennis* proves to be a valid species and not, as proposed by TRIPLEHORN & WATROUS, a synonym of *P. testacea*. *P. chevrolati*, though similar in the oviproct to *P. angustata*, differs for its phallus (MARCUZZI, 1983, p. 265, Figs 66 and 67), so that it cannot be considered as a synonym of *P. testacea* as suggested by the previous two authors. In this difficult genus systematics seem to need the examination of both phallus and ovipositor. Among the last tribes of *Tenebrioninae*, planticolous, phytosaprophages, bound to the primitive conditions of tropical forests (different from the first tribes), there is a great variation in ovipositor indicating various evolutionary lines, both in time and space. Only the examination of a great number of genera could permit to draw definitive conslusion. The division of coxites into four lobes, the presence of a folded membrane between coxites and well-developed gonostyli seem, however, to be a constant features, what must be considered — as TSCHINKEL & DOYEN Confirm — signs of great primitiveness. The most evolved

subfamilies and tribes, bound to xeric environments (geophilous, lapidicolous, psammophilous species) would originate only during a geocratic, arid period, probably Miocene, both in the New and Old World.

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LAGRIINE BEETLES OF THE SOLOMON ISLANDS (COLEOPTERA, TENEBRIONIDAE: LAGRIINI)*

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Three species of Lagriini are revealed to occur in the Solomon Islands. *Casnonidea tumida* sp. n. and *C. greensladei* sp. n. are described. *C. chalybeata* HELLER, 1934 is redescribed. A key to species is given. With 22 figures.

In the Indo-Australian region, the Solomon Islands (Fig. 1) constitute the easternmost border of range of the tribe Lagriini. The species occurring in this archipelago all belong to the genus *Casnonidea* FAIRMAIRE, 1882 (= *Synatractus* MACLEAY, 1887) of the subtribe Statirina. One of them has already been described by HELLER (1934) while the other two appear to be new. This rather poor fauna is obviously New Guinean in origin.

The depository of investigated specimens is indicated by four-letter abbreviations. I am greatly indebted to the curators of these collections, whose generous assistance made available to study their materials. Their names are given after the name of the institutions.

ANIC Australian National Insect Collection, Canberra, Australia. Dr. J. F. LAWRENCE.
BMNH British Museum (Natural History), London, United Kingdom. Dr. R. J. W. ALDRIDGE and Dr. M. E. BACCHUS.
CUIC Cornell University Insect Collection, Ithaca, NY., U.S.A. Dr. J. K. LIEBHERR.
FMNH Field Museum of Natural History, Chicago, Ill., U.S.A. Dr. H. G. NELSON.
HNHM Hungarian Natural History Museum, Budapest, Hungary.
IFPE Institut für Pflanzenschutzforschung, Eberswalde-Finow, German Democratic Republic. Dr. L. DIECKMANN.
MCZC Museum of Comparative Zoology, Cambridge, Mass., U.S.A. Dr. A. F. NEWTON, Jr.
SAMA South Australian Museum, Adelaide, Australia. Dr. E. G. MATTHEWS.
SMTD Staatliches Museum für Tierkunde, Dresden, German Democratic Republic. Dr. R. KRAUSE.

Identification key to Solomon Island species of Casnonidea Fairmaire, 1882

1 (2) Frons somewhat convex. Vertex distinctly swollen, with deep longitudinal furrow. Antennae and legs stout. Antennal segments III to X less than three times as long as broad, segment XI subcylindrical, slightly curved (Fig. 9). Unpaired elytral intervals with 7—12 setigerous punctures. Length 10.2—11.5 mm **chalybeata** HELLER, 1934

* 2nd Contribution to the Knowledge of Lagriini.

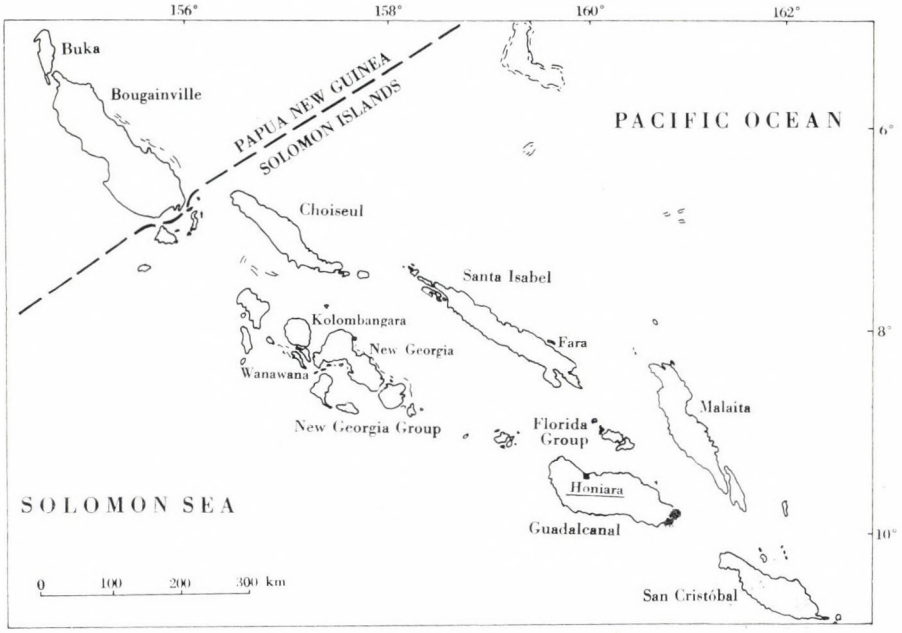


Fig. 1. Map of the Solomon Islands. Politically Buka and Bougainville belong to Papua New Guinea while the remaining islands are parts of the independent state of Solomon Islands. Rennell and Bellona (SW of San Cristóbal) as well as Santa Cruz Islands (E of San Cristóbal) are omitted from the map (no lagriine specimens are known by the author from there)

2 (1) Frons flattened. Vertex faintly swollen, with shallow or indistinct longitudinal furrow. Antennae and legs slender. Antennal segments III to IX or X about three times longer than broad, segment XI elongate ovoid (Fig. 10). Unpaired intervals with 0—4 setigerous punctures

3 (4) Pronotum transverse. Elytra distinctly widening. Punctural rows on elytra deeply impressed, all rows reaching elytral apex, so elytra without smooth preapical area. Intervals convex, unpaired intervals with 1—4 setigerous punctures. Length 8.2—9.1 mm **tumida** sp. n.

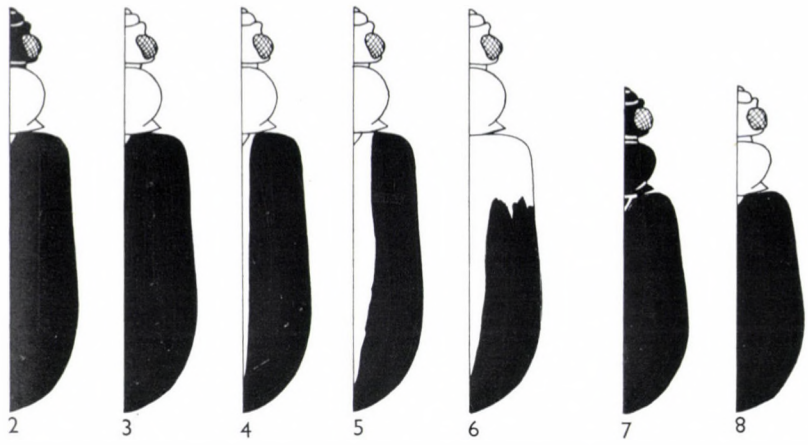
4 (3) Pronotum as long as broad. Elytra subparallel. Punctural rows on elytra shallowly impressed, not reaching elytral apex (except rows I and X), so elytra with smooth preapical area. Intervals flattened, glabrous, only interval VII with one postbasal setigerous puncture. Length 11.0 mm **greensladei** sp. n.

Casnonidea chalybeata HELLER, 1934 (Fig. 20)

Casnonidea chalybeata HELLER, 1934, p. 5, t. 1, fig. 12.
Synatractus chalybeatus BORCHMANN, 1936, p. 396, 401.

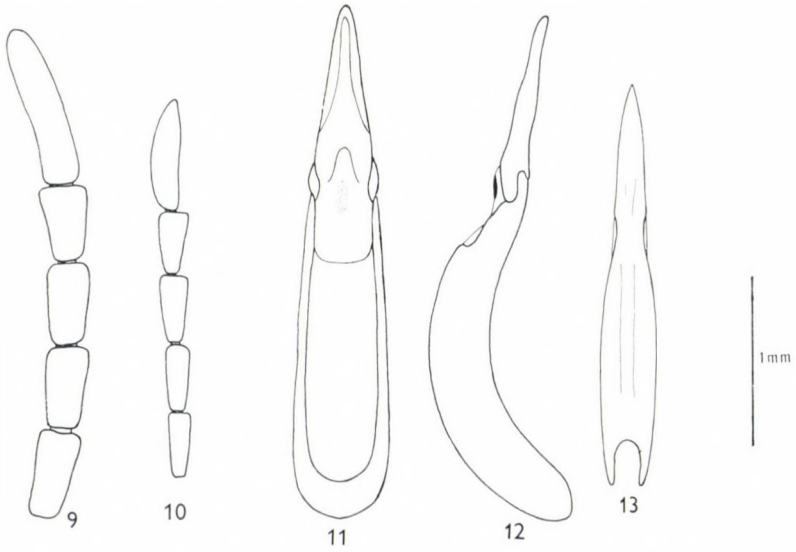
Original description: "Testacea, elytris quarta parte basali, spatio primo ultra medium suturaque testaceis, exceptis, chalybaeis; fronte, inter oculos foveola oblonga; palpis, antennis tarsisque totis, tibiis in parte apicali, nigris. Long. 10,5, lat. 3,5. Buka Salomo-Archipelagus (H)."

The original description is based on a single specimen. Examination of further specimens made it clear that the colour pattern is much more variable, so the description must be complemented as follows.

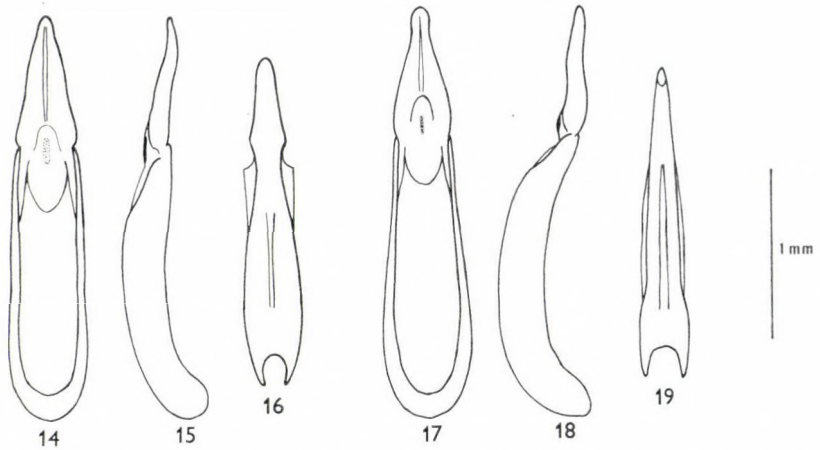


Figs 2—8. 2—6 = Colour pattern of *Casnonidea chalybeata* HELLER, 1934. — 7—8 = Colour pattern of *C. tumida* sp. n.

Head yellow (Figs 3—6), rarely black (Fig. 2). Pronotum and scutellum yellow. Elytra unicolorous bluish black (Figs 2—3) or bicolorous, bluish black and yellow. Yellow colouration restricted to interval I, not reaching the apex (Fig. 4) or extending to interval II (Fig. 5) or even to basal fourth of elytra (holotype) (Fig. 6). Antennae black, sometimes with two basal segments paler. Legs mostly yellow with apical part of tibiae blackish; sometimes the whole



Figs 9—13. 9 = Last five antennal segments of *Casnonidea chalybeata* HELLER, 1934. — 10 = Last five antennal segments of *C. tumida* sp. n. — 11—13 = Male aedeagus of *C. chalybeata* HELLER, 1934: tegmen, ventral view (11), tegmen, lateral view (12), median lobe, ventral view (13)



Figs 14—19. 14—16 = Male aedeagus of *Casnonidea tumida* sp. n.: tegmen, ventral view (14), tegmen, lateral view (15), median lobe, ventral view (16). — 17—19 = Male aedeagus of *C. greensladei* sp. n.: tegmen, ventral view (17), tegmen, lateral view (18), median lobe, ventral view (19)

tibiae or even the apical part of femora blackish; rarely the legs entirely black. Ventral surface yellowish, rarely black.

Head a little narrower than pronotum, not distinctly transverse. Frons somewhat convex; vertex strongly swollen, with well-developed deep longitudinal furrow. Antennae stout, segments III to X less than three times as long as broad, segment XI subcylindrical, slightly curved, blunt at apex (Fig. 9). Pronotum as long as wide, surface shiny, impunctate. Elytra elongate, sides subparallel. Punctural rows moderately impressed, strial punctures subcontiguous; rows vanishing before reaching apex, except rows I and X, so elytra with a smooth preapical area variable in size. Intervals flattened. Paired intervals entirely glabrous, unpaired intervals with setigerous punctures scattered throughout the whole length. Interval I with 12, III with 10, V with 8, VII with 7, IX with 11, lateral margin with 13 setigerous punctures. Setae dark, short, erect. Legs stout, with hairs rather short, semierect. Tegmen and median lobe as figured (Figs 11—13).

Length of body: 10.2—11.5 mm.

Type material. HELLER's specimen is labelled as follows: Buka Salomonen Juli 1930 / Coll. H. HEDIGER / *Casnonidea chalybeata* H Typus [red] / 1933 8. [blue] / Holotypus ♂ *Casnonidea chalybeata* HELLER, 1934 des. O. MERKL 1986 [red]. It is deposited in the SMTD.

Distribution: Endemic to Solomon Islands.

Non-type material examined. Country label only: VII—VIII. 1909, W. W. FROGGATT (1 ♂, ANIC); 30. V. 1922, E. A. ARMYTAGE (1 ♀, BMNH). Bougainville: Empress Augusta Bay, 30. XI. 1944, J. G. FRANCLEMONT (1 ♀, CUIC); id., 1. XII. 1944 (1 ♀, CUIC); id., 4. XII. 1944 (2 ♂♂, CUIC, 1 ♂, HNHM ex CUIC); Kieta (1 ♂, MCZC); Konga Village, Buin, 6. II.—21. III. 1961, W. W. BRANDT (1 ♂, ANIC). Choiseul: Malangono, 25. VIII. 1963, P. GREENSLADE (1 ♀, BMNH). New Georgia Group: Kulambangra, 4. VI. 1922, E. A. ARMYTAGE (1 ♀, BMNH); id., 8. VI. 1922 (1 ♀, BMNH); New Georgia, Munda, Pt. Area,

VI. 1944, J. G. FRANCLEMONT (1 ♂, CUIC). Santa Isabel: Fulakora, W. M. MANN (2 ♂♂, MCZC); Huhurangi, 18. II. 1956, E. S. BROWN (1 ♀, BMNH); Tatamba, 30. VII. 1962, P. GREENSLADE (1 ♀, BMNH). Guadalcanal: Aruligo, 26. IV. 1956, E. S. BROWN (1 ♀, BMNH); Gold Ridge, 3000', 3. IV. 1963, P. GREENSLADE (1 ♀, BMNH); Sulakiki R., 2000', 5. IV. 1963, P. GREENSLADE (1 ♀, BMNH). Florida Group: Tulagi (1 ♀, IFPE). Malaita: Malu'u, 28. V. 1955, E. S. BROWN (1 ♀, BMNH); Rai'oko, 27. V. 1955, E. S. BROWN (1 ♀, BMNH). Fara: Meringe, 3. VII. 1935, R. A. LEVER (1 ♂, BMNH). San Cristóbal: Kirakira, 27. IV. 1964 M. MCQUILLAN (1 ♀, BMNH).

HELLER (1934) described this species on the basis of a male specimen, yellow elytral colouration of which is abnormally expanded and extends to the basal fourth of elytra. The remaining characteristics, however (head, antennae, elytral striae, shape of aedeagus, etc.), correspond to those ot sther specimens. A specimen with yellow elytral interval I has cotype label and a label with BORCHMANN's handwriting ("*Synatractus salomonensis* n."). An other specimen with unicolorous black elytra has been supplied with a label "*Casnonidea solomonensis* (BORCH.) E. A. J. DUFFY det. 1964". Both specimens are found in the BMNH. The name "*salomonensis*" or "*solomonensis*", however, is only a manuscript name; as far as I know, BORCHMANN has never published it. The specimens in question undoubtedly belong to *Casnonidea chalybeata* HELLER, 1934.

Casnonidea tumida sp. n. (Fig. 21)

M a l e. Body unicolorous black, only tarsi, palps and two basal segments of antennae somewhat paler (Fig. 7), or rarely reddish brown, but elytra black and antennae dark brown, except two basal segments (Fig. 8).

Head nearly as broad as pronotum, rather short. Frons flattened, vertex very barely swollen, longitudinal furrow indistinct. Vertex separated from frons by two shallow, obliquely transverse impressions. Interocular space slightly narrower than diameter of an eye. Antennae thin, segments III to IX about three times longer than broad, segment X about twice as long as broad, segment XI elongate, slightly ovoid, acute at apex (Fig. 10). Pronotum short, transverse, surface shiny, impunctate. Elytra distinctly widening, greatest width at second-third. Punctural rows deeply impressed, strial punctures small, not contiguous, separated by distance about equal to diameter of a puncture. All rows reaching elytral apex, so elytra without smooth preapical area. Intervals rather convex. Paired intervals entirely glabrous, unpaired intervals with few setigerous punctures. Interval I with 1 postbasal and 1 medial, III with 2 postbasal and 2 preapical, V with 1 postbasal and 1 medial, VII with 1 postbasal, 1 medial and 1 preapical, IX with 2 preapical, lateral margin without setigerous punctures. Setae pale, short, erect. Legs slender, with pubescence reduced, hairs short, semierect. Tegmen and median lobe as figured (Figs 14—16).

Length of body: 8.2—9.1 mm.

F e m a l e similar to male; frons somewhat more convex, impressions separating vertex somewhat deeper, antennal segments slightly thicker.

H o l o t y p e ♂, labelled as follows: Solomon Is. New Georgia Wana Wana Is. 16/8. 1963 P. GREENSLADE 8610 / Solomon Is: Pres. P. I. M. GREENSLADE. B. M. 1966-477. / C. I. E. Coll. No. 19509 / *Casnonidea* sp ? E. A. J. DUFFY det. 1964 / Holotypus ♂ *Casnonidea tumida*,

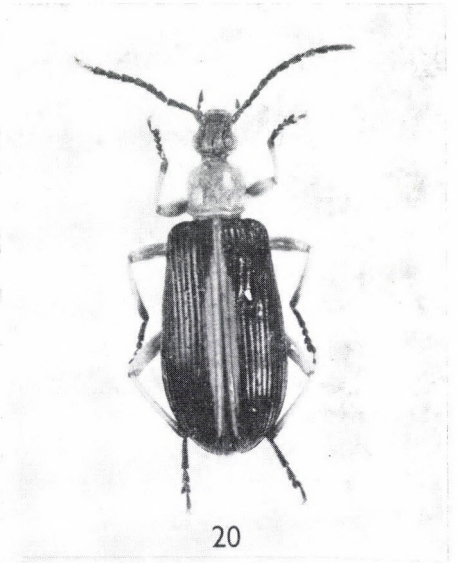
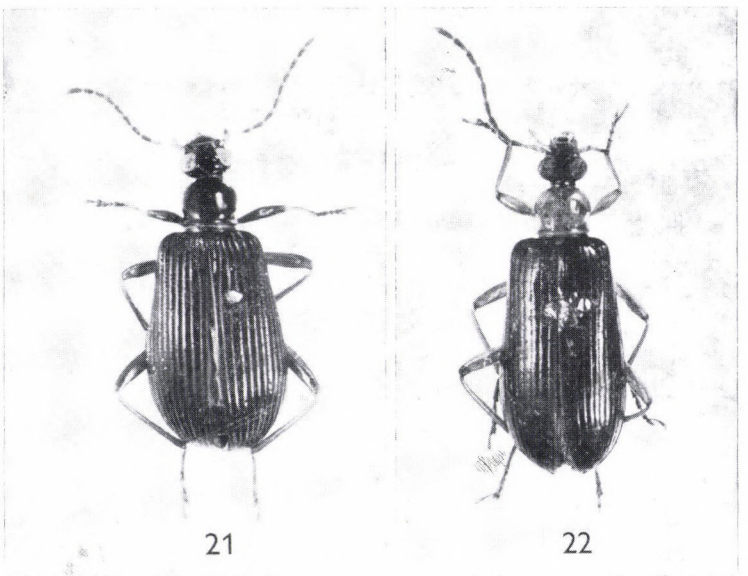


Fig. 20. *Casnonidea chalybeata* HELLER, 1934



Figs 21—22. 21 = *Casnonidea tumida* sp. n. — 22 = *C. greensladei* sp. n.

MERKL, 1986 [red]. It is deposited in the BMNH. — Paratypes: Bougainville: Empress Augusta Bay, II—IV. 1944, W. G. DOWNS (1 ♂, FMNH); Konga Village, Buin, 6. II.—21. III. 1961, W. W. BRANDT (1 ♂, ANIC); Piva River, 5. VIII. 1944, B. D. VALENTINE (1 ♂, 2 ♀♀, CUIC, 1 ♂, HNHM ex CUIC); no closer locality, A. H. VOYCE (1 ♀, SAMA). New Georgia Group: Kolombangara, Hunda, 20. VIII. 1963, P. GREENSLADE (1 ♀, BMNH); Wanawana, 16. VIII. 1963, P. GREENSLADE (2 ♀♀, BMNH, 1 ♂, 1 ♀, HNHM ex BMNH). Guadalcanal: Honiara district, Pona River, 29. I. 1956, E. S. BROWN (1 ♂, BMNH); Kukum, 8. XII. 1962, P. GREENSLADE (1 ♀, BMNH); Mt. Austin, 18. I. 1963, P. GREENSLADE (1 ♀, BMNH); Popamanasiu, 5000', 10. XI. 1965, P. MATUSAGA (1 ♀, BMNH); Umasani R., 8. VII. 1965, P. MATUSAGA (1 ♀, BMNH). Malaita: Su'u, 24. V. 1934, R. A. LEVER (1 ♀, BMNH). All specimens have been tagged with yellow paratype label.

D i s t r i b u t i o n. It is known from various members of the Solomon Islands.

The new species is similar to *Casnonidea variabilis* (MACLEAY, 1887) ranging in Australia and New Guinea and differs from it in the following external characteristics:

	tumida sp. n.	**variabilis** (MACLEAY)
1. Antenna	rather thin	rather stout
2. Pronotum	transverse	not transverse
3. Elytral sides	widening	subparallel
4. Elytral colour	black	yellow to black
5. Number of punctures on unpaired elytral intervals	1—4	6—12

Casnonidea greensladei sp. n. (Fig. 22)

M a l e. (The holotype is an apparently uncoloured specimen.) Head dark reddish brown, pronotum and scutellum yellowish red, elytra dark brown with sutural margin somewhat paler. Antennae dark brown, with two basal segments reddish. Legs and ventral surface yellowish red.

Head a little narrower than pronotum, rather short. Frons flattened, vertex hardly swollen, longitudinal furrow shallowly impressed. Interocular space distinctly narrower than diameter of an eye. Antennae thin, segments III to X about three times longer than broad, segment XI ovoid, acute at apex, not longer than segment X. Pronotum as long as broad, surface shiny, impunctate. Elytra elongate, sides subparallel. Punctural rows gently impressed, strial punctures small, not contiguous, separated by distance at least equal to diameter of a puncture. Rows not reaching elytral apex, except rows I and X, so elytra with a smooth preapical area; inner rows becoming troubled apically. Intervals flat. Vestiture of elytra highly reduced: only interval VII with one postbasal puncture bearing a long, erect seta. Legs slender, femora glabrous, tibiae with short, decumbent hairs. Tegmen and median lobe as figured (Figs 17—19).

Length of body: 11.0 mm.

F e m a l e unknown.

Holotype ♂, labelled as follows: Solomon Is. Guadalcanal Popamanasiu 5000' / 24/10 1965 20210 P. GREENSLADE / Solomon Is: Pres. P. J. M. GREENSLADE. B. M. 1966-477. / Holotypus ♂ *Casnonidea greensladei* MERKL, 1986 [red]. It is deposited in the BMNH.

Distribution. Only the holotype is known from the type locality (Mount Popamanasiu, Guadalcanal).

This new species differs from those Casnonidea species having smooth preapical area in the extremely reduced elytral vestiture.

The species is dedicated to P. J. M. GREENSLADE who was outstanding in collecting Solomon Island beetles.

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REVISION OF THE MACULATA AND ALBICINCTA GROUPS OF THE GENUS CEROPALES LATREILLE (HYMENOPTERA: CEROPALIDAE)

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References of the research concerning the *Ceropales* s.l. are enumerated. *Ceropales* s. str. are characterized and key is provided for the 2 old and the 4 new species groups. 27 species and subspecies 1090 specimens are revised in the two groups, 1 sp. and 4 ssp. are described as new: *tectigera* ♂, *bicoloripes dorni* ♀, *bipartita flava* ♀♂, *b. mediterranea* ♀♂ and *b. occidentalis* ♂; key and distributional data are given. The male of *albicincta wolfi* is described for the first time. Lectotypes and holotypes are partly designated and newly confirmed. New synonyms are established: *C. maculata flavopicta* GUSSAKOVSKIJ and *m.* f. *maculipennis* HAUPT synonym of *C. m. maculata* (FABRICIUS); *C. mongolicus* HAUPT ♂ and *C. anderssoni* HAUPT ♀ of *C. erythropoda* GUSSAKOVSKIJ; *C. anderssoni* HAUPT ♂ of *C. sibirica* RADOSZKOWSKI and *C. latitarsis* HAUPT ♀ of *C. erythropoda* GUSSAKOVSKIJ, that (*latitarsis* HAUPT ♂) synonym of *C. sibirica* RADOSZKOWSKI; *C. croceipes* PRIESNER synonym of *C. flavicornis* SPINOLA and *C. albicinctus mediterranicus* MÓCZÁR synonym of *C. bipartita bipartita* HAUPT.

The authors published mainly recapitulated descriptions and keys partly also new species concerning the *Ceropales* species (s. l.) distributed in the different lands or countries, as the Oriental Region and Central America (CAMERON, 1891), North America (FOX, 1892; TOWNES, 1957), India and Burma (BINGHAM, 1897—1903), Russian territories including Asia (GUSSAKOVSKIJ, 1926, 1931), Middle, North and East Europe (HAUPT, 1927), France (BERLAND, 1925), Central and South Africa (ARNOLD, 1937, 1950, 1955), Europe (DE BEAUMONT, 1947), South America (BANKS, 1947), Egypt (PRIESNER, 1955), Hungary (MÓCZÁR, 1956), Israel (HAUPT, 1962), Czechoslovakia and Switzerland (WOLF, 1971, 1972). A few published new species, e.g. from China, Manchuria (HAUPT, 1934, 1938), Mongolia (MÓCZÁR, 1967, 1977, 1978), tropical Africa (WAHIS, 1984, 1986), etc.

TOWNES (1957) suggested four species groups (*maculata*, *fulvipes*, *robinsonii* and *femoralis*) for *Ceropales* s. l. of North America. WOLF (1965) and PRIESNER (1969) distinguished three resp. four subgenera within *Ceropales* s. l. (*Ceropales* s. str., *Bifidoceropales* PRIESNER, *Hemiceropales* PRIESNER and *Aceropales* PRIESNER = *Priesnerius* MÓCZÁR) for the European species. MÓCZÁR (1978a, b) considered the generic status to be more reasonable than the subgeneric.

The revision of the world species of the above mentioned genera was started with the *Priesnerius* and *Hemiceropales*, as well as with the *fulvipes*,

ruficornis and *variegata*-groups of *Ceropales* (s. str.) (MÓCZÁR 1978b, 1986a, b). This paper attempted to summarize all the taxa of the *Ceropales* published before by the authors listed under each species belonging in the *maculata* and in the *albicincta*-group. The revision of the *helvetica*-group and of the *Bifidoceropales* genus is under preparation.

Ceropales LATREILLE

Ceropales LATREILLE, 1796, Prec. car. gen. Insect: 123
Ceropales: 1839, CURTIS, Brit. Ent., **16:** 756 (Type design.: *Evania maculata* FABRICIUS)
Ceratopales SCHULZ, 1906, Spolia hymen.: 174
Agenioxenus ASHMEAD, 1902, Can. Ent., **34:** 137
Hypsiceraeus MORICE and DURANT, 1914, Trans. ent. Soc. London, **1914:** 403, 405
Ceropales: 1927, HAUPT, Dt. ent. Z. (Beihefte): 295
Ceropales: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 1
Ceropales: 1937, ARNOLD, Ann. Transv. Mus., **19:** 81
Ceropales: 1947, BEAUMONT, Mitt. schweiz. ent. Ges., **20:** 505
Ceropales: 1955, PRIESNER, Bull. Soc. ent. Egypte, **39:** 22
Ceropales: 1957, TOWNES, Bull. U. S. natn. Mus., **209:** 238
Ceropales: 1972, WOLF, Ins. Helv. Fauna 5 Hym.: 165
Ceropales: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 115
Ceropales (subgen.) WOLF, 1965, Nachr. naturw. Mus. Aschaffenb., **72:** 37 ♀♂
Ceropales s. str. (subgen.): 1969, PRIESNER, Naturkundliches J. Stadt Linz: 115, 118 ♀♂
Ceropales s. str. (subgen.): 1972 WOLF, Ins. Helv. Fauna 5 Hym.: 168 ♀♂
Ceropales: 1979, DAY, Bull. Br. Mus. nat. Hist., **38:** 19
Ceropales: 1986, WAHIS, Notes faun. Gembloux, **12:** 34

Labrum large, semicircularly exposed. Eyes reniform. Face much wider above than below the antennae, antennal sockets prominent. Pronotum short. Postnotum usually linear or at most very short. Propodeum over about the basal half sloping down- and outwards from the midline, the space in between, as far as the posterior margin, is either moderately concave or nearly flat; the upturned apical border reduced to a narrow and short piece at each corner. In many species there is a median longitudinal groove, which with the postnotum forms a T-shaped figure. Second abdominal sternite without a transverse furrow. The six sternite of female elongated and strongly, transversely compressed, forming a false ovipositor. Claws of fore and middle tarsi normal, usually with a short and acute subapical tooth (♀) or inner claw of fore tarsus bifid (♂), rarely these specialized and unlike one another, the apical part of the hind tarsi rectangularly bent downwards. Wings with three cubital cells, the second discoidal cell is not angularly dilated downwards at its lower proximal corner. In the hind wing the transverse anal vein strongly prefurcal.

Type-species: *Evania maculata* (FABRICIUS, 1775)

Key of the species groups

1 Propodeum conspicuously flat over its entire length, viewed from the side and with deep longitudinal groove medially. Frons usually remarkably flat before antennal sockets and broken in an obtuse-angle at its two-thirds length between antennae and fore ocellus. Scutellum and postscutellum remarkably raised ..... **helvetica**-group

— Propodeum more or less convex basally and flat or only moderately convex in the declivous part. Longitudinal furrow at most short or only impressed medially. Frons usually convex. Scutellum and postscutellum moderately raised 2

2 Postnotum with nearly parallel margins, at most slightly impressed posteriorly in the middle. Propodeum moderately convex on the anterior part or over its entire length. Frons convex, at most rarely slightly broken. Head, thorax mat, coriaceous-granulated ..... **variegata**-group
— Margins of postnotum not parallel. Propodeum strongly or less convex at least basally. Frons usually convex or sometimes slightly broken. Head, thorax usually not mat, at least weakly shining with scattered or dense punctures 3

3 Propodeum strongly or moderately broken or bent on its one-fifth part basally and flat or concave on four-fifths declivous part, viewed from the side; surface smooth, weakly shining or mat basally and more coarsely rugose or rugulose at declivous part. Abdomen with continuous light bands 4
— Propodeum at most moderately convex on its one-third length and gradually flattened towards abdomen, surface more finely, not coarsely rugose, sometimes with a rough surface 5

4 Propodeum roundly courved and smooth, shining basally, declivous part transversally rugulose. Frons shining or subshining with minute punctures and also with scattered larger punctures. Pronotum, mesonotum usually deeply and densely punctured. Claws of middle tarsi (♂) specialized and unlike one another, as well as tarsal joints 2—4 of fore and middle legs very short and broad, joint 2 of middle legs about as long as broad. At least hind femur, tibia and tarsi ferruginous ..... **fulvipes**-group
— Propodeum mostly strongly broken, laterally often strongly punctured; surface mat basally, largely coarsely rugose on declivous part. Frons mat, convex or hardly broken and distinctly punctured together with mesonotum. Claws normal .... **ruficornis**-group

5 Propodeum more convex basally in lateral view, only rarely more flat (males of *solskii* and *erythropoda*), surface rather coarsely and irregularly sculptured, often granulate, uneven and more finely granulate only on males and on smaller specimens. Tergite 3 (often also 4) black. Face mat, with dense small adjacent punctures and without noticeably larger punctures, latter present only between ocelli and eye, rarely face also with larger punctures (*trjapizini* ♀♂, *magnifica* ♂). Flagellum black, at most lower side sometimes dark brownish black. Last abdominal segments (♀) broadly truncate apically ..... **maculata**-group p. 123
— Propodeum usually rather flat and only moderately convex, only rarely more convex (*altaica* ♂), in such a case body more extensively yellow; surface finely sculptured, silky shining, covered with short silvery hairs (♀♂), rarely mat, uneven (*flavicornis*). Face with larger and distinct, sometimes with dense punctures, only rarely finer or rather difficult to see owing to dense hairs (*dorni*, *bicoloripes*). Last abdominal segments uniformly pointed apically (♀). Sternite 9 deeply excised apically (♂) ..... **albicincta**-group p. 140

The maculata-group

The main characters were enumerated in the key of the species group. It is supplemented as follows: body usually black with yellow or whitish spots and bands, more frequently abdomen with two lateral spots on tergite 1, with a posterior band on 2 and only with small streaks medially on tergites 5—6, legs largely rufous-ferruginous, usually with black and yellow spots. Wings rarely hyaline, usually greyish, often yellowish golden or brownish infuscated. Antennae a little longer and more slender than in the other species groups. Second to fourth joints of fore and middle tarsi normal (♂), the second joint of middle tarsus about twice as long as broad; last joint of fore tarsus (♂) with a median thumb-like lobe on the anterior side. Claws with subapical tooth on fore and middle tarsi, except the inner claw of male of fore tarsi,

which is very deeply split owing to the unusually large not truncate inner tooth basally; both claws of the hind tarsus rectangularly curved.

The examination of the 842 specimens allowed the classification of the status of the 15 species, also enlarged our knowledge concerning the distribution of nearly all species and established the synonymy of the names on the basis of the examination of the genitalia of the type material: *C. maculata flavopicta* GUSSAKOVSKIJ and *m. f. maculipennis* HAUPT synonym of *C. maculata maculata* (FABRICIUS); *C. mongolicus* HAUPT and *C. anderssoni* HAUPT ♀ of *C. erythropoda* GUSSAKOVSKIJ; *C. anderssoni* HAUPT ♂ of *C. sibirica* RADOSZKOWSKI. Here is also opportunity to rectify an incorrect synonymy of *C. latitarsis* HAUPT, namely, the female is the synonym of *C. erythropoda* GUSSAKOVSKIJ, but the male that of *C. sibirica* RADOSZKOWSKI.

Although the ranging of the species *erythropoda*, *sibirica*, and *rubripes* is easy to accomplish close to *maculata*, the species *magnifica*, *solskii* and *trjapitzini* raise difficulties due the more or less punctured frons. Unfortunately, the female of *magnifica* is unknown by me, but the frons of the female *solskii* opaque and it is hard to discover any punctures there; only on that of the male and on *trjapitzini* (♀♂) can we see more punctures. Nothwithstanding the last broadly truncate segments (♀) of these species relegate them to the maculata group.

This group includes the species *maculata maculata* with ssp. *perligera*, *maior*, *turkmenensis*, *caenosa*, *stretchii*, *rhodomera* and *fraterna*. The species *suzukoae*, *erythropoda*, *sibirica*, *rubripes*, *magnifica*, *solskii* and *trjapitzini* are widely distributed in the Holarctic fauna territory.

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Key of the species (♀♂)

1 Frons only with dense small adjacent punctures, without noticeably larger punctures, latter present only between ocelli and eye. Propodeum usually uneven, granulated, often rather coarsely sculptured. Mesonotum with larger punctures, separated at most by about their diameter. Punctures of mesopleuron somewhat weaker, separated by about twice their diameter. Tarsal joints of ♂ sometimes remarkably shortened. Tergite 3 often (♀♂) black 2

— Frons also with some fine, scattered larger punctures. Propodeum with irregular, coarser sculpture. Mesonotum more densely punctured especially posteriorly before scutellum, separated at least or by shorter distance than their diameter. Punctures of mesopleuron denser, clearly separated by about their diameter below tegulae. Tarsal joints of ♂ normal, not shortened. Rarely (♂) tergite 3 black and only with a very small yellow spot ... 13

2 Tergite 3 entirely black, usually 1 with lateral ivory or yellowish white spots, 2 mostly with a continuous band apically, 4—5 often with a medial spot, rarely abdomen entirely, body largely black or only with reduced light spots 3

— Tergite 3, usually also further tergites with an apical yellow, whitish, creamy or ivory white band, 1 with larger yellow spots laterally or band apically, body, also abdomen never black, light colour mostly light yellow, creamy or ivory white 8

3 Femora, tibiae fulvous-ferruginous, at most femora more or less blackish infuscated basally and apically and hind tibia apically. Body typically with light colour or rarely nearly entirely black 4

— Femora largely blackish, only more or less apically and tibiae usually, largely fulvous. Body typically with light colour on lower face, on thorax and on tergites 1—2, (3)4—6 5

4 Wings usually moderately greyish infuscated, at most cells inside partly sometimes light yellowish gold whilst hyalin along veins. The small specimens rarely, nearly entirely black, usually inner eye margin, lower face, except the black streak longitudinally, pronotal apical margin and callus, postscutellum, posterior corners of propodeum, streaks on coxae and tergites ivory white or yellowish white, rarely lower face entirely yellowish white. Femora and tibiae largely fulvous-ferruginous, rarely (in Spain) partly basally and apically blackish. Propodeum smaller impressed in front at an obtuse angled, sculpture finer on smaller and on male specimens. Male genitalia: Fig. 1. 4—10 mm ..... **maculata maculata** (Fabricius)

— Wings rather dark brownish infuscated. Body largely black, at most with small and reduced yellowish white spots on lower face, on postscutellum, on tergite 2 laterally and on last tergite. Femora and tibiae more reddish than in *m. maculata*, only femur 1 basally and tibia 3 apically blackish. Propodeum deeper and more semicircularly impressed in front medially, here smooth, polished. 4.5—9 mm ..... **maculata perligera** (A. Costa)

5 Tergite 1 only with very small, reduced whitish lateral spots or entirely black, also further light colour, especially that on lower face remarkably narrow. Tergites 5—6 with medial streaks. 6.5—9 mm ..... **maculata maior** Costa

— Tergite 1 usually with large, somewhat triangular and widely separated lateral spots; at least tergite 2 with posterior band, spot on callus, hind margin of pronotum, postscutellum, small lateral spots on propodeum yellowish white 6

6 At least clypeus, labrum, adjacent small spot at hind corner of metapleuron, lateral spot on tergite 1, apical band on 2, rudimentary band on 4, underside of fore coxa, elongate apical spot on back of fore femur and on front on middle and hind femora and upper half of middle tibia, clear yellow (♂). Side of lower face and frons, narrow hind margin of pronotum, sometimes an adjacent small spot on propodeum, usually a small lateral spot on tergite 1, dorsal spot on tergite 5, often interrupted apical marks on tergites 2—5, pale yellow. Legs largely black (♀). 6 mm ..... **maculata caenosa** TOWNES
— Labrum largely or entirely black, clypeus and supraclypeal area only laterally yellow or yellowish white and black medially 7

7 Tergites 4—6 or 5—6 with light bands. Lower margin of labrum more or less yellowish brown. Light colour of body yellowish white. Apex of femora, fore tibia, middle and hind tibia nearly entirely, and all tarsi ferruginous, except the yellow basal spots of middle and hind tibiae, fore tibia in front, fore and middle metatarsi largely. Pronotum with dense, smaller punctures. Postnotum with longitudinal wrinkles. Propodeum more coarsely sculptured. 8.3 mm ..... **maculata turcmenensis** MÓCZÁR
— Tergites 3—5 black, 6 entirely yellow. Labrum entirely black. Light colour of body yellow. Apex of femur, both ends of fore tibia, almost entire mid and hind tibiae, and all tarsi ferruginous. A transverse narrow area just anterior to the posterior margin of pronotum with dense, and very large punctures. Propodeum irregularly reticulated, except the medio-apical area, where the surface is granularly sculptured. 7 mm (according to YASUMATSU) ..... **shizukoae** YASUMATSU and ISHIKAWA ♀

8 Legs, especially coxae, trochanters and femora more or less black, partly yellow and ferruginous, partly infuscated (*maculata* ssp. from North America) 9
— Legs, including coxae, nearly entirely ferruginous and yellow, at most fore, middle coxae partly and hind coxae only basally black (species from Asia) 11

9 Apical yellow mark on hind femur occupying more than the apical third outside, typically whole hind femur yellow, except a narrow spot basally and inside, at some other specimens the yellow may be broken into small blotches or the basal black spot reaching medially nearly the three-quarters of the length medially. Whole body, also legs richly coloured with extensive yellow, posterior half of hind tibia ferruginous, band of abdomen remarkably broad, more than disc of tergite 1 yellow, except the narrow posterior margin. Face of female entirely yellow, lateral spots of propodeum remarkably enlarged. Some males rarely also females indistinguishable from ssp. *fraterna*, where the ranges of the two overlap. 6—10.5 mm ..... **maculata stretchii** FOX
— Apical yellow mark on hind femur occupying less than the apical third outside, or absent, femur partly yellowish red, brown or largely black. Thorax, legs with moderate yellow or whitish markings. Face of female usually with a median black longitudinal area 10

10 Front face of hind femur largely black or brownish, sometimes partly darker yellowish red, with yellow apical spot. Body mostly with yellow or often with creamy or ivory white spots or streaks. Face (♀) usually with a median black longitudinal area, on ♂ yellow. Tergite 1 mostly with two large spots or they fuse into a continuous broad transverse band, 2 and further tergites with broad or sometimes rather narrower band, anterior margin of band 2 often several times emarginated, undulate. Propodeum granulated or more or less coarsely sculptured, sometimes transversally wrinkled. Frons rarely with some scattered and shallower punctures. Streaks of inner eye margins gradually narrowed, nearly pointed at upper part of the ocular sinus. Last abdominal segments (♀) strongly compressed in lateral view, lower margin straight, apex broadly rounded. ♀ 6—9, ♂ 4—7 mm ..... **maculata fraterna** SMITH
— Front face of hind femur clear rufous-yellowish red, more or less infuscate basally and usually with a yellow apical spot. Light colour of body clear yellow, not white. Abdominal bands remarkably broad, also propodeal spots enlarged. Face usually entirely yellow. 5.8—6.5 mm ..... **maculata rhodomera** TOWNES

11 Labrum entirely yellow (♀♂) only exceptionally with pale brownish spot basally in the middle (♀). White bands of tergites 2—5(6) reaching to lateral margin and 3—5 emarginate laterally; tergite 1 with continuous or narrowly interrupted broad band (♀) or with lateral spots (♂). Lower face entirely yellow, clypeus only exceptionally with a brownish medial

spot (♂) or with a longitudinal black band downwards narrowed medially and often more or less interrupted above clypeus (♀). Legs ferruginous, coxa 1 (2) with small black spot basally, lower side of all coxae yellow nearly entirely (♀) or yellow reduced on smaller male specimens. Propodeum more or less rugulose. Fore tarsi never widening (♂). Last tergite (♂) with two light spots, sternite 9 truncate at apex (Figs 6—7), with a reversed Y-shaped row of longer hairs. Genitalia: Figs 8—9. ♀ 5.8—8.1, ♂ 4.3—8.1 mm ..... **erythropoda** GUSSAKOVSKIJ

— Labrum nearly entirely black, rarely only with brownish spot or exceptionally with yellowish margin (♀), or when yellow, then fore tarsi unusually widening (♂) or coxae 1—2 largely black basally (♀) and longitudinal black streak of lower face extending over supraclypeal area (♀). Legs largely ferruginous except coxae, at most lower side of fore coxae yellow (♀). Pronotum with distinct longitudinal and parallel wrinkles 12

12 Coxae 1 and 2 largely black basally, ferruginous and only with small yellow spots laterally or only with more or less larger spot on fore coxae. At most posterior bands of tergites 2—3 (♀) or sometimes also 4 (♂) reaching the lateral side of abdomen. Fore metatarsus about a quarter shorter than the other tarsal segments together (♀). Tergite 1 usually with lateral spots or rather narrowly separated from each other. Band of tergite 4 (♀) rarely longer, usually tergites 4—6 (♀) or 5—6 (♂) with a medial, 7 (♂) with two lateral spots. Labrum usually with a broad black spot, lower margin dark red (♀) or on ♂ often yellow. Medial longitudinal black band of lower face broadened downwards or at least with parallel side in supraclypeal area. Interspaces between punctures of mesonotum usually larger than diameter of punctures. Horizontal part of propodeum shorter than one-third length of propodeum in lateral view. Hind femora and tibiae blackish infuscated apically (♂), ventral side of coxa 2 remarkably flat (♂). Genitalia: Figs 4—5. Last sternite (9) with a tuft of hairs basally, strongly convergent apically (Figs 2—3). ♀ 4.8—8.5, ♂ 5.5—8.1 mm ..... **sibirica** RADOSZKOWSKI

— Only a small spot on coxae 1—2 black outside, 1 largely yellow below. Posterior bands of tergites 2—5 reaching to lateral margins. Fore metatarsus as long as the other tarsi together (♀). Tergite 1 with two largely separated lateral spots. Labrum black, only its sides lighter. Medial longitudinal streak narrowing downwards in supraclypeal area. Interspaces usually narrower than punctures on mesonotum. Horizontal part longer, at least one-third the length of propodeum in lateral view. 5.5—6.4 mm .... **rubripes** MÓCZÁR ♀

13 Propodeum coarsely rugose, remarkably coarser than on maculata. Posterior margin of pronotum connected with the pale yellow and in front sharply emarginated band by a distinct hyaline streak. Frons relatively rather deeply punctured. Lateral margin of pronotum dark brownish translucent. Antennal joints 1—2 in front, antennal sockets broadly, supraclypeal area, clypeus, postscutellum, lateral corners of propodeum, a small spots above them, lateral spots of tergite 1, band of 2, small median spot of 4, larger spots of 5—7 medially, pale yellow. Tergite 3, flagellum, femora 2—3 nearly entirely black with rufous tips. Tarsal joint 5 remarkably large, inside deeply emarginated. 9.5 mm ..... **magnifica** GUSSAKOVSKIJ

— Sculpture of propodeum finer, not coarsely rugose. Hyaline streak absent on posterior margin of pronotum. Frons opaque (♀) or sparsely punctured (♂). Legs largely yellow and black, possibly partly ferruginous. Lower face entirely yellow (♂) or often with black spots or band (♀). Bands of abdomen remarkably broad (♀♂), tergite 3 black or only with very small yellowish spot (♂) 14

14 Propodeum at most finely rugulose basally. Frons with very dense small adjacent punctures (♀), mostly (♂) also with a few large punctures. Large yellow band of tergite 1 lying at about the middle of disc and nearly (♀) or narrowly (♂) interrupted medially. Femora largely (♀) or more basally black (♂), also partly dark ferruginous above (♀). Lower face entirely yellow (♂) or with a broad black streak beginning nearly at the lower margin of clypeus and extending up to antenna, labrum also black (♀); yellow eye margin ending broadly rounded, nearly truncate in the ocellar sinus. Tergite 3 black with a trace of a very small yellow spot (♂). ♀ 8 (11 according to RADOSZKOWSKI), ♂ 4.7—6.5 mm ..... **solskii** RADOSZKOWSKI

— Sculpture of propodeum coarser. Frons with very dense small adjacent punctures (♀) and with some distinct larger ones (♀♂). Broad band of disc on tergite 1 continuous, only rarely (♂) interrupted. Black spots of femora smaller. Lower face entirely yellow (♂), usually with a small brownish spot on labrum and on clypeus and with a W-shaped black mark below antenna (♀). Tergite 3 only with small yellow spot posteriorly (♂). ♀ 9, ♂ 10 mm ..... **trjapitzini** MÓCZÁR

Ceropales maculata maculata (FABRICIUS)

Evania maculata FABRICIUS, 1775, Syst. ent.: 345
Ceropales maculata: 1804, FABRICIUS, Syst. Piez.: 185
Ceropales semiannulatus CURTIS, 1839, Brit. Ent., **16:** 756 ♀ (syn. by DE BEAUMONT, 1947, DAY, 1979)
Ceropales maculatus: 1888, RADOSZKOWSKI, Bull. Soc. nat. Moscou, **2:** 489 fig. gen. app.
Ceropales tristis TOURNIER, 1889, Ent. genèv. **1:** 37, 39 ♀ (var. indiv. by de BEAUMONT, 1947)
Ceropales maculata var. *modesta* TOURNIER, 1889, Ent. genèv., **1:** 38 (syn. by DE BEAUMONT)
Ceropales balearica A. COSTA, 1893, Atti Acad. Sci. fis. mat. Napoli, (2) **5:** 28 ♀ (syn. by DE BEAUMONT)
Ceropales maculata: 1895, DALLA TORRE, Wien. ent. Ztg. **14:** 91
Ceropales maculata: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 343 ♀♂
Ceropales maculata: 1925, BERLAND, Faune Fr. 10 Hym. vespif. **I:** 220 fig. 437
Ceropales maculatus: 1927, HAUPT, D. ent. Z. (Beiheft): 297, 302, 351 ♀♂
Ceropales maculata: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 7, 21 ♀♂
Ceropales maculata flavopicta GUSSAKOVSKIJ, 1931, Ezheg. zool. Mus., **32:** 8, 22 **syn. n.**
Ceropales maculatus f. *maculipennis* HAUPT, 1934, Ark. Zool., **27A** (10): 12 ♀ **syn. n.**
Ceropales maculatus: 1938, HAUPT, Ark. Zool., **30A** (4): 11 ♀♂ (and var. *feminae* F. MORAWITZ, nom. in coll.?)
Ceropales maculatus: 1946, YASUMATSU, Mushi, **17:** 18
Ceropales maculatus: 1947, DE BEAUMONT, Mitt. schweiz. ent. Ges., **20:** 506, 513 Figs 4, 11 ♀♂
Ceropales maculatus: 1953, GUIGLIA and JUNCO y REYES, Annali Mus. civ. Stor. nat. Giacomo Doria, **66:** 213 ♀
Ceropales maculatus: 1955, YASUMATSU and ISHIKAWA, Mushi, **29:** 48 ♀♂
Ceropales maculatus: 1955, WAHIS, Bull. Inst. r. Sci. nat. Belg., **31:** 8
Ceropales maculatus: 1956, CEBALLOS, DUSMET y ALONSO and JUNCO y REYES, Trab. Inst. esp.: 355
Ceropales maculatus: 1956, MÓCZÁR, Fauna Hung., **13** (5): 76 ♀♂
Ceropales maculata maculata: 1957, TOWNES, U. S. natn. Mus., **209:** 239, 241 ♀♂
Ceropales (*Ceropales*) *maculatus maculatus*: 1965: WOLF, Nachr. naturw. Mus. Aschaffenb., **72:** 37 ♀♂
Ceropales maculatus: 1967, WOLF, Beitr. Ent., **17:** 525 ♂
Ceropales maculatus maculatus: 1967, WOLF, Acta ent. fenn., **23:** 43 ♀♂
Ceropales maculatus maculatus: 1969, WOLF, Opusc. ent., **34:** 14
Ceropales maculatus maculatus: 1970, WOLF, Nachr. Bl. bayer. Ent., **19:** 67 ♀♂
Ceropales strigellus HAUPT i.l. (syn. by WOLF, 1970)
Ceropales maculatus maculatus: 1970: WOLF and DINIZ, Mem. Estud. Mus. zool. Univ. Coimbra, No. **311:** 19 ♀♂
Ceropales (s. str.) *maculatus*: 1972, WOLF, Ins. Helv. Fauna 5 Hym.: 168, 169 Figs 472, 473, 484 ♀♂
Ceropales maculatus maculatus: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 118 Fig. 4 ♀♂
Ceropales maculata: 1979, DAY, Bull. Br. Mus. nat. Hist., **38:** 20 ♀ (design. of lectotype *Evania maculata* FABRICIUS)
Ceropales maculatus maculatus: 1981, WOLF, Mitt. zool. Mus. Berl., **57:** 210 ♀
Ceropales maculatus 1985, WOLF, Mitt. internat. ent. Ver. Frankfurt a.M. **10:** 10 Fig. 2 ♂
Ceropales maculata: 1986, WAHIS, Notes faun. Gembloux, **12:** 35
Ceropales concentricus Q. nom. in coll. (Berlin)

Specimens examined: 286♀, 163♂. F i n l a n d = Aland 1♀ (København); Argland 1♀; Eckerö 1♀ 1♂; Finby R. ELVFING 1♀; Ik Ollila K. Lahtivirta 3♀ 1♂ (Helsinki Univ.) and 1♀ (Budapest); Karkku 1♀; Kuopio N. Nauha 1♀ (Budapest); Lapinlakti 1♀ 1♂ R. ELVFING: Nagu Nötö Nordman 1♀; Nystad 1♀; N. Sipoo O. Ranin 1♂ (Lausanne); Pärna Nordström 2♀ 2♂; Ii salmi R. ELVFING 1♀; Seiskari 2♀ (Budapest); Sibbo 1♂; Teriioki 1♀ 1♂; Tvärmirme E. THUNEBERG 1♀; Vichtis 1♂; Ytterö 1♀ 1♂; collections data in Finland Jun—Aug 1932—1957; where the collector and the museum not listed, there legit HELLÉN and deposited in Helsinki Museum. — S w e d e n = Farön 14 Jun 1954 1♀ (Budapest); Gotland 1♂ (København); Gstr. Hille 6 Aug 1949 1♀ (Lausanne); Gtl. Ljungarn 25 Jul 1963 HELLÉN (Helsinki Mus.). — N o r w a y = 7♀ 5♂ (Bergen); 4♀ 2♂ (Oslo). — E n g l a n d = Devon, Bovey Tracey 17—18 Aug 1928 G. NIXON 1♀ (Lausanne); Halsdon 7 Sep 1927 G. M. SPOONER 1♂ (Lausanne). — D e n m a r k = Selande N. K. FASTER 2♀ 1♂ (Lausanne); 150♀ 74♂ (København). — W e s t G e r m a n y = Mainfranken 10 Jul 1946 J. HEINRICH 1♀ (Frankfurt); and Ahausi Westf. SCHULZ 1♀ 1♂ (Madrid); Nürnberg TRAUTMAN 2♂ (Madrid); Reinland,

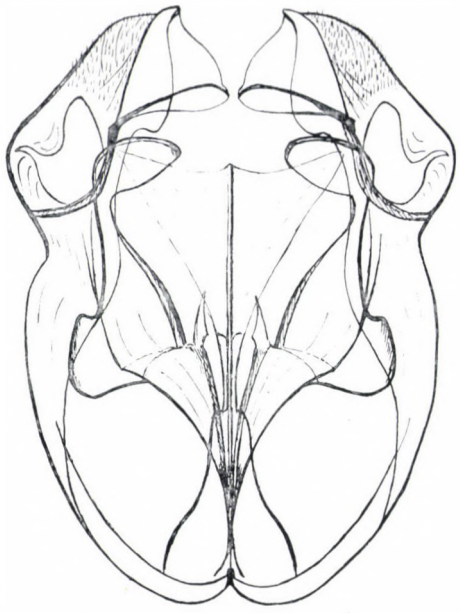


Fig. 1. *Ceropales maculata maculata* (FABRICIUS), male genitalia, ventral view (Original)

Siebengeb. Lüwenburg on Heracleum spondylium 3, 8 Aug 1937 3♀ 1♂, 25 Jul 1950 1♀ (Lausanne), and 28 Jul 1957 E. SCHMIDT 1♀ (Ottawa); Saarmund Nuthe 29 Jun 1930 1♀ (Lausanne); Frakfurt 1♀ (København). — E a s t G e r m a n y = Bellinchen O. 31 Jul 1932 1♀ (Halle); and 1♀ (Budapest); Schönbornsche Au b. Geisenheim on Angelica knospe 30 Jun 1927 1♂ (Lausanne); Schirmer 3, 15 Bukow 1♀ 1♂ and Dresden PRIESSNITZ 1♀ (Dresden). — T h e N e t h e r l a n d s = den Dolder 24 Sep 1939, 29 Jul 1944 PMF VERHOEFF 1♀ 1♂ and Hilversum 10 May 1945 PMF VERHOEFF 1♀ (Lausanne). — F r a n c e = Carpentras 17—20 Sep 1933 DE BEAUMONT 2♀, Dordogne le Eyzies 1♀, Pyr. Or. Argelis 19 Sep 1932 DE BEAUMONT 1♀ (Lausanne); Haute Savoie Sciez 12 Jul 1931 DE BEAUMONT 1♂ (Budapest). — S w i t z e r l a n d = Aigle 1♂; Chur 1♀ (Coll. Mochi); Ferreyres 1♂; Les Follaterres 4♀ 2♂; Genève Bois des Frères 1♀ (Budapest); Genève CHEVRIER 1♂ (Budapest); Grimentz 1 ♂; Lugano-Agno 1♀; Martigny 6♀ 12♂; Moremont 1♀ 3♂; Neuchâtel 4♀ 4♂; Neuville 5♀; Nyon 1♂; Peney 2♀; "P. 24. IX. 76", "Peney Coll. TOURNIER", "Ceropales ♀ tristis TOURNIER", 1♀ probably holotype, "Ceropales nigripes TOURN. TOURNIER det." (Geneva); Pied de Salève 2♀; Previanger 2♂; Sciez 1♀ and 1♂ (Budapest); Valais Saxon 1♀ 1♂; St. Sulpice 4♀; Venoge 1♀; Verbier 1♀ 1♂; ? Argent. 1♀ (All material from Switzerland deposited in Lausanne, respectively in the museum putting in parentheses. Collections data mainly July, August and June, less frequently from late spring to late October, rarely May. The majority of the specimens collected by J. DE BEAUMONT (1932—1936), the others by R. MATTHEY, J. AUBERT, P. BOVEY and B. JACOB (1900—1982). — A u s t r i a = Guntramsdorf 23 Sep 1958 KUSDAS 1♀ (Tel Aviv); Carinthia, Villach PALMÉN 1♀ (Helsinki Univ.). — C z e c h o s l o v a k i a = Rockovica 29 Jul 1939 1♂ (Budapest); Moravia cejc Aug 1958 KOCOUREK 1♂ (Budapest) and 1♂ (Brno). — P o l a n d = Mazury 7 Aug 1926 1♀ (Halle) and 1♀ (Budapest). — H u n g a r y = (See MÓCZÁR 1954, 1978), Bugac on Conium maculatum and Seseli annum, Csévharaszt, Malaise trap 5 Jun 1968 L. MÓCZÁR 1♂, Fülöpháza 9 Jun 1980 ZOMBORI 1♂, Kerekegyháza Malaise trap in Junipero Populatum albae L. MÓCZÁR 1♀, Orgovány 1♂ and Petőfiszállás 1♂; from Jun to Sep (Budapest); Simontornya 25 May 1928 1♀ PILLICH (Tel Aviv). — B u l g a r i a = Glozsene Kreis Teteven 25 Nov 1952 1♀, Kardjali 23 Jul 1964 N. ATANASSOV 1♂, Pancerevo Jul 1♀ 1♂ and Stara Zagora Aug 1♂ (Sofia). — I t a l y = Messina 1♀ (København); Sicily 27 Sep 1949 1♂ (Lausanne); ? Castelldessels 19 Mar 1894 TOURN 1♀ (Budapest). — S p a i n = Bilbao 1♂; Elcke Andéu 1♀; El Pla Valencia 1♀; Gava 10 Sep 1901 1♂ (Barcelona); Cataluna 24 Mar 1924 DE XAXARS 1♀ (Wien); Majorca 1♀; Navalparal Prov. Aquila 2♀; Orihuela 1♀; Pedralbes 20 Oct 1894 1♀, Ribas 7 Jul 1901 1♀ and Sabadill

26 May 1901 1♀ (Barcelona); Sierra del Cadi 1♀; Somajcera 1♂; Suances 1♂; Tiermas DUSMET 1♂; Valencia 1♂; Viladran 2♀; V De Ordesa 26 Jul 1914 DUSMET 2♀ (Madrid) and 1♀ (Budapest); Vilatorla 10 Aug 1902 1♂ (Barcelona); Villaviciosa de Odon MERCET 2♀ (all material deposited in Madrid, respectively in the museum putting before); lot of collectors and collecting data be missing). — R S S R = District of Kaliningrad: Königsberg Heide 11 Aug 1918 1♂ (Lausanne); Omsk 1♂ (Helsinki Mus.) and 1♂ (Budapest); Perm: Nizhniyaya kuriya 3—5 Aug 1967 W. J. PULAWSKI 1♂ (Coll. Wolf); (further localities: MÓCZÁR, 1978). — C y p r u s = Limassol 22 May 1962 A. MAVROMOUSTAKIS 1♀ (Coll. Wolf) and 1♀ (Budapest); Cherkes 19 Aug 1954 MAVROMOUSTAKIS 1♀ (Budapest). — S y r i a : Damas. Rte de Kissoue 2—18 May 1960 DE BEAUMONT 2♂ (Lausanne). — I r a n = Elburs 50 km S Chalus 2800 m 26 Jul 1977 J. GUSENLEITNER 1♂ (Coll. Gusenleitner); Elche E. Pons 1♀ (Halle). — M o n g o l i a = Charchira, 30 km SW Ulangom Steppe DORN 1♀ (Coll. Wolf). — C h i n a = Alin, Charbin-Harbin, Pinchiang Manchuria 21—27 Aug 1♀ 2♂, 25 Jun 1950 5♀ and 16 Sep 1961 1♀ (Coll. Wolf) except 2♀ (Budapest); Honan, Shankow DR RENUART 2♂ (Bruxelles) and 1♂ (Budapest); Kansu Nan-pin Tot 1♀ (Budapest); "Kina S. Kansu", "SVEN HEDINS Exp Ctr. Asien DR HUMMEL", "28/7", "Holotype" red label, "*maculatus* f. *maculipennis* Hpt. det Haupt 1933" with HAUPT's writing 1♀ and with the same labels, but with "Paratype" 1♀ (Stockholm); Sechwan Aug DC GRAHAM 1♀ (Coll. Wahis). — ? "Mis Droy July 1926", "*concentricus* nov. Q." "Typus", "*C. maculatus* F. 1965 det. L. MÓCZÁR" and "*Ceropales m. maculatus* (Fabr.) H. WOLF det. 1983 ♂" 2♂, nom. in coll. (Berlin).

The holo- and paratypes of *maculipennis* HAUPT are really two differently coloured specimens. The clypeus of the holotype broadly yellowish white laterally, that of paratype entirely black, only lower margin very dark reddish translucent. The lateral ivory white spots of tergite 1 are also different: they are normal on paratype, but extend towards the middle of disc to a such degree on the other specimens, that they nearly fuse (e.g. 3♀ Königsberg-Heide, 1♀ Seiskari, Finland, 2♀ Rheinporv., Siebengebirge-Lüwenburg, — but 1♀ with the same labels and date with normal lateral spots —, further 1♀ Genève, 1♀ Turgoyak, Russian SSR and 4♀ Charbin, China), or in fact completely fuse (holotype of *maculipennis*, from Kansu, China, 1♀ Pavlodar Kazakh SSR, 2♀ Charbin and specimen from Mongolia described by GUSSAKOVSKIJ, 1931 as ssp. *flavopicta*). This band is yellowish white in the majority of specimens (5) from Charbin, in contrast with the ivory white band of tergite 2. The lateral spots of tergite 1 being exceptionally absent (1♀ Limassol, Cyprus) or began to lengthen in a brownish-ferruginous colour towards the middle of disc (1♀ from Cyprus: Cherkes, 1♀ from Charbin), this ferruginous colour fuse in the middle (1♀ from Mongolia, Sutszukte). Finally the light band across the disc of tergite 1 continuous, but together with the further light spots and bands of body yellow, not white and tergite 1 posteriorly entirely brownish-ferruginous between the yellow band and the posterior margin (1♀ Kansu) (? var. *feminae* F. MORAWITZ, according to HAUPT, 1938).

Wings grey infuscated in most of the specimens (e.g. 1♀ Sutszukte, 14♀ and 14♂ Finland, and 5♀ Charbin), but yellowish gold infuscated (on holotype and paratype of *maculipennis* HAUPT, China or 7♀, 2♂ Finland etc.). Consequently, f. *maculipennis* HAUPT being only an individual variation together with *flavopicta* GUSSAKOVSKIJ, or var. *feminae* F. MORAWITZ, etc. The ivory band of pronotum posteriorly being sometimes not continuous, it is more or less interrupted in such cases, when the further light spots of body

smaller (e.g. Switzerland, Spain). On the other hand, the pronotal band being also continuous, when the lateral spots of tergite 1 remarkably reduced (Switzerland, Spain). The clypeus and the supraclypeal area usually are black medially. There are occasionally some specimens whose clypeus entirely yellow, this colour is independent from the size, or the richer colouring of the specimen, or a reduced coloured specimen with interrupted pronotal band or also the same on tergite 2. This large variability of colour appears also in the sculpture of propodeum, which is coarser on female and larger specimens and finer on male and smaller ones.

Distribution: Siberia (RADOSZKOWSKI, 1888), Europe (DALLA TORRE, 1897). Turkmen and Uzbek SSR (Kopet-Dag, Fergana) and Mongolia (GUSSAKOVSKIJ, 1931, WOLF, 1981). China, Korea (YASUMATSU, 1946). Algeria (DE BEAUMONT, 1947). Japan (YASUMATSU and ISHIKAWA, 1955). North Africa (WOLF, 1972). Turkey, Mongolia, Armenian, Azerbaidzhan, Tadzhik and Kazakh SSR, Afganistan (MÓCZÁR, 1978). Cyprus, Syria, Iran.

Ceropales maculata perligera (A. COSTA)

Priocnemis perligerus A. COSTA, 1882, Atti accad. sc. fis. Napoli, **9:** 23, 35 ♀♂
Priocnemis perligerus: 1883, COSTA, Atti accad. sc. fis. Napoli, **21:** 33, 58
Ceropales perligerus: 1886, A. COSTA, Atti accad. sc. fis. Napoli, **2** II. 8: 40
Ceropales perligera: 1887, COSTA, Prosp. Imen. Ital., **2:** 51 ♀♂
Ceropales perligera: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 92
Ceropales perliger: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 345
Ceropales maculatus perligera: 1947, DE BEAUMONT, Mitt. schweiz. ent. Ges., **20:** 514 (design. of lectotype)
Ceropales maculatus perliger: 1972, WOLF, Ins. Helv. Fauna, **5** Hym.: 169
Ceropales maculatus perliger: 1975, WOLF, Zool. Mededel., **49:** 48 ♀
Ceropales maculatus perligerus: 1981a, WOLF, Linzer biol. Beitr., **13:** 33 ♀♂ (design. of lectotype)

Specimens examined: 16♀, 8♂. Sardinia: Sardaigne (no further data) 2♀ (Geneva); Chilivani 2 Jun 1952 L. CERESA 1♂ (Budapest). — Morocco = Marrakech, Oued Tensift 13, 16 May 1947 J. DE BEAUMONT 10♀ 4♂ (Lausanne) and 2♀ 1♂ (Budapest), 1♂ (Wien). — Algeria — Ain Tokria 1897 VAULOGER 1♀ 1♂ (Paris). — Kirgiz SSR = Alai mont. 1905 KORB 1♀ (Coll. Wolf).

The colouring of this subspecies is not always perfectly uniform neither among the specimens of the different lands, nor among that of one country, nevertheless it is easy to separate from the basic species. E.g. the specimens from Morocco and Algeria wings and tarsal joints more darkly infuscated than on specimen from Sardinia. The single female from Marrakech has its tergite 1 dark reddish translucent medially; that from Alai Mts. lower face with two lateral yellowish streaks, also pronotum with an interrupted small yellow streaks apically and femora, tibiae entirely yellowish red, except the moderately blackish hind tibia posteriorly.

Distribution: Sardinia (COSTA, 1882). Corsica (WOLF, 1975). Algeria, Morocco (WOLF 1981), and Kirgiz SSR.

Ceropales maculata maior A. COSTA

Ceropales maculata var. *major* A. COSTA, 1888, Atti Accad. Sci. fis. mat. Napoli, **2** II: 11
Ceropales maculata var. *major*: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 91
Ceropales maculatus var. *major*: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 344
Ceropales maculatus var. *major*: 1947, DE BEAUMONT, Mitt. schweiz. ent. Ges., **20:** 514
Ceropales maculatus major: 1975, WOLF, Zool. Mededel., **49:** 48 ♀
Ceropales maculatus maior: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 121 ♀

Specimens examined: 12♀, 1♂. Spain = (no further data) 2♀ (Barcelona); Bilbao, Majorca 22 k. fr. Palma 30 Jun 1901 W. HOLLAND 2♀, Bilbao-Somorrostro 11 Jul 1970 PH. PRONK 2♀ (Madrid) and 1♀ (Coll. Wolf); F. FERNANDO G. MERCET 1♀, Logrono DUSMET 1♂, Navalpeval G. MERCET 1♀, Samojicerra DUSMET 1♀ and Valencia Terminon (Burgos) Aug 1942 M. PARRA 1♀ (Madrid); ? Athdowy Co. 30 Aug 1944 1♀ (Budapest).

The variability of this subspecies was published earlier (MÓCZÁR, 1978). On account of the transitional forms it is sometimes difficult to separate this subspecies from the nominate species.

Distribution: Sicily (COSTA, 1888). S. Europe (DE BEAUMONT, 1947). Spain, Sardinia, Corsica (WOLF, 1975). Portugal, Turkmen SSR (MÓCZÁR, 1978).

Ceropales maculata turcmenensis MÓCZÁR

Ceropales maculatus turcmenensis MÓCZÁR, 1978, Acta biol. Szeged., **24:** 121 ♂ (correction: holotype in Leningrad and paratype in Budapest).

Specimen examined: Turkmen SSR = Paratype 1♂ (Budapest).

Distribution: Turkmen SSR (MÓCZÁR, 1978).

Ceropales maculata caenosa TOWNES

Ceropales maculata caenosa TOWNES, 1957, Bull. U. S. natn. Mus., **209:** 239, 242 ♀♂
Ceropales maculata caenosa: 1979, KROMBEIN, Cat. Hym. Am. N. Mex., **2:** 1570 ♀♂

Specimens examined: 1♂. USA = California: Tulare Co. Bald mtn. 20 Jul 1986 R. D. HAINES 1♂ (Coll. Wasbauer).

Distribution: USA, California, Sierra Nevada Mts. (TOWNES, 1957).

Ceropales maculata stretchii FOX

Ceropales Stretchii FOX, 1892, Trans. Am. ent. Soc., **19:** 52 ♀
Ceropales Stretchii: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 92
Ceropales stretchii: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 345
Ceropales maculata stretchii: 1957, TOWNES, Bull. U. S. natn. Mus., **209:** 239, 247 ♀♂
Ceropales maculata stretchii: 1979, KROMBEIN, Cat. Hym. Am. N. Mex., **2:** 1570 ♀

Specimens examined: 32♀, 6♂. USA = Arizona = Pima Co. Cotalina Mts Sep 10 1980 E. FISCHER 1♀ (Coll. Wasbauer). — California = Alameda 1♀ (Madrid); Alameda, Berkeley Hills 9 Aug 1960 1♀ (Budapest); Atascadero Jun 10 1958 J. W. MACSWAIN 1♀ (Coll. Wasbauer); Danville 11 Oct 1951 F. X. WILLIAMS 1♀ (Coll. Wasbauer); Del Norte Co. Dunn Cr. 11 Jun 1960 T. R. HAIG 2♂ (Coll. Wasbauer); Ingleside 25 Aug 1908 J. CH. BRADLEY 1♀ (Budapest); Nevada Co. Russel Wly 26 Jun 1964 BOHART 1♀ (Coll. Wasbauer); Plumas Co. Little Long Valley, Spring Garden 4—10 Aug 1977 Mal. tr. M. WASBAUER 2♀, 2♂ (Coll. Wasbauer and Budapest); Siskiyou Co: Dry Lake Mtn Top 1 Aug 1982 T. R. HAIG 1♀ (Coll. Wasbauer), Antelope Cr. 13 Aug 1958 on Chrysothamnus viscidiflorus J. POWELL

1♀ and Grass Lake Summit 17 Jun 1981 T. R. HAIG 1♂ (Coll. Wasbauer); Trawberry 5 Jul 1957 J. M. BURNS 1♀ (Coll. Wasbauer); Trinity Co. Junction City 21 Apr 1977 T. R. HAIG 1♀ (Coll. Wasbauer). — C a r o l i n a = El Dorado Co. Mal. tr. 14 Aug 1982 L. G. BEZARK 4♀ (Coll. Wasbauer) and 1♀ (Budapest), Humbolt Co. Garbeville 7—7 Aug 1982 Mal. tr. M. WASBAUER 2♀ (Coll. Wasbauer) and S. L. Obispo Co. Montana de Oro 16—17 Aug 1983 M. WASBAUER, P. ADAMS 8♀, 1♂ (Coll. Wasbauer) and 1♀ (Budapest). — M o n t a n a = Ea. Unidos MERCET 1♀ (Madrid). — O r e g o n = Klamath R. SW Keno 30 Aug 1962 VERTREES, SCOTT, PHIPPS SHUH 1♀ (New York). — U t a h = Bryce Canyon 4 Aug 1956 1♀ (Budapest).

D i s t r i b u t i o n : California (FOX, 1892). Cal. East of Sierra Nevada Mts, n. to B. C. and e. to Idaho north, Nevada, Oregon and Utah (TOWNES, 1957).

Ceropales maculata fraterna SMITH

Ceropales fraterna SMITH, 1855, Cat. Hym. Brit. Mus., **3:** 180 ♀
Ceropales minima PROVANCHER, 1887, Addit. Corr. Faune ent. Canada Hym.: 265 ♂
Ceropales fraterna: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 91
Ceropales fraternus: 1897, DALLA TORRE, Cat. Hym. 8 Fossor: 342 ♀♂
Ceropales fraternus occidentalis COCKERELL, 1898, Ann. Mag. nat. Hist., (7) **2:** 455 ♂
Ceropales fraterna: 1898, PECKHAM, Bull. Wisc. nat. Hist. Soc., **2:** 154—155, 239
Ceropales maculata fraterna: 1957, TOWNES, Bul. U. S. natn. Mus., **209:** 239, 244 Pl. 1 fig. 14 ♀♂
Ceropales maculata fraterna: 1979, KROMBEIN, Cat. Hym. Am. N. Mex., **2:** 1570 ♀♂

Specimens examined: 98♀, 75♂. C a n a d a = Alberta Laggan 10 Aug 1940 BEAU 1♀ (Budapest); Alta 15 mi. East Morley 10 Aug 1962 K. C. HERRMANN 2♂ (Ottawa) and 2♂ (Budapest). — B r i t i s h C o l u m b i a = Mc Intyre Cr. Oliver 22 May 1959 R. E. LEECH 1♂ (Ottawa); Squillax B. C. Picea engelmanni 12 Jul 1963 1♀ 1♂ (Ottawa); Terrace B. C. 22 Jun 1960 C. H. MANN 1♀ (Budapest); Val Morin Aug 1925 C. J. QUELLET 1♀ (Wien). — O n t a r i o = Black Sturg Lake 1—15 Aug 1956 LINDBERG 1♀ (Helsinki Mus.); Dundas 7—11 Aug 1972 D. M. WOOD 2♀ (Ottawa and Budapest); Owen Sound 19 Jul 1962 on Geranium KELTON and BRUMSTON 1♀ (Ottawa); Ramsey, Sierra Vista 6000' 20 Jul 1967 STERNITZKY 1♂ (Budapest). — Q u e b e c = Hudson Heights 25—31 Aug 1956 LINDBERG 1♂ (Helsinki Mus.); Hull 7 Sep 1965 Malaise trap 9♀ 1♂ (Ottawa); Old Chelsea 1150' 16 Jun 1961 J. R. VOCKEROT 1♂ (Ottawa). — Y u c o n = Dawson 2 Aug 1962 P. J. SKITSKO 1♀ (Ottawa). — U S A = "US" (no further data) 1♀ holotype (Oxford); Etat Unis 2♀ (Geneva and Budapest); Frankonia N. H. 1♂ (New York); Swannanon N. C. 1♂ (New York). — A r i z o n a = Chiricahua Mts, Rustler Pk Cochisa Co. 5♀ 4♂ (New York) and 3♀ 1♂ (Budapest), as well as the same locality 4♀ 4♂ (♀ partly on Cocalia decomposita) (Coll. Wasbauer) 1♀ (Budapest); Coconino Co 1♂ (Coll. Wasbauer); Flagstaff, St. Francisco Mts 1♀ (New York); Fraham Co 1♀ (Budapest); Graham Mt 1♂ (Coll. Wasbauer); Mt Lemon Sa. 1♀ (Geneva); Santa Catalina Mts, Pima 1♀, Bear Wallow 1♂, Pima-Summerhaven 5♂ (New York) and 1♂ (Budapest); White Mts 1♂ (Coll. Wasbauer). — C a l i f o r n i a = Alameda Co. 1♂ (Madrid); Alpine Co 4♀ (Coll. Wasbauer); Big Pine Yuyo Co. 1♀ (Budapest); Danville 2♂ (Coll. Wasbauer) and 1♂ (Budapest); Grass Lake 1♂ and Macdoel on Achillea 1♂ (New York); Mono Co. Mill. Cr. 20♀ 2♂ (Coll. Wasbauer) 2♀ 1♂ (Budapest); Novato, Marin Co. 1♀ (Coll. Wasbauer); Plumas Co. Little Long Valley 1♂ (Budapest); San Miguel Is. Channel 1♂ (Budapest); St Cruz Beach 1♂ (Wien); Siskiyou Co: Grass Lake Summit 1♀ 2♂ (Coll. Wasbauer) and Lower Klamath Lk. on Cirsium, Valentine Caves Lava Bed 2♂ (New York and Budapest). — C a r o l i n a = Humbolt Co. Garberville 1♂ (Coll. Wasbauer). — C o l o r a d o = Estes Pk, Gothie Gunnison and Loweland Pass 3♂ (Ottawa); Morrison 1879 1♀ 1♂ (Budapest); State Bridge 1♂ (Ottawa); Vernal Utah Uintah 1♀ (Budapest). — C o n n e c t i c u t = New Canaan Fairfed Co. 1♀ (New York) and 1♂ (Budapest). — G e o r g i a = (no further data) 1♀ (Eberswalde) and 1♀ 1♂ (Berlin); Dalton Springs Camp 5 mi W Monticello San Juan Co. 1♀ (New York). — I d a h o = Waha 1♂ (Eberswalde). — I l l i n o i s = 1♀ (Geneva). — I o w a = Ames St. Nursery 2♀ (Coll. Wasbauer). — Massachusetts: Athol 1♀ (Eberswalde). — M i c h i g a n = Marquette 1♀ (Budapest). — M i s s o u r i = Columbia 3♀ (Coll. Wasbauer). — M o n t a n a = Ea. Unidos 1♀ (Madrid). — N e w J e r s e y = Englewood Bergen Co 1♂ (Budapest). — N e w M e x i c o = Bear Trap Cam 28. mi. SW Magdalena Soccoro Co. and Pine Camp 2 mi NE Cloudcroft, Otero 1♂ (New York); Grant Co. Silver City 1♀ (Coll. Wasbauer). — N e w Y o r k = Essex Co. Keene Valle 2♀ (Geneva);

Renn'l'ville KCW 1♀ (Budapest); Westchester Co. Lewisbobo 1♀ 5♂ (New York) and 1♂ (Budapest); Ulster Co. Cherryrown 4 mi NNW Kerhonkson 1♂ (New York). — Ohio = Newport R. I. 1♀ (Budapest). — Oregon = Albert Lk. on Cirsium 2♂, Crater Lk. Nat. Pk. 1♂, Keno Sprgs. Ranch, Klammath Co. 1♂ and N. Umpqua R. Kelsey Valley, Douglas County 1♂ (New York). — Tennessee = (no further data) 1♀ (Geneva). — Utah = Daniels Pass 2♂ (Ottawa); Kents Lake 16 mi E. Beaver 1♀ 1♂ (New York); Cedar Breaks, Iron Co. 1♂ (Budapest). — Virginia = Bald Knob and Mountain Lake ex Rubus 2♂ (Ottawa); Lost River St. Pk. 1♂ (Budapest). — Washington = Yakima Park 1♀ (Eberswalde). — Wyoming = Yellowstone N. P. 1♂ (New York). The great majority of collections dates are in July, August and September (♂), respectively in July, August (♀), less frequently collected from May (♂) and September (♀), resp. in June (♀), mostly between years 1960—1973, but there are specimens from 1879 till 1979. More specimens was collected by J. SCHOU, B. A. POOLE, the others are as follows: E. BEAVER, E. BELL, R. BOHART, M. CAZIER, J. G. CHILLCOTT, FAVREAU, W. GERTSCH, HANSEN, G. F. KNOWLTON, K. V. KROMBEIN, G. KRUEGER, L. LACEY, MERCET, MILLER, A. R. MOLDENKE, W. R. M. NASON, H. NORTMAN, E. ORDWAY, W. C. PETERS, S. PLIMPTON, P. M. RINDGE, J. G. and B. L. ROZEN, A. T. SLOSSON, M. STATHAM, V. L. VESTERBY, VERTREES, WYGODZINSKY. — Mexico = El Salto Dgo 1♂ (Budapest); Meadow Valley 1♀ (Halle).

The single female conserved in Oxford with label "US" perfectly corresponds with SMITH's description, consequently, this specimen is the holotype. The original SMITH's description was completed by TOWNES (1957). He reported about the spreading of this subspecies in North America, it is transcontinental, primary in the Canadian and Transition Zones; in the far West it is largely replaced by the subspecies *stretchii* and *caenosa* and from Alberta to the Dakotas area by the subspecies *rhodomera*. For the variability of the band of tergite 1 can useful see table below:

		Ivory coloured				Yellow coloured			
		♀	♂	♀	♂	♀	♂	♀	♂
Canada		5		7	10	2		1	3
USA		4	3	4		44	2	9	51
Mexico		1			1				
Total:	35 =	10	3	11	11	46	2	10	54 = 112

Although the colour of the holotype is ivory white, the ground colour of the majority of the specimens investigated by me was yellow (— = continuous and — —= interrupted band). A male from Utah (Cedar Breaks) seems to be an intergrade between *fraterna* and *rhodomera* with the femur and tibia largely darker yellowish red outside, while about one-third of the femur basally, also inside, as well as tibia above blackish, except the yellow basal spot. The light colour of body was yellow. On the other hand, among the 4 males from Alta, 1 was very similar to the male from Utah also in colour of the hind leg, nevertheless, the other 2 males conform to *rhodomera* with its entirely reddish-ferruginous hind femur and tibia; notwithstanding, the body of the 3 males not being yellowish but whitish. Finally, 1 male with the nearly

entirely brownish black hind femur and whitish spots on body, tipically agrees with *fraterna*. These differently coloured specimens prove the large variability of this subspecies, similarly to the *maculata maculata* in Palearctic Region.

Distribution: USA (SMITH, 1855). Transcontinental, primarily in the Canadian and Transition Zones (TOWNES, 1957). Mexico.

Ceropales maculata rhodomera TOWNES

Ceropales maculatus rhodomerus TOWNES, 1957, Bull. U. S. natn. Mus., **209:** 239, 243 ♀♂
Ceropales maculata rhodomerus: 1979, KROMBEIN, Cat. Hym. Am. N. Mex., **2:** 1570

Specimens examined: 2♀, 4♂. USA = California = Lower Klamath Lk., Siskiyou Co. on Cirsium 2♂ (New York and Budapest); Newell, Modoc County on Lactuca pulchella 1♂ (New York); Pacific Groove 1♂ (Budapest). — Colorado = Mesa Verde 1♀ (Budapest). — Illinois = Cⁿ DE SAUSSURE (no further data) 1♂ Geneva. — Missouri = Columbia Oct 2 1967 Malaise tr. F. D. PARKER 1♀ (Coll. Wasbauer).

The hind legs of the specimen from the Pacific Groove typically clear yellowish red beyond trochanter with hardly blackish base of femur and tibia apically, as well as with yellow spots at apex of femur and base of tibia outside. The light colour of body also clear yellow.

Distribution: South Alta and Mont. to Dakota occasional individuals from Minnesota, Michigan, New York and Massachussetts (TOWNES, 1957). California, Illinois, Missouri.

Ceropales shizukoae YASUMATSU et ISHIKAWA

Ceropales sizukoae YASUMATSU and ISHIKAWA, 1955, Mushi, **29:** 48 ♀

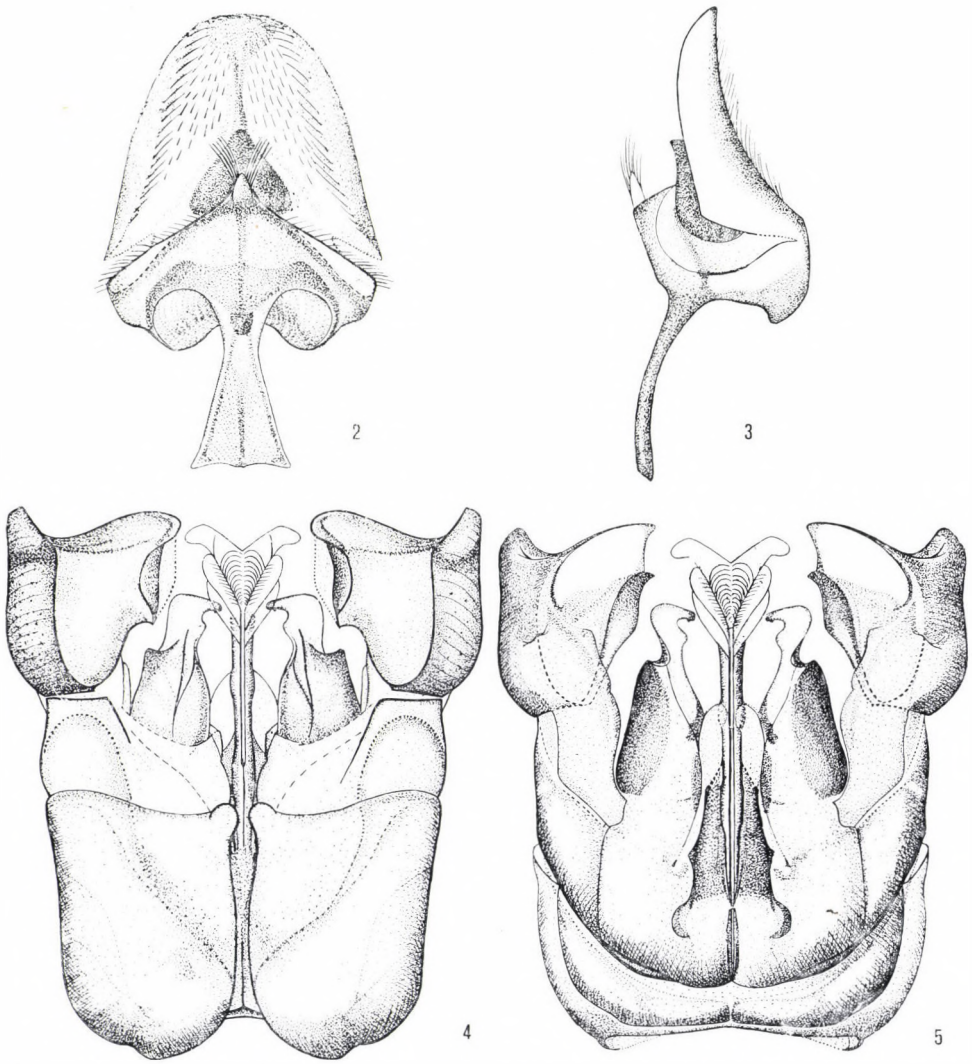
Specimen examined: —

According to the author this species is somewhat allied to *C. latitarsis* HAUPT, 1938 of Mongolia. I compared the description with a paratype of *latitarsis* HAUPT ♀, and because it differs essentially both from *erythropoda* and from *sibirica*, temporarily I insert it close to *maculata turcmenensis* on the basis of its diagnosis (= "frons with dense, distinct micropunctures between antennal sockets and anterior ocellus"). Holotype: "♀, 6. ix. 1949, Karuizawa, Province Shinano, Honshu, ISHIKAWA leg.". Paratype: 3♀. Unfortunately I could not receive the type material neither from Kiushu University, Fukuoka, Hokkaido University, Sapporo, nor from Tokyo Metropolitan University, Tokyo; the type material together with *C. hyrayamae* MATSUMURA et UCHIDA, 1926 and *C. appendiculatus* YASUMATSU, 1939 are probably lost.

Distribution: Japan (YASUMATSU et ISHIKAWA, 1955)

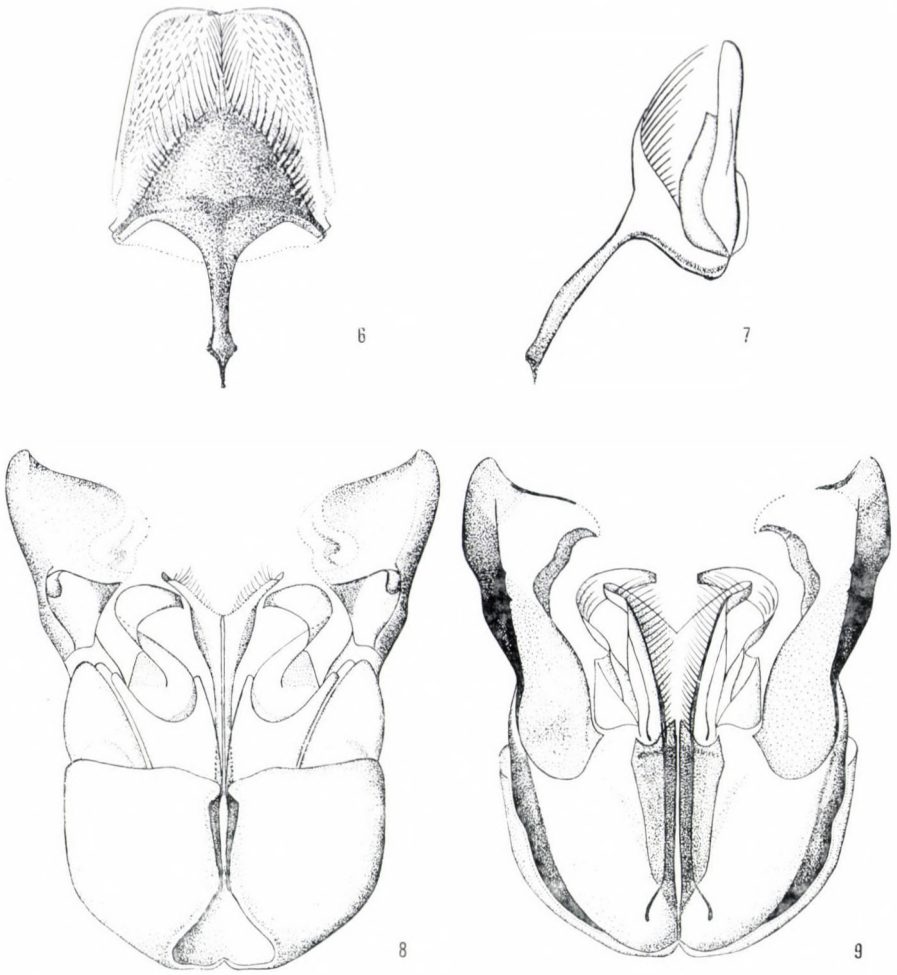
Ceropales erythropoda GUSSAKOVSKIJ

Ceropales erythropoda GUSSAKOVSKIJ, 1926, Ent. Oboz., **20:** 253 ♀♂
Ceropales erythropoda: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 7, 19 ♀♂
Ceropales (*Ceropales*) *erythropodus*: 1977, MÓCZÁR, Annls hist.-nat. Mus. natn. hung., **69:** 253, 256 Taf. I. figs 1—3 ♀♂



Figs 2—5. *Ceropales sibirica* RADOSZKOWSKI, male genitalia; 2—3 = sternite 9, ventral and lateral view; 4—5 = genitalia, dorsal and ventral view (Original)

Ceropales erythropodus: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 127 Fig. 21 ♀♂ (design. of lectotype)
Ceropales anderssoni HAUPT, 1938, Ark. Zool., **30A:** 11, 14 ♀ **syn. n.**
Ceropales mongolicus HAUPT, 1938, Ark. Zool., **30A:** 11, 12 Fig. 4 ♂ **syn. n.**
Ceropales latitarsis HAUPT, 1938, Ark. Zool., **30A:** 11, 13 ♀
Ceropales (*Ceropales*) *latitarsis*: 1967, MÓCZÁR, Acta zool. hung., **13:** 385 fig. 2 ♀
Ceropales latitarsis: 1970, MÓCZÁR, Mitt. zool. Mus. Berl., **46:** 51 ♀
Ceropales (*Ceropales*) *sibiricus*: 1967, MÓCZÁR, Acta zool. hung., **13:** 386 ♀ fig. 3—4, 10, nec RADOSZKOWSKI, 1888
Ceropales sibiricus: 1970, MÓCZÁR, Mitt. zool. Mus. Berl., **46:** 51 ♀
Ceropales sibiricus: 1977, MÓCZÁR, Annls hist.-nat. Mus. natn. hung., **69:** 253, 255 ♀
Ceropales sibiricus: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 123 ♀
Ceropales erythropodus: 1881b, WOLF, Mitt. zool. Mus. Berl., **57:** 210 ♀



Figs 6—9. *Ceropales erythropoda* GUSSAKOVSKIJ, male genitalia; 6—7 = sternite 9, ventral and lateral view; 8—9 = genitalia, dorsal and ventral view (Original)

Specimens examined: 12♀, 22♂. R u s s i a n S S R = Minusinsk, lectotype 1♂ (Leningrad); Balzina, Scit. n. zabajk 1 Aug 1925 VINOGRADOV 1♂ (Leningrad). — T u r k m e n S S R = Turkestan, paralectotype 1♀ (Budapest). — M o n g o l i a = Central aimak: Ulaan chodag 24 Jul 1966 on Urtica, Somon Lun, 1200 m 25 Jul 1966 and Somon Bajanbaraat, 1380 m 13 Jul 1967 Z. KASZAB 3♀, Kerulen, Njulga S 1200 m 3 Jul 1963 Z. KASZAB 2♀ 2♂ (Budapest); Chentej aimak: Ondörchaan 1000 m 30 Jul 1965 Z. KASZAB 1♀ (Budapest); Coibalsan aimak: Somon Galuut, 850 m 17 Aug 1965 Z. KASZAB 1♂ (Budapest); Chövsgöl aimak: Mörön, 1800 m 19 Jun 1968 2♂ and am See Tunamal nuur, Somon Scharga 1950 m 21 Jun—15 Jul 1968 Z. KASZAB 2♀ (Budapest); Mittelgobi aimak, Somon Delgerzogt 1480 m 13—14 Jul 1967 Z. KASZAB 3♂ (Budapest); "Mongoliet", "China ANDERS.", "Holotype" red label, "*latitarsis* HPT. det. HAUPT 1932" with HAUPT's writing 1♀, with the same data, except "Holotype" 2♀ paratypes (Stockholm and Budapest); "Mongoliet", "China ANDERS." "Holotype" red label, "*mongolicus* HPT. det HAUPT 1932" with HAUPT's writing 1♂ holotype (Stockholm) and with the same labels, except "Holotype", 3♂ as well as 3 specimens only with "♂", all 5♂ paratypes (Stockholm) and 1♂ paratype (Hym. Typ. No. 3720 Hung. Nat. Hist. Museum, Budapest); Sarkaj-hunduj Halha 24 Jul 1909 KOZLOV 1♂ and Tola Urga paralectotype of C. erythropodus 1♂ (Budapest); further locality see MÓCZÁR (1977, 1978).

The correct status of the species *latitarsis*, *mongolica*, *erythropoda*, *anderssoni* and *sibirica* was satisfactorily established on the basis of the comparision of the GUSSAKOVSKIJ's and HAUPT's type material of the genitalia, as well as the large and variegated material from Mongolia. The holotype of *latitarsis*, *mongolicus* and the allotype of *latitarsis* was designated by HAUPT. They correspond to the description, therefore only the further specimens with the same locality enumerated by HAUPT in the description may represent the paratypes. The large material refers to the variability of *latitarsis* (MÓCZÁR, 1967) and to the identity of the *sibiricus* MÓCZÁR ♀ and *latitarsis* MÓCZÁR ♀ (1967, 1970, 1977). The recent investigation proved the identity of *erythropoda* ♂ and *mongolicus* ♂, as well as that the *latitarsis* ♂ does not belong here, but to *sibirica* (MÓCZÁR, 1977, ♀ is to be deleted). Namely the genitalia and sternite of the species mentioned before are completely the same (Figs 6—9) and differing from that of *sibirica* (Figs 2—5). The separation of the *erythropoda* + *mongolica* + *latitarsis* ♂ from the *sibirica* is easier on the basis of the abdominal sternite 9 (Figs 6—7), than of the rather complicated structure of the genitalia (Figs 8—9).

GUSSAKOVSKIJ (1926, 1931) does not distinguish specimens with a continuous or interrupted black longitudinal streak on the lower face below antennal sockets. Both of them occur in different shape in the original material, as well as in the large Mongolian material, consequently, it is only a colour variety, and since this is the main character of *anderssoni* HAUPT ♀ it becomes a synonym. Also the further characters of HAUPT's diagnosis of *anderssoni* correspond to the *C. erythropoda* GUSSAKOVSKIJ ♀. Unfortunately neither the holotype nor the allotype are found in Stockholm or in Halle or in Berlin.

D i s t r i b u t i o n : South Siberia, Mongolia, Turkestan (GUSSAKOVSKIJ, 1926). Mongolia, Turkmen, Russian SSR, China (MÓCZÁR, 1978).

Ceropales sibirica RADOSZKOWSKI

Ceropales sibiricus RADOSZKOWSKI, 1888, Bull. Soc. nat. Moscou, **2:** 490 ♀♂
Ceropales sibirica: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 92
Ceropales sibiricus: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 345 ♀♂
Ceropales sibirica: 1926, GUSSAKOVSKIJ, Ent. Oboz., **20:** 254 ♀♂
Ceropales sibirica: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 6, 18 ♀♂
Ceropales sibiricus: 1970, MÓCZÁR, Mitt. Zool. Mus. Berl., **46:** 51 ♂
Ceropales (*Ceropales*) *sibiricus*: 1977, MÓCZÁR, Annls hist.-nat. Mus. natn. hung., **69:** 253, 255 Taf. I. fig. 4 II. 344 ♂
Ceropales sibiricus: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 123 fig. 20 ♂
Ceropales anderssoni HAUPT, 1938, Ark. Zool., **30A:** 11, 14 fig. 7 ♂ **syn. n.**
Ceropales latitarsis HAUPT, 1938, Ark. Zool., **30A:** 11, 13 figs 5—6 ♂
Ceropales (*Ceropales*) *latitarsis*: 1967, MÓCZÁR, Acta zool. hung., **13:** 385 fig. 1 ♀♂
Ceropales latitarsis: 1970, MÓCZÁR, Mitt. zool. Mus. Berl., **46:** 51 ♂
Sph(*ex?*) *crassicornis* PALLAS? nom. in coll (Berlin)

Specimens examined: 48♀, 46♂. R u s s i a n S S R = Enisey Gouv. Imek 14 Jun A. JAKOBSON 1♀ and ? Mandeina 1♀ (Budapest); Minusinsk K. EHNBERG 1♀ 1♂ (Helsinki Mus) and 1♂ (Budapest); "Ost Russland, PALLAS", "5788", "*crassicornis* n. Sph. crass. PALL." 1♀ (Berlin); Saktuj Nertshinsk zabajk 17, 18, 21, 23 Jun 1925 VINIGRADOV 1♀ (Leningrad)

and 1♀ (Budapest); v. Udukunsk, Odenvall 1♀ (Budapest). — Mongolia = "Mongoliet", "China ANDERS.", "*latitarsis* HPT. ♂ det. HAUPT 1932" with HAUPT's writing and "Allotype", as well as with the same labels without "Allotype" 2♂ paratypes (Stockholm and Budapest); Archangaj aimak: Changaj m. Somon Urdtamir, 1620 m 21 Jul 1966 1♀ 3♂ and NO Ogij nur 1350 m 2 Jul 1964 2♂ Z. KASZAB (Budapest); Central aimak: Kerulen Njalga Somon, Burgastin chosu 1200 m 3 Jul 1963, 25♀ 22♂, Somon Bajanbaraat 1380 m 13 Jul 1967 1♀ 1♂, Tosgoni ovoo, Ulan Baator 19—20, 22—24 Jul 1967 1♀, Ulaan chodag, Somon Öndörschireet 24 Jul 1966 on Urtica 5♀ 3♂ and Zuun-Chara 850 m 8 Jul 1964 2♂, all Z. KASZAB (Budapest); Ceorgol-hairhan Halha 23 Jul 1909 KOZLOV 1♀ (Budapest); Chentej aimak, Öndörchaan 30 Jul 1965 1♀ 2♂ Z. KASZAB (Budapest); Chövsgöl aimak, Mörön 1800 m 19 Jun 1968 Z. KASZAB 1♀ (published as *C. rubripes* MÓCZÁR 1977: 256) and the same locality and date 2♀ (Budapest); Lamingegen Hangaj 18 Jul 1926 Kiritsenko 1♂ and Mittelgobi aimak, Somon Delgercogt 1480 13—14 Jul 1967 Z. KASZAB 1♀ 2♂ (Budapest); Ulan-Bator Jun 1964 Muche 2♂ (Dresden and Budapest); Uos aimak, Somon Baruunturuun 1350 m 24 Jun 1968 Z. KASZAB 1♀ 2♂ (Budapest); Zavchan aimak: Choit chunch, ONO Telmen nuur 2150 m 13 Jul 1968 Z. KASZAB 1♀ (Budapest).

On the basis of the det. labels of the author studying the original material of *latitarsis* HAUPT, these males are paratypes. They are synonym of *C. sibirica* RADOSZKOWSKI owing to the similar morphological characters and genitalia (see the text by *erythropoda*). The type of *anderssoni* HAUPT as far as we know is lost, also seems to be the synonym of *sibirica* ♂ on the basis of HAUPT's description. The male of *sibirica* is easily separable from the other males owing to the unusually widened fore tarsi and to sternite 9 (Figs 2—3) with a basal small tuft of hairs and with a strongly convergent apical part. On the other hand, the main differences were given in the key.

Interestingly, some dark reddish brown spots occur on tergite 1 laterally, connecting the lateral streaks on the disc, similarly to *maculata* and *fraterna*. There are rarely also small reddish spots on the propodeum and episternum both on some *sibirica* and on same *erythropoda* specimens. For further variability of *sibirica* see earlier (MÓCZÁR, 1978).

Distribution: Siberia (RADOSZKOWSKI, 1888). Sib. merid., Mongolia (GUSSAKOVSKIJ, 1931 and MÓCZÁR, 1977, 1978).

Ceropales rubripes MÓCZÁR

Ceropales (*Ceropales*) *rubripes* MÓCZÁR, 1967, Acta zool. hung., **13:** 390 figs 7—8, 11 ♀
Ceropales rubripes: 1981b, WOLF, Mitt. zool. Mus. Berl. **57:** 210 ♀

Specimens examined: 2♀. Mongolia = Cojbalsan aimak, holotype 1♀ and N. Mongolei, LEDER (*C. sibiricus* RAD. det. KOHL) 1♀ (published as *C. erythropodus* GUSSAKOVSKIJ by MÓCZÁR, 1978: 129) (Budapest).

Distribution: Mongolia (MÓCZÁR, 1967).

Ceropales magnifica GUSSAKOVSKIJ

Ceropales magnifica GUSSAKOVSKIJ, 1926, Ent. Oboz., **20:** 252 ♂
Ceropales magnifica: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 22 ♂
Ceropales magnificus: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 122 Figs 12—15 ♂
Ceropales magnifica: 1985, LELEJ, Taxon. Ecol. Far-E. Arthrop.: 72, 73 ♀♂

Specimen examined: 1♂. Russian SSR = Manchuria 1 ♂ holotype (Leningrad).

According to LELEJ (1985) the length of this species is (♀♂) 8—11 mm and the female differs cheifly from *m. maculata* by the elongated apex of the last abdominal segment, which is twice as long as its average height, thus it is shorter than its height on *m. maculata*, in lateral view.

Distribution: Russian SSR: Manchuria (GUSSAKOVSKIJ, 1926). District of Khabarovsk and NE China (LELEJ, 1985).

Ceropales solskii RADOSZKOWSKI

Ceropales Solskii RADOSZKOWSKI, 1877, in FEDCENKO: Putes. Turkes. 14 II. Zoogeogr. Isl. V. 3 Spheg.: 13 Tab. VI. fig. 8 ♂
Ceropales Solskii: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 92
Ceropales solskii: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 345 ♂
Ceropales solskyi: 1926, GUSSAKOVSKIJ, Ent. Oboz., **20:** 252 ♀
Ceropales solskyi: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 6, 17 ♀♂
Ceropales solskyi: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 126 ♀♂

Specimens examined: 1♀, 2♂. Tadzhik SSR = Kalai-Vomar 14 Jul 1915 1♀ and Rujdasty 40 km N Stalinb. 4 Sep 1937 2♂ (Budapest).

Distribution: Uzbek SSR (RADOSZKOWSKI, 1877). Tadzhik SSR (GUSSAKOVSKIJ, 1931; MÓCZÁR, 1978).

Ceropales trjapitzini MÓCZÁR

Ceropales trjapitzini MÓCZÁR, 1978, Acta biol. Szeged., **24:** 127 figs 22—25 ♀♂

Specimens examined: 1♀, 2♂. Tadzhik SSR = Rujdasty, 40 km N Stalinb. 1♀ holotype (Leningrad) and with the same data 1♂ paratype (Budapest). — China = Tatschian-sy, Ch. Sep 1♂ (Budapest).

A male from China probably belongs to this species with its less coloured abdomen: band of tergite 1 broadly interrupted, 2 with smaller and only laterally broader band, 3 black, 4—7 only with smaller medial streaks. Legs largely dark brownish ferruginous, not black (the specimen was collected in 1887).

Distribution: Tadzhik SSR (MÓCZÁR, 1978). China.

The albicincta-group

Body usually largely black, the light colour yellow or white extending over a larger surface, usually over face, pronotum, often over larger part of propodeum and abdomen; antenna, body rarely partly ferruginous. Legs usually yellowish red, ferruginous with more or less yellow and black spots. Wings generally hyaline, hardly greyish infuscated. Hairs conspicuously finer, usu-

ally silvery and covering not only the sculpture of propodeum, but also the face; abdomen only weakly shining owing to the very fine toment on the fresh specimens. Sculpture, especially propodeum, mesonotum, lateral side of thorax remarkably more finely sculptured compared with the *maculata*-group. Frons with distinct and larger, sometimes with dense punctures, only rarely finer. Propodeum mostly rarely flat and only moderately convex basally. Last abdominal segments compressed laterally and uniformly pointed apically (♀). Sternite 9 remarkably deeply excised apically (♂). Legs, as well as claws of fore and middle tarsi normal with minute subapical tooth, except the inner tooth of fore leg (♂), which being asymmetric, deeply bifid and the last tarsal joint deeply emarginated inside close to it, similarly to the *maculata*-group.

The relatively more convex propodeum of *altaica* F. MORAWITZ compared with the other species of this group, the lack (abraded) of the silky hairs of propodeum and mainly the want of the last abdominal segments (female unknown) queries the relationship of *altaica* whether it belongs here or near to *solskii* in the *maculata*-group.

This group includes the species *altaica*, *albicincta albicincta*, *a. seraxensis*, *a. wolfi*, *b. bicoloripes*, *b. dorni* sp. n., *tectigera*, *flavicornis*, *bipartita bipartita*, *b. flava*, *b. mediterranea* and *b. occidentalis* partly widely distributed in the South Palearctic, from Morocco to Kazakh SSR and Mongolia, also in Japan, partly only sporadically known round the Mediterranean region.

The list of collections whose material were studied is given under the *maculata* group.

Key of the species (♀♂)

1 Pronotum often, also propodeum entirely or largely yellow or pale yellow, yellow coxa largely, trochanter and tarsi partly ferruginous, somewhat darker but not infuscated. Some tergites or thorax partly often ferruginous. Flagellum entirely black or pale ferruginous, at most slightly infuscated 2

— Pronotum, propodeum black, at most with broad yellow bands or spots, hind legs often partly darker, brownish or blackish infuscated, body only exceptionally (see *flavicornis*) ferruginous. Flagellum largely red, ferruginous or more or less black above. Coxa, trochanter at least basally black 3

2 Flagellum entirely black, scape and pedicel yellow. Propodeum with a remarkable longitudinal ridge between spiracle and lateral corner. Propodeum more convex in one-third length of propodeum. Body remarkable rich yellow or lemon yellow coloured with largely ferruginous legs; whole lower face, pronotum entirely, scutellum, postscutellum and propodeum largely, broad bands on tergites 1—2, 4—7 (on 3 rarely with 3 irregular spots), coxae nearly entirely, sternites 1—2 and 5 each with two spots, mesonotum with one, episternum with two small spots, a spot behind the basis of hind wings, yellow. Trochanters — tarsi nearly entirely ferruginous. 7.2—10 mm ..... **altaica** F. MORAWITZ ♂

— Flagellum, also scape and pedicel entirely pale ferruginous, at most slightly infuscated above. Propodeum rounded laterally and only moderately convex in one fourth length. Body usually pale yellow nearly entirely so, when darker yellow or the yellow spots reduced, the rest is black and especially so first tergites, somewhat thorax more or less, ferruginous. Large yellow spots extending usually from the ocular sinus towards the middle of frons, inner margins divergent above. Large mesonotal spot ending often in front in three lines. All tergites and often sternites with broad bands. Trochanters-tarsi largely yellow, at least

hind tibia—tarsi ferruginous. Last sternites strongly compressed laterally and gradually narrowed apically with a rather sharp pointed apex. (♀). 7.2—9.1 mm (6 mm, RADOSZKOWSKI) ..... **albicincta seraxensis** RADOSZKOWSKI

3 Light colour, especially on tergites, ivory white, at most yellowish white; legs and flagellum ferruginous, at most lower or partly, yellow, yellowish red, above often black 4
— Light colour of body yellow or orange, not ivory white; flagellum ferruginous, partly yellow, again with darker infuscation above 7

4 Hind tibia and tarsi ferruginous or often tibia apically or along upper side and tarsi largely brownish infuscated. Mandible, lower face largely white, rarely with black spots. Frons without a longitudinal sulcus and distinctly, rather densely, mesonotum also deeply punctured 5
— Hind tibia and tarsi entirely black, at least dark brownish. Mandible usually black basally, lower face with more or less black spotted (♀). Frons with a more or less shallow longitudinal sulcus. Frons hardly, mesonotum more finely punctured 6

5 Hind tibia usually largely or at least above, tarsi mostly entirely rather dark brownish infuscated, only more rarely (South East) not or hardly infuscated. Hind femur entirely, middle, excepting a small apical yellow spot, ferruginous (♀). Mandible and supraclypeal area usually white, only rarely (South East) with black spot. Episternum black, at most with a smaller white spot. Upper side of flagellum black (♀♂), lower side yellowish red with sharp limit. Posterior bands of tergites narrower than on next subspecies or sometimes interrupted medially, also the first band twice excised, anterior margins of the further bands differently developed. Outer side of fore and middle tibia, metatarsi sometimes with yellow spots. 4.7—8.5, rarely 11 mm ..... **albicincta albicincta** (ROSSI)
— Hind tibia hardly or at most apically infuscated, tarsi at most light brownish. Nearly the whole outer side of hind femora, apical half of middle femora outside yellowish white (♀). Mandible basally (only ♂), and two large triangular spots below antennae black (♀♂). Episternum with two (♀) or one large white spot (♂). Flagellum ferruginous, upper side entirely black (♀) or only proximal, joints partly infuscated (♂). All tergites with broader ivory white bands, the last one with spots, band 1 broadly semicircularly emarginate (♀♂), 2—4 narrowly excised laterally (♀) or 2—4 narrower medially than laterally (♂). ♀ 10.5, ♂ 8.3—9 mm ..... **albicincta wolfi** MÓCZÁR

6 Clypeus, supraclypeal area largely yellowish white or white (♂), at most with small black spots on clypeus and below antennae (♀). Mandible black basally (♀) or only on lower margin (♂). Posterior bands of tergites usually broad, especially laterally (♀), always narrowed medially, often twice emarginated before the lateral widening, interrupted medially on ♂. Especially fore coxae also reddish (♀), all coxae with larger white spots or streaks (♀♂), trochanters only basally (♀) or largely (♂) black, rest as legs ferruginous, except the hind brownish black tibia and tarsi. Light spots of body as before, as well as on mesonotum (only ♀), on scutellum and on episternum (only ♀). Frontal sulcus shallow medially (♂) or hardly distinct (♀). Propodeum granulate, but clathrate posteriorly in the middle. 6.5—8 mm ..... **bicoloripes bicoloripes** MÓCZÁR
— Clypeus, mandible, supraclypeal area largely black, only inner eye margin and lateral part of clypeus white. Tergites with white, undulate margin and narrow bands posteriorly, latter on tergite 1 interrupted, 5—6 with medial spots. Coxae, trochanters, hind tibia and tarsi largely black, rest ferruginous, trochanters and coxae with white spots apically, as well as white postscutellum, tegula and pronotal margins posteriorly and partly laterally. Labrum white, pale reddish translucent basally. Frontal sulcus sharply distinct. Propodeum uniformly granulate. 7.2 mm ..... **bicoloripes dorni** ssp. n. ♀

7 Lower face with black spots or entirely yellow, then tergite 4 black, without yellow. Surface of propodeum sometimes rather rough 8
— Lower face entirely yellow, all tergites with yellow bands or the last one with medial spots. Surface of propodeum granulate, never rough 9

8 Tergite 7 convex. Tergite 1 lighter, 2 partly brownish ferruginous or black, 1 dark reddish translucent medially. All tergites with rather narrow yellow bands, 1 semicircularly broadened in front laterally and broadly excised in a deep obtuse angle medially. Propodeum dull, with coarse granulate sculpture without distinct roughness. Postnotum two-thirds as long as postscutellum medially. Antennae except sometimes the upper side

of joints 1—2 and entire legs, except coxae basally ferruginous. Spot of ocular sinus rather broad or lanceolate. Hind margin of pronotum broadly yellow, laterally ferruginous, in front, scutellum, postscutellum, tegulae and lateral spots of propodeum yellow. 8.5—9 mm ..... **flavicornis** SPINOLA ♂

— Tergite 7 remarkably roof-shaped with a medial ridge. Tergites 1—2 black, bands of tergites broader and lemon yellow, except the black tergite 5, tergites 6—7 light yellow, sometimes also tergite 4 only with two lateral spots. Propodeum finely coriaceous, with silky sheen. Postnotum only half as long as postscutellum. Whole antenna entirely yellowish—pale ferruginous, only joint 2 somewhat infuscated above. Coxae and trochanters black basally, rest of legs nearly entirely yellow on outer side but ferruginous inside, hind tibia yellowish ferruginous. Yellow spots as in *flavicornis*, sometimes larger, even pronotum nearly entirely yellow. 9.1—10 mm ..... **tectigera** sp. n. ♂

9 Trochanters entirely black, except the narrow yellow apical circle, also basis of femora black, rest yellow, lower side of coxae largely yellow 10

— Trochanters only basally black, rest ferruginous, partly with yellow circle apically. Spot of ocular sinus always lanceolate, inner side diverging towards ocelli, at least parallel 11

10 Yellow spots of ocular sinus extending towards the middle of frons, usually touching each other or inner side at least convergent above. At most about one quarter of femora black, or reddish brown basally, three-quarters part yellow proximally, outside and largely ferruginous inside. Large yellow spots of propodeum extending also to lateral declivous part, lower margin here often pointed downwards. Pronotum with yellow band usually also laterally. Hind tibia and tarsi ferruginous, only last tarsal joint darker brown. Flagellum ferruginous entirely (♂) or partly and hardly infuscated above (♀). All tergites with broad yellow bands. ♀ 8.2—10.5, ♂ 7—9 mm ..... **bipartita bipartita** HAUPT

— Yellow spots of ocular sinus lanceolate, at most moderately extending towards the middle of frons or inner side divergent or at least parallel above antennae (♀♂). At least half or one-third part of femora black, rest yellow. Lower lateral margin of yellow spot of propodeum straight. Lateral margin of propodeum not coloured. Hind tibia and tarsi ferruginous (♀) or brownish (♂). Flagellum ferruginous, upper side sometimes more or less infuscated (♀♂). ♀ 6.5—8.6, ♂ 5.6—7.2 mm ..... **bipartita flava** ssp. n.

11 Flagellum ferruginous or upper side usually hardly infuscated. Pronotum rarely largely yellow. Femora nearly entirely yellow outside and ferruginous basally and entirely inside. Tibia, tarsus yellowish red, only last tarsal joint of hind legs brown. Bands of tergites 1—6 broad, 1 with a narrow black excision (♀) or a broader emargination (♂) medially. Lateral margin of pronotum at most narrowly yellow. Lower lateral margin of propodeal spot straight below. ♀ 8.3—10.5, ♂ 7—9.1 mm ..... **bipartita mediterranea** ssp. n.

— Flagellum black on upper side and sharply margined from the lower pale ferruginous side. Pronotum with rather broader posterior yellow margin. Femora nearly entirely ferruginous with small yellow spots apically and only rarely yellow rectangularly tinted outside. Hind tibia at least posteriorly and inside, tarsal joints (1)2—5, at least above, brownish infuscated. Bands of tergites usually narrower. Lateral margin of pronotum usually black or with a narrow yellow streak. 7—8.3 mm ..... **bipartita occidentalis** ssp. n. ♂

Ceropales altaica F. MORAWITZ

Ceropales altaica F. MORAWITZ, 1888, Trudy russk. ent. Obshch., **22:** 272 ♂
Ceropales altaica: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 90
Ceropales altaicus: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 340 ♂
Ceropales altaica: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 20 ♂
Ceropales altaicus: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 123, figs 16—19 ♂

Specimen examined: Kazakh SSR = Sentash-Piket 1♂ paralectotype (Budapest).

Distribution: Kazakh SSR (F. MORAWITZ, 1888).

Ceropales albicincta albicincta (ROSSI)

Evania albicincta ROSSI, 1790, Faun. Etrusca, **2:** 57 T. 6 fig. 8
Ceropales fasciata FABRICIUS, 1804, Syst. Piez: 186 (= *fasciator* DALLA TORRE syn. by HAUPT, 1927)

Evania histrio FABRICIUS, 1798, Suppl. Ent. Syst.: 241
Ceropales albicincta: 1881, KOHL, Ent. Nachr., **7:** 55
Ceropales histrio var. *trinotata* TOURNIER, 1889, Ent. Genève, **1:** 38 ♂ (var. individ. by DE BEAUMONT, 1947; syn. by WAHIS, 1986)
Ceropales histrio: 1891, F. MORAWITZ, Trudy russk. ent. Obshch., **25:** 186
Ceropales fasciator: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 91
Ceropales fasciator: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 342
Ceropales albicincta: 1922, ENSLIN, Arch. Naturgesch., **88:** 247 (on Seseli annum) ♀
Ceropales albicincta: 1925, BERLAND, Hym. vesp., **1:** 220, 221 fig. 443 ♀♂
Ceropales albicincta: 1927, HAUPT, D. ent. Z. (Beiheft): 297, 301 ♀♂
Ceropales albicincta: 1931: GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 5, 13 ♀♂
Ceropales albicincta: 1934, BALLES, Mitt. bad. Landesv. Naturk., **3:** 34 (on Daucus car.) ♀
Ceropales albicincta: 1941, CEBALLOS, Himen. esp.: 310 ♀ f. 227
Ceropales albicinctus var.: 1944, GUIGLIA, Annali Mus. civ. Stor. nat. Giocomo Doria, **62:** 145 ♀♂
Ceropales albicinctus: 1947, DE BEAUMONT, Mitt. schweiz. ent. Ges., **20:** 506, 515 figs 5, 16 ♀♂
Ceropales albicinctus: 1954, SCHNEID, Naturforsch. Ges. Bamberg, **34:** 37
Ceropales albicinctus: 1954: MÓCZÁR, Fol. ent. hung. (S. n.) **7:** 149 ♀♂
Ceropales albicincta: 1956, MÓCZÁR, Fauna Hung., **13** (5): 76 ♀♂
Ceropales albicincta: 1956, MOREL, NOUVEL and RIBAUD, Bull. Soc. Hist. nat. Toulouse, **91:** 340
Ceropales albicinctus: 1956, CEBALLOS, DUSMET y ALONSO and JUNCO y REYES, Trab. Inst. esp.: 355
Ceropales albicinctus: 1963, PRIESNER, Boll. Inst. Ent. Univ. Bologna, **26:** 50 ♀♂
Ceropales albicinctus: 1963, WAHIS, Bull. Annls Soc. r. ent. Belg., **99:** 85
Ceropales albicinctus: 1963, WAHIS, Fragm. Balcan., **4:** 195 (on Thapsia villosa) ♀♂
Ceropales albicinctus: 1963, LEHRER and SCUTARU, Bull. Annls Soc. r. ent. Belg., **99:** 271
Ceropales (*Ceropales*) *albicinctus albicinctus*: 1965, WOLF, Nachr. naturw. Mus. Aschaffenb., **72:** 37 ♀♂
Ceropales albicinctus albicinctus: 1966, WOLF, Boll. Mus. civ. Stor. nat. Venezia, **17:** 51 ♀♂
Ceropales albicinctus: 1969, PRIESNER, Naturkundliches J. Stadt Linz: 115, 119
Ceropales albicinctus albicinctus: 1971, WOLF, Acta faun. ent. Mus. natn. Pragae Suppl., **3:** 59 ♀♂
Ceropales (*Ceropales*) *albicinctus*: 1972, WOLF, Ins. Helv. Fauna 5 Hym.: 168, 169 figs 478, 489
Ceropales albicinctus albicinctus: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 129 ♀♂
Ceropales albicinctus: 1981b, WOLF, Mitt. zool. Mus. Berl., **57:** 210 ♀
Ceropales (*Ceropales*) *albicincta*: 1986, WAHIS, Notes faun. Gembloux, **12:** 34

Specimens examined: 70♀, 58♂. West Germany = Saaletal, Goseck, BLÜTHGEN 1♂ and Thüring. SCHMIED. 1♂ (Berlin). — Switzerland = Follateres: 23, 27 Jun 1933 2♂ (Lausanne and Budapest), 7, 19, 30 Jul 1935, 3♀ 1♂ and Aug 1936 5♀ 3♂ P. BOVEY (Lausanne); Martigny: 21—23 Jul 1930 3♀ (2♀ Lausanne, 1♀ Budapest), 6—29 Jun 1934 4♀ 1♂, 23 Jul 1935 3♀ 4♂, 19, 29 Jun, 4, 18 Jul 1936 4♀ 12♂ and 25—30 Jun 1943 2♀ DE BEAUMONT and R. MATTLEY (Lausanne); "Peney VII. 74", "Peney Coll. TOURNIER", "Typus", "*Ceropales albicincta* ROSSI v. *trinolata* TOURN. TOURNIER det." 1♂ holotype (Geneva); Sionnet 24 Aug 1930 DE BEAUMONT 1♀ (Lausanne). — Czechoslovakia = Martinov 7 Aug 1943 SNOFLÁK 1♀ (Budapest); Slov. merid. Aug 1961 KOCOUREK 1♀ (Budapest). — Hungary = Kapuvár 8—9 Jul 1953 BAJÁRI 1♀, Kiskunfélegyháza Jul 1904 M. MÓCZÁR 1♂ Párkány 1♂, Újvidék 8 Aug 1944 M. MÓCZÁR 1♂ (all in Budapest). — Yugoslavia = Baska 3—17 Jul 1965 J. HEINRICH 1♀ (Frankfurt); Corfu PAGANETTI 1♂ (Budapest); Krk MADER 1♀ 1♂ (Lausanne); Saloniki 4 Jul 1933 PADUSCHIN-KATTINGER 1♂ (Berlin). — Roumania = Agigea 20 Jun, 7, 8 Sep 1968 NAGY 3♀ 1♂, Caraorman 25 Aug 1968 NAGY 1♀ (Budapest); Transsylvania: B. Felix 10 Aug 1964 1♀, B. Herculane 10 Jul 1963 NAGY 1♂, Cluj 9 Jun 1963 1♀ and Oradea 13, 21 Jul 1963, 1 Aug 1966 NAGY 3♀ (Budapest). — Greece = Tolon 6 May 1966 W. SCHLÄFLE 1♀ (Leiden). — Italy = Aetna Südhang, Sicilia Jun 1♀ (Coll. Schwarz); "Italien", "Histrio F. *Evania albicincta* ROSSI Ital", "5777", "Typus" red label, "*Ceropales albicinctus* (ROSSI) ♂ H. WOLF det 1983" and another male only with "Italien" and "5777" 2♂ (Berlin); Asti, FREY 1♀ (Budapest); Cattolica 20 Aug 1959 GRÜNWALDT 1♀ (Coll. Wolf); Mte Manfre, Sona 13 Jul 1949 HAMAN 1♀ (Coll. Schwarz); Piemont St Martin b. Aosta 10—11 Aug 1925 S. G. BISCHOFF 1♂ (Berlin); Riccione 8 Jun 1964 W. HELLÉN 1♀ 2♂ (Helsinki), 1♀ 1♂ (Budapest); Sabadia 40 km S of Roma, Lazio 6 Aug 1939 1♀ (Coll. Mochi). — Spain = Algeciras, SCHMIEDEKNECHT 1♂ (Frankfurt); Andalusia, Staudinger 1♀ (Budapest); Balenyá 1 Aug 1891 SAUNDERS 2♀ (Barcelona); Béjar 960 m Prov. Salamanca Jul

1954 1♀ and Escorial MERCET 1♀ (Madrid); La Gamga 15 Aug 1900 1♀ (Barcelona); Los Molinos MERCET 1♀ and Madrid G. MERCET and DUSMET 9♀, Maria, DUSMET 1♀, Sierra-Morena 26 May 1927 A. SEYRIG 1♀, Tiermas Aug 1926 DUSMET 1♀ and Valle de Ocon F. Camara 1♀ (Madrid). — Russian S S R = Petrovskoe 1♂; Sarepta 16—20 Aug 1928 MORAWITZ 1♀, 1♂; Sochi 1♀ 1♂ (Budapest). — Ukrainian S S R = Tauria 2♂ (Budapest). — Armenian S S R = Caucasus 1♂ and Martunyi Sep 1927 1♂ (Budapest). — Kazakh S S R = Uralska 1♂ (Budapest). — Turkey = Bafra 12 Aug 1972 K. WARNCKE 1♀ (Coll. Wolf); Gürün 6 Jun 1970 GUSENLEITNER 1♂ and Konia 5 Sep 1911 NÁDAY (Budapest), Konia 4 Aug 1951 BYTINSKI-SALZ 1♂ (Tel Aviv); Meram 8 Sep 1911 NÁDAY 1♂ (Budapest); Mut 8 Jun 1968 J. GUSENLEITNER 2♂ (Coll. Gusenleitner) and 1♂ leg KUSDAS (Budapest); Sille 6 Sep 1911 NÁDAY 1♀ and Stambul HORVÁTH 1♀ (Budapest). — Israel = Nir'Am 26 Jun 1946 1♂ (Tel Aviv). — Lebanon = Beirut Inchak 25 May 1947 BYTINSKI-SALZ 1♂ (Tel Aviv). — Jordan = Jericho (= El-Riha) SCHMIEDKN. 1♂ (Wien). — Iran = Elburs, Chehor 2000 m 31 Jul G. HEINRICH 1♂ (Berlin).

According to FABRICIUS (1798) *C. histrio* "Habitat Halae Saxonum Dom. Hybner", consequently, the two males from "Italien" with the type label represent the type material only in that case, if "Halae" is the same as Halesa = Halaesa, an Sicilian town. Then the first specimen with "Typus" label is the holotype, the other the paratype of *C. histrio*. But Halae Saxonum may be more probable Halle/Saale (GDR) and then it is not the original material. Certainly these specimens conform with the original diagnosis of *histrio* and with the *albicincta* specimen from Italy (Riccione) with yellowish white mandibel and abdominal bands, but differs from it by the moderately infuscated hind tibia and tarsi also the border on the upper black and lower yellowish red side of flagellum posteriorly not so sharp.

				Mandible w. black spot	Black sp. below antenn.	Coxae partly reddish	Tibia 3 tarsi 3 — not inf. + inf.	Bands of tergites interrupt.
Czechosl	= Martinov		♀	+	+	+	—	—
Rom	= B. Hercul.		♂	+	—	—	+	1
Turk	= Bafra		♀	—	—	±	±	—
	Konia		♂	+	+	—	—	—
	Meram		♂	+	+	—	+	—
	Mut		3♂	+	+	—	±	—
	Gürün		♂	+	+	—	+	—
Greece	= Tolon		♀	+	+	+	—	—
It	= histrio typ.		♂	—	—	—	±	—
RSSR	= Sarepta		♀	—	—	+	—	—
	Sarepta		♂	+	—	±	+	+
	Petrovskoe		♂	+	—	+	—	—
	Sochi		♀	+	+	—	—	—
	Sochi		♂	+	+	—	+	+
Ukr. SSR	= Tauria		♂	+	—	—	+	—
	Tauria		♂	+	+	±	+	+
Arm. SSR	= Martu.		♂	+	—	±	—	—
	Caucasus		♂	+	—	+	+	+
Kaz. SSR	= Uralsk.		♂	+	—	+	—	—
Jor	= Jericho		♂	+	+	—	+	—

DE BEAUMONT (1947) detailed also the colour of this species. Concerning to the variation, further data were published before (MÓCZÁR, 1978) on the basis of about hundred specimens distributed from Switzerland to the far East Asia (Kazakh SSR). Among the specimens listed before some 60 specimens were found with typical colour: yellowish white mandible, ivory bands on abdominal tergites, infuscated hind tibia, blackish hind tarsi and with the sharply limited black upper and yellowish red lower side of flagellum. The further specimens vary in the characters, see p. 145.

The mandible of one male (Elburs) not only with more or less black spot, but also entirely black, except the red teeth; the light colour of body ivory white. On the other hand, specimens with ivory white or yellowish white colour occur both in Middle Europe and in the southern territories. The flagellum, exceptionally only partly black above, in this specimen the black triangular spots are below the antennae. Finally, the pronotum and propodeum laterally exceptionally partly ferruginous on one male (Sarepta). The above enumerated colour variations occur in different degree in the South and in the South East territories.

D i s t r i b u t i o n : Central and partly South Europe, Russian, Ukrainian, Georgian, Armenian, Azerbaidzhan and Kazakh SSR, Japan (MÓCZÁR, 1978). Roumania (LEHRER and SCUTARU, 1963), Turkey (WOLF, 1966), Mongolia (WOLF, 1981). Israel, Jordan, Lebanon and North Iran.

Ceropales albicincta seraxensis RADOSZKOWSKI

Ceropales histrio var. *seraxensis* RADOSZKOWSKI, 1893, Trudy russk. ent. Obshch., **27:** 61 ♀
Ceropales albicinctus var. *seraxensis*: DALLA TORRE, 1897, Cat. Hym. 8 Fossor.: 340 ♀
Ceropales albicincta seraxensis: 1931, GUSSAKOVSKIJ, Ezheg. zool. Mus., **32:** 5, 14 ♀♂
Ceropales albicinctus seraxensis: 1947, DE BEAUMONT, Mitt. schweiz. ent. Ges., **20:** 517
Ceropales albicinctus seraxensis: 1953, GUIGLIA and JUNCO y REYES, Annali Mus. civ. Stor. nat. Giacomo Doria, **66:** 213 ♀♂
Ceropales albicinctus seraxensis: 1970, WOLF and DINIZ, Mem. Estud. Mus. zool. Univ. Coimbra, No. 311: 18 ♀
Ceropales (*Ceropales*) *albicinctus seraxensis*: 1972, WOLF, Ins. Helv. Fauna 5 Hym.: 169 ♀♂
Ceropales albicinctus seraxensis: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 134 figs 35—37 ♀♂

Specimens examined: 10♀, 1♂. M o r o c c o = Moulay ain Djenane 24 Jun 1928 R. BENOIT 1♀ (Paris). — A l g e r i a = Biskra 9 Jul 1904 DR GULDE 1♀ (Frankfurt), 1♀ (Coll. Wolf) and 1—22 Jun 1948 J. DE BEAUMONT 4♀ (Lausanne), 2♀ (Budapest). — T u r k e y = URFA 3 Jun 1968 J. GUSENLEITNER 1♂ (Coll. Gusenleitner). — I r a n = Teher. Kamalabad 28 Aug 1955 F. SCHMID 1♀ (Lausanne).

The male from Turkey and the female from Algeria represent the typical rich coloured form of this subspecies. It was published by DE BEAUMONT (1947) from France, Sicily, Algeria and Morocco. Only the specimen from Algeria proved to be ssp. *seraxensis*, the further specimens belong to the subspecies *bipartita occidentalis*, *b. flava* and *b. mediterranea* as given here later. The specimen originating from Sabir Abad (Azerbaidzhan SSR) published before

(MÓCZÁR, 1978) proved to be *C. tectigera* sp. n. near to *C. flavicornis* SPINOLA, the differences are given in the key.

Distribution: Serax (RADOSZKOWSKI, 1893). Turkestania, Transkaspia et Persia boreali (GUSSAKOVSKI, 1931). Ukrainian, Uzbek, Tadzhik, East Kazakh and Turkmen SSR, Iran (MÓCZÁR, 1978). Morocoo, Turkey.

Ceropales albicincta wolfi MÓCZÁR ♂ nov.

Ceropales albicinctus wolfi MÓCZÁR, 1978, Acta biol. Szeged., **24:** 130 figs 26—30 ♀

Specimens examined: 2♀, 3♂. Greece = "Rhodos", "Hedenb." 1♂ nov. (Budapest). — Spain = Anatolien, Pozanti 1♀ holotype (Budapest); Erdschias Asia min. PENTHER 1♂ (as *C. albicinctus* ROSSI published by MÓCZÁR, 1978) (Wien); Sevilla 29 Jul 1950 1♀ (Budapest). — Armenian SSR = Martuny 19 Sep 1927 1♂ (Budapest).

♂. — Length 8.3—9 mm. Similar to *C. a. albicincta*, but differs chiefly from it as follows: also the upper side of flagellum ferruginous, only proximal joints medially and more apically brownish infuscated. Basal part of mandible broadly black, supraclypeal area below antennae usually with two large and triangular black spots, rarely (Martunyi) only with small black spots. Hind tibia nearly entirely ferruginous, at most apically or here only the inside, also hind tarsi, light brownish infuscated. Hind femur largely ferruginous, with yellow apical spot, outer side mostly partly indistinctly reddish-yellow or with a yellow line. Trochanters largely black, narrowly ferruginous and yellow only apically. Episternum with a larger white spot. All tergites with broader white posterior bands, tergite 7 nearly entirely white.

The specimen from Sevilla (♀) seems to be an intermediate form between the nominate and the subspecies *wolfi*. Lower face without black spots, abdominal bands as on ssp. *wolfi*; hind legs slightly darker brown, femora with narrower yellow spots and the white spot of episternum is also smaller than on ssp. *wolfi*, but tergite 1 medially, coxae partly ferruginous, which colour developed exceptionally on nominate species (Sarepta).

Distribution: Turkey (MÓCZÁR, 1978). Greece, Spain and Armenian SSR.

Ceropales bicoloripes bicoloripes MÓCZÁR

Ceropales (*Ceropales*) *bicoloripes* MÓCZÁR, 1967, Acta zool. hung., **13:** 387 figs 5—6 ♀
Ceropales bicoloripes: 1978, MÓCZÁR, Acta biol. Szeged., **24:** 117 ♀, ♂ **new**
Ceropales bicoloripes: 1985, LELEJ, Taxon. Ecology Far-E. Arthrop.: 71, 73

Specimens examined: 4♀, 1♂. Greece = Tolon 6 May 1966 W. SCHLAEFFLE 1♀ (Budapest). — Russian SSR (= Asia) = Blagovescenyszk 22 Jul 1928 1♀ (Budapest). — Turkmen SSR = Tashkepri r. Murgab 15 May 1954 1♂ (Budapest). — Mongolia = Cojbalsan and Suchebaator aimak Z. KASZAB, 2♀ holotype and paratype (Budapest).

The specimen from Greece was published (MÓCZÁR, 1978) as *C. a. albicinctus*, nevertheless, it belongs to this species, although, differs from the

holotype as follows: mandible, clypeus entirely white, without black spots and only two very short lines being below antennae, fore coxa largely black, without red; tergite with narrower posterior bands, on tergite 1 interrupted medially, all trochanters and basis of femora black, trochanters with narrow yellow circle apically; fore and middle tibia, partly tarsi not entirely ferruginous but with yellow spots. Propodeum with a short and distinct longitudinal sulcus basally. For further variaties see in an earlier paper (MÓCZÁR, 1978).

This species is more related to *albicincta* in contrast with the original diagnosis, where it was considered to be closer to *maculata* (MÓCZÁR, 1978).

In addition to the description of the male: basis of mandible largely white, only lower margin black; lower face entirely yellowish white, without dark spots; outer eye margin black, only adjoining mandible and above white narrowly; lateral margin of pronotum, mesonotum, episternum black, further light spots smaller and narrower than on female, the bands of tergites, on 1 and 5 broadly, on 2, 4 and 6 narrowly interrupted. Coxae black, without yellow spots, trochanters only partly red, basis of femora partly narrowly, as well as hind femora apically, narrowly black, yellowish white spots more distinct on femora apically and especially on outer side of fore and middle tibiae and metatarsi. Lower side of antennal joints 1—2 more extensively yellowish, 3—12 more broadly yellowish red coloured. Head remarkably broadened behind eyes, viewed from above, consequently, temple broader than on female; eyes only 2.7 times broader than temple. Propodeum uniformly granulate and only slightly wrinkled posteriorly in the middle.

D i s t r i b u t i o n : Mongolia (MÓCZÁR, 1967), Greece, Russian SSR.

Ceropales bicoloripes dorni ssp. n.

Specimen examined: 1♀. M o n g o l i a = "MVR-Exped. 1977 Charchira, 30 km SW Ulangom, Umg. Kurort Steppe 1340 m NN leg. DORN, Stat. I.a 24. 7—13. 8. 77", "*Ceropales albicinctus* (Rossi) ? H. WOLF det. 1979 ♀" ♀ holotype (Hym. Typ. No 3721, Hungarian National History Museum, Budapest).

♀. — Length 7.2 mm. Black, small spot on under side of scape apically, a spot on gena adjoining the basis of mandible, romboid spots on clypeus laterally; posterior band and separately lower part of lateral margin of propodeum, a spot on callus, or postscutellum, on tegula and two very small spots on lateral corners of propodeum, narrow bands on tergites 1—5, only on 1 interrupted medially, a large spot on tergite 6, small pots on coxae apically, white. Labrum white, pale reddish translucent similarly to lower margin of clypeus. Lower side of antennal joints 4—12 narrowly dark brownish red. Apical circle of trochanters, femora-tarsi ferruginous, except the dark brownish last tarsal joint of middle leg and the black hind tibia, tarsi nearly entirely; namely, hind tibial spurs and hind tibia basally and apically narrowly ferruginous.

Sculpture similar to *bicoloripes*, but differs as follows: puncture of head much finer, frontal sulcus sharply distinct in the lower half of frons; tempora slightly broader, eyes only 3.4 times (not fifths) broader than tempora medially in lateral view. Punctures of pronotum, mesonotum and episternum distinctly finer and sparser than on nominate species, in some places indistinct; cuneoli narrower, shallower, longitudinal wrinkles absent; propodeum more finely sculptured, finely granulated, with some larger punctures laterally. Wings, legs as on nominate species.

Distribution: Mongolia.

Ceropales flavicornis SPINOLA

Ceropales flavicornis SPINOLA, 1812, Savigny: Descr. de l'Egypte, Hymén. T. 18 fig. 20 ♀ 24 ♂
Ceropales flavicornis: 1838, SPINOLA, Annls Soc. ent. Fr., **7:** 463 ♂
Ceropales flavicornis: 1895, DALLA TORRE, Wien. ent. Ztg, **14:** 91
Ceropales flavicornis: 1897, DALLA TORRE, Cat. Hym. 8 Fossor.: 342 ♀♂
Ceropales albicinctus f. *croceipes* PRIESNER, 1955, Bull. Soc. ent. Egypte, **39:** 27 ♂ **syn. n.**
Ceropales albicinctus croseipes: 1966, PRIESNER, Israel J. Ent., **1:** 153 ♂
Ceropales flavicornis: 1947, DE BEAUMONT, Mitt. schweiz. ent. Ges. **20:** 505 (as ? syn. of *C. albicinctus* ssp. *seraxensis* RADOSZKOWSKI)

Specimen examined: 2 ♂. Egypt = "Museo di Zoologia della Universita Torino-Italia", without locality label, 1 ♂ holotype (Torino); "Amriach 14. 6. 35", "Egypt Min. Agric. (Egypt) Coll. Kasim", "Type" red label and "*Ceropales albicinctus* f. *croceipes* Pr." with PRIESNER's writing, holotype (Plant Protection Research Institute, Cairo).

The single specimen in SPINOLA's collection (Torino) corresponds with the original description, therefore must be regarded as the holotype of this species.

C. flavicornis rather similar to the *albicincta seraxensis* with the largely ferruginous tergites 1—2 (holotype), but it differs mainly by the yellow colour conspicuously less extended and not pale yellow, by ferruginous lateral margin of pronotum, by the minute ferruginous and by the small yellow spots on posterior corners of mesepisternum, by denser punctate frons, by coarser sculptured propodeum, by sternite 9 deeply excised apically and by the pointed two tips largely thickened outside and deeper hollowed inside, etc.

The light colour of the holotype of *croceipes* especially on lower face, on thorax and on coxae seems now largely orange-pale ferruginous (through the action of cyanide, also according to the PRIESNER's description). The original yellow colouring seems to be present only on tergites and the ferruginous on the legs. In spite of the fact that tergites 1—2 nearly entirely black and dark brownish red medially, not ferruginous, it agrees with *flavicornis* in sculpture and it is the junior synonym of *flavicornis*. In spite of the large material investigated by me in the group *albicincta*, no further specimen was found. This species is recognizable on the basis of the stronger punctures of head, thorax, of the rather rough surface of the propodeum and of the remarkably long postnotum as well as of the difference in colour.

Distribution: Egypt (SPINOLA, 1812)

Ceropales tectigera sp. n. ♂

Specimens examined: 2♂. Russian SSR: = "Azerbaidzhan, SSR: ACCP Sabir Abad Col. u. 23-VII 1928 1♂" holotype (Hym. Typ. No. 3786, Budapest). — Turkey = "Smyrna" (= Izmir) 1♂ paratype (Halle).

♀. — Unknown.

♂. — Length 9.1 (holotype)—10 (paratype) mm. Black, lower face entirely, including labrum and clypeus, except the red teeth, inner eye margin strongly broadened towards the middle of frons, then narrowed gradually as far as the truncate apex, an interrupted streak on outer eye margin, lower side of antennal joints 1—2, disc entirely and lateral side of pronotum, except two small black spots before tubercle, tegula, smaller spots on mesonotum, scutellum, larger ones on postscutellum, lateral corners of propodeum, on mesepisternum posteriorly above the medial coxa, broader bands in front and narrowed towards the end of tergites 1—4, 6, 7 entirely, rarely (paratype) only lateral spots on 4, small spots on sternites laterally, lower and lateral side of coxae, femora, tibiae and tarsi outside, except the ferruginous hind tibia and tarsi partly, lighter (lemon) yellow. Basis of abdomen hardly reddish translucent. Flagellum, legs inside largely ferruginous. Trochanters black basally, yellowish and brownish apically. Wings normal, hyaline, veins brown, pterostigma yellowish brown. Mesonotum, propodeum and ventral segments of thorax with short, fine and silky pubescence.

Head broader than its length (58 : 48), narrowing behind eyes. Ocelli in an acute angle. Frons convex, hardly broken below fore ocellus and with a shallow sulcus, surface with very dense, microscopical as well as with larger, shallow and scattered punctures. Pronotum, mesonotum, lateral half of propodeal disc, as well as lower part of mesepisternum with deep and scattered larger punctures, upper part of mesepisternum with very dense, close punctures medially. Postnotum about half as long as postscutellum. Propodeum convex basally and flat on its two-thirds length posteriorly, in lateral view, surface of disc finely coriaceous basally and wrinkled apically in the middle; sulcus hardly impressed, reaching nearly the middle of disc. Metapleural suture remarkably deep. Tergite 7 roof-shaped with a fine medial ridge. Sternite 9 deeply excised apically and largely thickened outside on the pointed two tips, as well as deeply hollowed inside.

Distribution: Azerbaidzhan SSR, Turkey.

Ceropales bipartita bipartita Haupt

Ceropales bipartitus Haupt, 1962, Bull. Res. Coun. Israel, **11B:** 33 ♀♂
Ceropales bipartitus: 1966, Priesner, Israel J. Ent., **1:** 151, 153 ♀♂
Ceropales albicinctus mediterranicus Móczár, 1978, Acta biol. Szeged., **24:** 133 figs 31—34 ♀♂
Ceropales maroccanus Tourn, ♂ nom. in coll. (Barcelona)

Specimens examined: 13♀, 11♂. Turkey = Antakya 5 Jun 1965 M. Schwarz 1♀ (Budapest, published as *C. albicinctus mediterranicus* Móczár, 1978) and 2♀ (Coll. Schwarz

and Wien), the same locality 1—7 Jun 1965 J. GUSENLEITNER 1♂ (Coll. Gusenleitner); Dujarbekir 6—7 Jul 1937 1♂ (Budapest). — C y p r u s = Kouklia 26 Jun 1939 LINDB. 2♂ (Budapest and Helsinki); Limassol "7. 6. 63" 1♀ paratype of *C. a. mediterranicus* MÓCZÁR, 1978 (Leiden), 3♂ (Budapest) and 18 Sep 1953 MAVROMOUSTAKIS 1♂ (Coll. Mochi); Zakaki 10 Aug 1954 A. MOCHI 1♀ (Coll. Mochi) as well as "19. 6. 1936" 1♀ holotype (Leiden), "24. 6. 1936" 1♂ allotype (Budapest), "29. 6. 36" 1♀ paratype (Budapest) of *C. albicinctus mediterranicus* MÓCZÁR, 1978; Yermasogia River "22. 7. 1936" 1♀ also paratype of *C. a. mediterranicus* MÓCZÁR, 1978 (Budapest), the same locality 7 Jun 1966 MAVROMOUSTAKIS 1♀ (Coll. Wolf). — I s r a e l = "Benjamina Palestine 29. V 1948 leg BYTINSKY-SALZ", "Holotype", and "Typus" red labels "*Ceropales bipartitus* HPT. ♀ HAUPT det 1952" with HAUPT's writing, 1♀ holotype (Tel Aviv); Benjamin 24 May BYTINSKI-SALZ 1♀ (Budapest); Bir Rechme 1 Jun and 20 Aug BYTINSKI-SALZ 2♀ (Budapest and Tel Aviv); Deganya 13 Jun 1942 1♂ (Budapest); "Palestine Haifa B. 9. 27. 7. 19 leg. BYTINSKI-SALZ", "Allo-Typus ♂" red label, "*Ceropales bipartitus* HAUPT ♂ HAUPT det 1953" with HAUPT's original writing 1♂ (Tel Aviv).

In the description of the *C. albicinctus mediterranicus* MÓCZÁR (1978) the type material was selected from Cyprus, and the different coloured further specimens were enumerated from Sardegna, Tunesia, Algeria, Morocco, Spain and from Turkey. After examining the type material of *bipartita* HAUPT deposited in Tel Aviv, *C. albicornis mediterranicus* MÓCZÁR, 1978 and 1♂ from Antakya (Turkey) proved to be a synonym of *C. bipartita* HAUPT. The further specimens enumerated also under *C. a. mediterranicus* belong to the *bipartita mediterranea* ssp. n. (Sardegna, Tunesia, Algeria and Morocco) and to the *bipartita flava* (Spain, etc.) (see below).

The colour and the sculpture not being uniform on the nominate species. The yellow spot is usually pointed towards the middle of frons, rarely more separated from each other (Bir Rechme); but inner side at least convergent and not parallel or divergent towards ocelli. The punctures above the antennal sockets between ocellus and eye hardly perceptible on the allotype (Palesine, Cyprus); distinct and scattered on the whole frons (on holotype: Benjamina ♀, on Antakya ♀ and on Dujarbekir ♂); on mesonotum partly being scattered (allotype), very dense (Israel: Deganya ♂) and not so dense (holotype ♀).

On the other hand, this species differs from *a. albicincta* (ROSSI) chiefly by the colour of body being light yellow, not white, by the broader and larger light spots and bands, by the legs largely yellow, not nearly entirely ferruginous, by almost entirely ferruginous and at most above infuscated flagellum, by not infuscated hind tibia, by the finer and shallower punctures of frons, etc.

D i s t r i b u t i o n : Israel-Palestine (HAUPT, 1962), Turkey and Cyprus.

Ceropales bipartita flava ssp. n.

Specimens examined: 13♀, 7♂. F r a n c e = "74, 11", "*Ceropales flavicinctus* LICHTENST. Gallia" with A. MOCSÁRY writing (antennae missing) 1♀ paratype (Hym. Type No. 3722 Budapest); Herault, Palavas 6 Aug 1934 J. DE BEAUMONT 1♀ (Lausanne); Montpellier 1♀ (Lausanne); "France-Pyr. Or. Le Balcarès, (Lido) 29—30—VII—1953 PMF VERHOEFF" 1♂ paratype (Coll. Wolf); "France-Vaucl. Carpentras VII—1953 PMF VERHOEFF" 1♀ paratype (Coll. Wolf). — S p a i n = Arganda (Madrid) DUSMET 1♂ paratype (Madrid); "exc. R.M.N.H-Spain Las Correderas (Jaen) 600 m 17—VI—1961", "Malaise-trap (cloth.)", "*C. albic. mediterranicus* Mócz. ♀ det. Móczár, 1977" 1♀ holotype (Hym. Typ. No 3724 Budapest); "Sta

Cruz del Valle (Avila) G. MERCET" 3♀ paratypes (Madrid) and 1♀ paratype (Hym. Typ. No. 3725 Budapest); "Madrid G. MERCET" 1♀ paratype (Madrid); "La Garviga 7 IX 90 2-495", "*Ceropales maroccanus*" nom. in coll. 1♂ paratype (Hym. Typ. No. 3726 Budapest); "Gavá 6 agosto 93 III Det Tourn." 1♂ paratype (Hym. Typ. No. 3727 Budapest); Granada 2 Jul 1957 1♂ (Budapest); "Rivas, Dusmet 21—6—16" 1♀ paratype (Hym. Typ. No. 3728 Budapest). — P o r t u g a l = "Portugal-Douro Resende 16—19—VII—1953 PMF VERHOEFF" 2♀ paratypes (Coll. Wolf and Hym. Typ. No. 3723 Budapest). — T u r k e y = Antakya 2 Jul 1965 M. SCHWARZ 1♂ (Coll. Schwarz). — C y p r u s = Limassol 10 May 1963 MAVROMOUSTAKIS 1♂ (Coll. Wolf).

♀. — Length 6.5—8.6 (holotype 8) mm. Similar to the nominate species, but differs chiefly as follows: yellow spots of ocular sinus smaller, lanceolate, inner side parallel (holotype), divergent or rarely at most moderately extending towards the centre of frons, never touching each other. Flagellum ferruginous, upper side (holotype) or only the last joints blackish infuscate or upper side exceptionally entirely black (Portugal). Lateral margin of pronotum dark blackish brown, without yellow marking. Mesonotum black. Lateral spots of propodeum smaller, not reaching beyond the base of spiracle, and lower margin straight. Tergites 1—6 with broad yellow bands, anterior margin of 1 ending in a point medially and slightly emarginated on both sides (holotype), at most straight or only narrowly excised (paratypes), not deeply emarginated medially as on nominate species. Abdominal sternites 2—5 with smaller yellow spots laterally, similarly to *b. bipartita*. Trochanters black entirely, only with narrow yellow or yellowish red circle apically, anterior one-third of femora black (holotype) or sometimes more so, the rest yellow, also the inside of all femora (holotype) (inside of hind femora largely ferruginous on *b. bipartita*). Hind tibia and tarsi ferruginous, 2—5 tarsal joints of hind leg narrowly black basally. Wings and sculpture similar, only punctures on frons deeper.

♂. — Length 5.3—7.2 mm. Largely similar to female in colour and sculpture of head and thorax. Abdominal yellow bands sometimes narrower and rarely slightly emarginated medially on tergite 1, exceptionally interrupted on 2 (La Garviga, Spain). Hind femur rarely entirely brownish (Antakya, Limassol) and sometimes hind tibia largely brown (Granada, Limassol).

This subspecies differs from *a. albicincta* (ROSSI) especially by its stronger sculpture of the frons, by the yellow colour, etc.

D i s t r i b u t i o n : France, Spain, Portugal, Turkey and Cyprus.

Ceropales bipartita mediterranea ssp. n.

Specimens exemined: 12♀, 15♂. S a r d i n i a = "Sardegna Ploage 9—VI—1952 L. Ceresa", "*C. albic. mediterranicus* MÓCZ. det. MÓCZÁR, 1977" 1♀ paratype (Zürich); "Sardegna Porto Torres 6—VI—1952 L. Ceresa", "*C. albic. mediterranicus* MÓCZ. ♂ det. MÓCZÁR, 1977" 1♂ paratype (Zürich); "Sardegna Siliqua 15—6—1954 L. Ceresa" 1♂ paratype (Coll. Wolf). — M o r o c c o = Amizmiz 16 Jun 1947 J. DE BEAUMONT 2♀ (Lausanne and Budapest); Gd. Atlas Asni à Arround 18 Jun 1947 J. DE BEAUMONT 1♀ (Budapest); Marrakech: Oued Tensift 15—16 May, 15 Jun 1947 J. DE BEAUMONT 1♀ 1♂ (Lausanne), 2♀ 2♂ (Budapest); Moyen Atlas Ifrane 25 Jun 1947 J. DE BEAUMONT 1♂ (Lausanne); "env. Tetuan (Ma.) 7/6/1955 leg. NF DE ANDRADE", "*C. albic. mediterranicus* MÓCZ. det. MÓCZÁR, 1977" 1♂ paratype (Wien). — A l g e r i a = "Algir 1895", "*Ceropales histrio* F. var. ♀♂ Hamam-Bon-Haljar" 1♀ holo-

type (Hym. Typ. No. 3729 Budapest, Hung. Nat. Hist. Museum); "Algir 1895" 1♂ paratype (Hym. Typ. No. 3730 Budapest); Biskra 2—6 Jun 1948 J. DE BEAUMONT 2♀ 2♂ (Lausanne); Biskra SCHMIEDEKNECHT 1♂ (Budapest); "Mascara Dr Cros", "12 Juin 08", "*C. albicinctus mediterranicus* ♀ det. MÓCZÁR, 1977" 1♀ paratype (Leiden); Mascara P. ROTH 1♀ (Zürich) published as *C. albic. mediterranicus* MÓCZÁR, (1978); Oran 1♂ (Lausanne); "Rocher Blanc près Rouiba My-Jun 1912 R. Benoist" 1♂ paratype (Paris). — T u n i s i a = "Syrakus 07 Schmiedkn.", "Collectio A. Weis" 1♂ paratype (Typ. No. SMF H 2083, Frankfurt); "Tunis 98 SCHMKN." 1♂ paratype (= allotype) (Hym. Typ. No. 3731 Budapest) published as *C. albicornis mediterranicus* MÓCZÁR (1978).

♀. — Length 8.3—10.9 (holotype 10.9) mm. Similar to *b. bipartita*, the main differences are as follows. Yellow spots in ocular sinus smaller, lanceolate, not broadened towards the middle of frons, inner margins divergent above antenna; outer orbit with a much narrower band and interrupted at one-third of its lenght (holotype), sometimes continuous, surface of frons with very fine and short gold hairs (holotype); flagellum ferruginous, only moderately infuscated on upper side (holotype) or basally and apically darker, sometimes entirely ferruginous, except last joints; yellow streak on lateral margin of pronotum narrow and less (holotype) or more so interrupted, on the other hand, all spots relatively large, also on mesonotum; lateral spots on propodeum reaching nearly the upper margin of spiracle (holotype), sometimes shorter; abdominal bands of tergites relatively narrower, 1 deeply excised (holotype), rarely more broadly emarginated, exceptionally yellowish red medially (from Marrakech only 1♀, the other ♀ black), lateral spots of sternites smaller. Trochanters only basally black, largely ferruginous, partly with yellow circle apically; inner side of femora entirely, nearly the half of outer side of fore, and basal part of middle and hind femora ferruginous, apical half of all femora nearly entirely yellow, black spots absent; hind tibia uniformly ferruginous, not infuscate, as on *b. bipartita*. Punctures of frons similar to the nominate species on head, but finer than on thorax.

♂. — Length 7—9.1 mm. Very similar to female both in colour and in sculpture, only abdominal bands often smaller, consequently, on tergite 1 more deeply emarginated.

This ssp. differs from *a. albicincta* (ROSSI) chiefly by the light colour yellow, not white, by larger and broader yellow spots and bands, by the largely yellow legs, not nearly entirely ferruginous, by almost entirely ferruginous and only partly above infuscated flagellum, by not infuscated hind tibia, by the finer and shallower punctures of frons, etc.

D i s t r i b u t i o n : Sardinia, Morocco, Algeria and Tunisia.

Ceropales bipartita occidentalis ssp. n.

Specimens examined: —♀, 21♂. F r a n c e = Cette 1♂ (Lausanne); "Museum Leiden France, Var Selves N 562XD 55 2—VII—1960 J. VAN DER VECHT" 1♂ paratype (Leiden). — S w i t z e r l a n d = "F. KOHL 1883 Bozen", "*albicincta* det. KOHL" 1♂ paratype (Wien); Valais Les Follateres 19 Jul 1935 P. BOVEY 1♂ (Budapest). — I t a l y = "Mte Manfre, Sona 13. 7. 1949 leg. H. HAMANN" 1♂ paratype (Hym. Typ. No. 3733 Budapest); "Seba 1° Julio 94 Det. Tourn. 166" 1♂ paratype (Hym. Typ. No. 3734); "Sicilia, Aetna Südhang; VI. VII. 49 leg. H. HAMANN" 6♂ paratypes (5♂ Coll. SCHWARZ, 1♂ Hym. Typ. No. 3735 Budapest).

— S p a i n = Spain (121) 1♂ (Barcelona); "Espana, Cádiz Jerez de la Frontera 10—12 Sep 1961 PMF VERHOEFF" 1♂ paratype 1♂ (Coll. Wolf); "Madrid" 1♂ holotype (Hym. Typ. No. 3732 Budapest); Madrid G. MERCET 1♂ (Madrid); "Madrid Montarco 25. VII. 1906" 1♂ paratype (Hym. Typ. No. 3736 Budapest); Montarco 4, 15 Aug 1904, 1909 G. MERCET 2♂ (Madrid and Budapest); "Oroel Bolivar", "Col. ESPANOL" 1♂ paratype (Madrid).

♂. — Length 7—8.3 mm. Similar to the nominate species, but differs chiefly as follows. Yellow colour moderate, spots in ocular sinus lanceolate, not broadened towards the middle, inner margin divergent beginning from antennae; outer orbit black with small yellow spot basally just above mandible and with a narrow streak apically (holotype) or rarely with broader streaks only exceptionally with a continuous band (one from Montarco, the other with an interrupted streak). Lower side of flagellum pale ferruginous, upper side black with sharp margin. Lateral margin of pronotum black, partly hyaline (holotype), sometimes with a yellow spot, exceptionally with a yellow band (1♂, Montarco). Mesonotum black, lateral corners of propodeum, as well as episternum only with a small yellow spot (holotype), rarely small spot on mesonotum or exceptionally larger ones on propodeum and episternum (2♂, Montarco). Posterior bands of abdomen narrower and more broadly emarginated medially (holotype), only rarely as broad as on *b. bipartita* (Montarco 2♂). At most the first half of trochanters black, the second one ferruginous, partly with apical yellow circle. Femora nearly entirely ferruginous, fore with a large (nearly on the upper half apically), middle and hind femora with small yellow apical spots (holotype), the middle and the hind femora often more or less yellow reticulately tinted (Sicily, Sona, Madrid-Montarco), exceptionally nearly entirely yellow (Montarco 2♂). Fore and middle tibia yellow, nearly entirely outside similar to nominate species, but hind tibia brownish infuscated at least apically, together with the upper side of tarsal joints, exceptionally upper side with a long yellow streak (Montarco 1♂). Punctures of frons slightly deeper, surface smoother and shining (holotype) or often mat, owing to the very fine punctures (France, Sicily). Punctures of mesonotum and episternum more moderate, not so deep as on *b. bipunctata*. Surface of propodeum more finely granulate, rarely with a short and narrow trace of a longitudinal sulcus medially. Wings and claws as in *b. bipartita*.

♀. — Unknown.

This subspecies differs chiefly from *a. albicincta* (ROSSI) as follows. By the light colour yellow and not ivory white, by entirely yellow supraclypeal area, never with black spots, by the deeper punctures of frons and by the surface of frons usually finely reticulate and shining (also holotype) and only rarely weakly shining, nearly granulated, it differs by the finer punctures of mesonotum. Spots of body rarely larger and broader, middle and hind femora sometimes yellow tinted, exceptionally largely yellow, fore and middle tibia with rich yellow colour and lower side of flagellum pale ferruginous.

D i s t r i b u t i o n : France, Switzerland, Italy and Spain.

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BRACONIDAE (HYMENOPTERA) FROM KOREA, VIII*

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Thirty-two Braconid species are reported from Korea representing the subfamilies Doryctinae (16 species) and Exothecinae (16 species). Eight species are described as new to science: *Hypodoryctes torridus* sp. n., *Heterospilus extasus* sp. n., *H. tirnax* sp. n., *Spathiomorpha furnata* sp. n., *Rhysipolis alacer* sp. n., *Rh. geranus* sp. n., *Rh. setmus* sp. n. and *Shawiana attonita* sp. n. The majority of the species are new to the fauna of Korea. The wasp material serving for the present elaboration is deposited in the Hungarian Natural History Museum, Budapest. With 56 figures.

1. LIST OF THE SPECIES

Thirty-two Braconid species are listed from Korea (i.e. the Democratic People's Republic of Korea) belonging to the subfamilies Doryctinae (16 species) and Exothecinae (16 species). Detailed collecting data are given for every species and, where necessary, completed with taxonomical as well as zoogeographical notes. The Braconid material was collected by the staff-members of the Hungarian Natural History Museum (Budapest) during collecting trips to North Korea in the years 1970—1982.

DORYCTINAE

Doryctes fulviceps REINHARD, 1865 (= *D. grandis* SZÉPLIGETI, 1896; ? = *D. petiolatus* SHESTAKOV, 1940) — A variable species concerning length of ovipositor sheath, sculpture of tergites 1—2, venation of wing and colour of head. The diagnostic differences given by BELOKOBYLSKIJ (1984a) in his key for the taxa *D. fulvipes* and *D. petiolatus* are but infraspecific variabilities of the same species. — Distributed in the Palaearctic Region, not frequent. New to the fauna of Korea.

L o c a l i t y 1 ♀: "Korea, Dephun ad Kujang-dong, 4 IX 1959, leg. B. PISARSKI".

Doryctes undulatus (RATZEBURG, 1852) — L o c a l i t y — 1 ♂: Prov. North Pyongan, Mt. Myohyang-san, 14 VIII 1982, leg. BERON et POPOV.

Exontsira mongolica (TELENGA, 1941) — Described from Mongolia, reported from the Asiatic part of the USSR (Tshitinskaya Territory, Buryatiya, Yakutiya). New to the fauna of Korea. — TELENGA (1941) had ranged his species in the *Doryctes* HALIDAY, BELOKOBYLSKIJ (1982) erected recently the genus *Exontsira* for a few species separated from the genus *Ontsira* CAMERON (= *Doryctodes* HELLÉN).

L o c a l i t y — 1 ♀: Prov. Ryang-gang: Chann-pay plateau, 24 km NW from Samzi-yan along the road to Mt. Pektusan, 2000 m, 24 VII 1975, No. 281.

* Zoological Collectings by the Hungarian Natural History Museum in Korea, No. 81.

Heterospilus extasus sp. n.: see p. 163.

Heterospilus leptosoma FISCHER, 1960 — Known from Austria, Hungary, Mongolia, in the USSR widely distributed as far eastwards as the Far East Maritime Territory. New to the fauna of Korea.

L o c a l i t i e s — 1 ♀: "Korea, Dephun ad Kujang-dong, 4 IX 1959, leg. B. PISARSKI". — 1 ♂: "Korea, Prov. Hamgjong-namdo: ad lac Cangdzin-ho, 9 VI 1965, leg. M. MROCZKOWSKI et A. RIEDEL.

Heterospilus longicaudatus ZAYKOV, 1980 — Described from Bulgaria, recently reported from the Far East Maritime Territory of the USSR (BELOKOBYLSKIJ, 1983). New to the fauna of Korea.

L o c a l i t y — 1 ♀: Chagang Prov., Mt. Myohyang, Hotel Myohyang, 14 IX 1980, No. 673.

Heterospilus orientalis BELOKOBYLSKIJ, 1983 — BELOKOBYLSKIJ (1983) described this species from the Far East Maritime Territory of the USSR (northwards from Korea). New to the fauna of Korea. — My Korean specimens (3 ♀ + 1 ♂) agree with the original description except the following features:

Korean specimens	Original description
1. Height of eye 1.5—1.8 times longer than malar space.	1. Height of eye 1.5 times longer than malar space.
2. Mesonotum almost smooth, i.e. with very weak reticulation.	2. Mesonotum reticulated.
3. Ground colour of body rusty brown to brown, with more or less dark brown to blackish pattern. Last 2—3 tergites yellow.	3. Ground colour of body black.

L o c a l i t i e s — 1 ♀ (in Zoologiczny Instytut, Warszawa): "Korea, Onpho ad Chongjin, 17 VIII 1959, leg. B. PISARSKI et J. PRÓSZYNSKI". — 1 ♂: Prov. South Pyongan, Changlyong san, 50 km N of Pyongyan and 15 km E from Sa-gam, 13 VIII 1971, No. 169. — 1 ♀: Prov. Ryang-gang, Hyesan, Hyesan hotel garden, 23 VIII 1971, No. 193. — 2 ♀: Kaesong, Mts. Pakyon (= Mt. Pagyon), Pakyon popo (= Pagyon falls), 27 km NE from Kaesong, 500 m, 9 IX 1971, No. 251.

Heterospilus tirnax sp. n.: see p. 164.

Heterospilus tobiasi BELOKOBYLSKIJ, 1983, ♀ nova — The species was described on the basis of the male sex. The female is similar to the male, they deviate from each other in the following features:

Female	Male
1. Mesosoma compressed dorso-ventrally, in lateral view mesonotum rising above pronotum more distinctly (Fig. 2).	1. Mesosoma compressed also dorso-ventrally, in lateral view mesonotum rising less above pronotum (Fig. 1).
2. Height of eye four times longer than length of malar space.	2. Height of eye 2.5 times longer than length of malar space.
3. *r2* 1.3 times longer than *r1*, and *r3* 3.45 times longer than *r2*.	3. *r2* 1.5—1.8 times longer than *r1*, and *r3* 2.7—3.7 times longer than *r2*.
4. Ovipositor sheath as long as three-fourths of metasoma.	4. —

Up to now known only from the type locality (USSR: district Sotchi, Lazarevskoye). New to the fauna of Korea.

L o c a l i t y — 1 ♀: Kangwon Prov., Samil po Inlet, 13 X 1978, No. 493.

Hypodoryctes bilobus (SHESTAKOV, 1940) — Distributed in the Far East region of the USSR (Tchitinskaya, Primorskiy, Habarovsk districts, Kunashir and Shikotan islands).

L o c a l i t y — 1 ♀ (in Zoologiczny Instytut, Warszawa): "Korea, Myohyang Mts., 1300—1500 m, 7 VIII 1959, leg. B. PISARSKI et J. PRÓSZYNSKI".

Hypodoryctes torridus sp. n.: see p. 161.

Spathiomorpha furnata sp. n.: see p. 166.

Spathius fasciatus WALKER, 1874 — NIXON (1943) remarked in his monograph on the *Spathius* species of the Old World that antenna is missing of the unique female type specimen

of this species. Antenna of the three Korean females with 30 (2 ♀) and 33 (1 ♀) joints, respectively, distinctly longer than body; before last two flagellar joints 7—8 joints white otherwise flagellum blackish brown, basally yellow. In other respects agreeing with the description (l.c.). — This is the second record of its distribution. Described from Japan more than a century ago, and so far no further faunistical report was published. New to the fauna of Korea.

Localities — 2 ♀: Prov. Gang von, district On dzong, Kum gang san, near Hotel Go song, 250 m, 4 VIII 1975, No. 315. — 1 ♀: same locality, 5 VIII 1975, No. 318.

Spathius phymatodis FISCHER, 1966 — Within the genus *Spathius* NEES this species represents the *labdacus*-group by NIXON (1943) with its dorso-ventrally flattened head + mesosoma. — The species was described from France (Avignon), reported by TOBIAS (1976) from the southern European part of the USSR. I possess 1 ♀ from Italy and a pair (1 ♀ + 1 ♂) from Mongolia (PAPP 1983). New to the fauna of Korea.

Locality — 1 ♂: Prov. Gang von, district On dzong, Kum gang san, along Okrudong, 600—800 m, 5 VIII 1975, No. 317.

Spathius rubidus (ROSSI, 1794) — Widely distributed and frequent in the Palaearctic Region. Reported from Java too. — The female specimen from the loc. No. 87 bears an unusually long ovipositor sheath, i.e. it is as long as hind tibia + first two tarsal joints together, usually ovipositor sheath (in European representatives) as long as hind tibia.

Localities — 1 ♀: Prov. Kanwon (= Kangwon), Kum gang san, Sam il po, 1 VI 1970, No. 87. — 1 ♀: Prov. South Pyongan, Za mo san, 60 km NE from Pyongyan, 2 IX 1971, No. 231.

Zombrus sjostedti (FAHRINGER, 1929) — Distributed in East China (Kiangshu), Korea, USSR (Far East Territory), Mongolia. First reported from Korea by WATANABE (1937). — Third coxa with a long upper and a short lower spines. Postnervellus curved outwards to tip of hind wing. Median field of tergite 2 transverse oval, bordered with crenulated furrow. Body testaceous, legs and antenna black. Length ♀: 11 mm, ♂: 6 mm.

Localities — 1 ♀: Prov. Kengi, Bagyon san, Kaesong, 7 VI 1970, No. 109. — 1 ♂: Prov. Ryang gang, Chann pay plateau, 15 km SSW from Sam zi yan on the road between Hyesan and Sam zi yan, 1600 m, 23 VII 1975, No. 277.

EXOTHECINAE

Colastes affinis (WESMAEL, 1838) — Head in dorsal view less transverse, 1.6—1.7 times broader than long (that of the European representatives 1.7—1.8 times); temple somewhat less strongly constricted (Fig. 49) in comparison to that of European forms (Fig. 50). Antenna with 28—34 joints (1 ♀: 28, 3 ♀: 30, 1 ♂: 34). Metasoma yellowish brown to dark brown, first tergite black. — Reported from Belgium and the European part of the USSR. New to the fauna of Korea.

Localities — 1 ♂: Prov. Kanwon (= Kangwon), Kum gang san, Sam il po, 1 VI 1970, No. 87. — 5 ♀ + 1 ♂: Kangwon Prov., Kum gang san, 12 X 1978, No. 488.

Colastes braconius HALIDAY, 1833 — Locality: 1 ♀: Kangwon Prov., Kum gang san, 12 X 1978, No. 488.

Colastes flavitarsis (THOMSON, 1891) — Antenna with 26 (1 ♀) and 27 joints (1 ♂). Metasoma of females dark coloured, first tergite black, otherwise blackish brown to brown. — Reported from Europe, new to the fauna of Korea.

Localities — 1 ♀: Prov. Ryang gang, Pektu san, 1900 m, 28 VIII 1971, No. 217. — 1 ♂: Prov. South Pyongan, Nam-po, 19 VII 1975, No. 273.

Hormius moniliatus (NEES, 1812) — Localities: 1 ♀ + 1 ♂: Prov. South Pyongan, Pyongyan, Nung-ra do, 14 VIII 1971, No. 175. — 2 ♀ + 1 ♂: Prov. Ryang-gang, Channpay plateau, 24 km NW from Sam-zi-yan along the road to Pektusan, 2000 m, 24 VII 1975, No. 281. — 1 ♀: Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 6 VIII 1975, No. 322. — 1 ♀: Pektusan, wooden environs of the Sam-zi-yan hotel, 19 VII 1977, No. 376. — 1 ♀: North Hwanghae Prov., Sariwon, 28 IX 1978, No. 423. — 2 ♀: (in Zoologiczny Instytut, Warszawa): Korea, Onpho ad Chongjin, 14—16 VIII 1959, leg. B. PISARSKI et J. PRÓSZYNSKI.

Hormius orientalis BELOKOBYLSKIJ, 1980 — The species was described from the Far East Maritime Territory of the USSR, i.e. northwards from Korea. New to the fauna of Korea.

Locality — 1 ♂: South Pyongan Prov., Lake Taesong-ho, 26 IX 1978, No. 406.

Phaenodus pallipes FÖRSTER, 1862 — Quite similar to the European representatives.

Body 3 mm long. — Hitherto known only from Germany, Hungary and Yugoslavia. New to the fauna of Korea.

Locality — 1 ♀: Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 4 VIII 1975, No. 315.

Rhysipolis alacer sp. n.: see p. 167.

Rhysipolis geranus sp. n.: see p. 169.

Rhysipolis hariolator (HALIDAY, 1836) — Frequent in the western Palaearctic Region. New to the fauna of Korea.

Locality — 2 ♀: Prov. South Pyongan, Mang-yong-dae, 25 km W from Pyongyan, 5 VIII 1971, No. 139.

Rhysipolis intermedius (WESMAEL, 1838)* — Recorded sporadically in Europe. New to the fauna of Korea.

Locality — 1 ♀: Prov. Ryang-gang, Chann-pay plateau, Sam-zi-yan, 1700 m, 28 VIII 1971, No. 218. — 1 ♀ + 1 ♂: same locality, 24 VII 1975, Nos 282 and 289.

Rhysipolis setmus sp. n.: see p. 171.

Shawiana attonita sp. n.: see p. 173.

Shawiana laevis (THOMSON, 1891) — Reported from Europe (Sweden, Finland, Germany), a sporadic species. New to the fauna of Korea.

Locality — 1 ♀: Prov. Ryang-gang, Chann-pay plateau, Sam-zi-yan, 1700 m, 24 VII 1975, No. 282.

Shawiana** **nuptus** (PAPP, 1983) — The species was described from Mongolia on the basis of the female sex only. This is its second distributional report. New to the fauna of Korea. — The male is similar to the female sex. First tergite 1.35 times longer than wide at hind; body somewhat more gracile; antenna with 31 joints.

Locality — 1 ♂: Prov. Kanwon (= Prov. Kangwon), Kum-gang san, Sam-il po, 29 V 1970, No. 56.

Xenarcha (Pseudophanomeris) pilosa (BELOKOBYLSKIJ, 1984) — I am not quite convinced than my two females from Korea represent this species. Below I give the differences between the original description and my specimens in a tabular form:

Original description of C. pilosus	**Korean specimens (2 ♀) named as C. pilosus**
1. First tergite 1.2 times wider behind than long.	1. First tergite slightly longer than wide at hind.
2. Hind femur 4.4 times as long as broad.	2. Hind femur 5 times as long as broad.
3. Tergites with weaker sculpture than that of propodeum.	3. Tergites with similar sculpture that that of propodeum.

Described from the Far East Territory of the USSR (Spasska). New to the fauna of Korea.

Locality — 2 ♀: Prov. Kangwon, Kum-gang san, 12 X 1978, No. 488.

* Further 3 specimens (2 ♀ + 1 ♂) seem also to represent this species, however, they differ from the nominate form in two features:

Dubious form	**Nominate form**
1. Ovipositor sheath half as long as hind tibia.	1. Ovipositor sheath two-thirds to three-fourths as long as hind tibia.
2. First tergite hardly longer than broad at hind, i.e. tergite relatively somewhat more broadening posteriorly.	2. First tergite 1.2(—1.3) times longer than broad at hind, i.e. tergite somewhat less broadening posteriorly.

In all other respects the specimens in question are similar to that of *Rh. intermedius*.

** Originally I have placed my new species in the genus *Colastes* HALIDAY (PAPP, 1983), however, I must change my taxonomic arrangement following VAN ACHTERBERG's new conceptions. The genus SHAWIANA was recently described by VAN ACHTERBERG (1983) for the species of *Phanomeris* auct. nec FÖRSTER. The generic name *Phanomeris* FÖRSTER, 1862 was put in synonymy with *Xenarcha* FÖRSTER, 1862 by him. The genus *Shawiana* VAN ACHTERBERG, 1983 includes the following European species: *Sh. catenator* (HALIDAY), *Sh. foveolator* (THOMSON), *Sh. laevis* (THOMSON), *Sh. lapponica* (THOMSON) and *Sh. phyllotomae* (MUESEBECK).

Xenarcha (X.) pubicornis (THOMSON, 1891) — Its collecting localities were listed from Sweden and Finland; I have specimens from Hungary (1 ♂) and Slovakia (1 ♂), new record. New to the fauna of Korea.

Locality — 1 ♂: Prov. Ryang-gang, Chann-pay plateau, Mt. Pektusan, Mu-do-bong, 2100—2200 m, 25 VII 1975, No. 287.

2. DESCRIPTION OF THE NEW SPECIES

Eight new species are described from North Korea representing the genera *Heterospilus* HALIDAY, 1836 (2 species), *Hypodoryctes* KOKUJEV, 1900 (1 species), *Spathiomorpha* TOBIAS, 1976 (1 species), *Rhysipolis* FÖRSTER, 1862 (3 species) and *Shawiana* VAN ACHTERBERG, 1983 (= *Phanomeris* auct. nec FÖRSTER, 1862; see footnote on p. 160) (1 species). Besides the detailed description each new species is related to its neares allies.

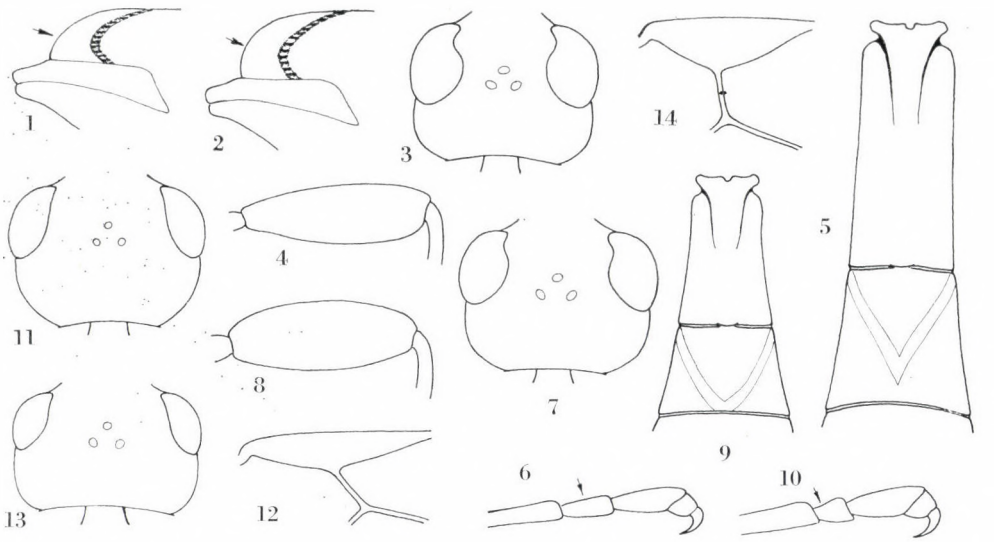
Hypodoryctes torridus sp. n. ♀ (Figs 3—6)

♀. Body 10 mm long. Head in dorsal view (Fig. 3) cubic, 1.36 times as broad as long, temple rounded and one-third shorter than eye. Distance between hind two ocelli as long as greatest diameter of an ocellus, distance between hind and fore ocelli shorter than diameter indicated. In lateral view eye one-fourth higher than wide, width of eye 1.4 times greater than width of temple, height of eye five times greater than malar space. Head polished; face and clypeus with punctation, interspaces shiny. Antenna about as long as body, with 64 joints.

Mesosoma in lateral view distinctly twice longer than high. Mesonotum between tegulae as wide as breadth of head. Notaulix deep, rugo-crenulated. Sternaulix narrow, rugo-crenulated. Propodeum areolated, hind areola rugulose and dull, further areolae smooth with punctures or rugae-rugulae, shiny. Pronotum almost evenly rugulose dull. Mesonotum with very fine and disperse punctation, shiny. Mesopleuron polished, epipleuron crenulo-rugose. Fore tibia with 8—10 reddish spines in two rows. Hind femur thrice as long as broad (Fig. 4); hind tibia twice as long as hind femur; hind tarsus almost as long as hind tibia. In lateral view fourth joint of hind tarsus twice as long as high; basitarsus of hind leg 1.7 times longer than second tarsal joint (Fig. 6).

Fore wing about one-third shorter than body, just surpassing posterior end of metasoma. Pterostigma five times as long as wide, issuing radial vein somewhat posteriorly from its middle; *r1* as long as width of pterostigma, *Cu2* long: *r2* distinctly 1.5 times as long as *cuqu1* and 2.2 times as long as *cuqu2*, *r3* reaching tip of wing and 1.4 times as long as *r2*; *n. rec.* antefurcal; nervulus just postfurcal; brachial cell closed. Hind wing without specific feature.

Metasoma somewhat longer than head and mesosoma together. First tergite (Fig. 5) relatively long, two-thirds as long as rest of metasoma, 2.4



Figs 1—2. *Heterospilus tobiasi* BELOKOBYLSKIJ: 1 = mesonotum (↑) and pronotum of male in lateral view, 2 = mesonotum (↑) and pronotum of female in lateral view. — Figs 3—6. *Hypodoryctes torridus* sp. n.: 3 = head in dorsal view, 4 = hind femur in lateral view, 5 = tergites 1—2, 6 = hind tarsal joints 4 (↑) and 5. — Figs 7—10. *H. bilobus* (SHESTAKOV): 7 = head in dorsal view, 8 = hind femur in lateral view, 9 = tergites 1—2, 10 = hind tarsal joints 4 (↑) and 5. — Figs 11—12. *Heterospilus extasus* sp. n.: 11 = head in dorsal view, 12 = pterostigma + *r1* of right fore wing. — Figs 13—14. *H. ceballosi* (DOCAVO): 13 = head in dorsal view, 14 = pterostigma + *r1* of right fore wing

times as long as broad at hind, its two sides parallel; its surface rugose-lacunose, pair of basal keel short, merging into sculpture at basal fifth of tergite. Second tergite quadrate, as long medially as wide at hind, with a V-form polished depression, otherwise tergite rugo-rugulose-lacunose with more or less longitudinal rugoses. Further tergites at their basal half to third with weakening rugulosity-subrugulosity and dense to rather disperse and fine to very fine punctation, hind part of tergites polished. Ovipositor sheath somewhat shorter than body.

Body black. Palpi pale yellow. Tegula and legs reddish yellow. Hind tibia basally whitish, otherwise together with hind tarsus black. Fore and middle tarsi darkening. Wings subhyaline, pterostigma and veins brownish.

♂ and host unknown.

L o c a l i t y — Holotype ♀: "Korea, Prov. North Pyongan, Mt. Myohyang-san" (first label), "18. VIII. 1982, leg BERON et POPOV, No. 3" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7073.

The new species, *Hypodoryctes torridus* sp. n., is closely related to *H. bilobus* (SHESTAKOV, 1940) (USSR: Far East region), they specific differences are somewhat difficult to recognize:

H. torridus sp. n.

1. First tergite conspicuously long, 2.4 times as long as broad at hind, with parallel sides (Fig. 5).
2. Second tergite quadrate, as long as wide at hind (Fig. 5).
3. Fourth joint of hind tarsus long, in lateral view twice as long as high (Fig. 6↓).
4. In dorsal view eye longer, 1.5 times as long as temple (Fig. 3).
5. Hind femur somewhat less thick, in lateral view thrice as long as broad (Fig. 4).
6. Body 10 mm long.

H. bilobus (SHEST.)

1. First tergite less long, 1.6 times as long as broad at hind, posteriorly with weakly diverging sides (Fig. 9).
2. Second tergite transverse, 1.4—1.7 times wider at hind than long medially (Fig. 9).
3. Fourth joint of hind tarsus short, in lateral view 1.4 times as long as high (Fig. 10↓).
4. In dorsal view less long, 1.25 times as long as temple (Fig. 7).
5. Hind femur somewhat thicker, in lateral view 2.6 times as long as broad (Fig. 8).
6. Body 3.9—7 mm long.

Heterospilus extasus sp. n. ♀ (Figs 11—12, 15)

♀. Body 2.3 mm long. Head in dorsal view (Fig. 11) subcubic, 1.4 times broader than long, eye somewhat longer than temple, latter rounded close behind eyes. Ocelli small, distance between two ocelli greater than diameter of an ocellus, OOL almost thrice as long as POL. Eye in lateral view distinctly 1.3 times higher than wide, temple widening ventrally but its widest measurement somewhat smaller than width of eye (Fig. 15). Eye 1.7 times higher than length of malar space. Face together with clypeus 1.5 times wider than high. Head polished. Antenna about one-third longer than body, with 24 joints. Flagellum filiform, first flagellar joint six times as long as broad, further joints gradually shortening so that penultimate joint four times as long as broad.

Mesosoma in lateral view twice as long as high, in dorsal view between tegulae somewhat less broad than head. Notaulix and sternaulix distinct, smooth. Propodeum weakly though distinctly areolated. Pronotum densely rugulose, mesonotum finely and rather weakly granulate, scutellum and mesopleuron polished. Propodeum anteriorly smooth to uneven, posteriorly uneven with few rugulae. Hind femur 3.75 times as long as broad, hind tibia and tarsus equal in length.

Fore wing about as long as body. Pterostigma (Fig. 12) five times as long as wide, issuing radial vein from its middle; *r1* somewhat longer than width of pterostigma, *r2* 1.5 times as long as *r1* and *cuqu2*, *r3* thrice as long as *r2* and reaching tip of wing; *cuqu1* effaced. Brachial cell open.

Metasoma as long as head and mesosoma together. First tergite distinctly broadening posteriorly, 1.2 times as long as wide at hind and twice wider behind than basally; its pair of basal keel short and merging into fine longitudinal striation. Basal half of second tergite as well as base of third tergite also with longitudinal striation, otherwise tergites polished. Ovipositor sheath as long as metasoma.

Ground colour of body brownish yellow to yellow. Head above brown,

mesonotum brownish. Palpi, pronotum and legs pale yellow. Wings subhyaline, pterostigma opaque yellowish, veins brownish yellowish.

♂ and host unknown.

Locality — Holotype ♀: "Korea: Prov. S Pyongan, Yonpung-ho, 10 km SW of Kaechon" (first label), "1. IX. 1978, leg. Dr. A. Vojnits et L. Zombori, No. 439" (2nd label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7075.

The new species, *Heterospilus extasus* sp. n., is related to *H. ceballosi* (Docavo, 1960) (? = *H. divisus* Wollaston, 1858)* (Canary Islands, Spain; ? Madeira Islands and ? USSR: Crimea), the two species may be separated by a few specific features:

H. extasus sp. n.	**H. ceballosi** (Doc.)
1. In dorsal view head subcubic, 1.4 times broader than long; temple close behind eyes rounded (Fig. 11).	1. In dorsal view head transverse, 1.5—1.6 times broader than long; temple not close behind eyes rounded (Fig. 13).
2. Head above polished.	2. Head above with transverse rugo-striation.
3. Radial vein issuing from middle of pterostigma and oblique to its fore margin (Fig. 12).	3. Radial vein issuing proximal from middle of pterostigma and perpendicular to fore margin of pterostigma (Fig. 14).
4. Antenna with 24 joints.	4. Antenna with 19—20 joints.
5. Ground colour of body brownish yellow to yellow with brownish pattern on head and mesosoma.	5. Ground colour of body brown to dark brown with yellowish brown pattern.
6. Body 2.3 mm long.	6. Body 2.7 mm long.

Heterospilus tirnax sp. n. ♀ (Figs 16—18)

♀. Body 3 mm long. Head in dorsal view 1.45 times broader than long, eye twice as long as temple, latter distinctly rounded (Fig. 16). Ocelli small distance between two ocelli twice as great as diameter of an ocellus, OOL clearly twice as long as POL. Eye in lateral view nearly round, 1.2 times higher than wide; temple widening ventrally, and below almost as wide as eye (Fig. 17). Eye 1.8 times higher than length of malar space (Fig. 17). Face together with clypeus 1.5 times wider than high. Head polished; frons, vertex and occiput with transverse and fine striation. Antenna about as long as body, with 28 joints. Flagellum filiform, first flagellar joint five times as long as broad, further joints gradually shortening so that penultimate joint almost four times as long as broad.

Mesosoma in lateral view 2.25 times as long as high, in dorsal view between tegulae somewhat less broad than head. Notaulix shallow, smooth.

* On the basis of the key for the species of *Heterospilus* given by Belokobylskij (1983) as well as the short description of *Heterospilus divisus* (Wollaston) and the examination of the holotype specimens of *H. ceballosi* (Docavo) suggest me that the two names indicated refer to the same species. Their synonymization is a task of the future taxonomic work.

Propodeum weakly areolated. Pronotum densely rugulose; mesonotum densely granulated, dull; scutellum uneven, shiny; propodeum anteriorly granulate (finer than that of mesonotum), posteriorly rugulo-rugose, dull. Mesopleuron polished, epipleuron rugo-crenulated, sternaulix linearly and deeply depressed smooth. Hind femur 3.3 times as long as broad. Hind tibia as long as hind tarsus.

Fore wing somewhat shorter than body. Pterostigma distinctly four times as long as wide, issuing radial vein somewhat distally from its middle; *r1* shorter than width of pterostigma, *r2* nearly twice as long as *r1* and 1.5 times as long as *cuqu2*; *r3* almost four times as long as *r2* and reaching tip of wing. Brachial cell open.

Metasoma as long as head and mesosoma together. First tergite (Fig. 18) moderately broadening posteriorly, 1.4 times as long as broad at hind, and 1.5 times wider behind than at base, its surface longitudinally and finely rugulo-striated; pair of basal keel short. Second tergite and fore half of third tergite with similar sculpture of first tergite, second tergite 2.6 times wider behind than long medially, fore-median surface of third tergite uneven to smooth and shiny. Rest of tergites polished. Ovipositor sheath one-fifth shorter than metasoma, or as long as hind tibia + tarsal joints 1—2.

Ground colour of body yellow, head above and mesonotum weakly darker. Pronotum and tegula pale yellow. Ovipositor sheath black, ovipositor bronze coloured apically black. Legs also yellow. Wings hyaline. Pterostigma opaque yellow, veins yellowish.

♂ and host unknown.

Locality — Holotype ♀: "Korea, Kum-gang san, Rükhaam, 10—12. VII. 1977" (first label), "No. 352 — netting in grasses, DELY & DRASKOVITS" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7076.

The new species, *Heterospilus tirnax* sp. n., runs to *H. tobiasi* BELOKOBYLSKIJ, 1983 (USSR: Sotchi district, Lazarevskoye); they are distinguished from each other by the following features:

H. tirnax sp. n.	**H. tobiasi** BELOK.
1. Malar space less short, in lateral view eye 1.8 times higher than length of malar space (Fig. 15).	1. Malar space conspicuously short, in lateral view eye 2.5 times higher than length of malar space (Fig. 19).
2. Antenna with 28 joints; first flagellar joint five times as long as broad.	2. Antenna with 19—20 joints; first flagellar joint four times as long as broad.
3. Head above (frons, vertex, occiput) with transverse and rather fine rugo-striation, dull.	3. Head above (frons, vertex, occiput) smooth and shiny.
4. First tergite less broadening posteriorly, 1.5 times wider behind than at base (Fig. 18).	4. First tergite more broadening posteriorly, 1.8 times wider behind than at base (Fig. 20).
5. Ground colour of body yellow without dark pattern.	5. Ground colour of body dark rusty, with light pattern.

Spathiomorpha furnata sp. n. ♀ (Figs 21—24)

♀. Body 4 mm long. Head in dorsal view cubic, distinctly 1.4 times broader than long, eye not protruding from outline of head and one-third longer than temple, latter moderately rounded (Fig. 21). Ocelli small, their diameter shorter than distance between two ocelli; OOL about twice as long as POL. Eye in lateral view almost 1.3 times higher than wide, one-fifth (or 1.2 times) wider than temple (Fig. 22). Malar space half as long as height of eye. Face wide, 1.6 times wider than high together with clypeus. Clypeus almost semicircular, distinctly thrice wider than high. Head polished, face above tentorial pit and below scape uneven. Antenna about one-third longer than body, with 34 joints. First flagellar joint thrice as long as broad, further joints gradually shortening so that penultimate joint twice as long as broad.

Mesosoma in lateral view twice longer than high. Notaulix deep, finely crenulated. Sternaulix rather wide, rugo-crenulated. Propodeum areolated, postero-laterally with a pair of spiniform tubercles. Pronotum foveo-rugose. Mesonotum and scutellum smooth, shiny. Mesopleuron polished, epipleuron rugose. Anterior pair of areolae of propodeum smooth, posterior areolae uneven with a few rugae-rugulae, entire propodeum shiny. Hind femur 4.5 times as long as broad. Hind tibia and tarsus of equal length.

Fore wing as long as body. Pterostigma (Fig. 23) thrice as long as wide, issuing radial vein distinctly distally from its middle; *r1* about half as long as width of pterostigma, *r2* and *cuqu1* equal in length, *r3* reaching tip of wing and twice as long as *r2*; *D1* wide, nearly twice wider than high; *n. rec.* antefurcal. Brachial cell closed. Hind wing without specific feature.

Metasoma as long as head and mesosoma together. First tergite or petiole (Fig. 24) 1.6 times longer than broad at hind; its pair of spiracles before middle, and its surface with longitudinal rugo-striation, shiny; pair of basal keels merging into sculpture anteriorly. Further tergites polished. Ovipositor sheath as long as metasoma and mesosoma together.

Ground colour of body black. Head with faint rusty suffusion. Metasoma, except petiole, brown to brownish. Oral opening and mandible brownish yellow, palpi pale yellow. Scape and pedicel light brownish yellow, flagellum greyish black. Tegula reddish yellow, parategula pale yellow. Legs reddish yellow. Wings subhyaline, pterostigma and veins brown to brownish.

♂ and host unknown.

Locality — Holotype ♀: Korea, Prov. Kengi (= Kyonggi), Bagyon san, Bagyon popo (= Mt. Pagyon, Pagyon falls), about 7 km SW from Kaesong, 7 VI 1970, leg. MAHUNKA et STEINMANN, No. 100. — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7074.

The new species, *Spathiomorpha furnata* sp. n., is closely related to *S. varinervis* TOBIAS, 1976 (USSR: Krasnodarsk, Azerbaidzhan; Yugoslavia), their specific differences are tabulated below:

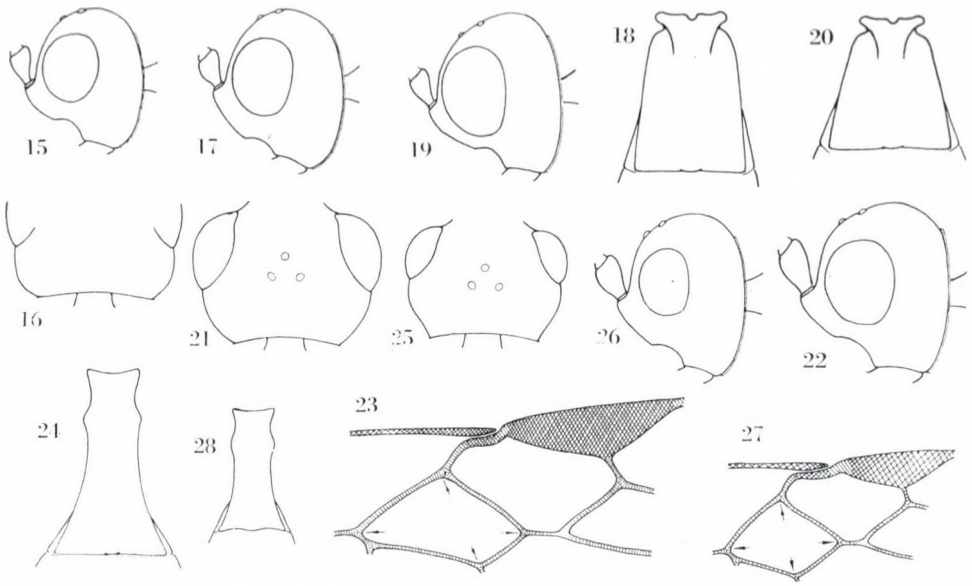


Fig. 15. *Heterospilus extasus* sp. n.: head in lateral view. — Figs 16—18. *H. tirnax* sp. n.: 16 = temple in dorsal view, 17 = head in lateral view, 18 = first tergite. — Figs 19—20. *H. tobiasi* BELOKOBYLSKIJ: 19 = head in lateral view, 20 = first tergite. — Figs 21—24. *Spathiomorpha furnata* sp. n.: 21 = head in dorsal view, 22 = head in lateral view, 23 = median part of right fore wing (pterostigma, *Cu1*, *D1*), 24 = first tergite. — Figs 25—28. *S. varinervis* TOBIAS: 25 = head in dorsal view, 26 = head in lateral view, 27 = median part of right fore wing (pterostigma, *Cu1*, *D1*), 28 = first tergite

S. furnata sp. n.

1. Body 4 mm long (♀).
2. Antenna with 34 joints.
3. In lateral view eye less small, distinctly 1.2 times wider than temple (Fig. 22); in dorsal view temple shorter than eye (Fig. 21).
4. Ovipositor sheath long, as long as metasoma and mesosoma together.
5. Petiole (or first tergite) more broadening posteriorly, 1.6 times longer than broad at hind (Fig. 24).
6. Pterostigma issuing radial vein distinctly distally from its middle; *r3* twice as long as *r2*; *D1* wide, about twice wider than high (Fig. 23).

S. varinervis TOBIAS

1. Body 1.5 (♀) and 1.5—2.8 mm long (♂).
2. Antenna with 23—25 joints.
3. In lateral view eye small, 0.8 times as wide as temple (i.e. temple distinctly 1.1 times wider than eye) (Fig. 26); in dorsal view temple somewhat longer than eye (Fig. 25).
4. Ovipositor sheath less long, as long as metasoma.
5. Petiole (or first tergite) less broadening posteriorly, twice to nearly twice longer than broad at hind (Fig. 28).
6. Pterostigma issuing radial vein hardly distally from its middle; *r3* 1.8 times as long as *r2*; *D1* less wide, only somewhat wider than high (Fig. 27).

Rhysipolis alacer sp. n. ♀ (Figs 29—31)

♀. Body 2.5 mm long. Head in dorsal view 1.6 times as broad as long, eye twice as long as temple, latter constricted (Fig. 29). Ocelli small, distance between two ocelli as long as diameter of an ocellus; OOL distinctly twice as long as POL. Eye in lateral view 1.4 times as high as wide and 1.5 times wider

than temple, latter moderately narrowing ventrally (Fig. 30). Malar space as long as basal width of mandible. Face 1.6 times wider than high. Head polished. Antenna about one-fourth longer than body, with 30 joints. First flagellar joint 3.5 times as long as broad, further joints gradually shortening and attenuating so that penultimate joint twice as long as broad.

Mesosoma in lateral view twice as long as high, in dorsal view between tegulae one-fourth less broad than head. Pronotum without pronope. Notaulix distinct and evenly deep, very finely crenulated. Propodeum areolated, evenly rugo-rugulose, dull. Sternaulix distinct, smooth. Mesosoma polished; pronotum medially rugo-rugulose, mesonotum behind at meeting of pair of notaulices rugulo-uneven, metanotum partly uneven. Hind femur five times as long as broad. Hind tibia one-fifth longer than hind tarsus. Hind basitarsus as long as hind tarsal joints 2—3.

Fore wing somewhat longer than body. Pterostigma rather wedge-shaped, nine times as long as wide, issuing radial vein from its proximal third, *r1* twice as long as width of pterostigma, *Cu2* long: *r2* 1.4 times as long as *cuqu1* and 2.6 times as long as *cuqu2*, *r3* reaching tip of wing and 2.3 times as long as *r2*. *N. rec.* distinctly antefurcal. Brachial cell closed.

Metasoma about as long as mesosoma (hind half of metasoma of the holotype specimen somewhat shrivelled). First tergite (Fig. 31) slightly longer than broad at hind, evenly broadening posteriorly, almost twice as wide at hind as at base; its converging pair of keels merging at middle into rugulo-granulose sculpture. Second tergite antero-posteriorly with weakening fine to very fine granulo-uneven sculpture. Further tergites polished. Ovipositor sheath one-fourth shorter than hind tibia.

Ground colour of body reddish yellow. Ocellar field blackish. Tergites brownish. Tegula pale yellow. Palpi yellow, legs rather yellow, hind tibia faintly blackish fumous. Wings subhyaline. Pterostigma and veins greyish yellowish.

♂ and host unknown.

Locality — Holotype ♀: Korea, Prov. South Phenan (= South Pyongan Prov.), Bong-ha ri (= Pongwa-ri) on the river Te-dong (= Taedong), 45 km E from Pyongyang, 23 V 1970, leg. MAHUNKA et STEINMANN, No. 19. — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7080.

The new species, *Rhysipolis alacer* sp. n., is related to *Rh. hariolator* (HALIDAY, 1836) (western Palaearctic Region, Korea) and to *Rh. caudatus* (THOMSON, 1891) (Sweden, Finland, Hungary), and differs in a few but clearcut features:

Rh. alacer sp. n.	**Rh. hariolator** (HAL.)
1. In lateral view temple moderately narrowing ventrally, eye 1.7 times wider than shortest width of temple (Fig. 30).	1. In lateral view temple distinctly narrowing ventrally, eye 2.5—3 times wider than shortest width (above mandible) of temple (Fig. 32).

2. First tergite slightly longer than broad at hind (Fig. 31).
3. Propodeum entirely rugo-rugulose, dull.

Rh. alacer sp. n.

1. In dorsal view twice as long as temple, latter relatively less constricted (Fig. 29).
2. Malar space as long as basal width of mandible (Fig. 30).
3. First tergite small and somewhat longer than broad at hind, evenly broadening posteriorly (Fig. 31).
4. Propodeum entirely rugo-rugulose, dull.

2. First tergite 1.3 times longer than broad at hind (Fig. 33).
3. Anterior half (or areolae basales) of propodeum smooth and shiny.

Rh. caudatus (THOMS.)

1. In dorsal view eye 2.4 times as long as temple, latter relatively more constricted (Fig. 34).
2. Malar space one-third shorter than basal width of mandible.
3. First tergite large and as broad as or slightly broader behind than long, from base to spiracle strongly, beyond spiracle moderately broadening (Fig. 35).
4. Anterior half (or areolae basales) smooth and shiny, otherwise propodeum rugo-rugulose, shiny.

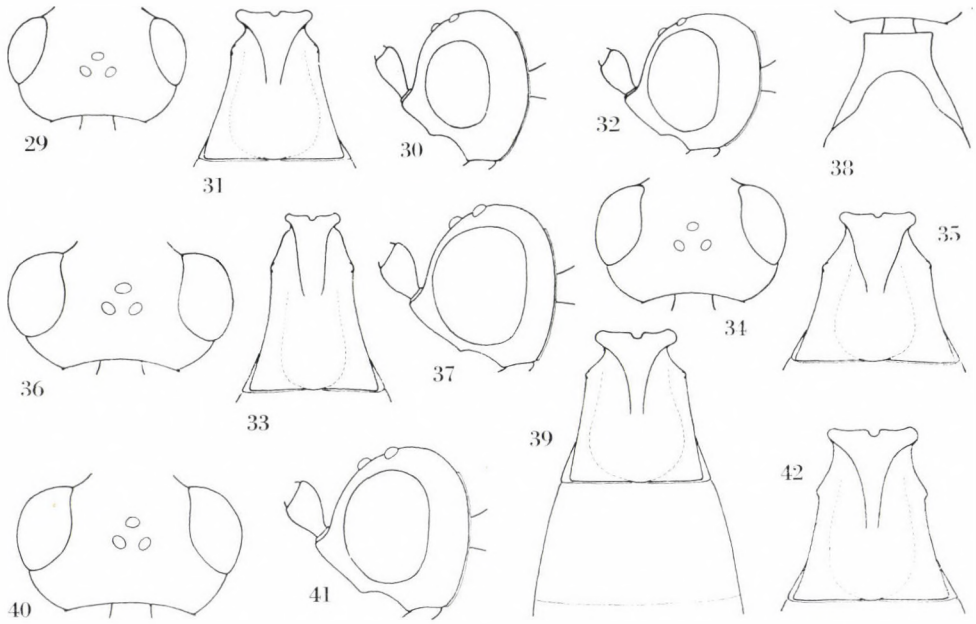
Rhysipolis geranus sp. n. ♀ (Figs 36—39)

♀. Body 4 mm long. Head in dorsal view transverse, 1.75 times broader than long, temple strongly constricted (Fig. 36), eye thrice longer than temple. Ocelli relatively large and elliptic in form, distance between two ocelli distinctly shorter than greatest diameter of an ocellus; OOL almost twice as long as POL. Eye in lateral view (Fig. 37) 1.3 times higher than wide and thrice as wide as temple. Malar space short, only somewhat longer than half of basal width of mandible. Face transverse, together with clypeus 1.5 times wider than high. Antenna about one-fourth longer than body, with 40 joints. First flagellar joint 2.8 times as long as broad, further joints shortening and attenuating so that penultimate joint twice as long as broad.

Mesosoma in lateral view nearly twice as long as high, in dorsal view head one-third broader than mesonotum between tegulae. Pronotum somewhat selliform (Fig. 38) and without pronope. Notaulix distinct and with very fine crenulation. Propodeum areolated. Sternaulix short, finely crenulated. Mesosoma polished; pronotum medially with longitudinal rugae-rugulae, basal pair of areolae of propodeum smooth and shiny, otherwise propodeum uneven-rugulose, shiny. Hind femur 4.8 times as long as broad; hind tibia and tarsus equal in length, hind basitarsus as long as tarsal joints 2—3.

Fore wing about as long as body. Pterostigma four times as long as wide, issuing radial vein somewhat proximal from its middle, *r1* as long as width of pterostigma and oblique to its fore margin, *Cu2* long: *r2* 1.5 times as long as *cuqu1* and 2.7 times as long as *cuqu2*, *r3* reaching tip of wing and twice as long as *r2*. *N. rec.* distinctly antefurcal. Brachial cell closed.

Metasoma as long as mesosoma. First tergite (Fig. 39) 1.15 as long as broad at hind, rather moderately broadening posteriorly, i.e. 1.5—1.6 times



Figs 29—31. *Rhysipolis alacer* sp. n.: 29 = head in dorsal view, 30 = head in lateral view, 31 = first tergite. — Figs 32—33. *Rh. hariolator* (HALIDAY): 32 = head in lateral view, 33 = first tergite. — Figs 34—35. *Rh. caudatus* (THOMSON): 34 = head in dorsal view, 35 = first tergite. — Figs 36—39. *Rh. geranus* sp. n.: 36 = head in dorsal view, 37 = head in lateral view, 38 = selliform pronotum, 39 = tergites 1—2. — Figs 40—42. *Rh. pallipes* (PROVANCHER): 40 = head in dorsal view, 41 = head in lateral view, 42 = first tergite

wider behind than at base, its surface longitudinally rugo-striated, pair of keels short. Second tergite less transverse, 1.6 times wider behind than long medially. Second and further tergites polished. Ovipositor sheath as long as two-thirds of hind tibia.

Ground colour of head and mesosoma brownish yellow, that of metasoma yellow with dark pattern. Ocellar field blackish. Three lobes of mesonotum, scutellum and epipleuron brownish. Metanotum, propodeum and first tergite blackish brown. Second tergite brownish, anteriorly blackish, posteromedially yellow. Hind margin of tergites 3—5 blackish brown. Ovipositor sheath brownish, apically blackish. Wings hyaline, pterostigma yellowish, veins brownish yellowish.

♂ and host unknown.

L o c a l i t y — Holotype ♀: "Korea, Prov. Gang-von district, On-dzong, Kum-gang san, along Ok-ru dong, 250—300 m" (first label), "No. 324, 7 August 1975, leg. J. PAPP et A. VOJNITS" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7078.

The new species, *Rhysipolis geranus* sp. n., is related to *Rh. pallipes* (PROVANCHER, 1888) (Nearctic Region), they are distinguished by the following features:

Rh. geranus sp. n.

1. Temple in dorsal view somewhat more constricted (Fig. 36), in lateral view eye thrice as wide as temple (Fig. 37).
2. First tergite somewhat less broadening posteriorly, i.e. 1.5—1.6 times wider behind than at base, tergite somewhat smaller (Fig. 39).
3. Second tergite polished.
4. Ovipositor sheath short, as long as two-thirds of hind tibia.
5. Flagellar joints less long, first flagellar joint 2.8 times as long as broad.

Rh. pallipes (Prov.)

1. Temple in dorsal view somewhat less constricted (Fig. 40), in lateral view twice as wide as temple (Fig. 41).
2. First tergite somewhat more broadening posteriorly, i.e. 1.75 times wider behind than at base, tergite somewhat bigger (Fig. 42).
3. Second tergite longitudinally uneven-subrugulose.
4. Ovipositor sheath long, as long as hind tibia + basitarsus.
5. Flagellar joints long, first flagellar joint four times as long as broad.

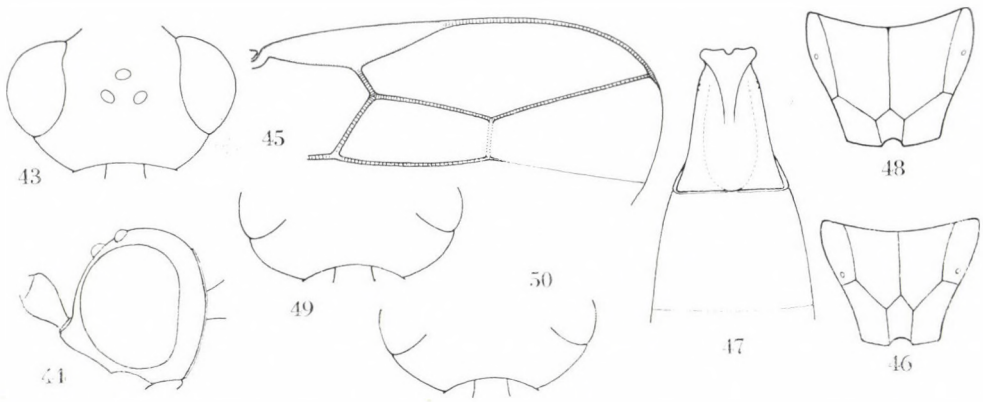
Rhysipolis setmus sp. n. ♀ (Figs 43—47)

♀. Body 3.5 mm long. Head in dorsal view (Fig. 43) less transverse, 1.6 times broader than long, temple strongly constricted, eye distinctly thrice as long as temple. Ocelli elliptic, distance between two ocelli as long as greatest diameter of an ocellus; OOL 1.6—1.7 times as long as POL. Eye in lateral view 1.3 times higher than wide and 3.5 times as wide as temple, latter somewhat though distinctly narrowing ventrally (Fig. 44). Malar space short, half as long as basal width of mandible. Face subquadrate, 1.25 times wider than high. Head polished. Antenna one-third longer than body, with 33 joints. First flagellar joint distinctly thrice as long as broad, further joints shortening and attenuating so that penultimate joint almost thrice as long as broad.

Mesosoma in lateral view distinctly twice as long as high, in dorsal view between tegulae one-third less broad than head. Pronotum without pronope. Notaulix distinct and evenly deep, finely crenulated. Propodeum areolated, see Fig. 46. Sternaulix distinct, smooth. Mesosoma polished; pronotum medially rugo-rugulose, mesonotum postero-medially at meeting of pair of notaulices rugose, propodeum along keels of areolation with short rugae-rugulae. Hind femur six times as long as broad, hind tibia somewhat longer than hind tarsus, hind basitarsus as long as hind tarsal joints 2—3.

Fore wing somewhat longer than body. Pterostigma (Fig. 45) 4.5 times as long as wide, issuing radial vein from its middle; *r1* shorter than width of pterostigma and oblique to its fore margin, *Cu2* long and with distally converging *r2* and *cu3*: *r2* almost twice as long as *cuqu1* and thrice longer than *cuqu2*, *r3* reaching tip of wing and 1.4 times as long as *r2*. *N. rec.* antefurcal. Brachial cell closed.

Metasoma somewhat longer than mesosoma but shorter than head + mesosoma together. First tergite (Fig. 47) broadening posteriorly, 1.2 times longer than broad at hind, almost twice wider behind than at base; its surface longitudinally rugo-striated, pair of basal keel parallel with each other on



Figs 43—47. *Rhysipolis setmus* sp. n.: 43 = head in dorsal view, 44 = head in lateral view, 45 = distal part of right fore wing, 46 = propodeum with areolae, 47 = tergites 1—2. — Fig. 48. *Rh. geranus* sp. n.: propodeum with areolae. — Figs 49—50. *Colastes affinis* (WESMAEL), temple in dorsal view: 49 = Korean and 50 = European specimen

middle third of tergite and posteriorly merging into sculpture. Second tergite 1.4 times wider behind than long medially. Second and further tergites polished. Ovipositor sheath half as long as hind tibia.

Ground colour of body brownish yellow. Metanotum, propodeum and first tergite brownish, hind margin of tergites 3—6 brown. Palpi, legs and sternites pale yellow. Ovipositor sheath dark greyish brownish. Wings hyaline, pterostigma opaque yellow, veins brownish yellowish.

♂ and host unknown.

Locality — Holotype ♀: "Korea, Prov. South Pyongan, Nampo" (first label), "No. 273, 19 July 1975, leg. J. PAPP et A. VOJNITS" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7079.

The new species, *Rhysipolis setmus* sp. n., is allied with *Rh. geranus* sp. n. and *Rh. pallipes* (PROVANCHER, 1888) (Nearctic Region), their specific differentation is difficult to recognize and given in a tabular form:

Rh. setmus sp. n.

1. Head in dorsal view less transverse, 1.6 times broader than long (Fig. 43); temple in lateral view slightly narrowing ventrally (Fig. 44).
2. Antenna with 33 joints.
3. First tergite smaller in size and somewhat more broadening posteriorly, i.e. almost twice wider behind than at base; second tergite somewhat less transverse, 1.4 times wider than long (Fig. 47).
4. Areolation of propodeum see Fig. 46: areola petiolaris long, areola superomedia relatively small, pair of areolae basales less large.

Rh. geranus sp. n.

1. Head in dorsal view transverse, 1.75 times broader than long (Fig. 36); temple in lateral view not narrowing ventrally (Fig. 37).
2. Antenna with 40 joints.
3. First tergite bigger in size and somewhat less broadening posteriorly, i.e. 1.5—1.6 times wider behind than at base; second tergite somewhat more transverse, 1.6 times wider behind than long (Fig. 39).
4. Areolation of propodeum see Fig. 48: areola petiolaris wide, areola superomedia large, pair of areolae basales larger.

5. Ovipositor sheath half as long as hind tibia.
6. Face subquadrate, 1.25 times as wide as high.

Rh. setmus sp. n.

1. Head in dorsal view (Fig. 43) somewhat less transverse, 1.6 times broader than long; in lateral view eye 3.5 times wider than temple (Fig. 44).
2. Ovipositor sheath as long as half hind tibia.
3. First tergite smaller in size and somewhat, i.e. 1.2 times longer than broad at hind (Fig. 47). Second tergite polished.
4. Mesosoma in lateral view distinctly twice as long as high.
5. Hind femur six times as long as broad.

5. Ovipositor sheath two-thirds as long as hind tibia.
6. Face transverse, 1.5 times as wide as high.

Rh. pallipes (PROV.)

1. Head in dorsal view (Fig. 40) transverse, 1.75 times broader than long; in lateral view eye twice wider than temple (Fig. 41).
2. Ovipositor sheath long, as long as hind tibia + basitarsus.
3. First tergite greater in size and almost as broad at hind as long (Fig. 42). Second tergite longitudinally uneven-subrugulose.
4. Mesosoma in lateral view 1.7 times as long as high.
5. Hind femur five times as long as broad.

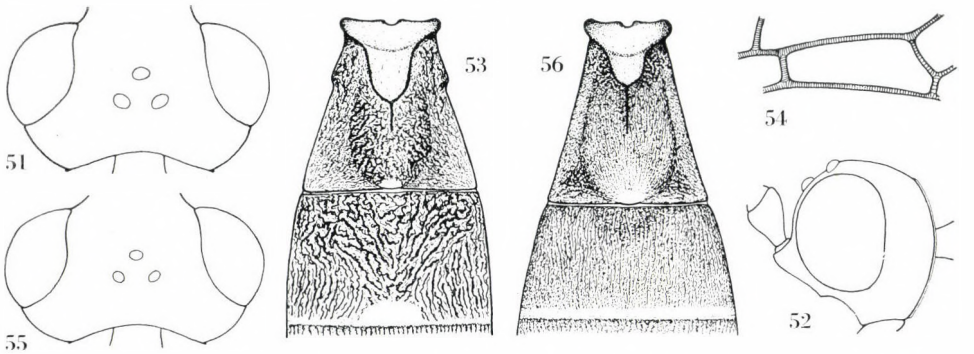
Shawiana attonita sp. n. ♀ (Figs 51—54)

♀. Body 4.1 mm long. Head in dorsal view transverse, 1.7 times broader than long, eye 2.6 times as long as temple, latter constricted (Fig. 51). Ocelli elliptic, distance between two ocelli somewhat greater than diameter of an ocellus, OOL 1.8 times greater than POL. Eye in lateral view 1.3 times higher than wide and twice wider than temple (Fig. 52). Malar space short, as long as basal width of mandible. Face together with clypeus 1.5 times wider than high. Head polished, face along inner margin of eye uneven-rugulose. Antenna about as long as body, with 42 (right antenna) and 43 joints (left antenna). First flagellar joint thrice as long as broad, further joints gradually shortening and slightly attenuating so that penultimate joint twice as long as broad.

Mesosoma in lateral view almost twice as long as high, in dorsal view between tegulae somewhat less broad than head. Pronotum with a distinct pronope. Fore half of notaulix distinct and deep, its hind half indistinct. Sternaulix absent. Mesosoma polished; pronotum medially foveo-crenulated, propodeum rugulo-rugose. Hind femur five times as long as broad. Hind tibia and tarsus equal in length; hind basitarsus long, as long as tarsal joints 2—4.

Fore wing somewhat longer than body. Pterostigma five times as long as wide, issuing radial vein proximal from its middle; *r1* minutely longer than width of pterostigma, *Cu2* long: *r2* 1.35 times as long as *cuqu1*, *r2* and *cu3* somewhat converging distally, *r3* reaching tip of wing and twice as long as *r2*. *N. rec.* antefurcal. Brachial cell closed and widening distally (Fig. 54).

Metasoma as long as mesosoma. First tergite (Fig. 53) strongly broadening posteriorly, its median length equal with its hind width, spiracle before its middle, its surface rugulose-rugose, pair of basal keels merging into sculpture at middle. Second tergite less transverse, 1.5 times wider behind than long



Figs 51—54. *Shawiana attonita* sp. n.: 51 = head in dorsal view, 52 = head in lateral view, 53 = tergites 1—2, 54 = brachial cell of right fore wing. — Figs 55—56. *Sh. phyllotoma* (MUESEBECK): 55 = head in dorsal view, 56 = tergites 1—2

medially (Fig. 53). Second tergite also rugulose-rugose; basal half of third tergite and base of fourth tergite rather rugulose. Rest of tergites polished. Ovipositor sheath almost as long as hind basitarsus.

Body black. Oral opening and mandible yellow. Palpi pale yellow. Scape yellow, apically blackish, otherwise antenna blackish. Tegula yellow, parategula light yellow. Legs pale yellow. Hind tibia apically and entire hind tarsus black. Last tarsal joints of legs 1—2 dark. Sternites brownish yellow to yellow. Wings hyaline, pterostigma and veins brown.

♂ and host unknown.

L o c a l i t y — Holotype ♀: "Korea, Prov. North Pyongan, Mt. Myohyang-san" (first label), "Hotel, 14 VIII 1982, leg. BERON et POPOV, No. 11" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7077.

The new species, *Shawiana** *attonita* sp. n., runs to *Sh. phyllotomea* (MUESEBECK, 1932) (Austria, introduced into eastern USA) with the help of ACHTERBERG's key (1983). The specific differences between the two forms are very little and hard to recognize:

Sh. attonita sp. n.	**Sh. phyllotoma** (MUES.)
1. Head in dorsal view minutely less transverse, i.e. 1.7 times broader than long; temple somewhat less constricted; ocelli less small (Fig. 51).	1. Head in dorsal view minutely more transverse, i.e. 1.8 times broader than long; temple somewhat more constricted; ocelli small (Fig. 55).
2. First tergite somewhat more broadening posteriorly, as long medially as wide behind; second tergite less transverse, 1.5 times wider behind than long medially; sculpture of tergites 1—3 rougher (Fig. 53).	2. First tergite somewhat less broadening posteriorly, 1.1 times longer than wide behind; second tergite more transverse, twice wider behind than long medially; sculpture of tergites 1—3 less rough (Fig. 56).
3. Hind femur five times as long as broad.	3. Hind femur 4—4.4 times as long as broad.

* See footnote 2 on page 160.

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TWO NEW GENERA AND SPECIES FOR THE SUBFAMILY LABIINAE (DERMAPTERA: LABIIDAE)

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Circolabia gen. n. for *Labia arcuata* SCUDDER, 1876, and *Spirolabia* gen. n. for a few *Labia* species with convoluted virga in the male genital lobe. *Spirolabia alpha* sp. n. from Celebes, and *S. solitaria* sp. n. from Fiji are described and figured, and a key for the genera of the subfamily Labiinae is constructed.

Within a revisional study of the systematica of the species of the subfamily Labiinae it was established that their natural grouping is possible to effectuate on the basis of the conformity and diversity of microsystematic features of their male genital apparatus. The species-groups may be erected, first of all, on the basis of the location of the virga. Similar to the evaluation of the generic features applied in other families and subfamilies within the order Dermaptera, a new generic grouping is to be achieved in the subfamily Labiinae taking into consideration their external features as well.

Identification key to the genera

1 (8) Branches of forceps of both sexes strongly setulose; those of male with or without a ventral inner flange, and those of female not narrowed from base, and inner margin with at least a ventral flange, the margins of which is strongly dentated or crenulated.
2 (5) Virga within genital lobe of the male genitalia more or less straight.
3 (4) External paramere of the male genitalia excised apically, the excision small or large, and inner and outer lobes prominent **Labia** LEACH, 1915
4 (3) External paramere of the male genitalia not excised apically, apex acuminate or blunt, and without inner and outer lobes **Paralabella** STEINMANN, in print
5 (2) Virga within genital lobe of the male genitalia spiral or with loop formation.
6 (7) Virga within genital lobe of the male genitalia with loop formation (Fig. 2); apices of external parameres broadly rounded; male forceps strongly curved, inner margins with sharp dorsal and ventral edges **Circolabia** gen. n.
7 (6) Virga within genital lobe of the male genitalia generally more or less spiral horizontally; apices of external parameres acuminate or blunt; male forceps various **Spirolabia** gen. n.
8 (1) Branches of forceps of both sexes not strongly setulose; those of male without a ventral inner flange, and those of female narrowed from base.
9 (12) Virga within genital lobe of the male genitalia helical, as in Figs 4—5.
10 (11) Penultimate sternite with three specific longitudinal protuberances; male ultimate tergite with a well marked median longitudinal sulcus; virga within genital lobe of the male genitalia characteristic, as in Fig. 4 **Isolabella** VERHOEFF, 1901
11 (10) Penultimate sternite smooth, without longitudinal protuberances; male ultimate tergite without, or sometimes with but only unmarked median longitudinal sulcus; virga within genital lobe of the male genitalia, as in Fig. 5
Paraspania STEINMANN, 1985

12 (9) Virga within genital lobe of the male genitalia more or less straight.
13 (14) Pronotum towards anterior margin clearly narrowing
Chaetolabia BRINDLE, 1972
14 (13) Pronotum not narrowing in front, lateral margins more or less parallel
Sphingolabis BORMANS, 1883

Circolabia gen. n.

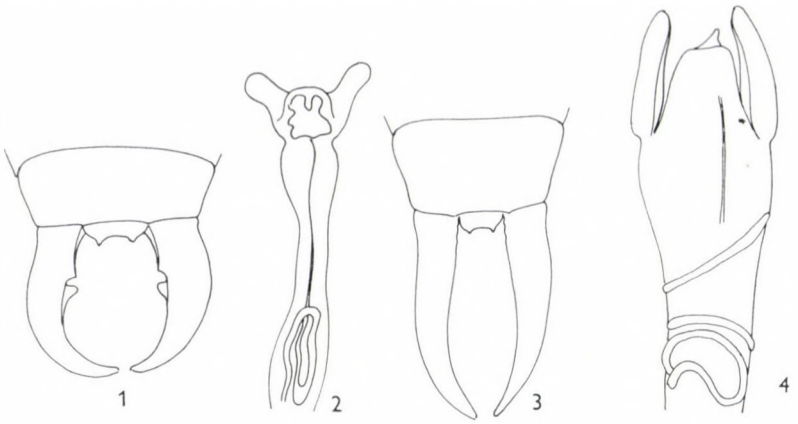
Head smooth, tumid, more or less rounded; antennae with elongate and cylindrical joints, the fourth and fifth almost or quite as long as third. Eyes typical of the subfamily; essentially shorter than the length of head behind eyes. Tegmina perfect, wings normally developed or sometimes concealed. Male forceps strongly arcuate, with sharp ventral and dorsal edges basally. Male genitalia characteristic, virga within genital lobe with a specific loop formation.

Type-species: *Labia arcuata* SCUDDER, 1876.

Circolabia arcuata (SCYDDER) comb. n.

1876 *Labia arcuata* SCUDDER, Proc. Boston Soc. nat. Hist., **18:** 257. Type male: location unknown; type-locality: Brazil. — 1911 *Labia arcuata* BURR, Genera Insectorum, **122:** 56 (proposed synonymy with *annulata* FABRICIUS, 1793). — 1917 *Labia nodifer* HEBARD, Proc. Acad. nat. Sci. Philad., **69:** 240. Type male: U.S. nation. Mus., Washington; type-locality: Guatemala. — 1971 *Labia arcuata* BRINDLE, J. nat. Hist., **5:** 176 (as valid taxon), and *Labia nodifer* HEBARD proposed synonymy with *arcuata* SCUDDER, 1876.

M a l e dark brownish-black; antennae dark brown; legs lighter brown; abdomen and forceps reddish-brown. Cuticle a little shining, strongly punctured and pubescent. Head large, broader than pronotum; tumid; postfrontal and coronal sutures indistinct; lateral margins with postero-lateral angles rounded, posterior margin concave in the middle. Eyes comparatively large, but of Labiid-type. Antennae 13-jointed; first joint well developed, only a little shorter than distance between antennal bases. Pronotum longer than broad, lateral margins finely narrowed posteriorly, and straight, posterior margin rounded. Tegmina comparatively short, but essentially longer than the pronotum; wings well developed. Abdomen short, broad, expanded medially; lateral glandular folds on tergites 3—4 present. Ultimate tergite transverse, simple, smooth. Posterior margin of penultimate sternite rounded. Pygidium very broad between the well-separated forceps, and posterior margin with two small but prominent tubercles. Each branch of forceps (Fig. 1) strongly curved; branches trigonal in cross-section basally and medially, cylindrical apically; inner dorsal edge with a smaller, and inner ventral edge with a larger tooth near midpoint. Genitalia (Fig. 2, gen. prep. No. 630, det. Dr. H. STEINMANN) characteristic, central parameral plate strongly narrowed medially, virga within genital lobe with a specific loop formation basally; external paramere



Figs 1—4. 1 = Male ultimate tergite with forceps of *Circolabia arcuata* (SCUDDER, 1876), 2 = ditto, male genital armature, and 3 = ditto, female ultimate tergite with forceps. — 4 = Male genital armature of *Isolabella graeca* VERHOEFF, 1901. Original

characteristic, stretched, apex broadly rounded. — F e m a l e very similar to male, but ultimate tergite larger, pygidium comparatively smaller, and forceps (Fig. 3) simple, tapering.

Length of body with forceps, in both sexes: 6.5—7.5 mm.

D i s t r i b u t i o n : Central and South America.

Spirolabia gen. n.

Very similar in external characters to *Labia* LEACH. Body generally short, broad, and a little depressed. Head smooth, frons tumid; postfrontal and coronal sutures indistinct. Cuticle punctured and pubescent. Tegmina well or fully developed. Male forceps various, generally short or median size; inner margins with or without tooth or teeth. Pygidium prominent. Virga within genital lobe of the male genital characteristic, generally more or less spiral horizontally.

Type-species: *Labia pilicornis* MOTSCHULSKY, 1863.

Identification key to the species

1 (4) Branches of male forceps simple, inner margins without tooth or teeth; male pygidium very broad, posterior margin angular, with a median lobe.
2 (3) Pygidium of male transverse (Fig. 6); external paramere of the male genitalia comparatively short, as in Fig. 7 **browni** (HINCKS, 1954)
3 (2) Pygidium of male about as long as broad (Fig. 8); external paramere of the male genitalia comparatively long, as in Fig. 9 **alpha** sp. n.
4 (1) Branches of male forceps with inner tooth or teeth; male pygidium large, prominent.

5 (6) Male forceps comparatively short, and strongly curved; inner margins with a very large, triangular lobe like tooth (Fig. 10); male genitalia with a characteristic sclerotized plate near base of virga (Fig. 11) **kermadecensis** (GILES, 1973)

6 (5) Male forceps comparatively longer, less curved; pygidium of male well developed, posterior margin with a bifurcated apex; male genitalia with otherwise sclerotized plate near base of virga.

7 (8) Apex of male external paramere obtuse (Fig. 14); male pygidium strongly broadened basally, and narrowed apically, apex of male pygidium with a small excision medially (Fig. 13) **pilicornis** (MOTSCHULSKY, 1863)

8 (7) Apex of male external paramere acuminate; male pygidium narrowed basally, and posterior margin of male pygidium with larger excision medially.

9 (10) Pygidium of male transverse, excision of posterior margin of pygidium rounded (Fig. 16); ventral edge of male forceps very long, about twice as long as the length of forceps; external paramere of the male genitalia strongly narrow (Fig. 17) **dubronyi** (HEBARD, 1922)

10 (9) Pygidium of male longer than broad, excision of posterior margin of pygidium angular (Fig. 19); ventral edge of male forceps shorter, and with two smaller tubercles at inner margin; external paramere of the male genitalia broader, as in Fig. 20 **solitaria** sp. n.

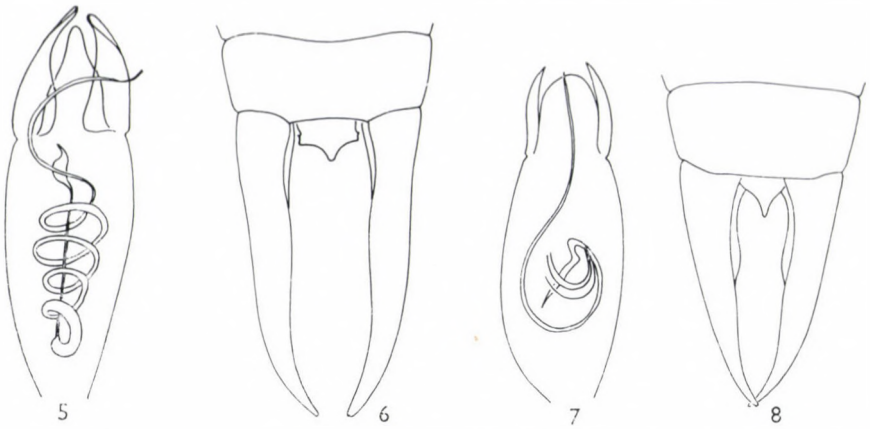
Spirolabia browni (HINCKS) comb. n.

1954 *Labia browni* HINCKS, Proc. R. ent. Soc. Lond., (B) **23:** 159. Type male: British Museum (Nat. Hist.), London; type-locality: Seychelles.

M a l e general colour brown, but legs and mouthparts lighter. Cuticle finely punctured and pubescent. Head transverse, postfrontal and coronal sutures absent; lateral margins behind eyes and postero-lateral angles rounded, posterior margin concave in the middle. Eyes small, typical. Antennae 15-jointed; first joint long and narrow, but shorter than the length of head behind eyes; rest typical, subpyriform. Pronotum slightly broader than long, and slightly narrowed anteriorly; sides straight; median longitudinal furrow on prozona well defined. Tegmina short, only a little longer than pronotum, posterior margins almost transversely truncate. Wings normally developed. Abdomen expanded to about seventh tergite, thence contracted to last tergite. Ultimate tergite transverse. Posterior margin of penultimate sternite almost truncate. Pygidium short, broad, pentagonal, pointed caudad. Forceps (Fig. 6) relatively long, deflexed; trigonal basally, flattened above and on inner face, becoming subcylindrical and slightly curved distally; inner margin finely crenulated, without tooth or teeth. Genitalia (Fig. 7) broad; central parameral plate oval, virga within genital lobe strongly convuluted, and associated with two spine-like sclerotized sclerites; external paramere a little asymmetrical. — F e m a l e similar to male, but pygidium hidden, forceps more abruptly tapering and less crenulate.

Length of body with forceps: male: 7.5 mm, female: 5 mm.

D i s t r i b u t i o n : Seychelles.



Figs 5—8. 5 = Male genital armature of *Paraspania discors* STEINMANN, 1985. — 6 = Male ultimate tergite with forceps of *Spirolabia browni* (HINCKS, 1954), and 7 = ditto, male genital armature. — 8 = Holotype ultimate tergite with forceps of *S. alpha* sp. n. Original

Spirolabia alpha sp. n.

M a l e generally dark brown; legs and forceps lighter. Cuticle finely punctured and pubescent, but posterior part of abdomen with ultimate tergite smooth. Head transverse, tumid; postfrontal and coronal sutures absent. Lateral margins of head behind eyes with postero-lateral angles broadly rounded; posterior margin straight. Eyes small, typical of the subfamily. Antennae 13-jointed; first joint long, well developed, but a little shorter than the distance between antennal bases; second quadrate, third a little longer than fourth. Pronotum more or less as long as broad; lateral margins straight and parallel; posterior margin with postero-lateral angles rounded; median longitudinal furrow faint. Tegmina and wings well developed. Abdomen normally developed, a little widened medially; ultimate tergite transverse, simple. Pygidium triangular, apex directed dorsally. Forceps (Fig. 8) simple, branches with sharp dorsal edge, inner ventral edge a little undulate basally. Genitalia (Fig. 9) with broad central parameral plate, virga within genital lobe convoluted and strongly sclerotized basally; external paramere long, and narrow. — F e m a l e unknown.

Length of body with forceps: 7 mm.

H o l o t y p e male: Celebes, Sulawesi, Malino, 1800 m, 3. II. '80, gen. prep. No. 870, det. Dr. H. STEINMANN. — Deposited in the Hungarian Natural History Museum, Budapest.

Spirolabis kermadecensis (GILES) comb. n.

1973 *Labia kermadecensis* GILES, N. Z. Ent., **5:** 306; fig. 1 (male ultimate tergite with forceps), 2 (penultimate sternite), 3 (genitalia of holotype), 4 (female forceps). Type male: Armidale University; type-locality: Kermadec Islands.

M a l e light, shining yellowish-brown to reddish-brown; head and forceps fuscous. Cuticle punctured and pubescent. Head large, tumid, very slightly longer than broad; posterior margin concave. Postfrontal and coronal sutures obsolete. Eyes small, essentially shorter than the length of head behind eyes. Antennae 12-jointed; first joint shorter than distance between antennal bases; second transverse, third a little longer than fourth. Pronotum nearly as wide as head, lateral margins subparallel, markedly carinate, posterior margin convex; median longitudinal furrow distinct anteriorly. Tegmina two-and-half times as long as pronotum, posterior margin truncate; wings very reduced, projecting from postero-lateral margins of tegmina as a pair of small non-contiguous triangles each approximately one-third length of visible part of tegmen. Abdomen almost parallel-sided, slightly narrower anteriorly; ultimate tergite broad, a little widened posteriorly, posterior margin trisinuate. Pygidium prominent, transverse, pointed or blunt above, but with teeth postero-laterally below. Forceps (Fig. 10) widely separated at base by pygidium, each branch strong basally, tapering to sharply curved apex; inner margin basally excavated to accommodate pygidium when forceps closed, behind excavation is large blunt prominence, from there to apex each branch with uniform sharp edge. Genitalia (Fig. 11) large, central parameral plate oval, virga within genital lobe strong and associated with a large sclerotized plate basally, external paramere well developed, blunt. — F e m a l e similar to male, but forceps (Fig. 12) depressed, straight, except incurved apex.

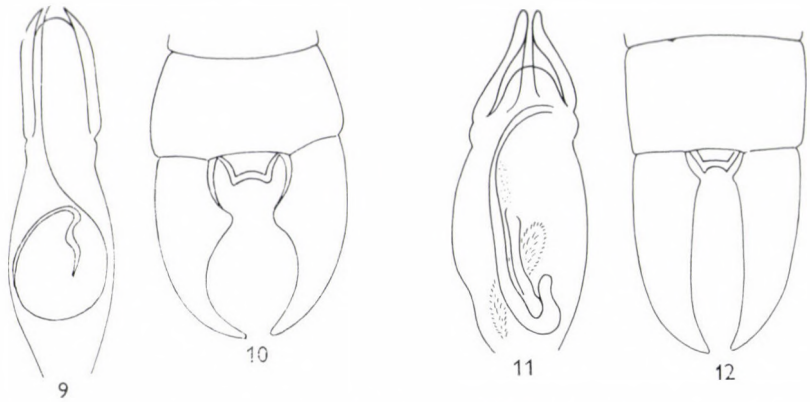
Length of body with forceps, in both sexes: 6—7 mm.

D i s t r i b u t i o n : Kermadec Island.

Spirolabia pilicornis (MOTSCHULSKY) comb. n.

1863 *Labia pilicornis* MOTSCHULSKY, Bull. Soc. nat. Moscou, **36:** 2. Type male: location unknown; type-locality: Ceylon. — 1903 *Labia rogenhoferi* BORMANS, in BURR, Ann. Mag. nat. Hist., (7) **11:** 238. Type male: Naturhistorisches Museum, Wien; type-locality: Ecuador. — 1914 *Labia minor* REHN & HEBARD (nec LINNAEUS, 1758), Proc. Acad. nat. Sci. Philad., **1914:** 377. Type female: HEBARD's Collection; type-locality: Florida. — 1917 *Labia rehni* HEBARD, Ent. News, **28:** 317 (new name for *Labia minor* REHN & HEBARD, a junior seconder homonymy of *Labia minor* (LINNAEUS, 1758). — 1985 *Labia rogenhoferi* BRINDLE, Entomologist's mon. Mag., **121:** 74 (proposed synonymy with *pilicornis* MOTSCHULSKY, 1863). — 1985 *Labia rehni* BRINDLE, Entomologist's mon. Mag., **121:** 74 (proposed synonymy with *pilicornis* MOTSCHULSKY, 1863)].

M a l e very similar in external characters to *Labia minor* (LINNAEUS, 1758); head dark brownish-black; antennae brown basally, with two, sometimes three distal joints yellowish; pronotum, tegmina brown, wings light brown; legs yellowish, abdomen and forceps reddish-yellow. Cuticle finely punctured and pubescent. Head large, broader than pronotum, tumid; post, frontal and coronal sutures indistinct; lateral margins behind eyes straight-postero-lateral angles rounded, posterior margin concava in the middle. Eyes



Figs 9—12. 9 = Holotype's genital armature of *Spirolabia alpha* sp. n. — 10 = Male ultimate tergite with forceps of *S. kermadecensis* (GILEA, 1973), 11 = ditto, male genital armature and 12 = ditto, female ultimate tergite with forceps. Original

typical. Antennae 12-jointed; first joint long, but slightly shorter than distance between antennal bases; second joint quadrate, third a little shorter than fourth. Pronotum small, lateral margins straight, a little widened posteriorly, posterior margin convex; median longitudinal furrow present. Tegmina and wings normally developed, sometimes shorter. Abdomen a little expanded medially, narrowed anteriorly and posteriorly; ultimate tergite broad, simple. Pygidium broad basally, narrowed distally, and apex bifid. Forceps (Fig. 13) simple, trigonal basally, cylindrical medially and apically; inner margins with a blunt tooth near pygidium. Genitalia (Fig. 14) large, central parameral plate oval, virga within genital lobe convolute, of the so-called *Spirolabia*-type, and associated with a larger sclerotized plate, external paranere normally developed, apex obtuse. — F e m a l e similar to male, but forceps (Fig. 15) simple, tapering, contiguous.

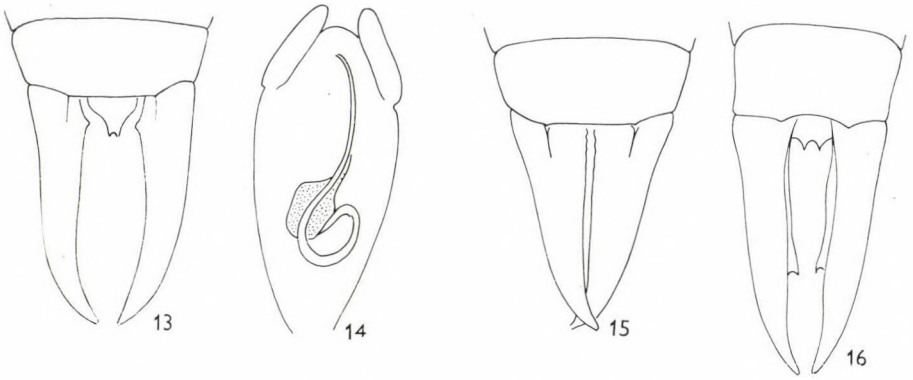
Length of body with forceps, in both sexes: 6.5—8 mm.

D i s t r i b u t i o n : Cosmopolitan.

Spirolabia dubronyi (HEBARD) comb. n.

1922 *Labia dubronyi* HEBARD, Bern. P. Bishop Mus., **7** (14): 318. Type male: B. P. Bishop Museum, Honolulu; type-locality: Hawaii. — 1932 *Labia swezeyi* HEBARD, Ent. News, **43:** 31. Type male: location unknown; type-locality: Hawaii. — 1948 *Labia swezeyi* ZIMMERMAN, Insects of Hawaii, **2:** 205 [proposed synonymy with *dubronyi* (HEBARD, 1922)].

M a l e head, median part of pronotum, femora basally, and ultimate tergite brownish-black; antennae brown; legs light brown. Cuticle shining, finely punctured and pubescent. Head large, depressed, postfrontal and coronal sutures indistinct; lateral margins behind eyes with postero-lateral angles rounded, posterior margin concave. Eyes small, typical. Antennae 12-jointed;



Figs 13—16. 13 = Male ultimate tergite with forceps of *Spirolabia pilicornis* (MOTSCHULSKY, 1863), 14 = ditto, male genital armature, and 15 = ditto, female ultimate tergite with forceps. — 16 = Male ultimate tergite with forceps of *S. dubronyi* (HEBARD, 1922). Original

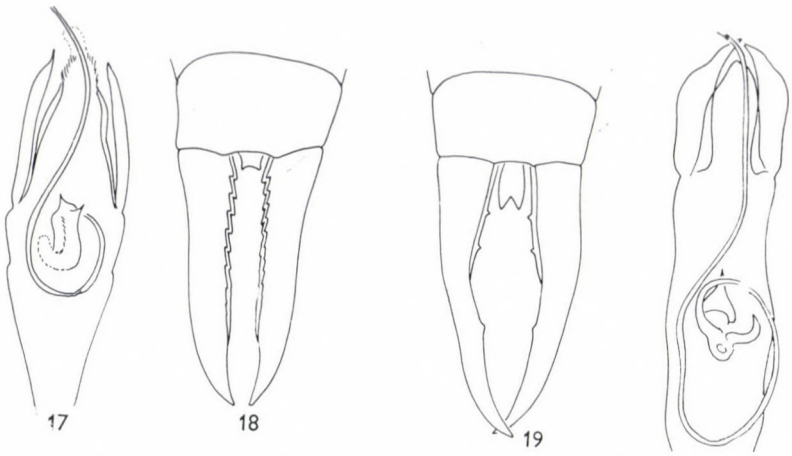
first joint comparatively long, about as long as distance between antennal bases; second quadrate, third long. Pronotum longer than broad; lateral margins more or less parallel, posterior margin straight, but postero-lateral angles broadly rounded; median longitudinal furrow well marked. Tegmina short, wings concealed, with long yellowish setae. Abdomen slender, a little depressed, finely narrowed anteriorly, and widened to 7th tergite; ultimate tergite broad, depressed medially near posterior margin; last margin trisinuate. Pygidium and forceps of *Spongovostox*-type; pygidium flattened, pentagonal, apex bifid, with deep or very deep rounded excision. Each branch of forceps (Fig. 16) with sharp dorsal and ventral edges, the ventral keel forming a flange, and ending in a sharp inner tooth. Genitalia (Fig. 17, gen. prep. No. 845, det. Dr. H. STEINMANN) characteristic, central parameral plate strongly narrowed basally, virga within genital lobe convoluted, of *Spirolabia*-type, and associated with a specific sclerotized plate basally; external paramere long, very narrow, apex acuminate. — F e m a l e as male, but forceps (Fig. 17) characteristic; branches straight, inner margins with strongly crenulated or serrated dorsal and ventral edges.

Length of body with forceps, in both sexes: 6.5—8.5 mm.

D i s t r i b u t i o n : Hawaii and Sumba.

Spirolabia solitaria sp. n.

M a l e general colour dark reddish-brown except legs, yellowish-brown. Cuticle shining, finely punctured and pubescent. Head longer than broad, tumid; postfrontal and coronal sutures indistinct; lateral margins with postero-lateral angles rounded, posterior margin concave in the middle. Eyes typical,



Figs 17—20. 17 = Male genital armature of *Spirolabia dubronyi* (HEBARD, 1922), and 18 = ditto, female ultimate tergite with forceps. — 19 = Holotype's ultimate tergite with forceps of *S. solitaria* sp. n., and 20 = ditto, holotype's genital armature. Original

essentially shorter than the length of head behind eyes. Antennae 11-jointed; first joint normally developed, shorter than distance between antennal bases; second quadrate, third longer than fourth. Pronotum longer than broad, slightly widened posteriorly; lateral and posterior margins straight, median longitudinal furrow faint. Tegmina comparatively short, only a little longer than pronotum, posterior margins obliquely truncate. Wings absent. Abdomen moderately long, more or less parallel-sided; ultimate tergite transverse, simple, smooth. Pygidium specific, longer than broad, narrowed basally and apically, lateral margins convex; apex with deep angular excision. Forceps (Fig. 19) long and slender, branches trigonal in cross-section on basal half, and cylindrical on apical half; dorsal edge without inner tooth, but ventral inner edge with two smaller tubercles, and inner margins at apical section with a smaller tooth. Genitalia (Fig. 20) fully developed, central parameral plate broad, virga within genital lobe very long, and associated with a large, specific, sclerotized plate basally; external paramere large, broad basally, apex acuminate and a little directed inwards. — F e m a l e unknown.

Length of body with forceps: 9 mm.

H o l o t y p e male: Fiji, Viti, Levu, Mt. Victoria, trail from Navai, 660—900 m, VII—2—1958, coll. Borys Malkin, Bishop Museum, gen. prep. No. 849, det. Dr. H. STEINMANN. — Deposited in the B. P. Bishop Museum, Honolulu.

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REVISION OF THE GENUS EUGNORISMA BOURSIN, 1946 (LEPIDOPTERA: NOCTUINAE)

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Redescription and taxonomic analysis of the known *Eugnorisma* s. l. taxa with the description of the following new taxa: *Sinognorisma* gen. n. for *gothica* BOURSIN; *Metagnorisma* subgen. n., *Eugnorisma puengeleri* sp. n., *heuristica* sp. n., *spodia* ssp. *psammochrea* ssp. n., *caerulea* ssp. *isabellina* ssp. n., *deleasma* ssp. *hissarica* ssp. n., *variago* ssp. *xanthiago* ssp. n., *pontica* ssp. *anis* ssp. n., *p.* ssp. *zaghros* ssp. n., *p.* ssp. *deserta* ssp. n.

The genus *Eugnorisma* was erected by BOURSIN in 1946 for a well-defined group of species of Noctuinae previously mentioned mostly as *Lycophotia* HÜBNER, 1813 (partim) and *Rhyacia* HÜBNER [1821] 1816 (partim) and designated *insignata* (LEDERER, 1853) as generotype. In this short "déscription préliminaire" were not mentioned all the species which were placed into this genus by the same author some years later. It was he, who made the redescription in 1954 and completed the list of the members of the genus as follows: *gothica* as new species, *tamerlana*, *spodia*, *chaldaica*, *caerulea*, *eminens*, *enargiaris*, *miniago*, *insignata* (= *conformis*, *variago*, *leuconeura*), *trigonica*, *gaurax*, *coryphaea*, *semiramis*, *rafidain*, *depuncta*, *pontica*. After this enumeration a detailed morphological characterization is given including the features of the male genitalia and the supposed phylogenetic relationships. Therefore, in our opinion the full description of the genus can be omitted here, only the most important characteristics must be summarized with the completion of the features of the everted vesica and the female genitalia. On the basis of the external and genitalic characters a new subgenus (*Metagnorisma*) and four distinct species groups can be separated regarding as natural (monophyletic) entities. The more detailed characterization of these groups is given in the Synopsis. From the species mentioned previously as *Eugnorisma* by BOURSIN (1954) the following two are excluded: *gothica* and *miniago*. The species, *gothica* belongs to a new, monotypical genus related to *Eugraphe* HÜBNER (1821) (*Sinognorisma* gen. n.), while *miniago* (FREYER, 1839) shows similarity both to *Eugraphe* and *Xestia* HÜBNER (1818) and its exact generic relegation without the revision of the Noctuinae genera related to *Xestia* is not to be decided. The species *xestioides* HAMPSON, 1905 referred sometimes also as

Eugnorisma — beside the convergential similarity of valvae to those of the *trigonica* group, but without the scale-like macrotricha on pollex — seems to be related to the genus *Paradiarsia* McDUNNOUGH, 1929.

As a result of our taxonomic revision a modification of the taxonomic judgement of the genus *Eugnorisma* is needed. The phylogenetic analysis of *Eugnorisma* and the related genera will be published in an other paper.

SYNOPSIS

The members of the genus *Eugnorisma* are relatively small (the smallest is *rafidain* with its alar expanse of 25—28 mm), medium-sized and moderately large species (the average alar expanse in the *chaldaica* group is 36—39 mm). Antennae of males more or less ciliate but not pectinate, frons is usually semiglobular, smooth. The shape of palpi normal, the third joint more or less pointed, laterally with dark scales and hairs, the proboscis is moderately long. The thorax is usually strong, the tegulae are normal, not strongly marked, the abdomen is usually covered by long hairs but without dorsal abdominal tufts or crests.

The structure of male genitalia: the uncus strong, more or less long and curved, sometimes pointed or medially dilated, in special case spatulate (*conformis*). The tegumen is relatively wide, usually high, the valvae are generally broad and elongate, without the corona, cucullus and clavus (the last feature is an important divergence to the *Protexarnis-Dichagyris* group); the harpe is strong, often curved, elongate or sword-like, its basis is wide, with a characteristic outer edge or outer processus. The valvae have — with the exception of the *Metagnorisma* species — pollex and apical costal lobe. The sacculus is symmetric, normal, without processes (see *gothica* with strong asymmetry of sacculus — a difference from the true *Eugnorisma* species), fultura inferior wide, often with apical processus or medial crest(s). Vinculum is strong, V-shaped, saccus small and membranous (*gothica* has very large and strong saccus). The size and shape of the aedoeagus varies strongly in the genus but characteristic for the species groups. The dorsal surface of the distal part is usually strongly sclerotized, in most cases forms a slightly convex, dentated shield. In a special group of species (*caerulea* and *spodia*) this shield reverted to a large ventral hook. In two groups of species this plate may be reduced — in a convergent way — to a slightly sclerotized, smooth or only minutely dentated lamina. The vesica is conspicuously (probably synapomorphic) uniform in the whole genus, this structure serves as a most important evidence for the phylogenetic coherence of the genus. The vesica consists of two main parts: a large, spacious sac that is often elongated, sometimes recurved and a slender, often short diverticulum originating from near to sinus penis and terminated in a small, not bulbed cornutus. The large sac has a more or less

expanded spinulose field near to ductus ejaculatorius consisting of tighting spiculi which can be erected from the membrane during evertation, this field forms in some cases a pocket-like pouch (*eminens*, *chaldaica*, *caerulea*, *spodia*) and with somewhat different manner in the *insignata-conformis* pair of species. The spinules of this field cannot be considered as a fascia of cornuti (see *Mythimna* s. l., *Hoplodrina*, etc.) but they are developed from the granulous structure of the vesica (as in some species of *Protexarnis*).

Female genitalia: papillae anales slightly sclerotized, short and usually wide, rounded or triangular, gonapophyses rather short. The configuration of ductus bursae is considerably different in the two subgenera similarly to the structure of the ostium. The species of *Eugnorisma* s. str. have very strong ostium and ductus bursae, the latter is usually plicate, folded or/and reflexed, while in the subgenus *Metagnorisma* they are generally less sclerotized, ductus bursae sometimes with stronger laminae laterally, ostium may be membranous, or more or less sclerotized. The apex bursae is strong and usually strongly rugulose, arcuate or retroflexed in *Eugnorisma* s. str. since in subg. *Metagnorisma* is not or very slightly separated from the corpus bursae. The bursa copulatrix elliptical or rounded, more or less large and wide, in the subg. *Metagnorisma* with signa.

In the following part a more detailed characterization of the species groups and the description of the genus *Sinognorisma* and subgenus *Metagnorisma* are given.

Sinognorisma gen. n.

Type-species: *Eugnorisma gothica* BOURSIN, 1954.

Description: Antennae of the male are finely ciliate, relatively short. The frons is smooth, the labial palp is normal, its third segment is slightly pointed. The metatarsus with three rows of spines. The abdomen is covered with more or less long hairs, but without dorsal tufts or crests. The colouration of both sexes dark, hind wing dark brown. The wing pattern of fore wing is similar to some groups of *Eugnorisma*, *Xestia*, *Diarsia*, etc. species. The configuration of the male genitalia can be characterized by short and slender uncus, gracile and narrow tegumen, very long and strong vinculum with well-developed saccus, strong elongate valvae without cucullus and corona and with two pollex-like extensions on outer margin. One of the most characteristic feature is the strong asymmetry of the sacculus and their different lobes. The harpe is long and straight, its basis less developed .The aedoeagus is long and strong, distally strongly sclerotized on both surfaces, the vesica is relatively simple, without spinulose field, diverticles and cornuti. The female genitalia has short ovipositor, strongly sclerotized ostium and ductus bursae,

the latter with long dorsal crests, apex bursae small and membranous, the corpus bursae with four long, ribbon-like signa.

The new genus by a series of characteristic features can be separated from the genus *Eugnorisma* (the asymmetry of sacculus, the large saccus, the very different vesica, the different type of signa of bursa copulatrix, etc.) and the relatively similar dark pattern of fore wing must be considered as the result of a convergential development which is not unusual in the genera related to *Xestia*.

Sinognorisma gothica (BOURSIN, 1954) (Plate I: 1)

Bonner Zool. Beitr., **5**: 255, figs IV/14, 17; XI/50 (*Eugnorisma*). — Type-locality: China: Li-kiang.

Examined material: holotype male: Li-kiang, China, Prov. N Yuennan, 22. 8. 1935, leg. H. HÖNE; paratype ("allotype") female, from same locality, 23. 8. 1935, the types are deposited in Alexander Koenig Museum, Bonn (= MB). Slides Nos 1729 (♂), 1730 (♀) RONKAY.

Description: Head, thorax and fore wing dark brown with more or less fine violet shade and light greyish irroration. Subbasal line short, dark, antemedial line strong, oblique, dark brownish-black, defined by grey, basal field with strong greyish irroration. Orbicular spot triangular, large, reniform elliptical, constricted at middle, their outlines whitish grey. Preorbicular and intermacular blackish spots conjoined, strong, postmedial line light greyish defined by dark brown. Subterminal line diffuse, slightly sinuous, greyish, terminal line grey. Hind wing dark brown, cellular lunule absent. Underside of fore wing dark brown, without any pattern, hind wing somewhat lighter, upper part of transversal line and cellular lunule can be slightly observed.

Male genitalia (Figs 1—2): uncus short and slender, tegumen gracile, fultura inferior subtriangular with medial crest, vinculum very long and strong, saccus well developed. Valvae strong, elongate, apical part with rounded processus, apical lobe absent. Outer margin with two triangular, pollex-like extensions. Harpe very long, straight, its basis very short and less chitinized. Sacculus well developed, asymmetric, with two processes, in one side inner processus large and elongate, outer small while the other side outer strong and inner smaller. Aedoeagus long, distal end strongly sclerotized on both sides: dorsal surface with teeth, ventral with a rounded emergence. Vesica everted ventrally, elongate, simple, without spinulose field and diverticles.

Female genitalia: ovipositor and gonapophyses short and wide, ostium strongly sclerotized, rounded quadrangular with strong "frame" on caudal side. Ductus bursae long and strong with large dorsal crests, proximal part becoming membranous. Apex bursae small, membranous, corpus bursae elongate, large, sac-like, with four narrow, long, ribbon-like signa.

Distribution: China.

Figs 1—2. Male genitalia of *Sinognorisma gothica* BOURSIN. Holotype, China

Eugnorisma BOURSIN, 1946

Generotype: *Graphiphora insignata* LEDERER, 1853

Eugnorisma (*Eugnorisma* s. str.)

A — *chaldaica* group: *tamerlana* (HAMPSON, 1903)
puengeleri sp. n.
chaldaica (BOISDUVAL, 1840)
spodia (PÜNGELER, 1899)
caerulea (WAGNER, 1932)
eminens (LEDERER, 1855)
atrabaelbops VARGA, 1975
enargiaris (DRAUDT, 1936)

B — *coryphaea* group: *coryphaea* (PÜNGELER, 1900)

C — *trigonica* group: *gaurax* (PÜNGELER, 1900)
deleasma BOURSIN, 1967
trigonica (ALPHÉRAKY, 1872)
D — *insignata* group: *variago* (STAUDINGER, 1882)
insignata (LEDERER, 1853)
conformis (SWINHOE, 1885)
asad BOURSIN, 1963
semiramis (BOURSIN, 1940)

Eugnorisma (**Metagnorisma** subgen. n.)

Generotype: *Agrotis pontica* STAUDINGER, 1891
pontica (STAUDINGER, 1891)
heuristica sp. n.
rafidain (BOURSIN, 1936)
depuncta (LINNAEUS, 1761)

SHORT CHARACTERIZATION OF THE SPECIES GROUPS OF EUGNORISMA S. STR.

A) The *chaldaica* group

Large or medium-sized members of the genus with more or less robust body, fore wing elongate and usually narrow, apex pointed. The ground colour — with the exception of *enargiaris* — grey or greyish, often with special, pastel-like reddish, blueish, violaceous or ochreous shade being characteristic of some species and subspecies. Pattern only seldom regular (e.g. *chaldaica*), often reduced (*tamerlana*, *enargiaris*) or modified (*eminens*, *atrabaelbops*). Hind wing of both sexes white or whitish with some darker irroration on veins at marginal field, especially by females. The main features of the male genitalia: large, trapezoidal, elongate valvae, long, usually sword-like harpe, pollex without scale-like macrotricha, a small apical lobe at outer tip (except in case of *enargiaris*). Aedoeagus long and strong, distal end of it a heavily sclerotized plate on dorsal surface covered with teeth or spines. This structure can be modified to a ventral, robust, reclinate hook (*spodia* and *caerulea*). Vesica elongate with a long and slender diverticulum terminated in a small, spine-like cornutus and with a spinulose field consisting of spinules being erected on the fairly inflated organ, this field in some cases forms a pocket-like pouch. The female genitalia can be characterized — beside the very strong and usually long ductus bursae and strong ostium — with the arcuate and rugulose apex bursae, and the absence of signa.

B) The *coryphaea* group

This species of which only the female holotype is known can be separated only provisionally as a distinct species group by a series of differential characters in comparison with the other groups, but — on the basis of the simi-

larity of the wing pattern and some features of the female genitalia to some *Eugnorisma* species it must be considered as a member of the genus. The exact taxonomic relegation of this species without the knowledge of the male genitalia is very problematic.

C) The *trigonica* group

Generally medium-sized species, their fore wing nearly triangular, elongate with pointed apex and with characteristic dark pattern. The ground colour of hind wing white or whitish with only fine dark irroration of marginal field, mostly in case of the females. The configuration of the male genitalia is generally similar to that of the *chaldaica* group but less robust and smaller, since the valvae more or less elongate with a characteristic pointed apical lobe directed laterally. An important feature (probably synapomorphic with the next group) is that the pollex is covered by scale-like macrotricha. The aedoeagus is moderately long or rather short, more or less arcuate, the distal dorsal lamina less sclerotized without or with only minute spines. The vesica is hollowed, peach-shaped, in other characters is similar to those of the *chaldaica* group. The female genitalia has a strong, trapezoidal ostium, ductus bursae strong and short, slightly twisted with an inflexed dorsal crest at the ostium. The bursa copulatrix consists of a large, more or less rugulose apex bursae and a short, rounded corpus bursae, signa are absent.

D) The *insignata* group

This group contains the generotype of the genus, *insignata* LEDERER. The species of this group are medium-sized or relatively large, the shape of fore wing triangular, more or less broad, the apex slightly pointed or rounded. The black pattern of fore wing is reduced, but the elements of the typical noctuid pattern are well discernible. Hind wing white or whitish but often with darker marginal suffusion. The male genitalia can be characterized by strong, more or less broad valvae, the apex of them is rounded or slightly angulate, apical lobe small. The pollex is covered by scale-like macrotricha, the aedoeagus is medium-sized, curved, the distal dorsal lamina is more or less strongly dentated. The vesica is less elongate, the small terminal cornutus of the diverticulum is short, wide-based, often claw-like; in case of some specimens of *semiramis* it can be reduced. In the female genitalia the ductus bursae is short and more or less triangular, usually flattened, the apex bursae is well sclerotized, rugulose, the corpus bursae is without signa.

Metagnorisma subg. n. (*Cortia* RJABOV, in litt.)

Type-species: *Agrotis depuncta* var. *pontica* STAUDINGER, 1891

Description: This subgenus consists of small, medium-sized and relatively large species. The fore wing is wide, usually triangular with more or less pointed apex. The dark pattern may be very variable in one and the same species, sometimes strongly reduced. The hind wing is whitish ochreous with more or less strong brownish irroration or dark brownish (in case of *depuncta*). The male genitalia is considerably less sclerotized as in case of the *Eugnorisma* s. str. species, the valvae are elongate, usually dilated at middle, the apex rounded, the apical lobe and the pollex are absent. The harpe is moderately long, sometimes slender, but usually thick and less arcuate; the basis of it is wide, often T-shaped. The aedoeagus is relatively short, the distal dorsal lamina is well developed with small teeth or reduced to a small plate (in case of *pontica*). The vesica is large and rounded, sometimes more elongate, the small diverticulum is slender and more or less long, erected relatively far from the distal end of aedoeagus. The spinulose field may be large and with long spinules but in some cases reduced to a small group of spinules. The female genitalia are also less sclerotized, both the ostium and the ductus bursae; the apex bursae is not rugulose, the corpus bursae is large, elliptical or sac-like with signa.

Key of the species based on their external characters

1 (24) Fore wing with characteristic black or blackish pattern in the cell.
2 (3) Hind wing of both sexes dark brown **Sinognorisma gothica** (BOURSIN, 1954)
3 (2) Hind wing white, whitish or pale ochreous brown.
4 (5) Hind wing pale ochreous brown with well discernible cellular lunule **Eugnorisma (Eugnorisma) coryphaea** (PÜNGELER, 1900)
5 (4) Hind wing white or whitish without cellular lunule.
6 (19) Two parts of blackish pattern in the cell well separated.
7 (10) Subterminal line with strong, dark triangular spots.
8 (9) Antemedial and postmedial lines conjoined at inner margin **E. (E.) eminens** (LEDERER, 1855)
9 (8) Antemedial and postmedial lines distinct **E. (E.) atrabaelbops** VARGA, 1975
10 (7) Subterminal line without blackish triangular spots.
11 (12) Ground colour of fore wing rosy grey or pinkish **E. (E.) chaldaica** (BOISDUVAL, 1840)
12 (11) Ground colour of fore wing ashy, sandy or bluish-grey.
13 (14) Preorbicular black spot very narrow and elongate **E. (E.) tamerlana** (HAMPSON, 1903)
14 (13) Preorbicular spot much shorter and wider.
15 (16) Intracellular blackish spots with special golden bronze shine* **E. (E.) spodia** (PÜNGELER, 1899)
16 (15) Intracellular spots without golden bronze shine.
17 (18) Hind wing pure white, fore wing bluish grey or sandy grey, sometimes with fine scarlet shine **E. (E.) caerulea** (WAGNER, 1932)
18 (17) Hind wing whitish with some greyish covering, fore wing ashy or brownish-grey **E. (E.) puengeleri** sp. n.

* These species can be surely separate sometimes only by the study of their genitalia!

19 (6) Two parts of intracellular blackish pattern conjoined (or — very rarely — very near to each other).
20 (21) Fore wing wider, less pointed, blackish pattern of fore wing widely conjoined **E. (E.) trigonica** ALPHÉRAKY, 1872)
21 (20) Fore wing narrower and strongly pointed, dark pattern of cell conjoined with a fine line.
22 (23) Elements of pattern of fore wing much extensive and darker, transversal lines often blackish; or ground colour light ochreous grey with reduced wing pattern **E. (E.) deleasma** BOURSIN, 1967
23 (22) Elements of pattern of fore wing paler, transversal lines usually shadow like **E. (E.) gaurax** (PÜNGELER, 1900)
24 (1) Fore wing without characteristic black(ish) pattern in cell, only — sometimes — some dark spots or a part of diffuse, dark medial line can be darker than ground colour.
25 (30) Ground colour of fore wing yellowish or orange (rarely orange brown).
26 (27) Fore wing yellow, elements of pattern — outlines of maculae and covering of veins — orange-brown, filling of reniform yellow **E. (E.) enargiaris** (DRAUDT, 1936)
27 (26) Fore wing orange or yellowish, filling of reniform darker than ground colour, veins without orange-brown covering.
28 (29) Large (34—40 mm) species, reniform large with darker filling, hind wing pure white **E. (E.) variago** (STAUDINGER, 1882)
29 (28) Smaller (27—32 mm) species, reniform smaller and narrower with darker filling usually in lower part, hind wing usually with some greyish in marginal field **E. (M.) heuristica** sp. n.
30 (25) Ground colour of fore wing greyish or brownish (sometimes reddish — in case of the Syrian race of *insignata*).
31 (32) Orbicular spot encircled with fine black line **E. (E.) asad** BOURSIN, 1963
32 (31) Outline of orbicular whitish or ochreous, sometimes with brownish shadow (or obsolete).
33 (38) Pattern of fore wing pale or obsolescent, transversal lines and maculae — except at costal area — only slightly darker than ground colour.
34 (35) Hind wing white, partly transparent, marginal field only with very few darker scales **E. (E.) insignata pallescens** (CHRISTOPH, 1893)
35 (34) Hind wing with darker marginal suffusion.
36 (37) Hind wing whitish, or whitish ochreous, costal parts of antemedial and postmedial lines often dark brown **E. (E.) semiramis** (BOURSIN, 1940)
37 (36) Hind wing pure white (except marginal field), transversal lines not dark brownish **E. (E.) conformis** (SWINHOE, 1885)
38 (33) Fore wing with more or less strong dark pattern.
39 (40) Hind wing brown* **E. (M.) depuncta** (LINNAEUS, 1761)
40 (39) Hind wing white or whitish-ochreous.
41 (42) Small species (26—31 mm) with small, elongate orbicular spot, hind wing not white **E. (M.) rafidain** (BOURSIN, 1936)
42 (41) Larger species (33—40 mm) with large, usually rounded orbicular spot.
43 (44) Claviform spot well defined, its outline usually dark, hind wing white with darker margin **E. (E.) insignata** (LEDERER, 1853)
44 (43) Claviform spot absent or obsolescent with only pale outline, hind wing whitish-ochreous or sometimes pale grey** **E.(M.) pontica** (STAUDINGER, 1891) and **depuncta arenoflavida** (SCHAWERDA, 1934)

Key for Eugnorisma species based on the structure of the male genitalia

1 (32) Valvae with pollex, shape of valvae more or less quadrangular.
2 (17) Pollex covered with scale like macrotricha.
3 (8) Tip of valvae narrow and with long apical lobe, harpe more or less falcate.
4 (5) Valvae long and slender, distal part of it (from pollex to apex) longer than basal part **trigonica** (ALPHÉRAKY, 1872)

* With the exception of ssp. *arenoflavida*.

** These two taxa can be separated evidently — beside their localities — by their genitalia but the external characters are overlapping, mostly *pontica* f. *consenescens* may be similar to *arenoflavida*, the latter has relatively stronger cellular lunule on hind wing.

5 (4) Shape of valvae less elongate, distal part of it shorter than basal part.
6 (7) Pollex considerably longer and stronger than apical lobe, aedoeagus short, nearly straight **deleasma** BOURSIN, 1967
7 (6) Pollex only slightly stronger than apical lobe, aedoeagus longer and much curved **gaurax** (PÜNGELER, 1900)
8 (3) Tip of valvae broader, apical lobe short.
9 (10) Basis of harpe with very long outer processus **semiramis** (BOURSIN, 1940)
10 (9) Basis of harpe without long outer processus.
11 (12) Aedoeagus short, thick and straight, valvae with only very short apical lobe **asad** BOURSIN, 1963
12 (11) Aedoeagus longer and slender, curved, apical lobe longer.
13 (14) Uncus spatulate **conformis** (SWINHOE, 1885)
14 (13) Uncus normal.
15 (16) Basal part of harpe thick, its distal part considerably thinner, distal dorsal lamina of aedoeagus fairly dentated **variago** (STAUDINGER, 1882)
16 (15) Basal part of harpe only slightly thicker than its distal part, distal dorsal lamina of aedoeagus not or minutely dentated **insignata** (LEDERER, 1853)
17 (2) Pollex with only normal hairs.
18 (19) Aedoeagus without cornutus **enargiaris** (DRAUDT, 1936)
19 (18) Aedoeagus with cornutus.
20 (23) Aedoeagus with a large, ventral hook.
21 (22) Harpe very thick, apex valvae laterally elongate, with a characteristic, pointed valval protuberance near pollex **spodia** (PÜNGELER, 1899)
22 (21) Harpe more slender, apex valvae only moderately elongate, with a characteristic, elongate valval crest near pollex **caerulea** (WAGNER, 1932)
23 (20) Aedoeagus without large, ventral hook.
24 (25) Aedoeagus very long and slender, curved only in its distal part **puengeleri** sp. n.
25 (24) Aedoeagus shorter, straight or curved.
26 (27) Harpe only slightly falcate, aedoeagus large, straight and thick, valvae distally slightly dilated **tamerlana** (HAMPSON, 1903)
27 (26) Harpe falcate, aedoeagus curved.
28 (29) Distal dorsal lamina of aedoeagus very long and strong, diverticulum of vesica large **chaldaica** (BOISDUVAL, 1840)
29 (28) Distal dorsal lamina smaller, diverticulum small.
30 (31) Spinulose field of vesica forms a pocket-like pouch **eminens** (LEDERER, 1855)
31 (30) Spinulose field of vesica not a pocket-like pouch **atrabaelbops** VARGA, 1975
32 (1) Valvae without pollex, shape of valvae elongate with rounded apex.
33 (34) Basis of harpe with long outer processus, distal dorsal lamina of aedoeagus strong **depuncta** (LINNAEUS, 1761)
34 (33) Basis of harpe without or only with short outer processus, distal dorsal lamina of aedoeagus less strong.
35 (36) Uncus very short and thick, harpe short and thick **rafidain** (BOURSIN, 1936)
36 (35) Uncus long and slender, harpe longer and more gracile.
37 (38) Aedoeagus short, distal dorsal lamina fairly dentate, vesica large, globular, harpe strongly recumbent **heuristica** sp. n.
38 (37) Aedoeagus longer, distal dorsal lamina not or minutely dentate, vesica of elongated shape, harpe less recumbent **pontica** (STAUDINGER, 1891)

Key for Eugnorisma species based on the structure of the female genitalia

1 (34) Bursa copulatrix without signa, ductus bursae strongly sclerotized.
2 (3) Apex bursae not separated **coryphaea** (PÜNGELER, 1900)
3 (2) Apex bursae well developed, rugulose.
4 (19) Apex bursae with nearly parallel margins.
5 (8) Ductus bursae elongate, distal part of it longer than its proximal, folded part.
6 (7) Distal part of ductus bursae nearly twice longer than its proximal part **puengeleri** sp. n.
7 (6) Distal part of ductus bursae not more than one and the half longer than its proximal part **tamerlana** (HAMPSON, 1903)
8 (5) Distal part of ductus bursae shorter or as long as its proximal part.
9 (12) Proximal part of ductus bursae bulbous, not folded only at most with some dorsal crests.

10 (11) Bulbous part of ductus bursae strongly convex, distal margin of ostium only slightly arcuate **spodia** (PÜNGELER, 1899)
11 (10) Bulbous part of ductus bursae less convex, distal margin of ostium U- or V-shaped **caerulea** (WAGNER, 1932)
12 (9) Proximal part of ductus bursae folded.
13 (14) Apex bursae short, simple **enargiaris** (DRAUDT, 1936)
14 (13) Apex bursae long, more or less helical.
15 (18) Distal margin of ductus bursae slightly arcuate.
16 (17) Folded part of ductus bursae broad, very strong, triangular **chaldaica** (BOISDUVAL, 1840)
17 (16) Folded part of ductus bursae narrower, only a small pocket **atrabaelbops** VARGA, 1975
18 (15) Distal margin of ductus bursae V-shaped **eminens** (LEDERER, 1855)
19 (4) Apex bursae with curved or divergent margins.
20 (27) Ductus bursae folded.
21 (26) Ostium bursae calycular.
22 (25) Corpus bursae relatively small and rounded, apex bursae large, elliptical.
23 (24) Ductus bursae longer than ostium **gaurax** (PÜNGELER, 1900)
24 (23) Ductus bursae shorter than ostium **deleasma** BOURSIN, 1967
25 (22) Corpus bursae larger, apex bursae slightly helical **trigonica** (ALPHÉRAKY, 1872)
26 (21) Distal margin of ostium medially incised **conformis** (SWINHOE, 1885)
27 (20) Ductus bursae not folded, smooth or rugulose.
28 (29) Distal margin of ostium medially incised **insignata** (LEDERER, 1853)
29 (28) Distal margin of ostium curved or straight, not incised.
30 (31) Ostium nearly triangular **variago** (STAUDINGER, 1882)
31 (30) Ostium trapezoidal or quadrangular.
32 (33) Apex bursae large, broad **semiramis** (BOURSIN, 1940)
33 (32) Apex bursae narrower, lentiform **asad** BOURSIN, 1963
34 (1) Bursa copulatrix with signa, ductus bursae less sclerotized.
35 (36) Sclerotization of ostium stronger than that of ductus bursae **depuncta** (LINNAEUS, 1761)
36 (35) Sclerotization of ostium less strong than that of ductus bursae.
37 (38) Bursa copulatrix with special, rounded, double signa **rafidain** (BOURSIN, 1936)
38 (37) Bursa copulatrix with longer, ribbon like signa.
39 (40) Ostium membranous, apex bursae less developed **heuristica** sp. n.
40 (39) Ostium not membranous but more or less sclerotized, apex bursae larger **pontica** (STAUDINGER, 1891)

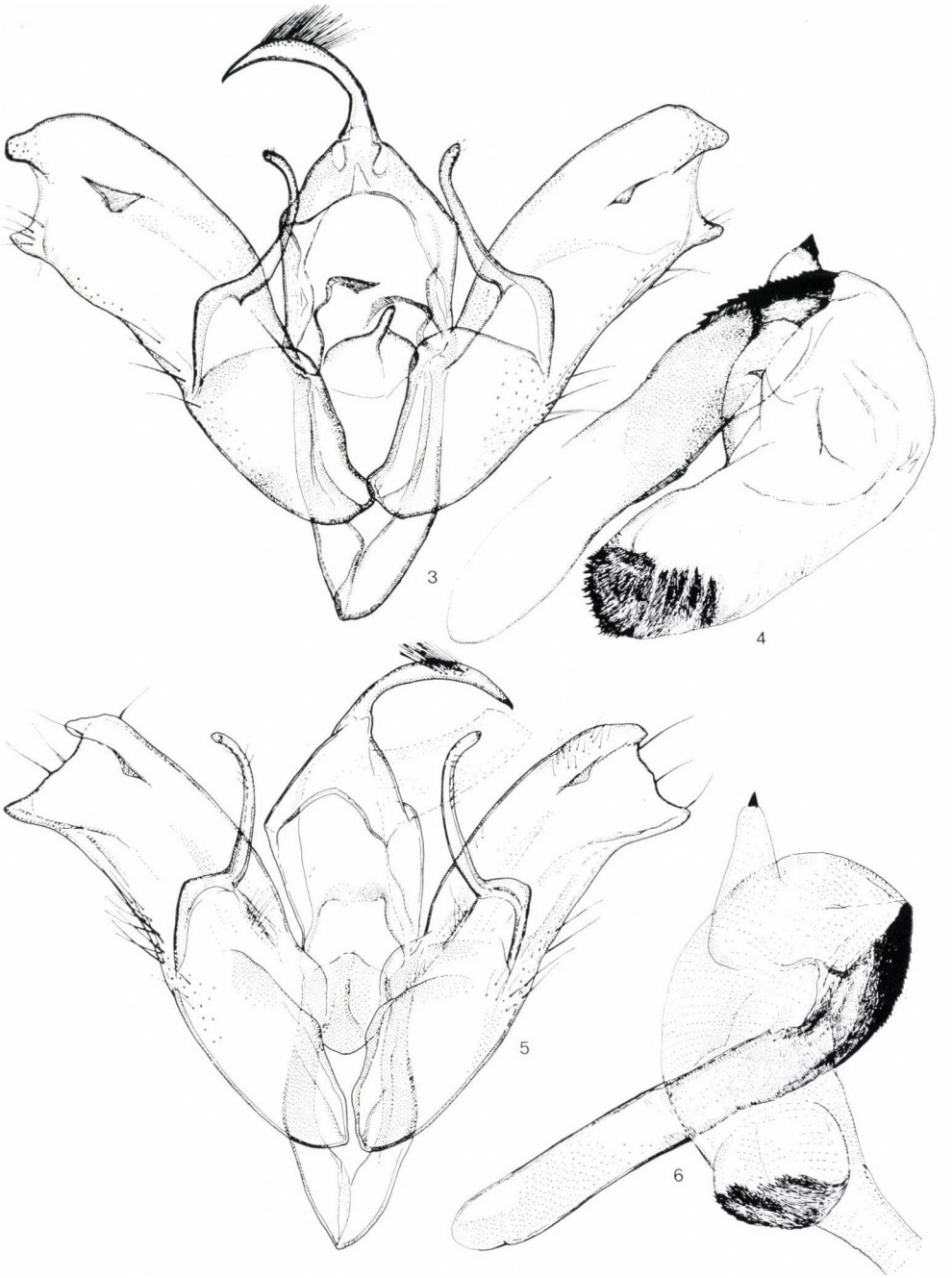
SYSTEMATIC PART

Eugnorisma (*Eugnorisma*) *tamerlana* (HAMPSON, 1903) (Plate I: 2—3)

Cat. Lep. Phal., **IV:** 451 (*Lycophotia*). — Type locality: West Turkestan, Syr-Darja.

Examined material: 1 ♀, Aulie Ata, 1 ♂, Turk. or., Karakara, Tien-Shan centr. (Naturhistorisches Museum, Vienna = NHMW); 1 ♂, Syr-Darja, Aulie Ata (Zoologische Staatssammlung Munich = ZSM); 1♂, 4 ♀, Turkmenia, Cholotani, 1 ♀, Tadzhikistan, Tigrovaia balka (coll. TSVETAJEV, Zoological Museum of University, Moscow = ZMM); 13 ♂♂ and ♀♀, Syr-Darja, Baigacum, Merv, Murgabskoje gosudarevo, 3 ♂, 1 ♀, Turcomania, Bairam-Ali (coll. Zoological Institute Academy of Sciences USSR, Leningrad = ZIN). Slides Nos: MW 78 BOURSIN, 1580 (males), 3038 VARGA (female).

Description: Head, thorax and fore wing light, shiny ash-grey or sandy grey, outer side of palpi with dark hairs; thorax and collar with some blackish irroration. Shape of fore wing elongate, narrow, pointed. Antemedial and postmedial lines double, pale with lighter filling, costal part with darker spots. Orbicular spot large, oblique, flattened, reniform spot large, their outlines whitish with some darker shadow. Preorbicular spot black, very long



Figs 3—6. 3—4 = *Egnorisma* (*E.*) *tamerlana* HAMPSON, Aulie Ata. 5—6 = *E.* (*E.*) *puengeleri* sp. n. Paratype, Afghanistan

and narrow, intermacular spot black, small, triangular. Subterminal line diffuse, slightly sinuous with darker upper part, terminal line whitish, defined with some dark spots. Cilia light grey with two darker lines. Hind wing pure white, patternless. Underside of wings shiny greyish with some reddish shade at margins, patternless or with pale shadow of two blackish spots in cell and upper part of transversal line.

Male genitalia (Figs 3—4): uncus long and slender, tegumen high, fultura inferior a rounded quadrangular plate with apical processus, vinculum strong, V-shaped. Valvae very large, elongate, dilated near apex, apex with a triangular costal lobe. Pollex relatively short, triangular. Apical part of valvae with a small, erected emergence near to apex at costal margin. Harpe very long and slender, sword-like, its basis less strong, its outer edge rounded. Aedoeagus large, thick with strong distal plate on dorsal surface covered with strong teeth. Vesica everted ventrally, elongated, sac-like, spinulose field large, not pocket-like. Diverticulum wide and short, cornutus wide-based, short.

Female genitalia (Fig. 123): papillae anales short and wide, gonapophyses moderately long. Ostium bursae strong, quadrangular, ductus bursae long, heavily sclerotized, its proximal part constricted and folded. Apex bursae large, arcuate, strongly rugulose, corpus bursae elongate, large, without signa.

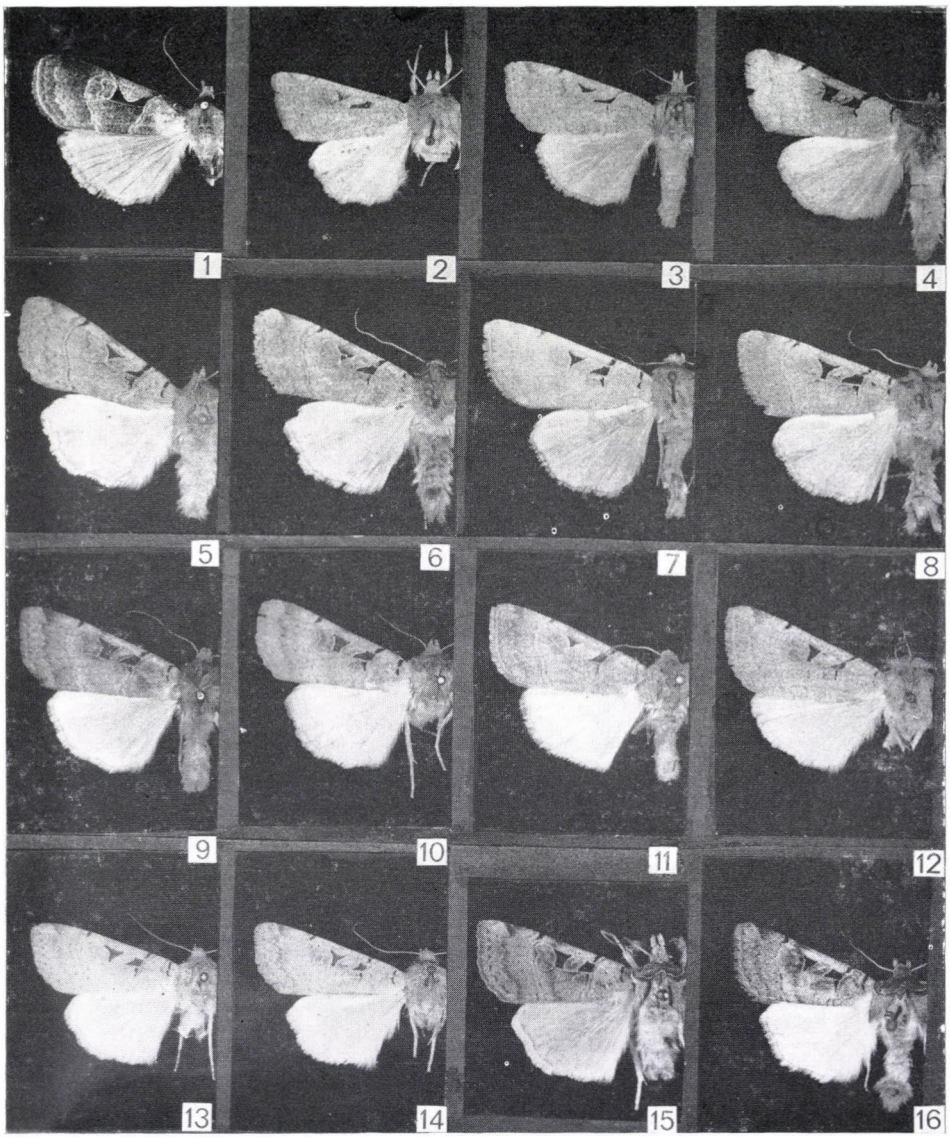
Distribution: a typical semi-desert or desert species occurring in sandy and saline deserts of Soviet Turkestan.

Eugnorisma (Eugnorisma) puengeleri sp. n. (Plate I: 4—8)

Holotype male: Afghanistan, Paghman, 30 km NW Kabul, 20—30. IX. 1963, leg. VARTIAN, deposited in coll. VARTIAN (= SVV). Slide No. 3017 VARGA. Paratypes: 1 ♂, 1 ♀ from same locality and data (SVV); 1 ♀, Afghanistan, Tang-i-Gharu, 1700 m, 30. IX. 1973, leg. et coll. RESHÖFT; 3 ♂, E Afghanistan, Sarobi, 1100 m, 15. X. 1961, leg. EBERT; 2 ♂, E Afghanistan, Khinjan valley, leg. KLAPPERICH (ZSM); 1 ♀, "Mts. Alt.", coll. ERSHOV (ZIN); 1 ♂, Pamir, Chorog, Tadzhikistan, USSR, in coll. HEINICKE; 1 ♂, Aulie Ata (NHMW), 1 ♂, 1 ♀ from same locality, 1903, "*Agr. chaldaica*, *Eu. spodia* PÜNG." (MB); 1 ♀, Ispajran, Alai sept. (NHMW); 3 ♂, USSR, Uzhbekistan, Aktash, Korzhin-Tau, 5. X. 1964, leg. TSVETAJEV (ZMM); 10 ♂, 14 ♀, USSR, Uzhbekistan, Alai Mts., Jordan, Dugobo, IX. 1985, leg. VARGA, coll. VARGA, HACKER and Hungarian Natural History Museum, Budapest (= HNHM); 1 ♂, 1 ♀, Sarepta, "*chaldaica*" (MB). Slides Nos 1378, 1386, 1718 RONKAY, 1871, 2469, 2681, 3017, 3314, 3315, 3317, 3320, 3356 (VARGA (males), 1385 RONKAY, 3039, 3133 VARGA (females).

Description: Alar expanse 35—42 mm, length of fore wing 16—19 mm. Head, thorax and fore wing light grey with more or less strong brownish or sandy grey irroration. Sides of palpi dark brown, collar and thorax with some dark scales. Shape of fore wing elongate, wide, slightly pointed. Transversal lines well discernible, double, brownish, its filling usually same as ground colour, with darker spots at costal margin. Shape of orbicular and reniform spots strongly variable, orbicular usually large, flattened and oblique, often with some reddish-brown filling. Preorbicular and intermacular spots black or blackish with variable shape, preorbicular usually elongate, inter-

Plate I



1 = *Sinognorisma gothica* BOURSIN, holotype, China. — 2 = *Eugnorisma* (*E.*) *tamerlana* HAMPSON, male, Aulie Ata, and 3 = female, Aulie Ata. — 4 = *E.* (*E.*) *puengeleri* sp. n., holotype, Afghanistan, 5 = paratype, Afghanistan, 6—7 = paratypes, Alai Mts. and 8 = paratype, Uzhbekistan, Korzhin-Tau. 9 = *E.* (*E.*) *chaldaica* BOISDUVAL, male, Issyk-Kul and 10 = female, Sarepta. — 11 = *E.* (*E.*) *spodia* PÜNGELER, lectotype, Askhabad and 12 = male, Askhabad ("neoallotype"). — 13 = *E.* (*E.*) *spodia psammochrea* ssp. n., holotype, Aulie Ata and 14 = paratype, Aulie Ata. — 15 = *E.* (*E.*) *caerulea* WAGNER, Turkey, Gürün and 16 = ditto, Armenia, Aragats Mts

macular wedge-shaped. Subterminal line a diffuse shadow with a pale grey outer line, terminal line ochreous white, fine, cilia brownish-grey with somewhat darker inner part. Terminal field sometimes with some dark scales on veins. Hind wing whitish with some greyish shade, veins and marginal part covered with grey. Cilia whitish with some darker scales on inner side. Underside of fore wing greyish white with more or less strong dark grey irroration, marginal areas usually lighter. Pattern obsolescent, a part of postmedial line and shadows of maculae can be seen.

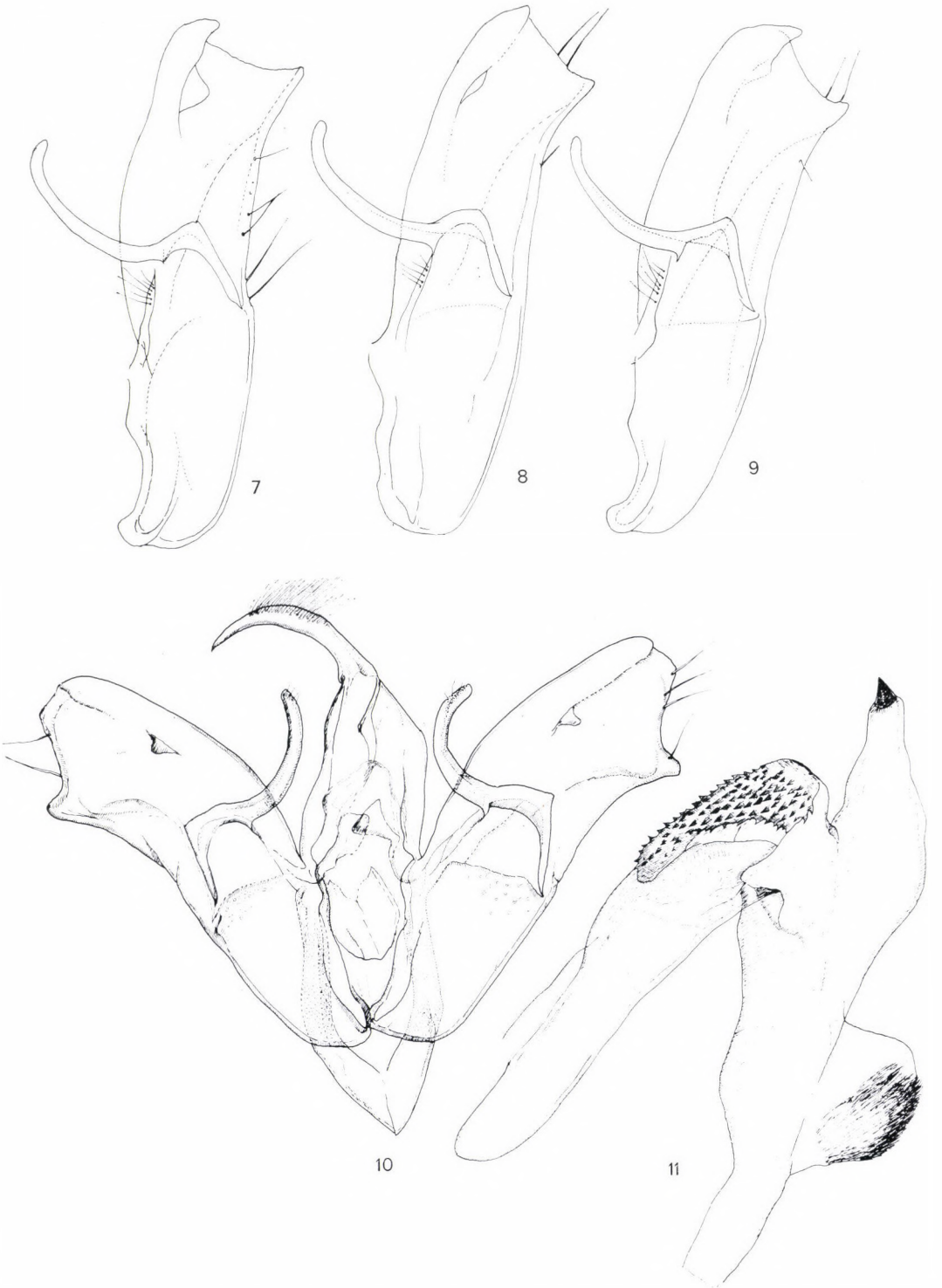
Male genitalia (Figs 5—9): uncus long and slender, tegumen high, fultura inferior a rounded plate with medial crest, vinculum strong, V-shaped. Valvae large, elongate with nearly parallel margins. Apical lobe small, pollex large and wide, triangular, valval lobe near to costa small. Harpe very long and slender, sword-like, its basis relatively strong, outer edge usually rounded. Aedoeagus very long and slender, distal part slightly curved, distal dorsal lamina strong with spine-like teeth. Vesica everted ventrally, reflexed to dorsal side, spinulose field more or less pocket-like. Diverticulum narrow, terminal cornutus small.

Female genitalia (Fig. 125): papillae anales slightly elongate, gonapophyses rather short. Ostium bursae well sclerotized, quadrangular, ductus bursae very long, heavily sclerotized, proximally constricted and strongly folded. Apex bursae large, curved, strongly rugulose, corpus bursae elliptical, big.

The new species is similar in its appearence to *spodia* and *caerulea*, but — by the characteristics of the genitalia of both sexes — it is more closely related to *tamerlana*, in spite of their relatively strongly different wing pattern. It differs from *tamerlana* by the different shape of wings, different dark pattern of fore wing, different colouration of hind wing, the male genitalia with different shape of valvae, very different configuration of aedoeagus, the female genitalia with much longer ductus bursae. The *spodia-caerulea* pair of species has more similar wing pattern — with some differences, for example the greyish shade of hind wing of *puengeleri* —, but the male genitalia of these species have very different shape of valvae and aedoeagus with large ventral hook at distal end, and their female genitalia have much shorter ductus bursae with different structure of proximal part. The last species having similar wing pattern, *chaldaica* has special, rosy-grey ground colour and, by its genitalic features it has an intermediate status between the *tamerlana-puengeleri* and the *spodia-caerulea* pairs of species with very distinctive specific characters.

Distribution: The known area of this species extends from the southern Ural to East Afghanistan.

This species was previously identified and figured (e.g. BOURSIN, 1954) as *E. spodia* and the "specific status of *spodia*" was based on the characters



Figs 7—11. 7—9 = *Eugnorisma* (*E.*) *puengeleri* sp. n. 7 = holotype, Afghanistan, 8—9 = paratypes, Mts. Alai. 10—11 = *E.* (*E.*) *chaldaica* BOISDUVAL, Issyk-Kul

of this species. The mistake originated from the neglection of the study of genitalia of the female types of *spodia*. The comparative study of this group is evidently pointed out the female types of *spodia* and the male specimens considered to be as *spodia* are not conspecific, the true *spodia* males — from the type locality — have similar genitalia to *caerulea*. An interesting fact the ranges of *puengeleri*, *spodia*, *caerulea* and *chaldaica* are partly overlapped, they occurs sympatrically in Aulie-Ata and its vicinity, but from the type locality of *spodia* (Askhabad) only this species has been recorded.

Eugnorisma (*Eugnorisma*) *chaldaica* (BOISDUVAL, 1840) (Plate I: 9—10)

Gen. Ind. Meth., p. 140 (*Orthosia*). — Type-locality: South Russia.

Examined material: 2 ♀, Russia mer., Coll. E. FRIVALDSZKY, 2 ♀, Issyk-Kul, coll. E. FRIVALDSZKY (HNHM); 1 ♀, from same locality, coll. SCHAWERDA, 1 ♂, from same locality, 13. VIII. 36, coll. THIELE, 2 ♂, 2 ♀ from same locality, without more data (NHMW); 3 ♂, from same locality (MB); 2 ♂, 1 ♀ from same locality (ZSM); 3 ♀, Margelan (ZSM); 1 ♂, 1 ♀, Altai (NHMW); 1 ♂, 1 ♀ from same locality, coll. STAUDINGER, Zoological Museum, Humboldt University, Berlin (= HZMB), 1 ♀, Saisan, coll. STAUDINGER (HZMB); 1 ♂, Sarepta (ZSM); 1 ♂, 1 ♀, "Ural" (NHMW), 1 ♂, "S Russia" (NHMW); 19 ♂♂ and ♀♀ from Issyk-Kul, Semirethsje, Altai, Tarbagatai, Saratov, Sarepta (ZIN). Slides Nos: 1376 RONKAY, 75/276, 3013 VARGA (males), 827, 983, 984 RONKAY, 3037 VARGA (females).

Description: Alar expanse 35—40 mm, length of fore wing 16—19 mm. Head and thorax reddish brown, palpi with dark brown scales on outer side, collar with some fine darker lines. Ground colour of fore wing light reddish-brown with characteristic rosy-grey or pinkish shade. Subbasal line fine, blackish, antemedial line double, oblique, outer side blackish, defined by light greyish at inner side, basal field with some darker brown irroration. Orbicular spot elongate, more or less flattened, reniform large, their outlines whitish, filling of them darker than ground colour. Preorbicular spot relatively short, triangular or somewhat trapezoidal, intermacular spot trapezoidal with constriction at middle, their colouration variable, black, blackish or dark brown. Claviform spot absent or obsolete, its lighter outline and some darker brown scales of its filling sometimes can be observed. Postmedial line double, sinuous, obsolescent with exception of costal part. Subterminal line pale grey, waved, more or less diffuse with darker shadow at inner side, terminal line consists of dark, fine arches, often less visible, veins usually with fine darker covering in outer part of wing. Cilia reddish-brown with two fine darker line. Hind wing whitish with some ochreous grey shade, veins often with darker brown scales in marginal field. Underside of fore wing light greyish with some rosy shade, medial area of wing with darker brown irroration, upper part of transversal line and shadows of maculae usually well visible. Hind wing lighter, cellular lunule and upper part of transversal line sometimes slightly darker.

Male genitalia (Figs 10—11): uncus slender, tegumen high, fultura inferior rounded quadrangular, vinculum V-shaped. Valvae elongate, apex rounded, apical lobe small or reduced, pollex short and triangular, valval lobe at costal margin small. Harpe long and narrow, curved, its basis strong with rectangular outer edge. Aedoeagus long and strong, distal dorsal lamina very large and elongate, covered by large teeth. Vesica everted ventrally, tube-like, spinulose field pocket-like. Diverticulum long and broad, terminal cornutus wide-based, relatively big.

Female genitalia (Fig. 126): ovipositor and gonapophyses rather short, ostium bursae a slightly curved quadrangular lamina, sterigma very short. Ductus bursae moderately long, proximally strongly, twice folded. Apex bursae rugulose, curved, corpus bursae large, pyriform, without signa.

Distribution: S Ural, Sarepta, Soviet Turkestan, Altai, Tarbagatai.

Eugnorisma (*Eugnorisma*) *spodia* (PÜNGELER, 1899) (Plate I: 11—12)

Iris **12:** 289 (*Agrotis chaldaica* var.). — Type-locality: Askhabad.

Examined material: Lectotype (designated here), female, "Asia centr., (Aschabad) 1898", "Type v. *spodia* PÜNGELER", "Gen. prep. No. 1384 RONKAY", deposited in coll. PÜNGELER (HZMB). Paralectotype: female with same data (HZMB). 1 ♂, from same locality, 26. IX. 906, AHNGER, coll. DUSKE, Zoological Museum, University of Helsinki (ZMH) ("neoallotype"), 2 ♂, from same locality, coll. STAUDINGER (HZMB), 11 ♂♂ and ♀♀ from same locality, coll. VEL. KN. NIKOLAIA MIKHAILOVITSA (in Russian) (ZIN), 5 ♂, 10 ♀, from same locality, 17. IX. 1954, leg. POTOPOLSKI (ZMM); 1 ♂, Tura, 21. VIII. 91 (HNHM); 1 ♂ from same locality (ZIN); 1 ♀, Turkmenia, Mergen-golen, 1 X. 90, leg. BIANCHI (ZIN); 1 ♀, Kopet-Dagh, Turcomania, leg. POTOPOLSKI (ZIN); 3 ♂, Ai-Dere, EYLANDT (ZIN). Slides Nos: 826 RONKAY, 75/278, 3112, 3355 VARGA (males), 1384 RONKAY (female).

Redescription: Alar expanse 37—41 mm, length of fore wing 17—19.5 mm. Head and thorax light brownish-grey with darker grey scales, outer side of palpi dark brown, collar and thoracic tufts with fine darker lines. Abdomen somewhat more greyish, without dorsal tufts. Fore wing more or less unicolorous, brownish grey with very fine ochreous shine. Subbasal line only a small spot at costa, antemedial line double, outer line blackish from costa to submedian area. Orbicular spot large, oval, oblique, reniform usually somewhat smaller, outline of them light whitish grey. Preorbicular spot deltoidal, larger than small, triangular intermacular spot. These spots black or blackish with characteristic golden-bronze shine. Postmedial line double, darker grey with somewhat lighter filling, with a small blackish spot at costa. Subterminal line ochreous grey, waved with diffuse, darker reddish-brown shadow. Terminal line ochreous, cilia grey with lighter outer part. Hind wing white or whitish with some greasy shine, veins covered by brown, mostly by females, in marginal field with somewhat stronger greyish irroration. Cilia whitish with darker medial line, inner margin of wing with long whitish hairs.

Underside of fore wing brownish grey, marginal field darker, transversal line and shadow of reniform more or less visible. Hind wing whitish with fine ochreous shade, with somewhat darker marginal areas.

Male genitalia (Figs 12—13, 15): uncus relatively short, tegumen wide, fultura inferior quadrangular with apical processus, vinculum strong, V-shaped. Valvae strong and wide, apical part slightly curved, apex rounded with a small apical lobe. Pollex strong, elongate, triangular, with a characteristic, pointed, conical protuberance at its base. Harpe thick, curved, its basis strong, outer edge usually rectangular. Aedoeagus long and slightly curved, distal part with very strong ventral hook. Vesica everted dorsally, reflexed to ventral side, spinulose field more or less pocket-like, diverticulum short and basally widened, terminal cornutus small, elongate.

Female genitalia (Fig. 128): papillae anales wide and short, gonapophyses relatively short. Ostium bursae strongly sclerotized, quadrangular with short sterigma. Ductus bursae moderately long, bulbous, not folded proximally, at most with some dorsal crests. Apex bursae strongly rugulose, corpus bursae long, elliptical.

This species is similar in its appearence to *puengeleri* and *chaldaica*, but differs from those with a series of characters. The structure of genitalia of both sexes of *spodia* and *puengeleri* is very different (see the figures), *spodia* related much closely to *caerulea*. But *spodia* has intracellular dark spots with golden-bronze shine, not fully black as in the case of *chaldaica*, hind wing of *spodia* not pure white. The male genitalia of *spodia* can be characterized with thick harpae and pointed, conical protuberance at pollex, since *caerulea* has much slender harpe and a more or less elongated crest at pollex. The bulbous part of ductus bursae in case of *spodia* more convex than that of *caerulea*, ostial margin of *spodia* medially incised, not U-shaped as in *caerulea*.

Distribution: SW Turkmenia.

Eugnorisma (Eugnorisma) spodia psammochrea ssp. n.
(Plate I: 13—14)

Holotype male: Aulie Ata, in coll. NHMW. Slide No. 2679 VARGA. Paratypes: 1 ♀, Aulie Ata, Syr-Darja, coll. F. POPP (ZSM); 1 ♀, Margelan, in coll. STAUDINGER (HZMB); 1 ♀, Kara-Tjube, W of Samarkand, Uzhbekistan, 10—18. VIII. 96, leg. VERIGIN (ZIN). Slides Nos: 2679 VARGA (male), 1214 RONKAY, 3133 VARGA (females).

Description: Size and shape of wings similar to nominate race, ground colour of head, thorax and fore wing special ochreous sandy grey, upper parts of transversal lines strong, blackish. Subbasal line short, antemedial double, oblique, orbicular spot large, reniform elliptical, lower part narrower. Preorbicular spot deltoidal or nearly triangular, intermacular spot small, triangular, black with golden-bronze shine. Postmedial line double, slightly sinuous, lower part obsolescent. Subterminal line strongly waved, pale

Figs 12—16. 12—13, 15 = *Eugnorisma* (*E.*) *spodia* PÜNGELER, Askhabad. 14, 16 = *E.* (*E.*) *spodia psammochrea* ssp. n. Holotype, Aulie Ata

brown with narrow inner shadow. Terminal line a row of brown spots, outer part of wing with some dark scales on veins. Hind wing pure white with only very fine greyish irroration in marginal fields. Underside of wings whitish-ochreous, marginal fields and shadow of reniform pale sandbrown. Configuration of genitalia of both sexes similar to nominate subspecies (Figs 14, 16, 127).

This eastern subspecies differs from the nominate *spodia* with its much lighter colouration, the characteristic ochreous ground colour and nearly pure white hind wing.

Distribution: East Turkestan.

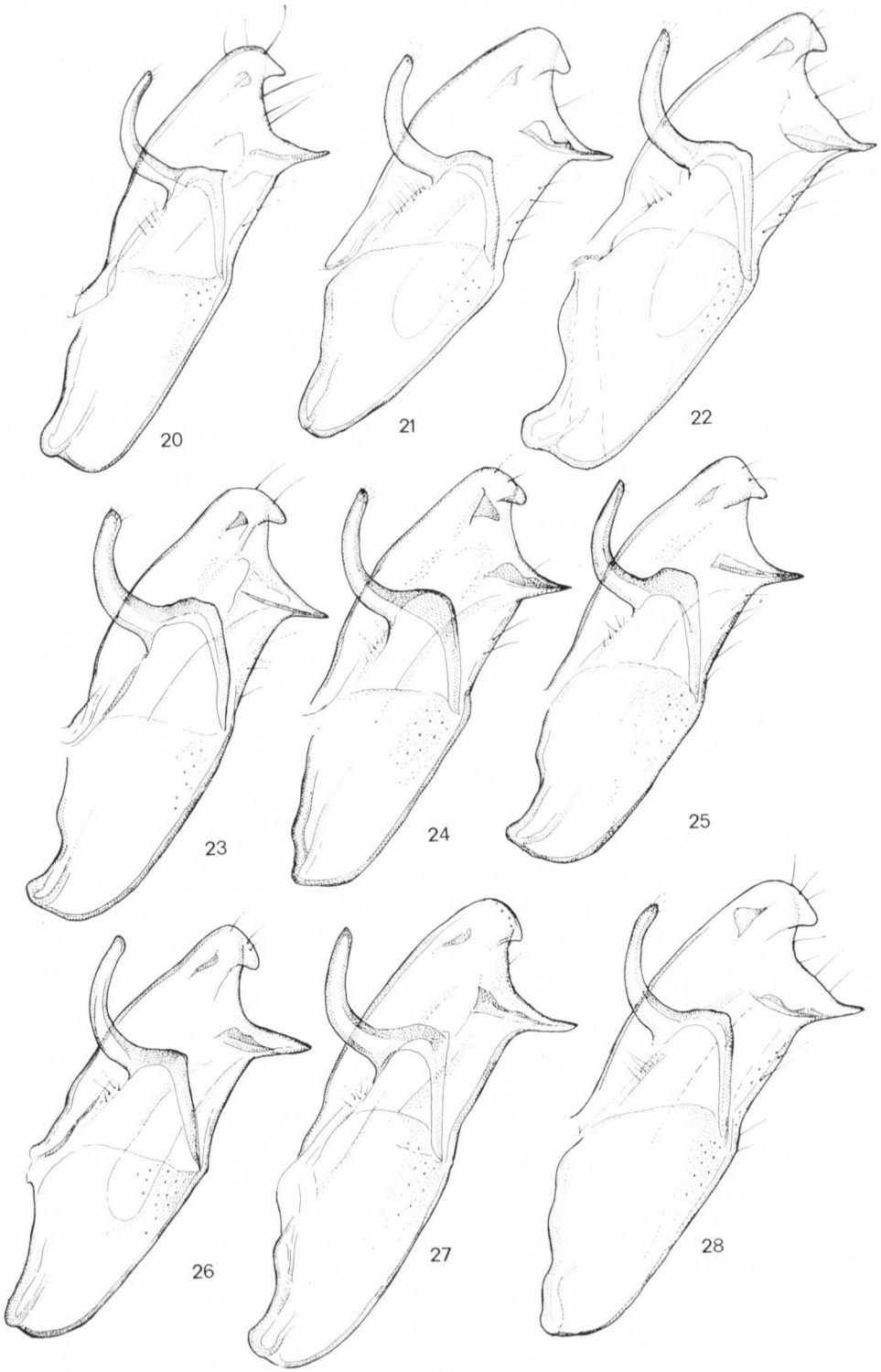
Eugnorisma (*Eugnorisma*) *caerulea* (WAGNER, 1932)
(Plate I: 15—16, II: 17—20)

Int. Ent. Zeitschrift, **26:** 141 (*Agrotis chaldaica* var.). — Type-locality: Akshehir (Turkey).

Examined material: Lectotype and Paralectotype, two males "Ak-Chehir, Tschiftlik, IX. 1931, coll. WAGNER" (NHMW); a series from Turkey, Prov. Bitlis, Mus Ovasi, 17. IX. 1985, leg. et coll. HACKER; 1 ♂, Asia min., Erzurum, Kop-Mayen-Dagh, IX. 1937 (ZSM); 5 ♂, Asia min., Gürün, 13—21. IX. 1975, leg. FRIEDEL (ZSM); 1 ♂ Malatya (HNHM); a series of males and females from Armenia Geghard 3—11. IX. 1975 leg. KASY et VARTIAN in coll. VARTIAN; a series from same locality 27—29. IX. 1983, leg. et coll. VARGA; a series from Armenia, Aragats Mts., Antarut 20—21. IX. 1982, leg. MERKL and RONKAY (HNHM); 1 ♂, Sarepta, coll. DUSKE (ZMH); 1 ♂, 1 ♀ without locality, coll. KINDERMANN (NHMW); 1 ♂, Sarepta, 1 ♂, Lepsa, 2 ♂, Saisan ("*chaldaica*", in coll. STAUDINGER, HZMB); 1 ♂, Altai ("*spodia*", coll. STAUDINGER, HZMB); 1 ♂ from same locality, 1 ♂, Sibiria, ex coll. NEUBURGER (HNHM); 1 ♀, Afghanistan, Paghman (coll. VARTIAN); 13 ♂♂ and ♀♀ from Sarepta, Daghestan, Yerevan, Altai (ZIN). Slides Nos: 970, 973, 974 RONKAY, 75/730, 75/837, 2346, 2347, 2468, 2470, 3135, 3573 VARGA (males), 981 RONKAY, 75/731, 75/892, 1387, 1840 VARGA (females).

Description: Alar expanse 35—39 mm, length of fore wing 15—19 mm. Head and thorax greyish-brown, outer side of palpi blackish-brown, thorax with light grey hairs. Abdomen somewhat lighter. Collar and thoracic tufts with brown or reddish-brown lines. Ground colour of fore wing very variable; specimens of Asia Minor and Armenia light, shiny grey with bluish shine, specimens from Sarepta somewhat darker grey and not bluish, eastern (Central Asian) specimens dark grey with more or less strong reddish or fine scarlet tinge; lighter parts of medial area in case of western populations more intensive. Subbasal line single, blackish, short, antemedial line double, arcuate or sinuous, dark brown or blackish. Orbicular spot relatively small, oblique, flattened, often with reddish-brown filling; reniform spot larger, elliptical, their outlines whitish, filling of reniform brownish or plumb-grey. Intracellular spots strong, black, sometimes with fine shine. Claviform reduced but sometimes its darker outline can be observed. Medial line pale, obsolescent, shadow-like, postmedial line double, costal part with blackish spot, lower part usually obsolete. Subterminal line strongly waved, whitish grey with reddish-brown shadow at inner side, upper part with triangular, dark spot. Terminal line ochreous white, cilia grey with a fine lighter line at middle. Terminal area with some darker covering on veins and some dark spots near terminal line.

Figs 17—19. 17—18 = *Eugnorisma* (*E.*) *caerulea isabellina* ssp. n., Paratype, Iran. 19 = *E.* (*E.*) *caerulea* WAGNER, Armenia, Aragats Mts



Figs 20—28. 20—25 = *Eugnorisma (E.) caerulea* WAGNER. 20 = Gürün, 21 = Sarepta, 22 = Afghanistan, 23—25 = Armenia. 26—27 = *E.* (*E.*) *caerulea isabellina* ssp. n. Paratypes, Iran. 28 = *E.* (*E.*) *caeraleu kurdistana* HACKER, GROSS et KUHNA. Paratype, E Anatolia

Hind wing shiny, pure white, sometimes basal part slightly transparent; darker scales at marginal field very rare. Underside of wings whitish or whitish-ochreous, pattern reduced to some darker scales in marginal areas and shadows of reniform spot and transversal line.

Male genitalia (Figs 19—25): uncus slender, tegumen high and wide, fultura inferior quadrangular with apical processus, vinculum strong, V-shaped. Valvae strong, apex with a short costal lobe. Pollex strong, pointed triangular, with a characteristic, more or less strong crest at its base. Harpe relatively short but slender, its basis strong, outer edge of it nearly rectangular. Aedoeagus long and strong, slightly curved, with very strong ventral hook distally. Vesica everted dorsally, reflexed to ventral side, spinulose field more or less pocket-like. Diverticulum relatively long, terminal cornutus short, pointed.

Female genitalia (Fig. 130): papillae anales wide and short, gonapophyses short. Ostium bursae strongly sclerotized, ductus bursae heavily sclerotized, bulbous, relatively short. Apex bursae large, elongate and slightly curved, strongly rugulose, corpus bursae long, without signa.

Distribution: Central and Eastern Anatolia, Armenia, Daghestan, Sarepta, Altai, Saisan, Afghanistan.

Eugnorisma (*Eugnorisma*) *caerulea kurdistana* HACKER, GROSS and KUHNA, 1986 (Plate II: 21)

Entomofauna, **1986:** 89. — Type-locality: Turkish Kurdestan.

Examined material: Holotype, ♂, Turkey, Prov. Bingöl, Buglan Gecidi, 30. IX. 1981, leg. KUHNA, coll. HACKER; paratypes ♂♂ and ♀♀ from same locality and data (coll. HACKER, KUHNA, VARGA); ♂♂ and ♀♀ from Turkey, Prov. Bitlis, 23 km Tatvan, in coll. HACKER and KUHNA. Slides Nos: 3572, 3781 VARGA (males).

This subspecies differs from the nominate race with its unicolorous, brownish-grey, relatively dark ground colour of fore wing and the absence of reddish irroration of orbicular and reniform spots. These characters show some similarity to the Iranian race describing in the following part.

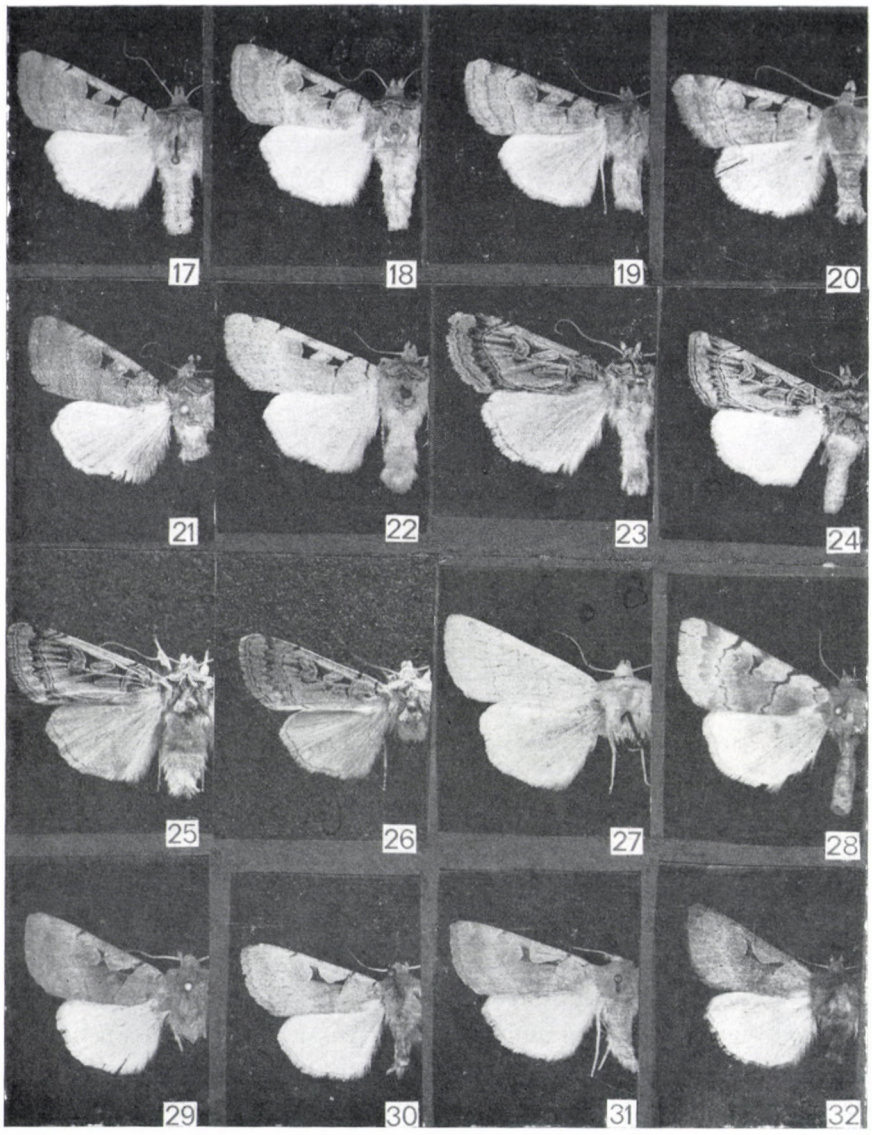
Distribution: Turkish Kurdestan.

Eugnorisma (Eugnorisma) caerulea isabellina ssp. n. (Plate II: 22)

Holotype male: W Iran, Bala-vi-Taq, 3—4. X. 1965, leg. et coll. VARTIAN. Paratypes: series of males and females from same locality and data; males and females from Iran, Kasri-Shirin; males and females from N Iran, Demavend, Vahane; N Iran, Derbend; in coll. VARTIAN, ZSM, VARGA and HNHM. Slides Nos: 931, 969 RONKAY, 75/728, 75/831, 1423, 2345, 3136 VARGA (males), 1263 RONKAY (female).

Description: Size of it identical with nominate race, shape of fore wing somewhat narrower. Head, thorax and fore wing light ochreous grey with slight brownish irroration, fore wing strongly unicolorous. Elements

Plate II



17—18 = *Eugnorisma* (*E.*) *caerulea* WAGNER, Armenia, Aragats Mts., 19 = ditto, Armenia, Geghard and 20 = ditto, Sarepta. — 21 = *E.* (*E.*) *caerulea kurdistana* HACKER, GROSS and KUHNA, paratype, Turkey. — 22 = *E.* (*E.*) *caerulea isabellina* ssp. n., paratype, Iran, Kasri-Shirin. — 23 = *E.* (*E.*) *eminens* LEDERER, Issyk-Kul and 24 = ditto, Issyk-Kul. — 25 = *E.* (*E.*) *eminens clarior* VARGA, paratype, Afghanistan. — 26 = *E.* (*E.*) *atrabaelbops* VARGA, paratype, Afghanistan. — 27 = *E.* (*E.*) *enargiaris* DRAUDT, Asia Minor. — 28 = *E.* (*E.*) *coryphaea* PÜNGELER, holotype, Kuku-Noor. — 29 = *E.* (*E.*) *gaurax* PÜNGELER, holotype, Tien-Shan, 30 = ditto, Turkestan, Shahristan, 31 = ditto, Semirethsje and 32 = ditto, Alai Mts.

of pattern similar to *caerulea caerulea*, but without reddish filling of orbicular and reniform, intracellular spots not black but dark brown with fine metallic shine. Subterminal line less strong, pale brownish, cilia light ochreous grey. Hind wing pure white without darker covering, underside of wings white with some ochreous, darker pattern reduced, shadows of reniform and upper part of transversal line sometimes slightly discernible. Configuration of genitalia does not differ significantly from that of nominate race (Figs 26—27, 30—31, 129).

The new subspecies differs from the two previously described subspecies of *caerulea* with its very characteristic light ochreous grey fore wing, the absence of reddish pattern and with brown intracellular spots, underside of wings is also lighter.

Distribution: North and NW Iran.

Eugnorisma (*Eugnorisma*) *eminens* (LEDERER, 1855) (Plate II: 23—24)

Verh. zool.-bot. Ges., Wien, **1855:** 106 (*Graphiphora*). — Type-locality: Altai.

Examined material: 1 ♂, Issyk-Kul, in coll. Zoological Institute, Eberswalde; 1 ♂ from same locality (HNHM); 6 ♂♂ and ♀♀ from same locality (MB); 1 ♂, 4 ♀ from same locality (NHMW); 2 ♂ from same locality, coll. STAUDINGER (HZMB); 1 ♀, Uzhbekistan, Alai Mts, Iordan, 29. IX. 1985, leg. et coll. VARGA; 35 ♂♂ and ♀♀ from Aksu, Altyn-Tagh, Iran: Khorassan, Hissar Mts, Issyk-Kul (ZSM); ♂♂ and ♀♀, N Iran, Demavend, Vahane, 24—26. IX. 1965, leg. VARTIAN (in coll. VARTIAN, VARGA and HNHM); 1 ♂, Iran: Khorassan, Koh-i-Binaloud, coll. BRANDT (NHMW); 1 ♀, Tiflis (= Tbilisi), coll. SCHAWERDA (HNMW); 1 ♂, 3 ♀, Aksu (NHMW); 1 ♂, Altai, coll. STAUDINGER (HZMB), 3 ♂, Saisan, coll. STAUDINGER (HZMB); 19 ♂♂ and ♀♀, Ala-Tau, Tarbagatai, Askhabad, Pamir: Chorog, Tadzhikistan (ZIN); 10 ♂, 9 ♀, Askhabad, 17—26. IX. 1954, leg. TSVETAJEV (ZMM); 2 ♂, Uzhbekistan, Aktash, Korzhin-Tau, coll. TSVETAJEV (ZMM); 2 ♂, 1 ♀, Uzhbekistan, Tshatkal, coll. TSVETAJEV (ZMM); 1 ♂, Pamir: Liangar, coll. TSVETAJEV (ZMM); ♂♂ and ♀♀ from Turkey, Prov. Erzurum, Palandöken daglari, Prov. Kars, Arax valley; Prov. Agri, Tahir Gecidi; Prov. Van, Güselzu; Prov. Bitlis: Tatvan, Güseldere; Prov. Bingöl, Karliova (coll. HACKER). Slides Nos: 976, 977 RONKAY, 75/275, 3137 VARGA (males), 975 RONKAY (female).

Description: Alar expanse: 34—40 mm, length of fore wing 15—19 mm. Head and thorax greyish brown, collar and thoracic tufts defined by black. Fore wing elongate, narrow, pointed, ground colour pale brownish-grey or ochreous-grey, with more or less strong brownish irroration. Subbasal line straight, blackish, basal area strongly covered with blackish-brown, mostly at veins. Antemedial and postmedial lines blackish-brown, double, filled with grey, conjoined at inner margin. Median field wide orbicular oblique, elongated, relatively small, reniform elliptical, slightly arcuate, claviform long, their outlines double. Preorbicular and intermacular spots large, black; with long blackish triangles running from reniform to postmedial line, and some darker irroration below cell. Subterminal line strong, consisting of a light grey, waved line and a row of blackish triangles, terminal line black, cilia greyish with darker brown line at middle. Hind wing pure white, cellular lunule absent, cilia whitish. Underside of wings light greyish with some brown-

Figs 29—33. 29 = *Eugnorisma (E.) caerulea kurdistana* HACKER, GROSS and KUHNA. Paratype, E Anatolia. 30—31 = *E. (E.) caerulea isabellina* ssp. n. Paratypes, Iran. 32—33 = *E. (E.) enargiaris* DRAUDT, Asia Minor

ish irroration, upper part of transversal line and reniform spot usually can be seen.

Male genitalia (Figs 34—35, 40—41): uncus moderately long, tegumen wide and high, fultura inferior subtriangular with apical processus, vinculum strong. Valvae elongate, distal part of costal margin slightly arcuate. Apical lobe small, pollex short, triangular with a small crest at its base. Harpe arcuate, more or less slender, relatively short, its basis strong, outer edge rounded, pulvillus well-discernible. Aedoeagus moderately long, distal dorsal lamina strong with large teeth. Vesica everted ventrally, spinulose field strongly pocket-like. Diverticulum relatively long, terminal cornutus elongate, pointed.

Female genitalia (Fig. 131): papillae anales wide and short, gonapophyses rather short. Ostium bursae well sclerotized with deep incision on caudal margin, proximal margin V-shaped. Ductus bursae moderately long, heavily sclerotized, strongly folded. Apex bursae rugulose, corpus bursae large, elliptical.

Distribution: Eastern Turkey, Georgia, Iran (N), Turkmenia, Turkestan, Tien-shan, Altai, Saisan.

Eugnorisma (*Eugnorisma*) *eminens clarior* VARGA, 1975 (Plate II: 25)

Z. Arbeitsg. österr. Ent., **27** (1—2): 12. — Type-locality: Afghanistan, Khurd-Kabul.

Examined material: Holotype male, Afghanistan, Khurd-Kabul, 1900 m, 20 km SO Kabul, 4—10. IX. 1965, leg. et coll. VARTIAN. Paratypes: 3 ♂, 1 ♀ from same locality and data, 1 ♂, Afghanistan, Paghman, 1 ♂, Afghanistan, Dasht-i-nawar, in coll. VARTIAN. Further material can be found in coll. ZSM from Afghanistan: Paghman, Salang, Ferusch-Tagan, Khinjan, Ejan.

This subspecies differs from the nominate race with its somewhat larger size, lighter colouration of fore wing, mostly in medial and terminal areas. This race of *eminens* has sympatric occurrence with the closely related species, *atrabaelbops*. The differential characters are as follows: *eminens* has conjoined antemedial and postmedial lines which are distinct in case of *atrabaelbops*, the male genitalia of *eminens* has very strongly pocket-like spinulose field of vesica and costal margin of valvae slightly arcuate, since the spinulose field of *atrabaelbops* not pocket-like and costal margin of the valvae is straight. The female genitalia of *eminens* with strongly folded proximal part of ductus bursae and a deep incision on ostium bursae, while the proximal part of ductus bursae is less folded and ostium bursae with arcuate ostial margin.

Eugnorisma (*Eugnorisma*) *atrabaelbops* VARGA, 1975 (Plate II: 26)

Z. Arbeitsg. österr. Ent., **27** (1—2): 11. — Type-locality: Afghanistan, Khurd-Kabul.

Examined material: Holotype male: Afghanistan, Khurd-Kabul, 1900 m, 4—9. IX. 1965, leg. et coll. VARTIAN. Paratypes: 2 ♂, 1 ♀ from same locality and data; 2 ♀,

Figs 34—41. 34—35, 40—41 = *Eugnorisma* (*E.*) *eminens* LEDERER. 34—35 = Issyk-Kul, 40—41 = Altai. 36—39 = *E.* (*E.*) *atrabaelbops* VARGA. Paratypes, Afghanistan

Afghanistan, Paghman, 2300—2450 m, 16—19. IX. 1965, coll. VARTIAN. Further material: 1 ♀, Dzhugan-Dala, semi-desert, S Balzash (ZIN). Slides Nos: Va 123 BOURSIN, Va 31 VARGA (males), a preparate on paper label made by RONKAY in Leningrad (female).

D e s c r i p t i o n : Alar expanse 32—37 mm, length of fore wing 14.5—17 mm. Head, thorax and fore wing pale ashy grey with only very slight brownish shade. Collar and thoracic tufts with blackish lines, outer side of palpi blackish. Fore wing narrow, more or less triangular. Subbasal line short, blackish, basal area with some darker scales in submedian fold, antemedial line sinuous, double, outer part blackish, inner greyish, its filling pale grey. Orbicular spot oblique, elongate, reniform elliptical, slightly arcuate, claviform obsolescent, their outlines double. Intracellular spots black, large, blackish triangles running from reniform to postmedial line; medial field with some blackish scales below cell. Postmedial line double, consisting of spots and short lines, subterminal line strongly waved, dark triangles at inner side more or less strong, blackish. Terminal line a row of black spots, cilia pale grey with darker line at middle. Hind wing pure white, terminal line slightly darker, cilia white. Underside of fore wing greyish with upper part of transversal line and reniform as darker pattern. Hind wing pure white, with only very few darker scales at margins.

Male genitalia (Figs 36—39): uncus moderately long and slender, tegumen high, fultura inferior subtriangular with apical processus, vinculum strong, V-shaped. Valvae elongate, relatively narrow, distal part of costal margin straight. Apical lobe small, rounded, pollex small, triangular with a small crest at its base. Harpe arcuate, narrow, but relatively short, its basis strong, pulvillus well discernible. Aedoeagus elongate, distal dorsal lamina strong with short teeth, vesica everted ventrally, sac-like, spinulose field not (or only very slightly) pocket-like. Diverticulum wide at base, moderately long, terminal cornutus conical, short.

Female genitalia (Fig. 133): ovipositor short, gonapophyses moderately long. Ostium bursae quadrangular, ductus bursae relatively short, heavily sclerotized, proximally folded, distal margin of it arcuate. Apex bursae rugulose, corpus bursae elongate, large.

D i s t r i b u t i o n : East Afghanistan, Soviet Turkestan.

Eugnorisma (*Eugnorisma*) *enargiaris* (DRAUDT, 1936) (Plate II: 27)

Ent. Rundschau, **1936:** 469 (*Xestia*). — Type-locality: Taurus.

E x a m i n e d m a t e r i a l : Lectotype (designated here), male, Amanus, Yüksek Dagh, prep. MM 66 BOURSIN, in coll. ZSM. Paralectotype, male, Taurus, Marash, in coll. ZSM. Further material: 12 ♂, 3 ♀, Malatya-Tecde (NHMW); 1 ♂, Amanus, Yüksek Dagh (ZSM); 1 ♂, Asia min., Karadja Bey, AJTAY-KOVÁCS (HNHM); 1 ♀, Asia min. (HNHM), 1 ♂, Turkey, Prov. Mus, Boylan Pass, 1600 m, 30. IX. 1981, leg. et coll. HACKER. Slides Nos: 838, 839 RONKAY, 2682 VARGA, MM 66 BOURSIN (males), 3129 VARGA (female).

Description: Alar expanse 32—37 mm, length of fore wing 15—17 mm. Head, thorax and fore wing yellowish with some orange, shade, pattern of fore wing pale or obsolescent, orange-brown. Subbasal line deleted, antemedial and postmedial lines double, orbicular spot large, oblique, more or less quadrangular, conjointed with reniform, subterminal line obsolescent, slightly sinuous. Veins of wing covered with orange-brown. Terminal line pale, brownish, cilia yellowish with somewhat darker line at middle. Hind wing white, terminal line ochreous brown, cilia whitish with very pale line at middle. Underside of wings white or whitish, patternless.

Male genitalia (Figs 32—33): uncus relatively long and slender, tegumen wide, fultura inferior quadrangular with apical processus, vinculum strong and relatively long. Valvae elongate, apex slightly pointed, apical lobe absent. Pollex elongate, triangular, pointed. Harpe relatively short and thick, slightly arcuate, its basis strong with rounded outer edge. Aedoeagus long, distal dorsal lamina strong with large teeth. Vesica everted ventrally, large, vesicular, spinulose field relatively small, diverticulum and cornutus absent.

Female genitalia (Fig. 124): papillae anales wide, gonapophyses relatively long. Ostium bursae quadrangular, ductus bursae rather short, strongly sclerotized, proximally folded. Apex bursae small, finely rugulose or plicate, corpus bursae large, hear-shaped, without signa.

Distribution: Middle and Eastern Anatolia.

Eugnorisma (*Eugnorisma*) *coryphaea* (PÜNGELER, 1900) (Plate II: 28)

Iris, **13**: 118 (*Agrotis*). — Type-locality: Kuku Noor, Tibet.

Examined material: Holotype female: "Tibet (Kuku-Noor), 1898" "*coryphaea* PÜNG. ♀, Original, v. R. TANCRÉ, 5.05" "Type *coryphaea* PÜNG. ♀", "Gen. prep. No. 1382 RONKAY", deposited in coll. PÜNGELER, HZMB.

Description: Alar expanse 38 mm, length of fore wing 18 mm. Head and thorax reddish-grey with some brownish, palpi brown in outer side. Ground colour of fore wing light ochreous brown with some fine violet-grey shade, mostly in basal field and at costal margin; terminal area with pale bronze shine. Subbasal line blackish brown, strongly waved, antemedial line blackish, with a dark spot at costa. Basal area with metal-grey shine in lower part. Orbicular spot large, rounded quadrangular, outline obsolescent, reniform spot large, oval, inner part of outline whitish, straight, outer part concave, greyish white, its filling plumb-grey. Preorbicular spot small, blackish intermacular spot narrow, blackish, continued above and below in diffuse stripe as medial line. Medial area with reddish-brown irroration below cell, postmedial line blackish, strongly waved, with some ochreous shade at lower part on inner side. Costal margin with black spot between reniform and postmedial line, subterminal line diffuse with dark triangular spot at costa and

with reddish-brown shadow on inner side. Terminal line ashy grey, cilia ochreous brown. Hind wing whitish-grey with ochreous shade, cellular lunule diffuse but well discernible, grey. Marginal area somewhat darker than other parts of wing, cilia whitish grey, terminal line grey. Underside of wings red-grey, with some darker grey irroration at medial part of fore wing, cellular lunules darker, brownish-grey.

Female genitalia (Fig. 132): papillae anales short and wide, gonadophyses short. Ostium bursae short and wide, its margin sinuous. Ductus bursae elongate, slightly constricted at middle, not folded but with fine dorsal crests. Apex bursae reduced, corpus bursae large, without signa.

Distribution: Tibet (Kuku-Noor).

Eugnorisma (*Eugnorisma*) *gaurax* (PÜNGELER, 1900) (Plate II: 29—32)

Iris, **13:** 117 (*Agrotis*). — Type-locality: Tien-shan, Alexander Mts.

Examined material: Holotype male: "Asia centr., Tien-schan, Alexander Gebirge, RÜCKBEIL, 1899" "Type *gaurax* PÜNG. ♂" "préparation No. MB 148 BOURSIN", deposited in coll. PÜNGELER, HZMB. 2 ♀, Semiretshje, Naryn, 2140 m, 10. VIII. 1908, leg. DAZENKO (ZIN); 2 ♂, Turc(omania), Maur. (MB); 1 ♂, Ispajran, Alai sept. (MB); 2 ♂, Turkestanski hr., Shahristan (in Russian), 2000 m, 15. VIII. 1960, leg. MIKHAILOV (ZMM); 1 ♂ from same locality, 18. VII. 1958, leg. TSVETAJEV (ZMM); 1 ♂, Ferghana (ZIN); 2 ♂, 2 ♀, Uzhbekistan, Alai Mts, Dugobo, 31. IX. 1985, leg. et coll. VARGA. Slides Nos: MB 148 BOURSIN, 1720 RONKAY, 3227, 3318, 3319, 3332, 3336, 3337 VARGA (males), 3110, 3131 VARGA (females).

Description: Alar expanse 29—35 mm, length of fore wing 14—17 mm. Head, thorax and fore wing light rosy-grey, palpi with darker outer side, frons whitish-grey, antennae of male finely ciliate. Shade of fore wing variable, rosy-grey ground colour with more or less strong reddish-brown or fumous grey irroration, mostly in medial field. Transversal lines more or less obsolescent or reduced, subbasal line only a dark spot at costa, antemedial line more or less straight, oblique, dark brown. Postmedial line double, fine, slightly sinuous, with darker spot at costal margin. Orbicular spot very large, triangular or subtriangular with whitish outline at lower side. Reniform spot more or less narrow, arcuate, encircled with whitish, its filling greyish. Intracellular spots blackish, strong, conjoined with a fine blackish line. Subterminal line more or less strong, sinuous reddish-brown stripe, terminal line light reddish-brown, cilia reddish-grey. Hind wing white, sometimes with some ochreous shine, veins rarely with some dark scales in marginal area. Cilia white with some darker scales at apex. Underside of fore wing light reddish-grey, elements of dark pattern usually can be seen as pale shadows. Underside of hind wing white, sometimes with some darker scales in marginal field and upper part of transversal line.

Male genitalia (Figs 42—45): uncus relatively short and thick, tegumen wide, fultura inferior broad, quadrangular with medial crest, vinculum short, strong. Valvae elongate, narrower at distal part, margins more or less parallel,

Figs 42—48. 42—45 = *Eugnorisma* (*E.*) *gaurax* PÜNGELER. 42 = holotype, Tien-Shan, 43—45 = Turcomania. 46—47 = *E.* (*E.*) *deleasma* BOURSIN, Afghanistan, Wakhan-valley. 48 = *E.* (*E.*) *deleasma hissarica* ssp. n. Holotype, Hissar Mts

apex rounded with large, pointed apical lobe. Pollex large, triangular, covered with macrotricha. Harpe slightly arcuate, short and relatively thick. Aedoeagus long, curved, distal dorsal lamina more or less twisted, sometimes with small spines. Vesica everted ventrally, large, vesicular, reflexed to dorsal side, spinulose field large. Diverticulum wide and short, terminal cornutus small-

Female genitalia (Figs 134—135): ovipositor and gonapophyses short and wide, ostium wide, well sclerotized, trapezoidal, ductus bursae relatively short, caudally more heavily sclerotized, proximal part with strong dorsal crest. Apex bursae large, rounded, plicate or finely rugulose, corpus bursae small, globular, signa absent.

Distribution: Tien-Shan, Alai Mts, Turkestan, Ferghana, Semiretshje, Turkmenia.

This species is very similar to the closely related *deleasma* and both of these species highly vary in colouration and intensity of wing pattern. The external characters slightly overlap the northern populations of *deleasma* and *gaurax*, as the subspecies of *deleasma* occurring in Hissar Mts. has similarly reddish- or rosy-grey ground colour being characteristic to *gaurax*. (The latter has a dark greyish race in Alai Mts.) The best differential character of the external morphology the strong reduction of transversal lines in case of *gaurax* while *deleasma* has strong, usually blackish antemedial and postmedial lines. The differences between this speciespair in case of the configuration of the male genitalia are also not so conspicuous, but the whole organ of *gaurax* larger and stronger, valvae more elongate, distal dorsal lamina of aedoeagus stronger and twisted, usually covered with spines, aedoeagus longer. The female genitalia of *gaurax* have nearly two times longer ductus bursae than in the case of *deleasma*. The third species of this group, *trigonica* has much larger differences both in external characters and in the configuration of genitalia.

Eugnorisma (*Eugnorisma*) *deleasma* Boursin, 1967 (Plate III: 33—36)

Entomops, **11:** 45. — Type-locality: Afghanistan, Badakshan.

Examined material: Holotype male: Afghanistan, Badakshan, Sarekanda, 4200 m, 31. VII. 1953, leg. Klapperich (ZSM). Paratypes: 8 ♂ from same locality and data (ZSM); 4 ♂, Afghanistan, Wakhan-Valley, 3400 m, Kotal-i-Dalez, 23—28. VII. 1971, leg. Ebert and Naumann (in coll. Landesmuseum für Naturkunde, Karlsruhe); 1 ♂, Afghanistan, Panchir valley, 3500 m, 7—8. VIII. 1963, leg. Omoto (ZSM); 1 ♂, Afghanistan, Badakshan, Baba-Kuran 3500—4200 m, 28. VII—3. VIII. 1963, leg. Omoto (ZSM); 1 ♂, Afghanistan, Anjuman, 3000 m, 4. VIII. 1963, leg. Omoto (ZSM); 5 ♂, Pamir, Chorog, Tadzhikistan, leg. Bundel (ZIN); 1 ♀, Almata, Almatanka, Tadzhikistan, coll. Bundel (ZIN). Slides Nos: 965, 966 Ronkay, 3105, 3106, 3107, 3138, 3359, 3385 (Varga (males), 3111 Varga (female).

Description: Alar expanse 31—36 mm, length of fore wing 14.5—16 mm. Ground colour of fore wing, head and thorax very variable, grey, greyish or brownish, in some populations with more or less strong reddish-brown irroration. Subbasal line short, dark brown, arcuate, antemedial line

Figs 49—55. 49—53 = *Eugnorisma* (*E.*) *deleasma* BOURSIN. 49 = holotype, Afghanistan, Badakshan, 50 = paratype, Afghanistan, Anjuman, 51—53 = Pamir, Chorog. 54—55 = (*E.*) *trigonica* ALPHÉRAKY. 54 = lectotype, Tien-Shan, 55 = Hissar Mts

oblique, slightly sinuous, double, outer part much darker, blackish. Orbicular spot very large, more or less triangular, reniform spot slender, arcuate, preorbicular and intermacular spots black, conjoined with a fine line. Postmedial line sinuous, inner line black(ish), outer line pale, waved, median area somewhat darker than other parts of wing. Subterminal line usually a diffuse shadow, with some dark triangles, terminal line a row of darker spots, cilia greyish, sometimes slightly spotted. Hind wing white or whitish with some scattered darker greyish scales, cilia white. Underside of fore wing unicolorous light gery, elements of dark pattern often visible, hind wing white, rarely with some dark inoration at apex.

Male genitalia (Figs 46—47, 49—53): uncus relatively thick, tegumen wide, fultura inferior a broad, quadrangular plate with medial crest, vinculum strong, short. Valvae elongate, margins more or less parallel, outer margin with a stronger angle at pollex. Apical part elongate, narrow, apex more or less pointed, apical lobe narrow, pointed. Pollex strong, triangular with scale-like macrotricha. Harpe relatively short, slightly curved, its basis strong, rounded. Aedoeagus relatively short, distal dorsal lamina without spines, less sclerotized. Vesica everted ventrally, reflexed to dorsal side, spinulose field large. Diverticulum wide-based, short, terminal cornutus small.

Female genitalia (Fig. 136): ovipositor and gonapophyses short, ostium bursae trapezoidal, more or less wide. Ductus bursae short, strongly sclerotized with large dorsal crest in proximal part. Apex bursae large, finely rugulose, corpus bursae small, rounded, signa absent.

Distribution: East and NE Afghanistan, Pamir.

Eugnorisma (*Eugnorisma*) *deleasma reducta* Boursin, 1967
(Plate III: 37)

Entomops, **11**: 46. — Type-locality: Afghanistan, Band-i-Amir.

Examined material: Holotype male: C Afghanistan, Band-i-Amir, 3000 m, 30. VII. 1963, leg. Kasy et Vartian, coll. Vartian. Paratypes: 6 ♂ from same locality and data, in coll. Vartian, ZSM; 2 ♂, from same locality, 31. VII—1. VIII. 1965, leg. Kasy et Vartian, in coll. Vartian. Slides Nos 3019, 3023 Varga.

Description: Size and shape of wings similar to nominate subspecies, head, thorax and fore wing light ochreous grey, dark pattern of wing strongly reduced. Transversal lines usually only some dark spots at costal margin, outlines of orbicular and reniform spots also obsolescent, claviform absent. Preorbicular and intermacular spots dark grey or blackish, conjoined only with a very fine line. Subterminal line obsolete, terminal line a pale grey row of triangle, cilia ochreous with a somewhat darker medial line. Hind wing white, terminal line greyish, cilia white, underside of fore wing pale ochreous or greyish, usually patternless, hind wing white. Configuration of male genitalia similar to that of nominate race.

Plate III

33 = *Eugnorisma* (*E.*) *deleasma* BOURSIN, holotype, Afghanistan, Badakshan, 34 = ditto, Afghanistan, Wakhan valley, 35 = ditto, Almata and 36 = ditto, Pamir, Chorog. — 37 = *E.* (*E.*) *deleasma reducta* BOURSIN, paratype, Afghanistan, Band-i-Amir. — 38 = *E.* (*E.*) *deleasma hissarica* ssp. n., holotype, Hissar Mts. — 39 = *E.* (*E.*) *trigonica* ALPHÉRAKY, lectotype, Tien-Shan, 40 = ditto, holotype of *capnoptera* PÜNGELER, 41 = ditto, Hissar Mts., 42—43 = ditto, Afghanistan and 44 = ditto, Issyk-Kul. — 45 = *E.* (*E.*) *variago* STAUDINGER, lectotype, Saisan and 46 = ditto, Afghanistan. — 47 = *E.* (*E.*) *variago xanthiago* ssp. n., paratype, Margelan (paralectotype of *variago variago* STAUDINGER) and 48 = paratype, Hissar Mts.

The western subspecies of *deleasma* differs from the nominate subspecies with its very characteristic ochreous ground colour and strongly reduced dark pattern of fore wing.

Distribution: Middle Afghanistan.

Eugnorisma (Eugnorisma) deleasma hissarica ssp. n. (Plate III: 38)

Holotype male: USSR, Hissar Mts., Anzob Pass, Kondara, 17. VIII. 1960, leg. TSVETAJEV, deposited in coll. ZSM. Paratypes: 2 ♂ from same locality and data, (ZSM); 2 ♂ from same locality and data (in coll. ZMM). Slides Nos: 1203 RONKAY, 3333, 3476 VARGA.

Description: Alar expanse 33—35 mm, length of fore wing 15—16 mm. Head, thorax and fore wing dark, intensive reddish-grey, elements of pattern strong, black. Subbasal line fine, arcuate, antemedial and postmedial lines strong, subterminal line a diffuse brownish shadow. Orbicular spot large, triangular, reniform spot narrow, arcuate, their outlines more or less visible, light whitish-grey. Preorbicular and intermacular spots small, triangular, conjoined only with a fine line. Terminal line ochreous white, cilia reddish-grey. Hind wing white, finely transparent, with very slight greyish covering on veins in marginal area; cilia whitish. Underside of fore wing pale brownish-grey with rosy shade, shadow of dark pattern slightly can be seen. Underside of hind wing white with reddish-brown irroration in marginal area and on veins. Configuration of male genitalia similar to nominate subspecies, valvae of *hissarica* slightly larger and stronger.

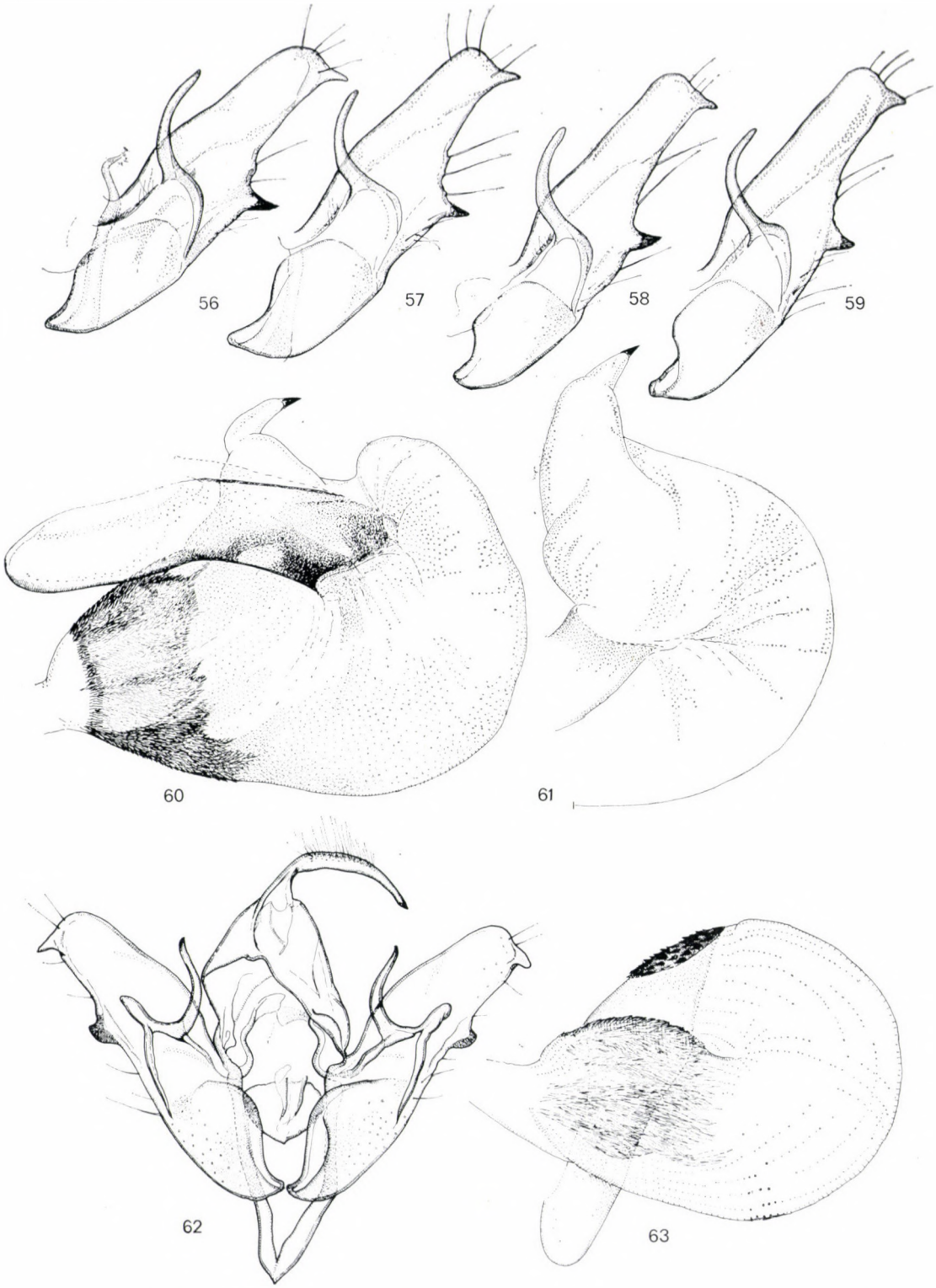
The new subspecies differs from *deleasma deleasma* with its characteristic colouration, fine black(ish) wing pattern and slightly stronger valvae (Fig. 48).

Distribution: Hissar Mts.

Eugnorisma (*Eugnorisma*) *trigonica* (ALPHÉRAKY, 1872)
(Plate III: 39—44)

Horae soc. ent. Ross., **17:** 43 (*Agrotis*) (= *capnoptera* PÜNGELER, 1899). — Type-locality: Tien-Shan.

Examined material: Lectotype (designated here), male, "*trigonica*, Charkhode, Tian-Chian, 14. VII. A. WOCKE", "Kol. Vel. Kn. NIKOLAIA MIKHAILOVITSA (in Russian)", slide No. 3108 VARGA, deposited in coll. ZIN. Paralectotype: female, "*trigonica* ALPH., Culdsha", in coll. ZIN. Further material: 6 ♂♂ and ♀♀, Ili (ZSM); 7 ♂♂ and ♀♀, Hissar Mts. (ZSM); 1 ♀, Dzhelabad (ZIN); a long series from Pamir, Chorog, coll. BUNDEL (ZIN); 1 ♂, Kazakhstan (ZIN); 2 ♂, 2 ♀, Issyk-Kul (coll. STAUDINGER, HZMB); 1 ♀, Kuldja (coll. STAUDINGER, HZMB); 7 ♂♂ and ♀♀, Issyk-Kul (NHMW), 1 ♂, Alai Mts (NHMW); 7 ♂, 8 ♀, Alaisk (ZMM); 18 ♂, 14 ♀, Hissar Mts. (ZMM); 7 ♂, Turkmenia, Shahristan (ZMM); 1 ♂, Uzhbekistan, Aktash, Korzhin-Tau (ZMM); 2 ♂, 1 ♀, Zhailishki Alatau (ZMM); 42 ♂♂ and ♀♀, Afghanistan, Salang (coll. VARTIAN); 1 ♂, Ispajran, Alai sept. (HNHM); 1 ♂, Alai Mts., Dugobo (coll. VARGA); 2 ♀, Afghanistan, Ferusch-Tagan (ZSM); Slides Nos: WM 59 BOURSIN, 980 RONKAY, 3016, 3021, 3104, 3132, 3334, 3335, 3360, 3483, 3074, 3075 VARGA (males), 964, 1385, 1388 RONKAY, 1204 RONKAY, 2680 VARGA (females). Holotype of *capnoptera* PÜNGELER, "Asia centr. (Issykul) (sic!), 1396" "Type *capnoptera* PÜNGELER" "Gen. prep. No. 1375 RONKAY".



Figs 56—63. 56—61 = *Eugnorisma* (*E.*) *trigonica* ALPHÉRAKY. 56 = holotype of f. *capnoptera* PÜNGELER, 57—59 = Pamir, Chorog, 60 = Hissar Mts., 61 = Afghanistan. 62—63 = *E.* (*E.*) *semiramis farsica* BOURSIN, Iran, Kasri-Shirin

D e s c r i p t i o n : Alar expanse 32—39 mm, length of fore wing 15—19 mm. Colouration of species very variable, colour of head, thorax and fore wing can be a very different shade of grey or/and brown, intensity of wing pattern may also vary. Subbasal line reduced to some dark spots or a fine line, antemedial line double, oblique, outer part much darker. Orbicular spot usually triangular, more or less large, encircled with dark brown and pale grey, reniform large, its outline similar to that of orbicular, claviform absent. Preorbicular and intermacular spots usually widely conjoined dark brown or blackish. Postmedial line double, its filling usually lighter than ground colour. Subterminal line a sinuous, light line with diffuse darker shadow at inner side. Terminal line pale, a row of dark spots, cilia usually unicolorous. Hind wing white or whitish, rarely with slight greyish suffusion at marginal area, cilia darker with more or less strong medial line. In case of f. *capnoptera* fore wing with bronze-red shine, elements of pattern coppery-brown, veins covered with brown, intracellular dark spots brownish, greyish suffusion of hind wing strong. Underside of fore wing pale reddish-brown or greyish with very pale pattern, hind wing white with ochreous shine, sometimes with darker scales in marginal field.

Male genitalia (Figs 54—61): uncus moderately long, tegumen high, fultura inferior subtriangular, vinculum strong, short. Valvae strongly elongate, apical part narrow, apex rounded, apical lobe pointed, bill-like. Pollex relatively short, more or less triangular, covered with scale-like macrotricha. Harpe slender, arcuate, its basis less sclerotized. Aedoeagus slightly curved, distally less sclerotized on dorsal than in ventral side. Vesica everted ventrally, very large, rounded, spinulose field large, diverticulum wide and moderately long, terminal cornutus fine, pointed.

Female genitalia (Fig. 137): ovipositor and gonapophyses short, ostium bursae wide, less sclerotized. Ductus bursae very short, heavily sclerotized, dorsal surface with a strong crest, proximal part slightly twisted. Apex bursae large, strongly rugulose, corpus bursae elongate, large, without signa.

D i s t r i b u t i o n : This species is widely distributed in mountain chains of Central Asia.

Eugnorisma (*Eugnorisma*) *variago* (STAUDINGER, 1882)
(Plate III: 45—46)

Stettiner ent. Ztg, **1882:** 44 (*Hiptelia*). — Type-locality: Saisan.

E x a m i n e d m a t e r i a l : Lectotype (designated here), male, "Saisan, Hbhr" "Origin." in coll. STAUDINGER (HZMB). [The paralectotype (male) specimen from Margelan belongs to an another, new subspecies!] Further material: 7 ♂♂ and ♀♀ from Afghanistan, Ferusch-Tagan, Khinjan valley, leg. KLAPPERICH, in coll. ZSM; 1 ♂, Pamir, Chorog, leg. POTOPOLSKI (in coll. HEINICKE). Slides Nos: 1205, 1377 (lectotype) RONKAY, 75/281 VARGA (males), 1380 RONKAY (female).

Figs 64—67 = *Eugnorisma* (*E.*) *variago* STAUDINGER. 64—65 = lectotype, Saisan, 66 = Afghanistan, Ferusch-Tagan, 67 = Pamir, Chorog

D e s c r i p t i o n : Alar expanse 31—38 mm, length of fore wing 15—18 mm. Head, thorax and fore wing light ochreous or yellowish-brown with more or less strong brownish irroration, palpi brown on outer side, antennae of male finely ciliate. Transversal lines of fore wing brownish, double, their

fillings ochreous. Antemedial line slightly, postmedial line strongly sinuous with short dark lines on veins. Orbicular and reniform spots relatively small, encircled with yellowish, their fillings dark brown, claviform similarly dark. Medial line a diffuse, wide, dark brown stripe, subterminal line brown, slightly sinuous, with darker triangular spot at costal margin. Terminal area with brownish irroration, cilia yellowish-brown. Hind wing white, shiny, cilia white with greyish basal line. Underside of fore wing ochreous white with darker brownish irroration at margins, elements of darker pattern can be seen as brownish shadows. Underside of hind wing pure white.

Male genitalia (Figs 64—67): uncus relatively short and thick, tegumen wide, fultura inferior a rounded quadrangular plate with central crests, vinculum strong, short. Valvae less elongate, strong and wide, apex rounded, apical lobe small. Pollex strong, triangular, pointed, covered with macrotricha. Harpe short, thick, slightly arcuate, basis of it wide, rounded. Aedoeagus curved, distal dorsal lamina with relatively large teeth. Vesica everted ventrally, sac-like with small spinulose field. Diverticulum relatively long, narrow, terminal cornutus pointed, small.

Female genitalia (Fig. 141): papillae anales wide and short, gonapophyses rather short. Ostium bursae trapezoidal, ductus bursae short, heavily sclerotized, proximally folded, sometimes constricted. Apex bursae large, rounded, rugulose, corpus bursae small, without signa.

D i s t r i b u t i o n : Saisan, Pamir, East Afghanistan.

Eugnorisma (Eugnorisma) variago xanthiago ssp. n.
(Plate III: 47—48, IV: 49)

H o l o t y p e male: Hissar Mts., Kondara, Anzob Pass, 4. X. 1965, leg. TSVETAJEV (in coll. ZSM). Paratypes: 10 ♂♂, and ♀♀ from same locality and data (ZSM); 5 ♂, 10 ♀ from same locality and data (ZMM); 4 ♂, 4 ♀, Uzhbekistan, Aktash, Korzhin-Tau, in coll. TSVETAJEV (ZMM); 1 ♂, Margelan, Hbhr., in coll. STAUDINGER (HZMB) (paralectotype of variago variago !). Slides Nos: MB 147 BOURSIN, 1206 RONKAY, 3399, 3400 VARGA (males), 1379 RONKAY (female).

D e s c r i p t i o n : 34—41 mm, alar expanse, length of fore wing 15.5—19 mm. Head, thorax and fore wing light yellowish, head and thorax with more or less strong brownish irroration, palpi darker brown on outer side, antennae of males finely ciliate. Fore wing with fine orange-brown or ochreous brown shade and irroration, mostly in medial and terminal fields. Basal field light, unicolorous, antemedial line dark reddish-brown with fine lighter shadow on inner side, postmedial line double, its intensity very variable, usually pale brownish with lighter filling. Orbicular spot large, rounded quadrangular, encircled with whitish line, its filling greyish, reniform large or very large, outline whitish, filling of it usually dark grey or greyish-brown. Claviform usually well developed, its filling lighter brown. Medial line pale, diffuse, subterminal line very pale, slightly sinuous shadow, cilia brownish yellow with

Figs 68—70 = *Eugnorisma* (*E.*) *variago xanthiago* ssp. n. 68 = paratype, Margelan (paralectotype of *variago variago*!), 69 = Uzhbekistan, Korzhin-Tau, 70 = Hissar Mts

darker medial line. Specimens from Korzhin-Tau have reduced dark pattern, their colouration pale reddish. Hind wing white with fine shine, cilia white with greyish basal line. Underside of fore wing light ochreous white, elements of dark pattern usually can be observed as pale shadows. Underside of hind wing white.

Male genitalia (Figs 68—70): valvae more elongate than that of nominate race, apical lobe larger, apical part narrower. Female genitalia (Fig. 142) identical with that of nominate race.

The new subspecies differs from the nominate subspecies with its larger size and broader wings, much yellowish-orange ground colour and less intensive darker brownish irroration of the medial and terminal fields; valvae of *xanthiago* has different shape, apical part more elongate and narrower, the whole organ somewhat larger.

Distribution: Hissar Mts, Uzhbekistan: Korzhin-Tau, Margelan.

During his studies BOURSIN examined only the Margelan specimen and the male genitalia of this race more similar to *insignata* than that of the nominate *variago variago*. On the basis of the configuration of male genitalia of the Margelan specimen he did not separate the species from *insignata* but considered it to be a subspecies of *insignata* (BOURSIN, 1952). (Interestingly, on the identification label he mentioned it as "*Eugnorisma variago* Stgr.".) The species *variago* has sympatric occurrence with *insignata* and partly with *conformis*, and it can be separated very easily from the related two species by external and genitalic characters, too.

Eugnorisma (*Eugnorisma*) *insignata* (LEDERER, 1853) (Plate IV: 50—54)

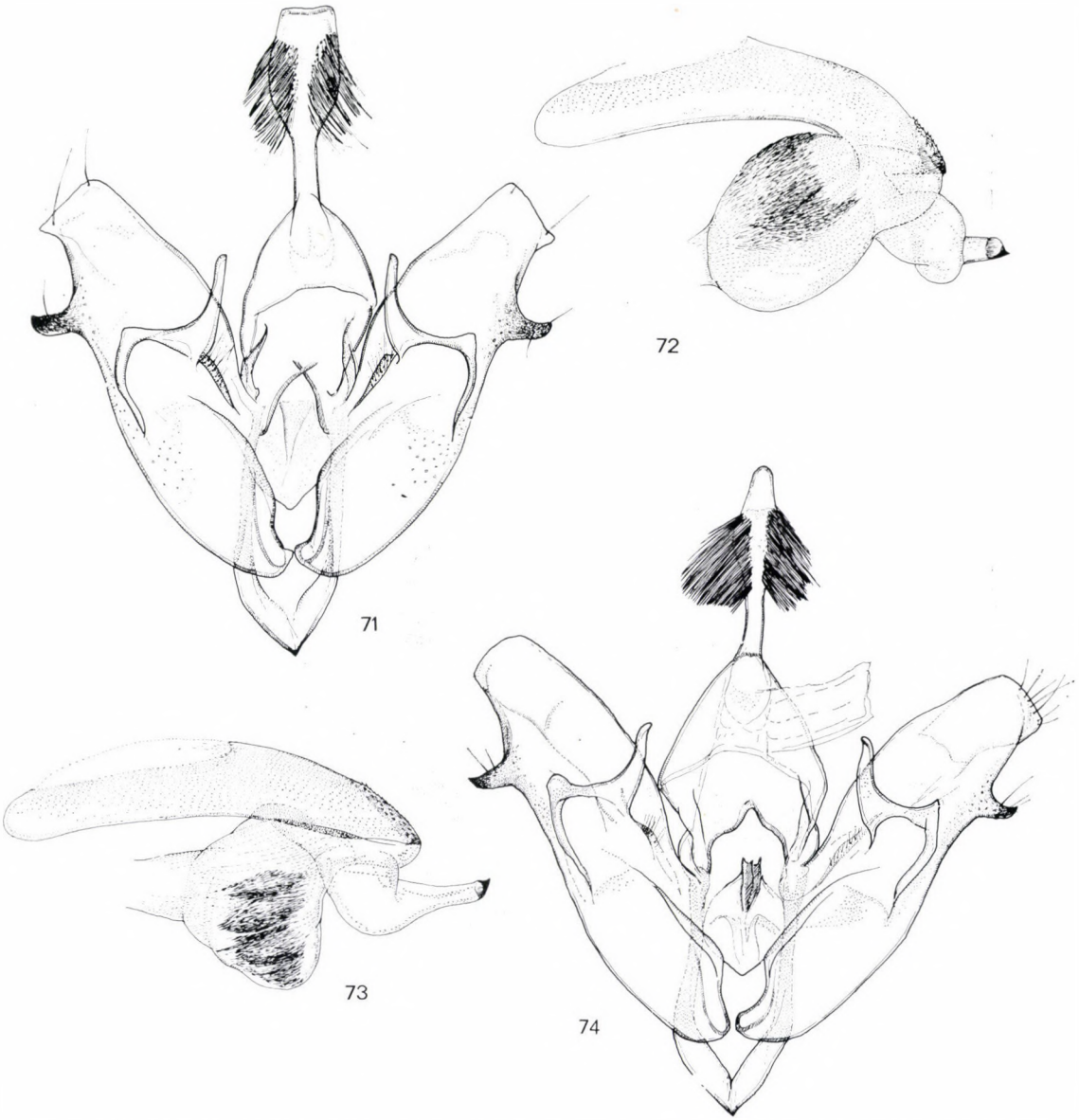
Verh. zool.-bot. Ges., Wien, **1853:** 366 (*Graphiphora*) (= *intermedia* EVERSMANN, 1855, *columbina* DRAUDT, 1936). — Type-locality: Altai.

Examined material: 1 ♂, 1 ♀ Types, "Origin", "coll. LEDERER", in coll. STAUDINGER, HZMB. Further material: 3 ♂, Sarepta, Altai (coll. STAUDINGER, HZMB); large series from Afghanistan: Paghman, Khurd-Kabul, Sarobi, NW Karakoram, Gilgit (in coll. VARTIAN, ZSM, VARGA, HNHM); Sarepta (in coll. DUSKE, ZMH, HNMW, HNHM, MB, ZIN); Altai (NHMW, ZIN); Issyk-Kul (NHMW, ZSM, ZIN, MB, ZMM); Russia merid. (NHMW, HNHM); Pamir (ZIN, HNHM, ZSM, ZMM); Aksu (ZSM, MB); Ili (ZSM); Uzhbekistan: Tashkent, Samarkand, Korzhin-Tau (ZIN, ZMM); "Siberia" (ZIN, HNHM); Hissar Mts. ZMM); Ala-Tau (ZMM); Alai Mts. (ZMM); Iran: Demavend, Bala-vi-Taq, Kasri-Shirin (coll. VARTIAN); Uralsk (ZSM); Syria, Damaskus (coll. VARTIAN); the type of *intermedia* EVERSMANN "Altaj, *intermedia* KINDERMANN" "coll. EVERSMANN" (ZIN); Armenia, Yerevan (coll. Zoological Institute, Yerevan); Malatya (NHMW); further localities from Turkey (Prov. Erzurum, Prov. Ankara, Prov. Kars, Prov. Agri, Prov. Van, Prov. Bitlis, Prov. Hakkari; in coll. HACKER, VARGA and HNHM). Slides Nos: 830, 832, 954, 956, 957, 961, 962, 963, 1300, 1305, 1313 RONKAY, 75/700, 75/775, 75/784, 75/838, 1578, 1579, 1837, 1838, 1839, 1840, 1870, 1983, 2343, 2344, 2465, 2466, 2467, 3204, 3205, 3020, 3042, 3224, 3575 VARGA (males); 986, 987 RONKAY, 75/355, 3040, 3041, 3208, 3209, 3211, 3225 VARGA (females).

Description: Alar expanse: 30—39 mm, length of fore wing 14—19 mm. Colouration of head, thorax and fore wing very variable: reddish,

Plate IV

49 = *Eugnorisma* (*E.*) *variago xanthiago* ssp. n., paratype, Uzhbekistan, Korzhin-Tau. — 50 = *E.* (*E.*) *insignata* LEDERER, Pamir, 51 = ditto, Sarepta, 52 = ditto, Turkey (f. *columbina* DRAUDT), 53 = ditto, Afghanistan and 54 = ditto, Syria. — 55 = *E.* (*E.*) *insignata leuconeura* HAMPSON, Armenia, Geghard. — 56 = *E.* (*E.*) *insignata pallescens* CHRISTOPH, Askhabad. — 57 = *E.* (*E.*) *conformis* SWINHOE, Afghanistan. — 58 = *E.* (*E.*) *asad* BOURSIN, Kashmir and 59 = paratype, Afghanistan. — 60 = *E.* (*E.*) *semiramis farsica* BOURSIN, Iran, Kasri-Shirin. — 61 = *Eugnorisma* (*Metagnorisma*) *pontica* STAUDINGER, lectotype, Amasia, 62 = ditto, holotype of f. *consenescens* STAUDINGER, Amasia, 63 = ditto, Pontus and 64 = ditto, Greece



Figs 71—74. 71—72 = *Eugnorisma* (*E.*) *conformis* SWINHOE, Afghanistan. 73—74 = *E.* (*E.*) *insignata* LEDERER, Iran

sandy-brown, sandy-grey, ash-grey, greyish-brown. Elements of wing pattern also may vary, reduced or well discernible, sometimes strong. Subbasal line only some dark spots or fine lines, antemedial line oblique, double, outer part with dark brown or blackish spots. Orbicular and reniform spots large, their

outlines whitish-ochreous with darker shadow on both sides, their fillings usually darker than ground colour, sometimes with dark brown or blackish spots. Claviform usually strong but short, dark, medial line a more or less intensive and diffuse, dark stripe. Postmedial line slightly sinuous, double, inner part with darker spots, subterminal line sinuous, sometimes with dark triangles, but usually a pale line with darker shadow. Terminal line consists of small dark spots or arches, cilia with two pale lines at middle. Hind wing white or whitish, cellular lunule absent, marginal field with some dark scales.

Male genitalia (Figs 73—75, 77, 79): uncus relatively long, dilated at middle, pointed at apex. Tegumen high, fultura inferior subtriangular with apical crest, vinculum strong, V-shaped. Valvae elongate, slightly curved, apical lobe wide, less pointed, pollex subtriangular, slightly curved, covered by macrotricha. Harpe short and thick, slightly arcuate, its basis strong, usually pointed. Aedoeagus slightly curved, distal dorsal lamina moderately strongly sclerotized, with small teeth. Vesica everted ventrally, more or less spherical, spinulose field forms a wide ribbon. Diverticulum relatively long and narrow, terminal cornutus wide-based, short.

Female genitalia (Figs 138—139, 144): ovipositor and gonapophyses rather short, ostium well-sclerotized. Ductus bursae relatively short and narrow, heavily sclerotized, not folded or twisted [only sometimes with dorsal crest(s)]. Apex bursae rugulose with a transversal fold on ventral side. Corpus bursae large, rounded.

Distribution: A widely distributed species, occurs from Asia Minor (Anatolia, Syria) to Central Asia.

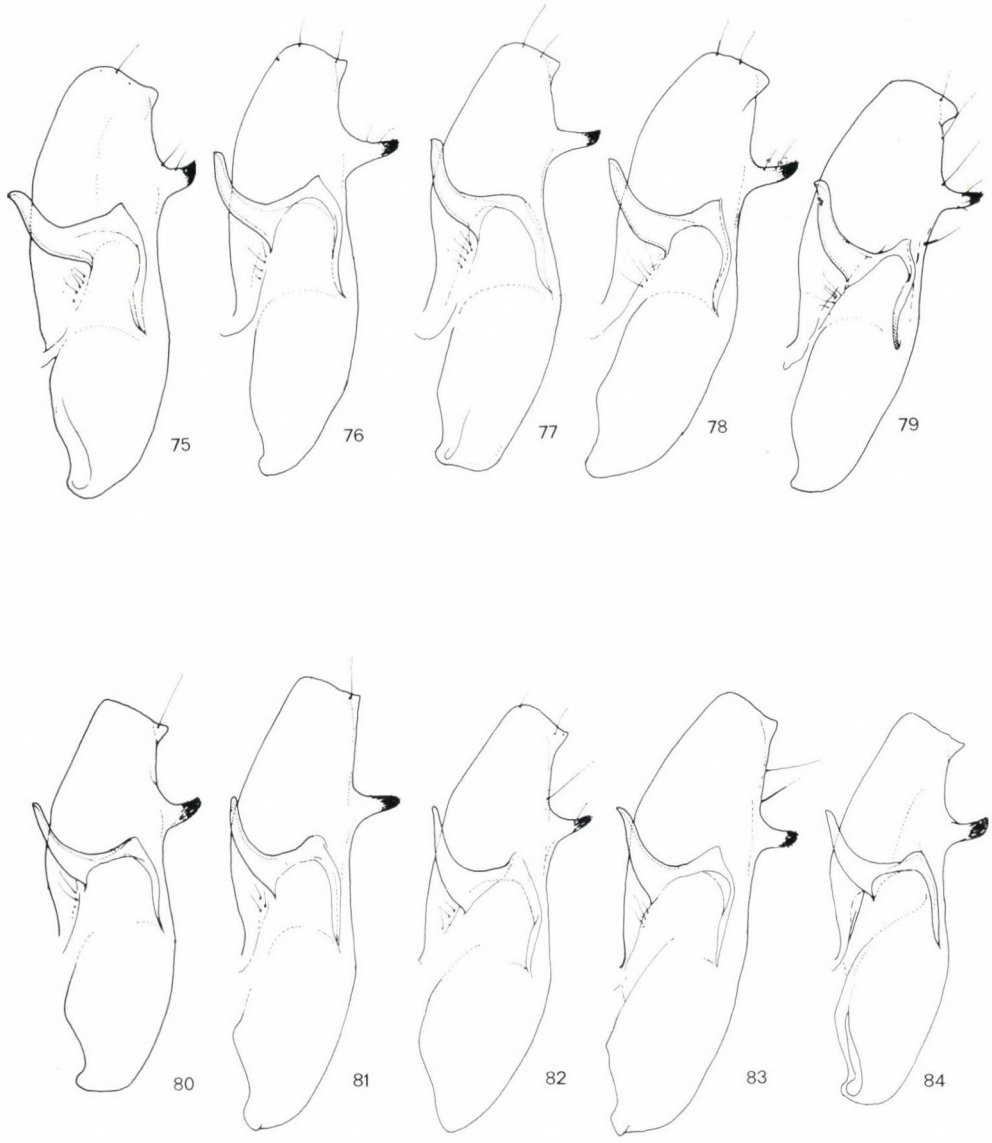
The variability of this species very large, it has some characteristics being different nearly in every locality, but these differences usually slight and it would be very problematic to separate them as distinct subspecies. The form *columbia* occurs in a series of localities but the frequency of these specimens is different in the populations, much frequent in the western populations, in Turkey and some places of Armenia.

Eugnorisma (*Eugnorisma*) *insignata leuconeura* (HAMPSON, 1918)
(Plate IV: 55)

Nov. Zool., **25** (1918): 113 (*Lycophotia*) (= *fuliginosa* DRAUDT, 1936). — Type-locality: Lake Van.

Examined material: A very large series from Armenia, Geghard (coll. VARTIAN, VARGA, HNHM); a series from Arax-valley (ZIN, ZSM); Amanus sept., 1 ♂; (ZSM); 1 ♂, Turkey, Prov. Hakkari, Zap valley, 1300 m, leg. et coll. HACKER. Slides Nos: 832 RONKAY, 75/729, 75/733, 75/800, 75/802, 75/963, 1735, 1872, 3165, 3790 VARGA (males); 959, 960, 972 998 RONKAY, 3210 VARGA (females).

Description: Ground colour of thorax and fore wing dark olive-brown with usually strong brown irroration. Elements of pattern similar to



Figs 75—84. 75 = *Eugnorisma* (*E.*) *insignata* LEDERER, Sarepta, 76 = *E.* (*E.*) *insignata leuconeura* HAMPSON, Armenia, 77 = *E.* (*E.*) *insignata* f. *columbina* DRAUDT, Malatya, 78 = *E.* (*E.*) *insignata pallescens* CHRISTOPH, Askhabad, 79 = *E.* (*E.*) *insignata* LEDERER, Afghanistan. 80—84 = (*E.*) *conformis* SWINHOE, Afghanistan

that of nominate subspecies but usually stronger and darker, veins with characteristic pale whitish-ochreous covering from antemedial line to terminal area. Hind wing pure white. Configuration of genitalia of both sexes is identical with that of the nominate race (Figs 76, 140).

This subspecies in zoogeographical point of view not fairly isolated from the nominate *insignata* (in this region mixed with *columbina*) but in the populations are very uniform in their appearence and the range of *leuconeura* very small — from Van Lake to SE Armenia; does not overlap with other parts of the range of *insignata*.

Eugnorisma (*Eugnorisma*) *insignata pallescens* (CHRISTOPH, 1893) (Plate IV: 56)

Iris, **6:** 90 (*Agrotis*). — Type-locality: Tura, Hyrcania.

Examined material: 1 ♂ Type, Transcaspia, CHRISTOPH (in coll. ZIN); 2 ♂, Askhabad, in coll. STAUDINGER (HZMB); 2 ♂ from same locality, coll. HNMW; 1 ♂ from same locality (coll. DUSKE, ZMH); 16 ♂, 13 ♀, Turkmenia, Askhabad (ZIN). Slides Nos: 3014 VARGA (male), 3208 VARGA (female).

Description: Shape of wings and elements of pattern similar to nominate subspecies but ground colour of fore wing pale ochreous grey, dark pattern pale brownish-grey, reduced to outlines of orbicular, reniform, claviform and sometimes antemedial and postmedial lines also can be seen as fine lines. Veins in subterminal area usually with some dark spots, hind wing pure white with fine greasy shine. Underside of wings patternless, pale whitish or ochreous grey. Configuration of genitalia of both sexes identical with that of nominate subspecies (Fig. 78).

This semi-desert and desert subspecies of *insignata* is more similar to *conformis* than *insignata*, but the darker grey suffusion being characteristic to *conformis* is absent, and the genitalia of both sexes evidently shows its taxonomic position.

Eugnorisma (*Eugnorisma*) *conformis* (SWINHOE, 1885) (Plate IV: 57)

Trans. ent. soc., London, **1885:** 349 (*Agrotis*). — Type-locality: Quetta (Pakistan).

Examined material: Very long series from Afghanistan: Khurd-Kabul (coll. VARTIAN, ZSM, VARGA, HNHM); Paghman (coll. VARTIAN, VARGA, HNHM); Sarobi (ZSM). Slides Nos: 950, 963, 1310, 1312, RONKAY, 75/774, 75/782, 75/785, 75/783, 75/855, 1167, 1727, 1730, 1731, 1732, 1733, 1734, 3203, 3203 VARGA (males); 952 RONKAY, 75/836, 3207 VARGA (females).

Description: Alar expanse 30—37 mm, length of fore wing 14—17 mm. Head pale ochreous, thorax and fore wing pale ochreous or brownish-grey, sometimes sandy-brown. Elements of pattern only somewhat darker

than ground colour, rarely slightly lighter. Subbasal line a spot on costa, antemedial line oblique, slightly sinuous, double with dark spot at costa, its filling light ochreous. Orbicular, reniform and claviform spots with whitish annulus, their filling — mostly by reniform — darker brown. Postmedial line less sinuous, double with darker spots at costa, its filling light grey or ochreous-grey. Subterminal line a diffuse shadow, terminal field sometimes with some darker scales on veins, terminal line pale, obsolescent, cilia nearly unicolorous. Hind wing white, marginal field with characteristic pale greyish suffusion, cilia white. Underside of fore wing patternsless pale whitish grey, margins with some dark shade, hind wing white.

Male genitalia (Figs 71—72, 80—84): uncus relatively long, distal part strongly spatulate, tegumen high, fultura inferior subtriangular with medial crest, vinculum strong, usually V-shaped. Valvae elongate, apical part with nearly straight costal margin, apex more or less pointed, apical lobe wide but with pointed processus. Harpe thick and short, finely arcuate, its basis strong with pointed outer edge. Pollex elongate, slightly curved, covered by macrotricha. Aedoeagus slightly curved, distal dorsal lamina with small teeth. Vesica everted ventrally, spherical, spinulose field large. Diverticulum relatively long, terminal cornutus wide-based, short.

Female genitalia (Figs 143—145): ovipositor and gonapophyses short, ostium bursae strongly sclerotized, trapezoidal. Ductus bursae rather short, heavily sclerotized, strongly folded. Apex bursae rugulose with transversal fold on ventral side. Corpus bursae large, rounded, without signa.

Distribution: Afghanistan, Pakistan (Baloutchistan).

This species was considered to be synonymous with *insignata* for a long time. But the true *conformis* an eremial-xeromontane, Eastern Central Asian species occurs sympatrically with *insignata* in Afghanistan. The specific characters (characteristic greyish suffusion on hind wing occurs only in f. *columbina* in *insignata*, which has very different colouration; uncus of *conformis* spatulate while elongate and pointed in case of *insignata*; ductus bursae of *conformis* strongly folded since smooth or with only some crests by *insignata*) are very conspicuous.

Eugnorisma (*Eugnorisma*) *asad* BOURSIN, 1963 (Plate IV: 58—59)

Bull. mens. soc. linn., Lyon, **32:** 293. — Type-locality: Afghanistan, Paghman.

Examined material: Holotype male: Afghanistan, Paghman, 30 km NW Kabul, 2100 m, 1—9. VIII. 1962, leg. et coll. VARTIAN. Paratype: 1 ♂ from same locality and data, in coll. VARTIAN. Further material: ♂♂ and ♀♀ from same locality, 3. VIII. 1963, 5—10. IX. 1965 (in coll. VARTIAN, ZSM, VARGA and HNHM); 1 ♀, Pakistan, Swat, Gabrat valley (in coll. VARTIAN); 1 ♂, Kashmir, leg. PLANTE (coll. VARTIAN); 1 ♀, Pakistan, SW Himalaya, Kaghantal Naran, 3100—4500 m, 16. VII.—5. VIII. 1977, leg. DE FREINA (ZSM); Slides Nos: 1077 RONKAY, 3018, 3134, 3765 VARGA (males), 971, 1422 RONKAY (females).

Figs 85—87 = *Eugnorisma* (*E.*) *asad* BOURSIN. 85 = paratype, Afghanistan, 86—87 = Kashmir

D e s c r i p r i o n : Alar expanse 34—40 mm, length of fore wing 16—19 mm. Head, thorax and fore wing pale rosy-grey with more or less strong light rosy-brown shade. Shape of fore wing elongate, narrow, slightly pointed. Subbasal line only some dark spots, antemedial line oblique, blackish with light shadow at inner side. Orbicular spot narrow, elongate, encircled with a

fine blackish line and some whitish. Reniform spot less visible, its outline consists of some dark spots an short whitish lines, its filling somewhat darker than ground colour. Claviform absent or only a shadow of its darker outline. Medial line very pale, diffuse, brownish, postmedial line double with blackish line at costa, lower part obsolescent, subterminal line absent or very slightly visible, veins with some darker covering from median area to outer margin. Terminal line a row of pale brown spots, cilia nearly unicolorous. Hind wing whitish with some greyish-brown shade, cellular lunule absent, marginal field somewhat darker, cilia whitish. Underside of fore wing light rosy-grey with some darker grey irroration, dark pattern reduced. Underside of hind wing whitish with some darker scales at apex and marginal area.

Male genitalia (Figs 85—87): uncus long and relatively thick, distally dilated but with pointed apex. Tegumen high, fultura inferior subtriangular with apical processus, vinculum strong, V-shaped. Valvae elongate, more or less arcuate, apex rounded, apical lobe reduced or very small, pollex elongate slightly curved, covered with macrotricha. Harpe strong and thick, its basis strong with more or less pointed outer edge. Aedoeagus thick, less curved, distal dorsal lamina short but strong with small teeth. Vesica large and vesicular, spinulose field consists of rows of spine-like cornuti, diverticulum wide-based, terminal cornutus pointed.

Female genitalia (Fig. 146): ovipositor short, gonapophyses relatively long. Ostium bursae trapezoidal, ductus bursae moderately long, heavily sclerotized and plicate. Apex bursae finely rugulose with a long, triangular, well-sclerotized part. Corpus bursae rounded, without signa.

Distribution: East Afghanistan, Pakistan, Kashmir.

The southern populations of *asad* probably belongs to a distinct subspecies with their darker colouration and slight differences in male genitalia but the material is too small for an exact taxonomic relegation.

Eugnorisma (*Eugnorisma*) *semiramis* (Boursin, 1940)

Mitt. münchn. ent. Ges., **38:** 49 (*Rhyacia*). — Type-locality: Iraq (Kurdistan).

Examined material: Turkey, Prov. Hakkari, Cilo Dagh, 1330 m, 12. IX. 1985, leg. et coll. Hacker, a short series; 9 ♂, 4 ♀, Dzhuga (coll. Rjabov, ZIN). Slide No. 3574 (Varga (male).

Description: Alar expanse 35—42 mm, length of fore wing 16—19 mm. Head whitish grey, thorax and fore wing light grey with some brownish shade. Elements of dark pattern more or less reduced, subbasal line absent or a dark costal spot, antemedial line brown, oblique, double. Orbicular spot small, elliptical, often obsolescent, encircled with ochreous brown. Claviform relatively narrow, constricted at middle, lower part filled with greyish brown. Medial line a diffuse, somewhat darker brownish stripe, postmedial line

obsolescent with a small dark spot at costa, its filling somewhat lighter than ground colour. Subterminal line less sinuous, a diffuse stripe with a dark, strong, usually blackish spot (or two spots) at costa, terminal line very pale, cilia nearly unicolorous. Hind wing whitish with darker greyish marginal field, cilia whitish. Underside of fore wing whitish-grey, shadow of reniform and transversal line usually well discernible, marginal fields also with dark scales, underside of hind wing white.

Male genitalia: uncus long, slender, tegumen high, fultura inferior subtriangular with medial crest, vinculum V-shaped. Valvae elongate, apex narrow with a pointed, small apical lobe. Pollex short and wide, covered with macrotricha. Harpe long and slender, arcuate, its basis strong with long outer processus. Aedoeagus slightly curved, distal lamina strongly sclerotized, with large teeth. Vesica everted ventrally, slightly helical, spinulose field large, diverticulum short with conical terminal cornutus (which may be reduced!).

Female genitalia: ovipositor short and wide, gonapophyses rather short. Ostium bursae more or less trapezoidal, with sinuous proximal margin. Ductus bursae short, strongly sclerotized, only slightly twisted proximally. Apex bursae large, lentiform, rugulose, corpus bursae large, rounded, without signa.

Distribution: Iraq, S. Armenia, E. Turkey.

Eugnorisma (*Eugnorisma*) *semiramis farsica* (BOURSIN, 1940)
(Plate IV: 60)

Mitt. münchn. ent. Ges., **30:** 492 (*Rhyacia*). — Type-locality: Iran, Fars.

Examined material: A short series from Iran: Kasri-Shirin, 4. X. 1965; Kasri-Shirin, Sar-i-Mill, 5. X. 1965; Bala-vi-Taq, 3. X. 1965, leg. VARTIAN, coll. VARTIAN, VARGA and HNHM. Slides Nos: 1266 RONKAY (male), 951, 1265 RONKAY (females).

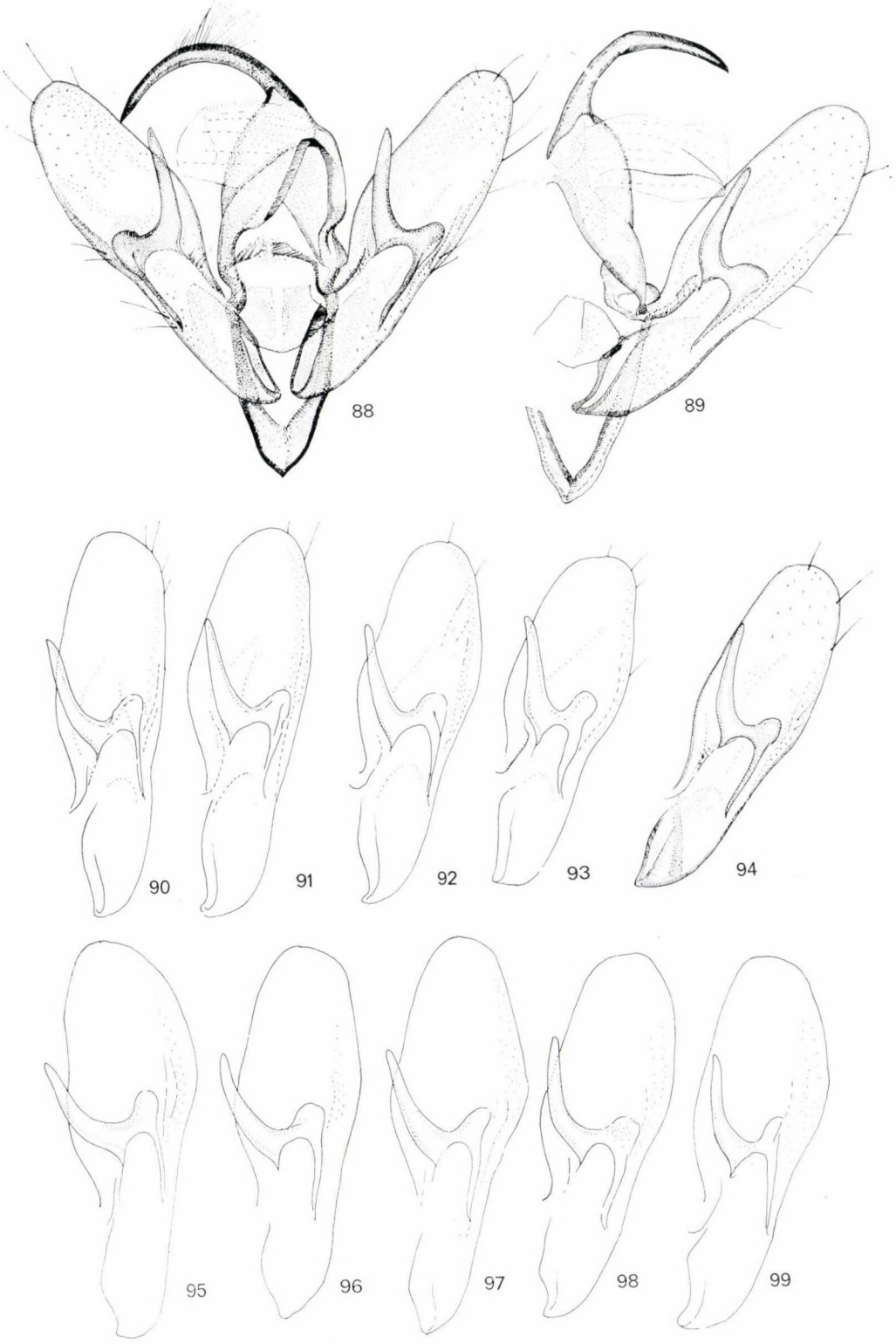
Description: Ground colour of fore wing light ochreous brown with fine reddish or rosy shade, elements of dark pattern strongly reduced, pale brownish except dark spots of transversal lines at costal margin. Underside of wings almost patternless, configuration of male genitalia (Figs 62—63) identical with that of nominate subspecies, female genitalia depicted in Fig. 147.

Distribution: SW Iran.

This eastern subspecies of the species differs from the nominate race with its brownish-reddish ground colour and paler dark pattern of fore wing.

Eugnorisma (*Metagnorisma*) *pontica* (STAUDINGER, 1891)
(Plate IV: 61—64, V: 65—66)

Iris, **4:** 226 (*Agrotis depuncta* var.), (*Agrotis pontica consenescens* STAUDINGER, 1891, "ab."). — Type-locality: Pontus, Amasia.



Figs 88—99. 88, 90—93 = *Eugnorisma* (*M.*) *pontica* STAUDINGER. 88 = Amasia, 90 = Bulgaria, 91 = Amasia, 92 = Turkey, Prov. Bitlis, 93 = Turkey, Prov. Nevsehir. 89 = *E.* (*M.*) *pontica deserta* ssp. n. Paratype, Ai-Dere. 94 = *E.* (*M.*) *pontica zaghros* ssp. n. Paratype, Iran, Kasri-Shirin. 95—99 = *E.* (*M.*) *pontica anis* ssp. n. Paratypes, Armenia

Examined material: Types of *pontica* and *consenescens* (two males) from Amasia, in coll. STAUDINGER (HZMB). Further material: large series from Herkulesfürdő (Baile Herculane, Roumania), Bulgaria, Greece and different localities of Turkey. Slides Nos: 2019, 2900 HACKER, 823, 828, 917, 1207, 1299 RONKAY, 75/280, 75/917, 3531, 3532 VARGA (males), 2017 HACKER, 980, 991 RONKAY (females).

Description: Alar expanse 31—38 mm, length of fore wing 14—18 mm. Colouration of head, thorax and fore wing very varianle, light ochreous-brown with fine rosy-grey irroration in pastel shade or more or less brownish, in case of *consenescens*-like specimens very pale ochreous-grey with some brownish or greyish irroration and fine ochreous shade. Subbasal line dark, blackish spots or a short line, antemedial line double, oblique, slightly sinuous, with darker brown or red-brown spots from costa to claviform spot, lower part of it light brownish or greyish. Orbicular spot large, elliptical, reniform spot large, outer part concave, their outlines whitish-ochreous. Intracellular spots sometimes brown or brownish and darker than ground colour. Medial line absent or a pale brownish-greyish stripe, postmedial line sinuous, double, brownish, its filling somewhat lighter than ground colour. Subterminal line double, only slightly sinuous, inner line brownish, outer whitish-ochreous, costal part often a darker triangular spot. Terminal line waved, grey or brown, cilia with two darker medial lines. Subterminal fields with more or less intensive greyish-brown covering on veins, initial part of veins, and in case of *consenescens*-like specimens from base to postmedial line with whitish-ochreous scales. Hind wing white or whitish with some ochreous or greyish shade and darker marginal suffusion. Underside of wings whitish with darker stripe of transversal line and shadow of reniform, marginal areas usually with darker irroration, sometimes with rosy shade, cellular lunule of hind wing absent.

Male genitalia (Figs 88, 90—93): uncus long and slender, tegumen high, fultura inferior more or less quadrangular. Vinculum short, V-shaped. Valvae elongate, its shape very variable, usually slightly dilated at middle, apex rounded, without apical lobe and pollex. Harpe relatively long and slender, slightly arcuate, its basis strong with short, rounded outer processus. Aedoeagus short and wide, distal dorsal lamina only slightly sclerotized, without or only with minute spines. Vesica everted ventrally, elongate, field of cornuti large, diverticulum wide-based, short, terminal cornutus small, pointed.

Female genitalia (Fig. 149): ovipositor and gonapophyses moderately long, ostium bursae trapezoidal, less sclerotized than medial part of ductus bursae. Ductus bursae narrow, relatively short with sclerotized lateral laminae at medial part. Apex bursae a rounded, membranous lobe, corpus bursae large, sac-like with short, ribbon-like signa.

Distribution: A Ponto-Mediterranean species, occurs from the Southern Carpathians to East Anatolia, the *consenescens*-like specimens occur everywhere but much more frequent in Central and Eastern Anatolia populations.

Eugnorisma (Metagnorisma) pontica anis ssp. n. (Plate V: 67—68)

Holotype male: Armenia, Geghard, 1700 m, 40 km E from Yerevan, 3—11. IX. 1975, leg. et coll. VARTIAN. Paratypes: very long series of males and females from the same locality and data (coll. VARTIAN, VARGA, HNHM, ZSM); from the same locality, 27—29. IX. 1983, leg. VARGA (coll. VARGA, HACKER and HNHM); from Armenia, Aragats Mts, Antarut, 1956 m, 20—21. IX. 1982, leg. MERKL et RONKAY (coll. HNHM, VARGA and HACKER); a series from the vicinity of Yerevan (coll. Zoological Institute, Yerevan) and 7 specimens from Armenia in coll. ZIN. Slides Nos: 775, 915, 916, 979, 1314 RONKAY, 75/799, 75/802, 1143, 2341, 2342, 3161, 3162, 3164, 3166 VARGA (males), 978 RONKAY (female).

Description: Alar expanse 34—39 mm, length of fore wing 16—19 mm. Shape of fore wing relatively broader than that of nominate *pontica*, ground colour of thorax and fore wing more or less dark rosy-brown with some violet-grey irroration at basal field and subterminal area. Elements of wing pattern dark, sometimes blackish, preorbicular spot also can be very dark. Medial area with relatively strong reddish-brown irroration, veins covered with brownish. Hind wing whitish or ochreous grey with ochreous shine, marginal area suffused with greyish-brown. Underside of wings whitish grey or brownish, with rosy shade, elements of dark pattern (transversal line and cellular lunule of fore wing) relatively strong.

The new subspecies differs from the nominate *pontica* with its special rosy colouration and dark pattern, dark covering of veins and darker hind wing; shape of valvae (Figs 95—100) more spatulate, harpe longer. The *consenescens*-like specimens very rare and considerably darker than in other populations. It has a well-isolated area as it occurs only in the southern part of Armenia.

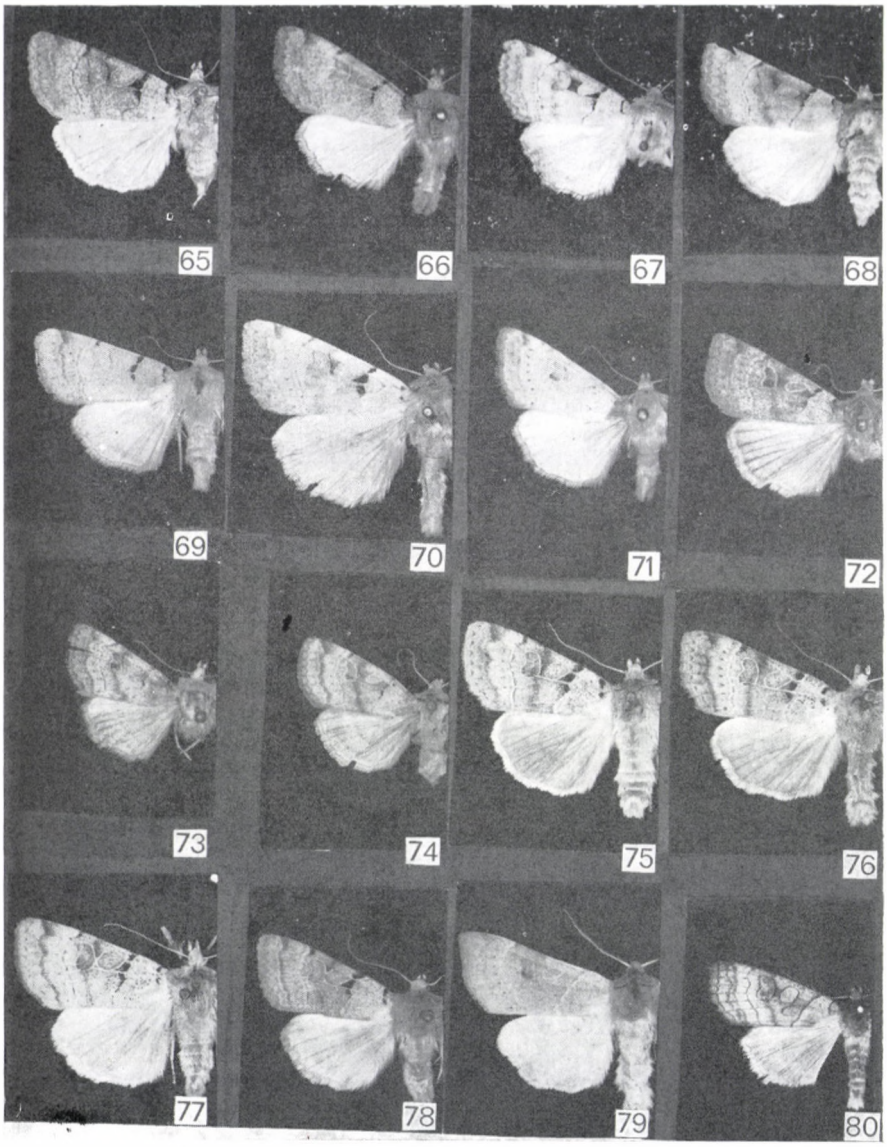
Eugnorisma (Metagnorisma) pontica zaghros ssp. n. (Plate V: 69)

Holotype male: W Iran, Kasri-Shirin, 4. X. 1965, leg. et coll. VARTIAN. Paratypes: 34 ♂♂ and ♀♀ from Iran: Kasri-Shirin, Sar-i-Mill, Bala-vi-Taq; Demavend, Derbend. Slides Nos: 967, 1267, 1288, 1290, 1291, 1292 RONKAY, 3015, 3022 VARGA (males), 968 RONKAY, 3043 VARGA (females).

Description: Alar expanse 32—37 mm, length of fore wing 14—17 mm. Head, thorax and fore wing pale ochreous grey in pastel shade, dark pattern reduced. Subbasal line two blackish spots, antemedial line double, arcuate, outer side with blackish-brown spots from costa to place of claviform. Orbicular and reniform spots very pale, their outlines whitish-ochreous, claviform spot absent. Postmedial line double, pale brown, slightly sinuous, with blackish spot at costa, subterminal line reddish-brown, slightly sinuous with a small triangular spot at costa. Terminal area somewhat darker, terminal line ochreous with some darker spot on inner side, cilia nearly unicolorous Hind wing whitish with darker greyish marginal suffusion. Underside of wings whitish with some ochreous shade, dark pattern absent or very pale.

This subspecies differs from the *consenescens*-like specimens of *pontica*

Plate V



65 = *Eugnorisma* (*M.*) *pontica* STAUDINGER, Greece and 66 = ditto, East Anatolia. — 67 = *E.* (*M.*) *pontica anis* ssp. n., paratype, Armenia, Aragats Mts. and 68 = paratype, Armenia, Geghard. — 69 = *E.* (*M.*) *pontica zaghros* ssp. n., paratype, Iran, Kasri-Shirin. — 70 = *E.* (*M.*) *pontica deserta* ssp. n., holotype, Askhabad. — 71 = *E.* (*M.*) *heuristica* sp. n., paratype, Eastern Anatolia and 72 = paratype from the same locality. — 73 = *E.* (*M.*) *rafidain* BOURSIN, East Anatolia and 74 = ditto, East Anatolia. — 75 = *E.* (*M.*) *depuncta* LINNAEUS, Sweden, 76 = ditto, Ural and 77 = ditto, Pyrenees. — 78 = *E.* (*M.*) *depuncta arenoflavida* SCHAWERDA, Madrid. — 79 = *Xestia* (s. l.) *miniago* FREYER, Sarepta. — 80 = *Paradiarsia* (s. l.) *xestioides* HAMPSON, China

with its nearly unicolorous, light ochreous ground colour and reduced pattern of cell and medial area. The shape of the valvae more elongate and less dilated at middle, harpe usually longer and slender (Fig. 94).

D i s t r i b u t i o n : North and SW Iran.

The specimens from Elburs Range somewhat reddish and with more extensive darker pattern.

Eugnorisma (Metagnorisma) pontica deserta ssp. n. (Plate V: 70)

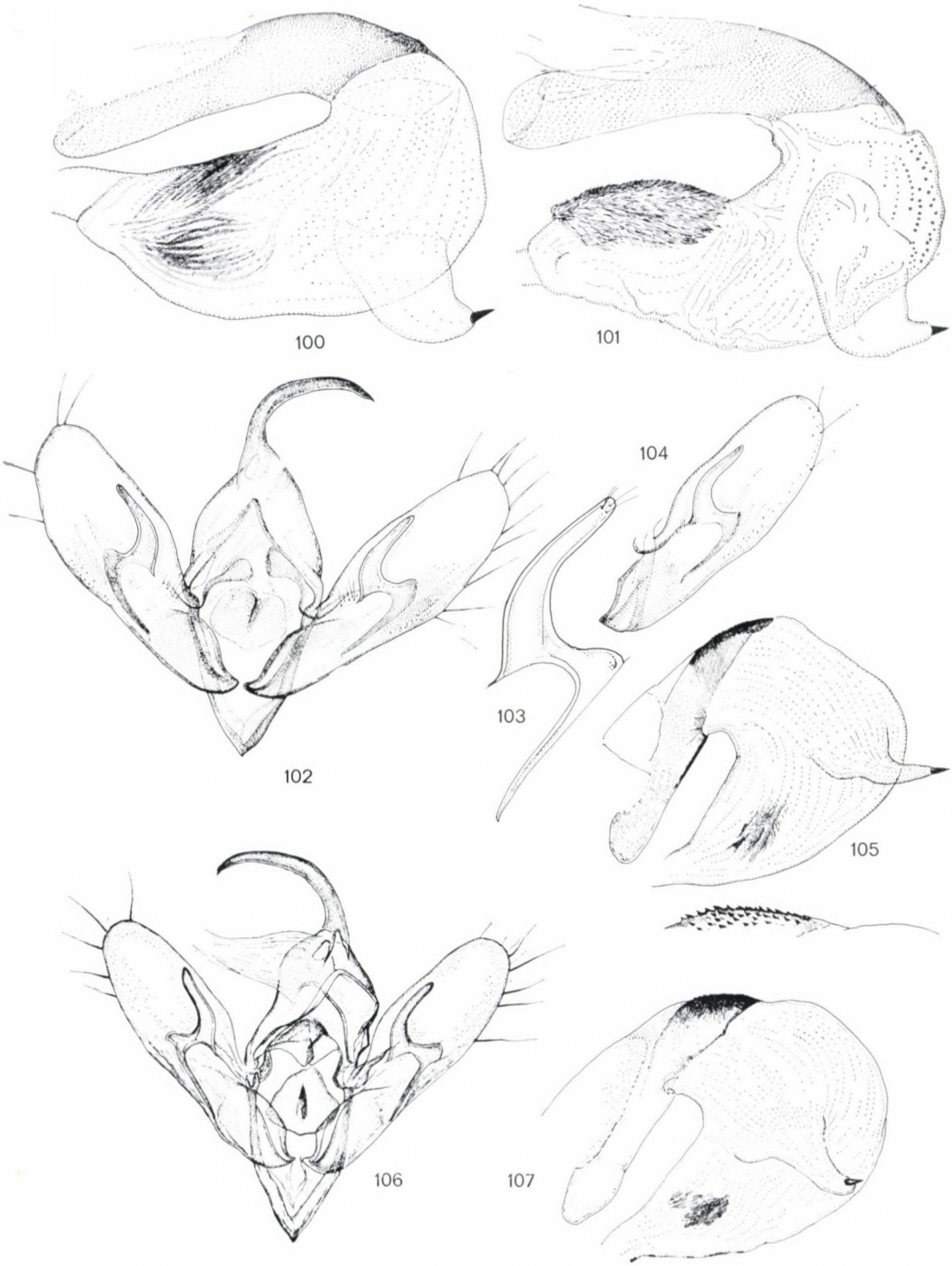
H o l o t y p e male: USSR, Turkmenia, Askhabad, 19. IX. 1954, leg. POTOPOLSKI, in coll. ZMM. Paratypes: 2 ♂, 1 ♀, Ai-Dere, EYLANDT, 3—5. IX. (18)93; 1 ♀, Askhabad, AHNGER, deposited in coll. ZIN. Slides Nos: 3109, 3358 VARGA (males), 3130, 3415 VARGA (females).

D e s c r i p t i o n : Alar expanse 38—41 mm, length of fore wing 17—19 mm. Head and thorax ochreous brown abdomen shlightly lighter. Fore wing elongate broad, ground colour light ochreous brown with fine light greyish shade. Subbasal line two dark spots, basal field with ochreous cowering. Antemedial line oblique double pale brown outer side with three dark blackish brown spots from costa to claviform spot. Orbicular spot large reniform spot elliptical, their outlines fine whitish grey their filling light plumb grey. Medial line an obsolescent wide, diffuse shadow, postmedial line double, slightly sinuous with a small dark spot on inner side at costa. Subterminal line double outer side ochreous inner side reddish-brown; with a dark grey triangular spot at costa. Terminal field covered with plumb-grey terminal line ochreous with fine blackis triangular spots on inner side; cilia brownish with two lighter medial lines. Hind wing ochreous grey, marginal field somewhat darker, cilia whitish grey. Underside of wings light brownish with ochreous shine, nearly patternless, only pale shadows of transversal line and a reniform can be observed.

This most Eastern subspecies of *pontica* strongly differs from the other races with its darker hind wing — this character resembles to *depuncta!* — larger size and with essentially larger valvae and with very large spinulose field of vesica (Figs 89, 101).

Eugnorisma (Metagnorisma) heuristica sp. n. (Plate V: 71—72)

H o l o t y p e male: Prov. Hakkari, Altin Daglari, Süvarihalil Gecidi, 2400 m, 14. IX. 1985 (leg. et coll. HACKER). Paratypes: 1 ♀, from same locality and data (coll. DERRA); 1 ♂, Armenia, Geghard, 3—11. IX. 1975 (leg. et coll. VARTIAN); 1 ♂, from same locality, 29. IX. 1983 (leg. et coll. VARGA); 1 ♂, Turkey, Prov. Konya, Seytan Daglari, 1400 m, 2. IX. 1983 (leg. et coll. HACKER); 2 ♂, 2 ♀, Prov. Agri, Ishir Gecidi, 2600 m, 10. IX. 1985 (leg. et coll. HACKER); 2 ♂, 8 ♀, Agri, Tahir Gecidi, 2400 m, 10. IX. 1985 (coll. DERRA); 1 ♀, Prov. Hakkari, Tanin Daglari, Elkek Gecidi, 2200 m, 15. IX. 1985 (leg. et coll. HACKER); 1 ♂, Prov. Hakkari, Altin Daglari, 2400 m, 14. IX. 1985 (leg. et coll. HACKER). Slides Nos: 1833 HACKER, 1220 RONKAY, 3533, 3534, 3535 VARGA (males), 3656 VARGA (female).



Figs 100—107. 100 = *Eugnorisma* (*M.*) *pontica anis* ssp. n. Paratype, Armenia. 101 = *E.* (*M.*) *pontica deserta* ssp. n. Paratype, Ai-Dere. 102—107 = *E.* (*M.*) *heuristica* sp. n. 102—104, 107 = Paratypes, E Anatolia, 105—106 = paratype, Armenia

D e s c r i p t i o n : Alar expanse 31—35 mm, length of fore wing 14—16 mm. Colouration of both sexes may be variable, but head, thorax and fore wing usually light yellowish. Shape of fore wing elongated, more or less triangular, apex pointed. Dark pattern strongly reduced, subbasal and antemedial lines absent or very pale, postmedial line only slightly darker, double, with some dark spots on veins at outer side. Orbicular and reniform spots encircled with pale lines, filling of reniform usually somewhat darker, brownish with small blackish spot in lower part. Subterminal line diffuse, slightly sinuous with a dark brown spot at costa, terminal line brownish, cilia light ochreous brown. Hind wing white or whitish with few dark scales in marginal field. Rarely much darker specimens can also be found, with light orange-brown ground colour, dark brownish irroration in medial and terminal areas. Antemedial line oblique, blackish, medial line a diffuse brown stripe, postmedial line slightly sinuous, brown, filled with pale ochreous. Subterminal line ochreous with dark shadows on both sides. Orbicular spot narrow, oblique, reniform spot elliptical, constricted at middle, their outlines light ochreous, filling of reniform, dark brown. Hind wing whitish — ochreous, on veins with some dark scales, marginal field with darker suffusion. Underside of wings whitish, with some ochreous shade, dark pattern reduced.

Male genitalia (Figs 102—107): uncus long and slender, tegumen high, fultura inferior a more or less quadrangular plate with medial crest, vinculum relatively short but strong, V-shaped. Valvae elongate, medial part usually widened, apex rounded, apical lobe and pollex absent. Harpe relatively short and narrow, arcuate, considrably recumbent to valval surface. Its bases strong with short, rounded outer processus. Aedoeagus short and thick, distal dorsal lamina strong, dentated. Vesica everted ventrally, large, proximally more or less globular, spinulose field small. Diverticulum directed ventro-laterally, wide-based, terminal cornutus fine, pointed.

Female genitalia (Fig. 152): ovipositor and gonapophyses relatively long, ostium bursae membranous: Ductus bursae narrow, elongate with strongly sclerotized medial part. Apex bursae very small, corpus bursae elongate, sac-like, with short, ribbon-light signa.

The new species differs from the related taxa with its unique coloruation in this subgenus, male genitalia with recumbent harpe and very large and globular vesica, the female genitalia with membranous ostium bursae and narrow strongly sclerotized medial part of ductus bursae.

D i s t r i b u t i o n : East Anatolia, Armenia.

Eugnorisma (*Metagnorisma*) *rafidain* (BOURSIN, 1936)
(Plate V: 73—74)

Bull. soc. ent. France, **1936:** 224 (*Rhyacia*). — Type-locality: Iraq.

Examined material: 1 ♂, 1 ♀, Turkey, Prov. Konya, Seytan Daglari, 1400 m, 2. IX. 1983 (leg. et coll. HACKER); 1 ♀, Prov. Bitlis, Mus. Ovasi, 1620 m, 17. IX. 1985 (leg. et coll. HACKER). Slides Nos: 1852 HACKER (male), 1383 RONKAY, 3667 VARGA (females).

Description: Alar expanse: 25—28 mm, length of fore wing 11.5—13 mm. Head, thorax and fore wing light ochreous-brown with some reddish shade. Subbasal line a short, blackish; antemedial line dark brown, oblique, becoming obsolete at inner margin. Medial line usually dark, diffuse, postmedial line slightly sinuous, double, with dark spot at costa. Orbicular spot narrow, oblique, reniform spot elliptical, constricted at middle, their outlines light ochreous. Filling of orbicular light brownish, that of reniform dark brown with a small blackish spot in lower part; with some darker irroration in cell between orbicular and reniform. Claviform spot absent or only its light outline can be observed. Subterminal line strong, sinuous, dark brown with large spot at costa, terminal line fine, consists of dark arches, cilia brownish with dark line at middle. Hind wing light ochreous brown with somewhat darker transversal line and marginal area. Terminal line brown, cilia ochreous with darker medial line. Underside of wings light ochreous brown with darker shade in marginal fields, cellular lunule and two transversal lines of fore wing usually strong.

Male genitalia (Figs 108—109): uncus short and thick, tegumen wide, fultura inferior subtriangular, vinculum V-shaped. Valvae relatively short, apically dilated, apex slightly rounded, apical lobe and pollex absent. Harpe very short and thick, its bases with short discal processus. Aedoeagus short, distal dorsal lamina strong with small, spine-like teeth. Vesica everted ventrally, sac-like, spinulose field very small. Diverticulum short, terminal cornutus pointed.

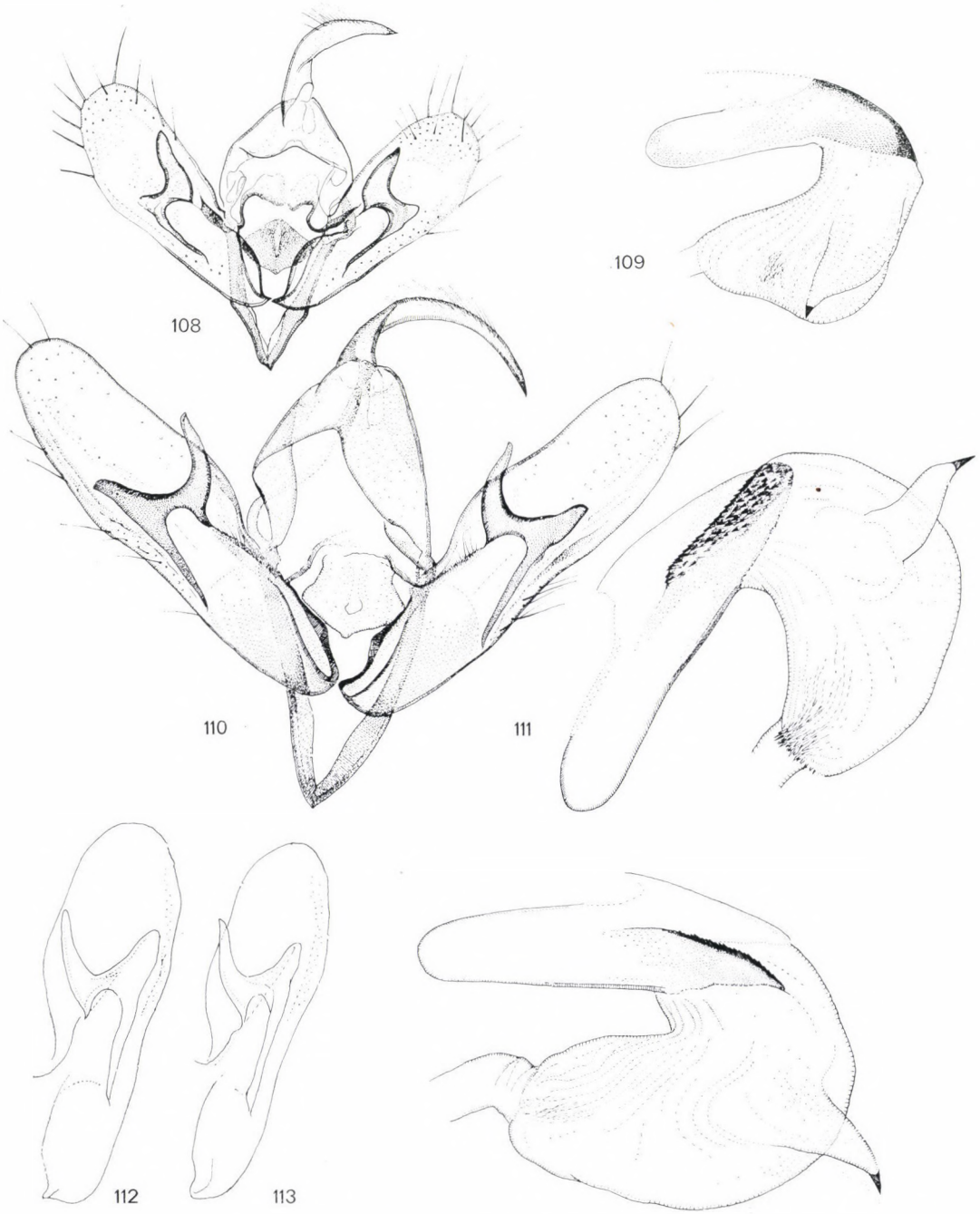
Female genitalia (Fig. 154): ovipositor short, gonapophyses moderately long. Ostium bursae more or less calycular, well sclerotized. Ductus bursae short, laterally strongly sclerotized. Apex bursae a small lobe, corpus bursae large, elongate, sac-like with characteristic double signa.

Distribution: Iraq, East Anatolia.

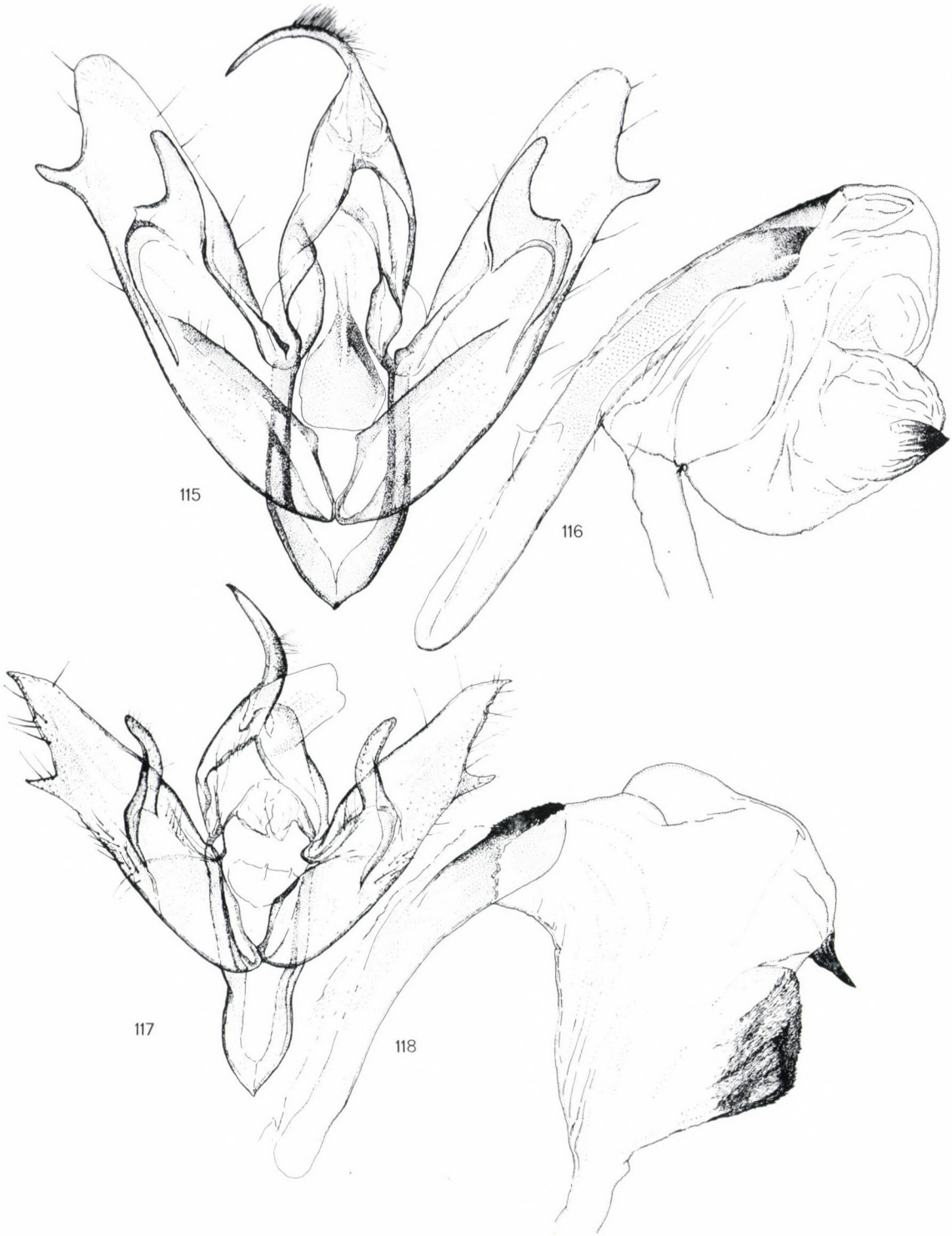
Eugnorisma (*Metagnorisma*) *depuncta* (LINNAEUS, 1761)
(Plate V: 75—77)

Fauna Suaecica, p. 321 (*Phalaena Noctua*). — Type-locality: Sweden.

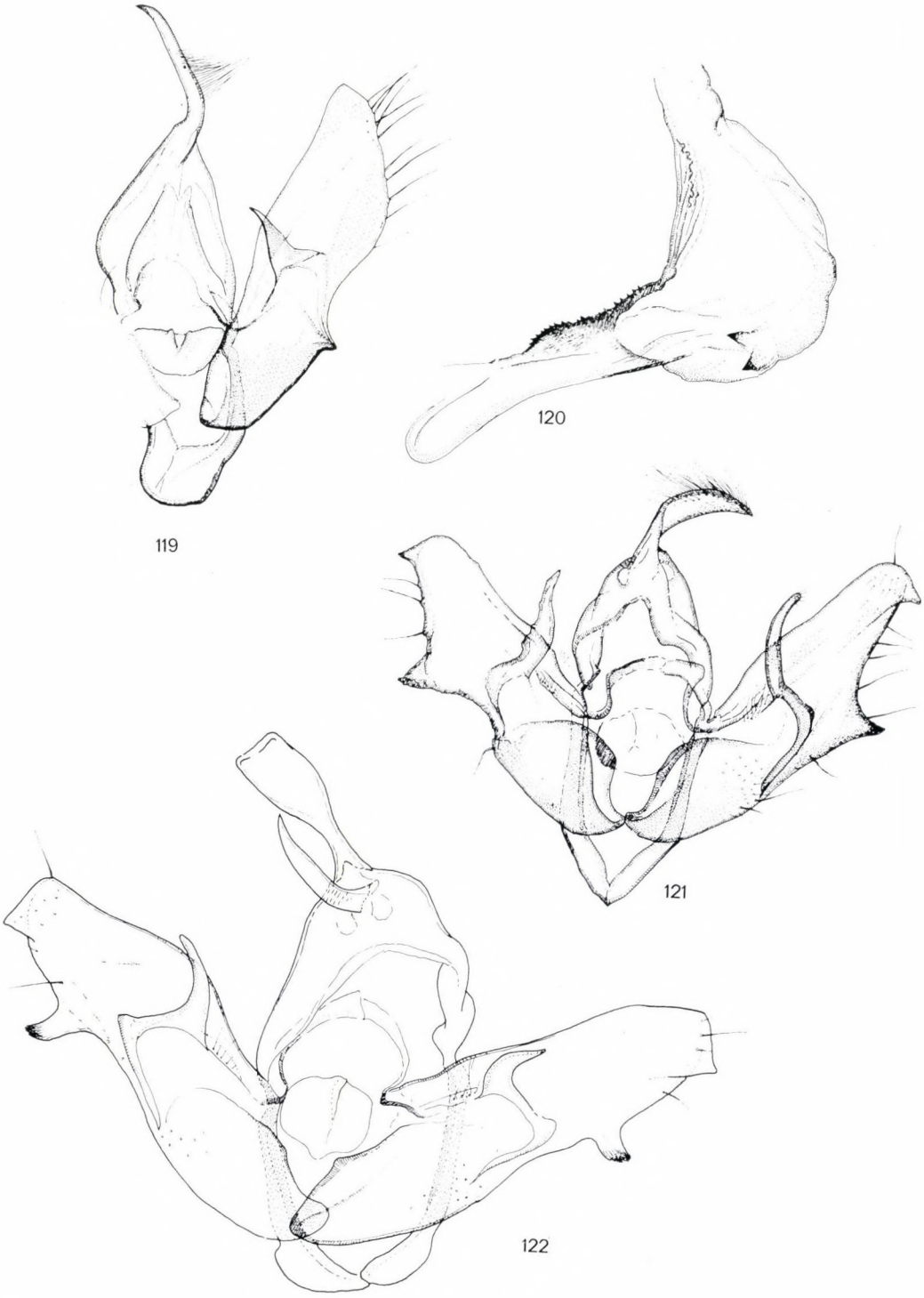
Examined material: Large series of males and females from Europe (Sweden, Finland, Poland, Central Europe: Slowakia, Hungary; France, Spain, Italy, Roumania, Bulgaria); 1 ♀, Novosilj, Russ. C. (HNHM); 1 ♀, Armenia, Aragats Mts. (HNHM); 1 ♀,



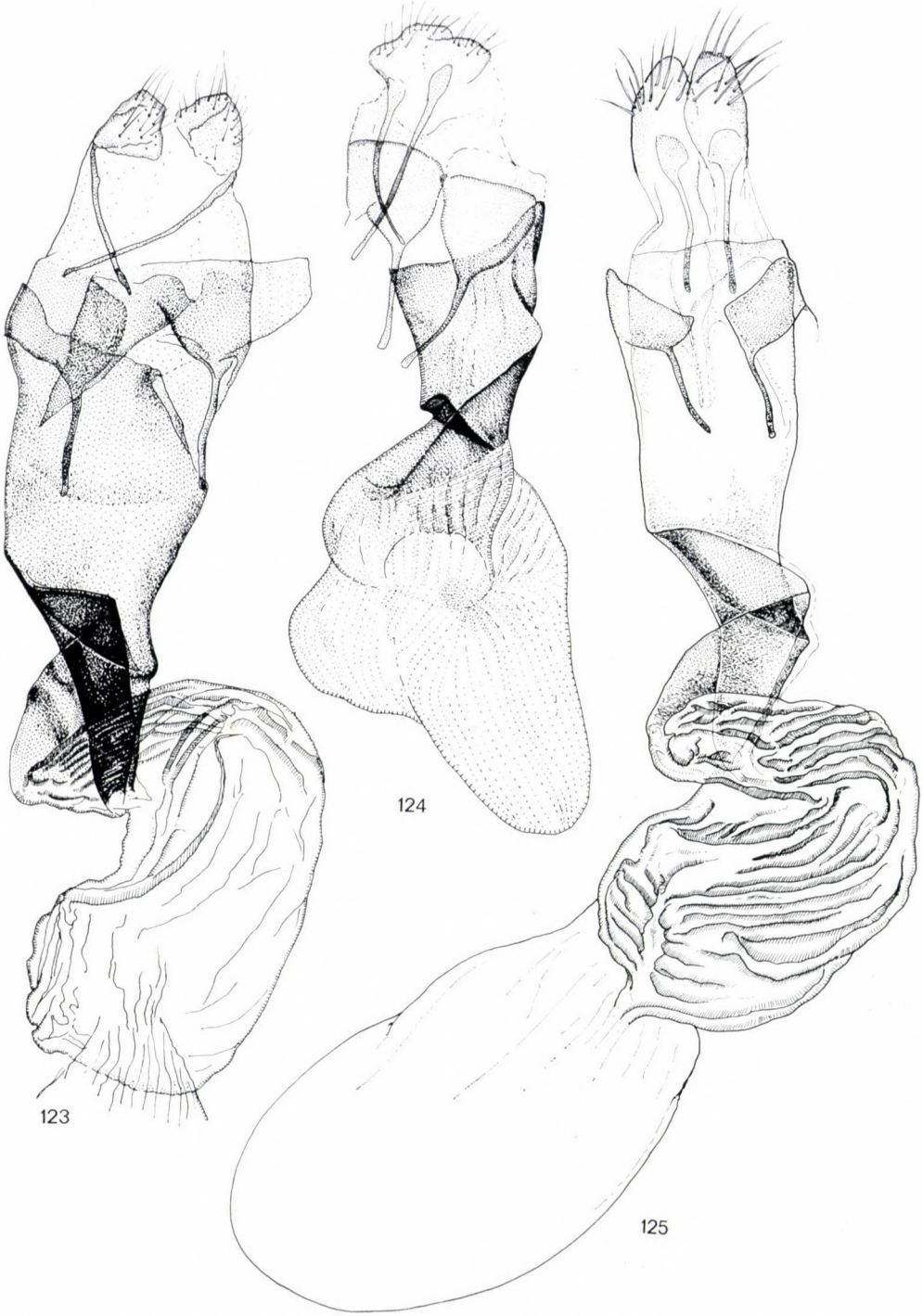
Figs 108—114. 108—109 = *Eugnorisma* (*M.*) *rafidain* BOURSIN, E Anatolia. 110—111 = *E.* (*M.*) *depuncta*, LINNAEUS, Hungary 112—114 = *E.* (*M.*) *depuncta arenoflavida* SCHAWERDA, Spain, Madrid



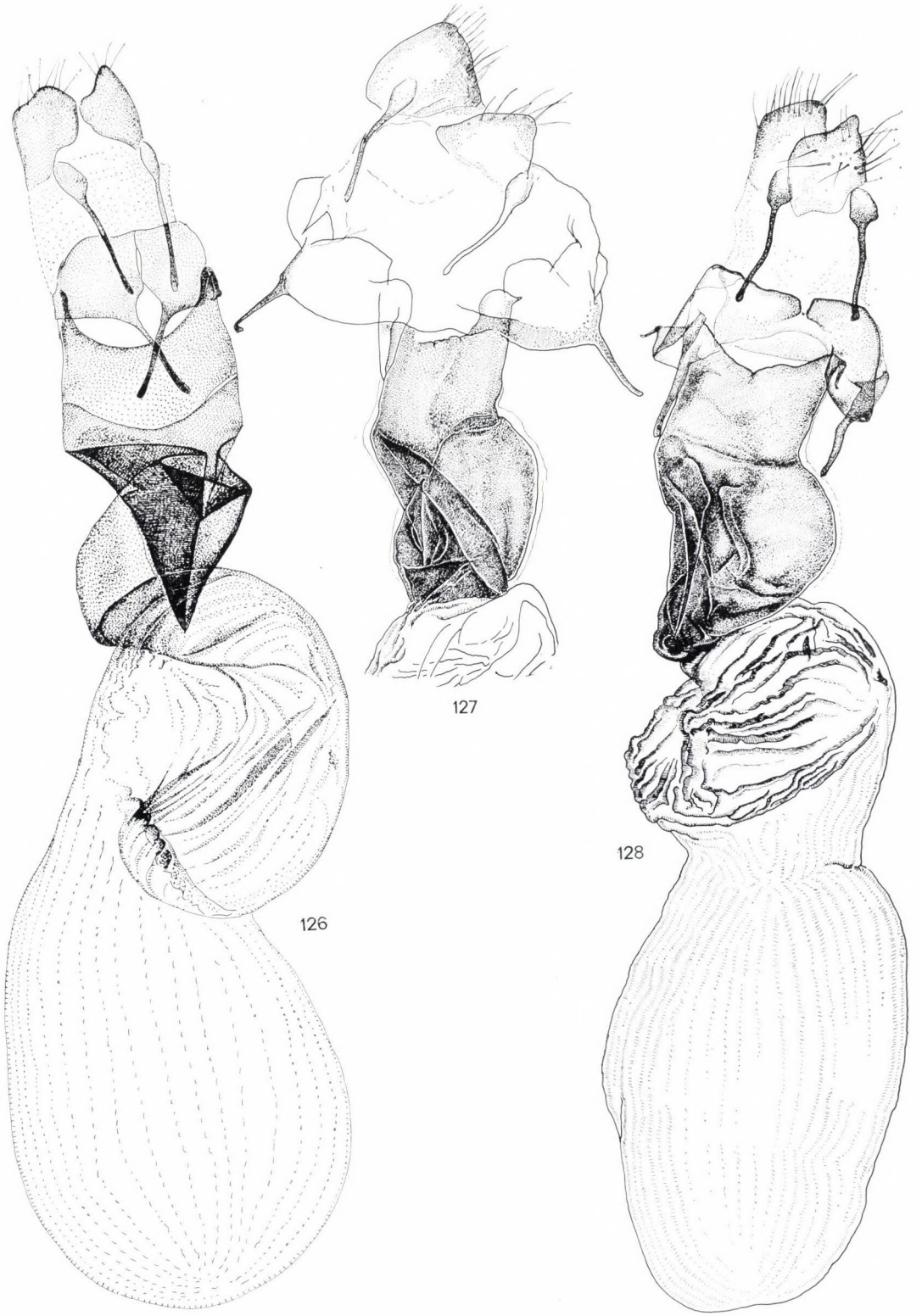
Figs 115—118. 115—116 = *Xestia* (s. l.) *miniago* FREYER, Sarepta. 117—118 = *Paradiarsia* (s. l.) *xestioides* HAMPSON, China



Figs 119—122. 119—120 = *Paradiarsia glareosa* ESPER, Germania. 121 = pathological valvae of *Eugnorisma* (*E.*) *gaurax* PÜNGELER, Ispajran. 122 = pathological development of uncus and tegumen of *E.* (*E.*) *conformis* SWINHOE

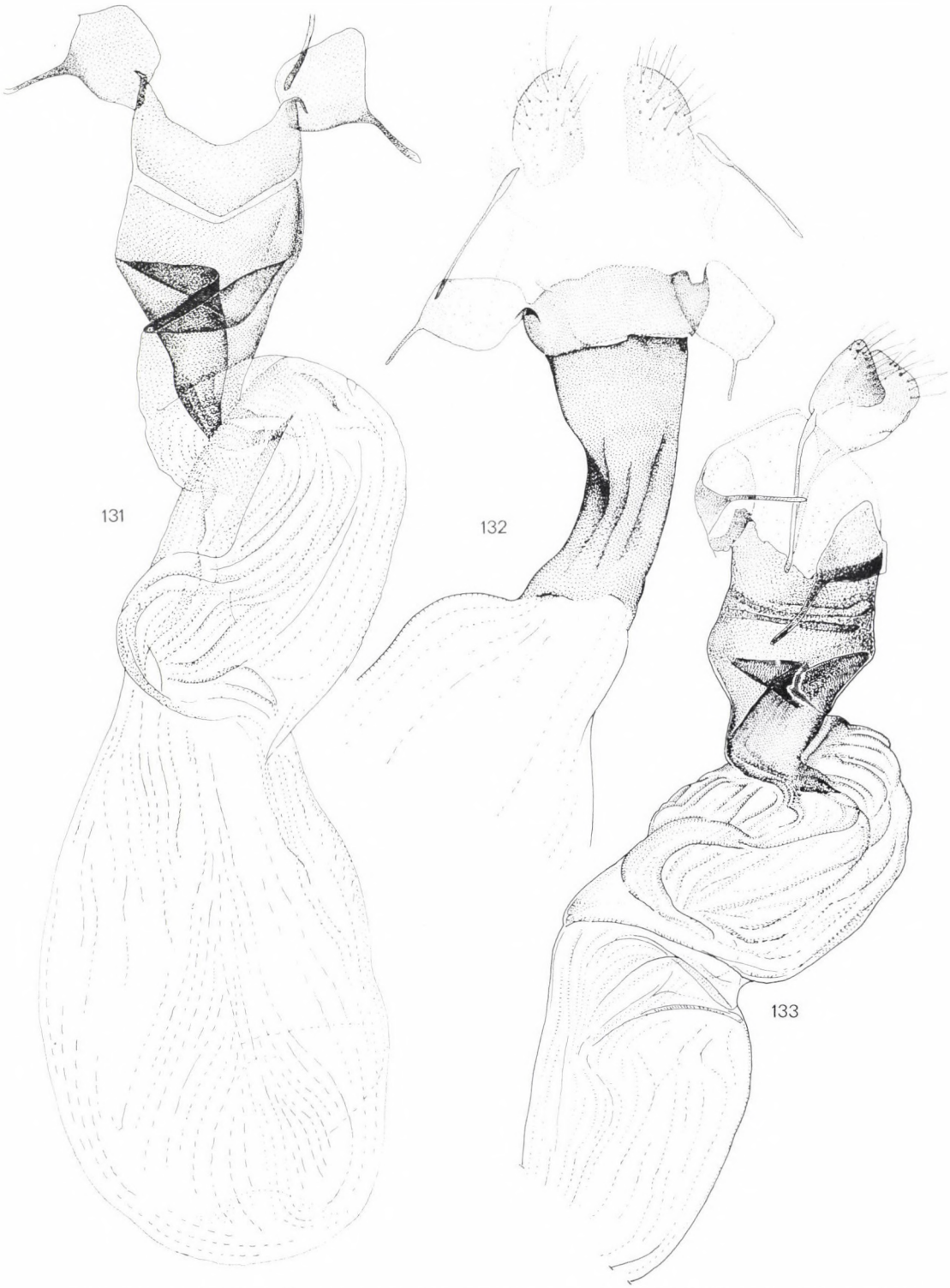


Figs 123—125. 123 = *Eugnorisma* (*E.*) *tamerlana* HAMPSON, Aulie Ata. 124 = *E.* (*E.*) *enargiaris* DRAUDT, Asia Minor. 125 = *E.* (*E.*) *puengeleri* sp. n. Paratype, Afghanistan

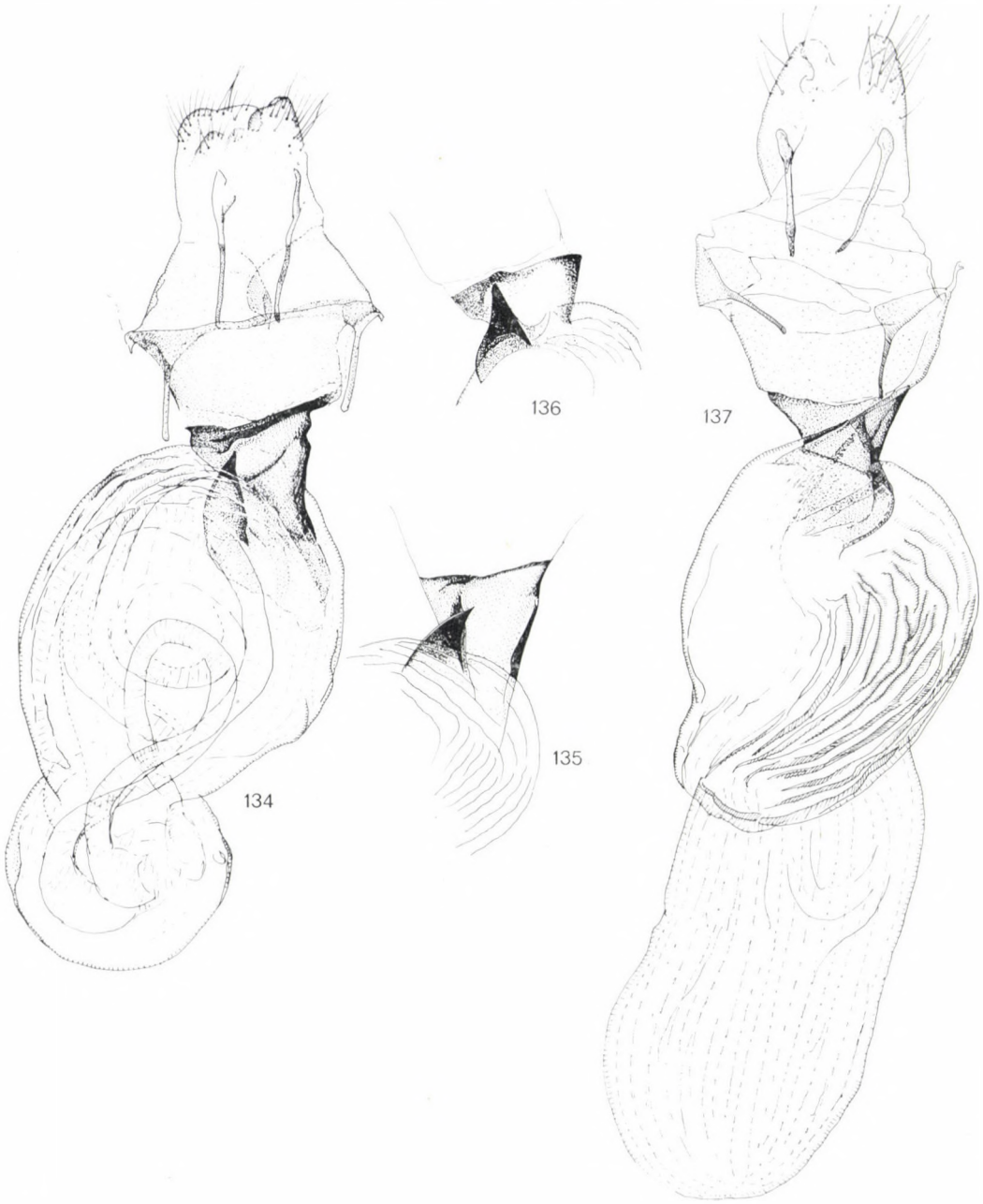


Figs 126—128. 126 = *Eugnorisma* (*E.*) *chaldaica* BOISDUVAL, Issyk-Kul. 127 = *E.* (*E.*) *spodia psammochrea* ssp. n. Paratype, Aulie Ata. 128 = *Eugnorisma* (*E.*) *spodia* PÜNGELER, lectotype, Askhabad

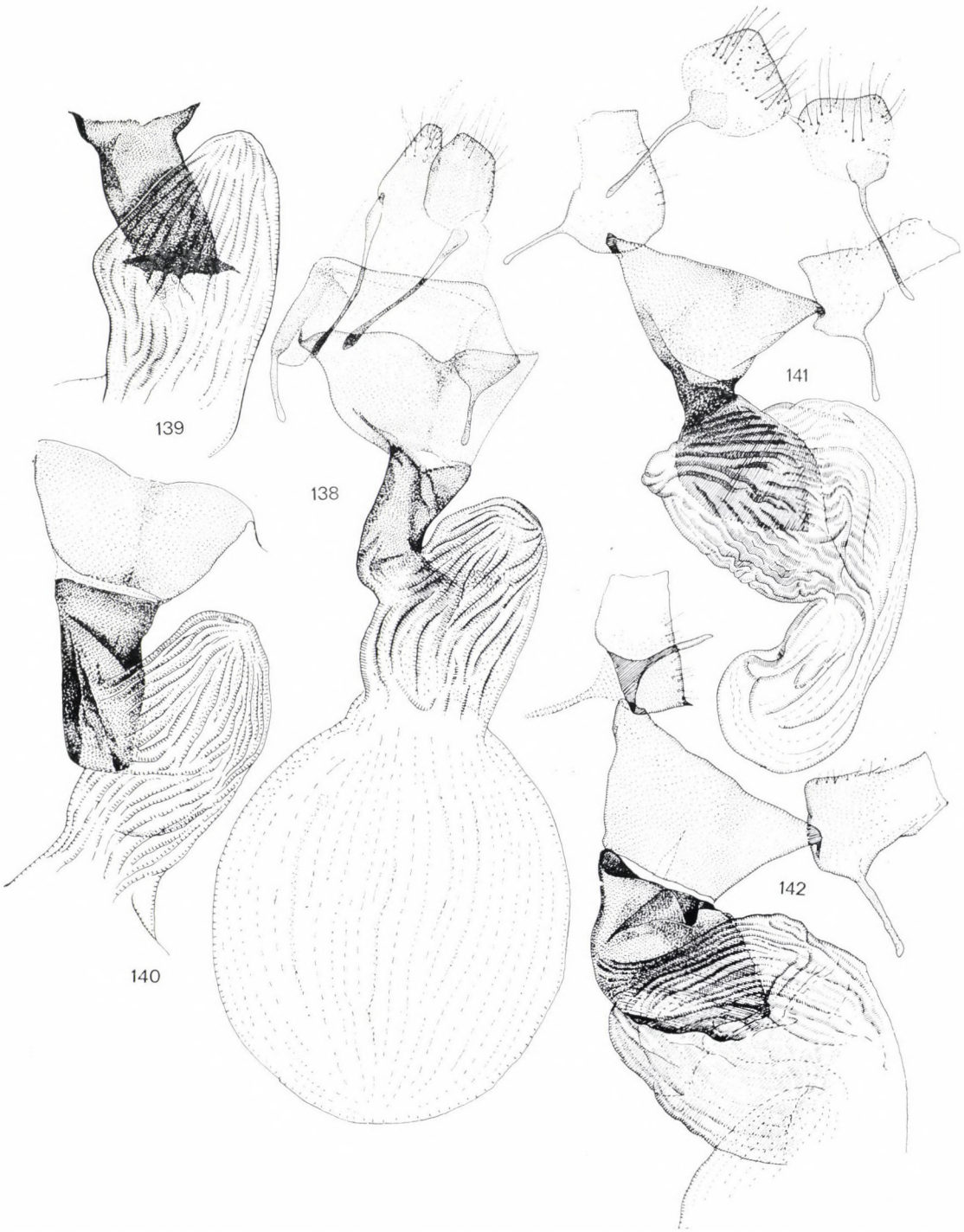
Figs 129—130. 129 = *Eugnorisma* (*E.*) *caerulea isabellina* ssp. n. Paratype, Iran, Kasri-Shirin. 130 = *E.* (*E.*) *caerulea* WAGNER, Armenia



Figs 131—133. 131 = *Eugnorisma* (*E.*) *eminens* LEDERER, Issyk-Kul. 132 = *E.* (*E.*) *coryphaea* PÜNGELER. Holotype, Kuku-Noor. 133 = *E.* (*E.*) *atrabaelbops* VARGA, Dzhugan-Dala



Figs 134—137. 134—135 = *Eugnorisma* (*E.*) *gaurax* PÜNGELER, Semiretshje. 136 = *E.* (*E.*) *deleasma* BOURSIN, Almata. 137 = *E.* (*E.*) *trigonica* ALPHÉRAKY, Afghanistan



Figs 138—142. 138—139 = *Eugnorisma* (*E.*) *insignata* LEDERER. 138 = Sarepta, 139 = f. *columbina* DRAUDT, Ankara. 140 = *E.* (*E.*) *insignata leuconeura* HAMPSON, Armenia. 141 = *E.* (*E.*) *variago* STAUDINGER, Afghanistan. 142 = *E.* (*E.*) *variago xanthiago* ssp. n. Paratype, Hissar Mts

Armenia, Sevan (coll. VARGA); 1 ♂, Sarepta (coll. DUSKE, ZMH); 1 ♂, Uralsk (HNHM); 2 ♂, 3 ♀ cotypes of "ssp." *meridionalis* DANNEHL, 1925, Appenn. Centr., Montagna Grande (ZSM). Slides Nos: 824, 988, 994 (RONKAY, 1293, 1298 VARGA (males), 933, 952, 1297 RONKAY (females).

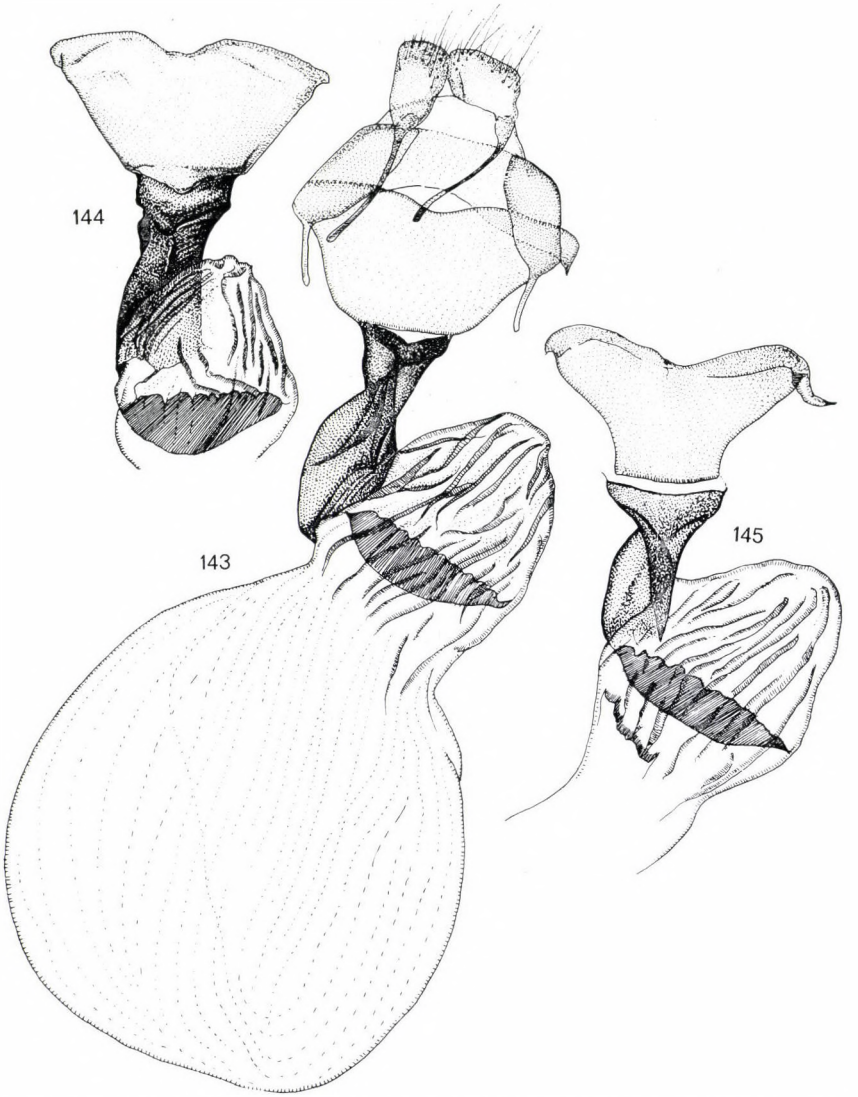
Description: Alar expanse 35—40 mm, length of fore wing: 16—18 mm. Head, thorax and fore wing light reddish brown, abdomen slightly lighter and greyish. Shape of fore wing broad and more or less elongate, slightly pointed. Subbasal line consists of two black spots, basal field with some dark brown irroration. Antemedial line oblique, outer side with chocolate-brown spots from costa to claviform spot, sometimes to inner margin. Orbicular spot large oval reniform also, their outlines whitish, sometimes conjoined. Claviform spot absent or very pale. Medial line a diffuse brownish stripe filling of reniform dark brown or greyish in lower part. Postmedial line double brownish with dark spot at costa, subterminal line light brown, sinuous, with dark triangular spot at costa and brownish shadow on inner side. Terminal line brownish with some fine blackish triangles or arches, cilia brownish with darker scales. Subterminal area often with dark spots on veins, which can be covered with ochreous scales in medial field. Hind wing brown or brownish with lighter inner area, cellular lunule and transversal line often visible but pale, marginal field of wing darker. Terminal line ochreous brown, cilia pale rufous. Underside of wings light ochreous brown with some reddish shade at costal margins. Medial area of fore wings darker, cellular lunules and transversal lines well discernible.

Male genitalia (Figs 110—111): uncus long and slender, tegumen high, fultura inferior more or less quadrangular with medial crest, vinculum V-shaped, relatively long. Valvae elongate, narrow, spex rounder, apical lobe and pollex absent. Harpe short and thick, slightly arcuate, its bases very strong with long distal processus. Aedoeagus relatively short and wide, distal dorsal lamina strong with spiniform teeth. Vesica everted ventrally, horseshoe-shaped, spinulose field very small. Diverticulum short, terminal cornutus pointed.

Female genitalia (Fig. 153): ovipositor and gonapophyses relatively long. Ostium bursae quadrangular or trapezoidal with sinuous proximal margin; its sclerotization much stronger than that of ductus bursae. Ductus bursae elongate, narrow, less sclerotized, nearly membranous. Apex busae a more or less triangular lobe, corpus bursae large, sac-like with short, ribbon-like signa.

Distribution: A widespread species occurring from the Pyrenees to the Ural and Armenia; also recorded from Morocco.

The colouration of the species shows a tendency: the southern populations more reddish and lighter.

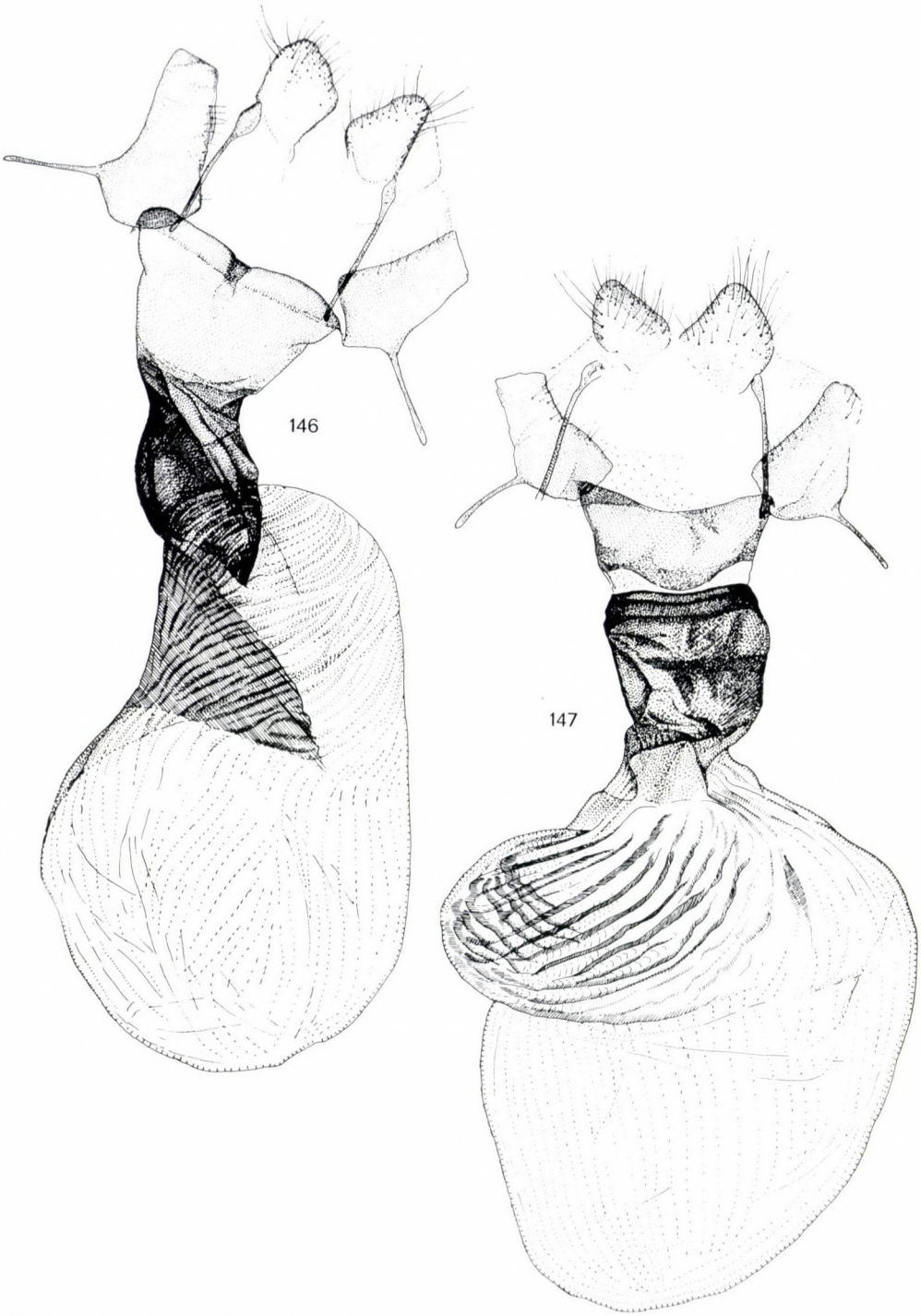


Figs 143—145. 143, 145 = *Eugnorisma* (*E.*) *conformis* SWINHOE, Afghanistan, 144 = *E.* (*E.*) *insignata* LEDERER, Afghanistan

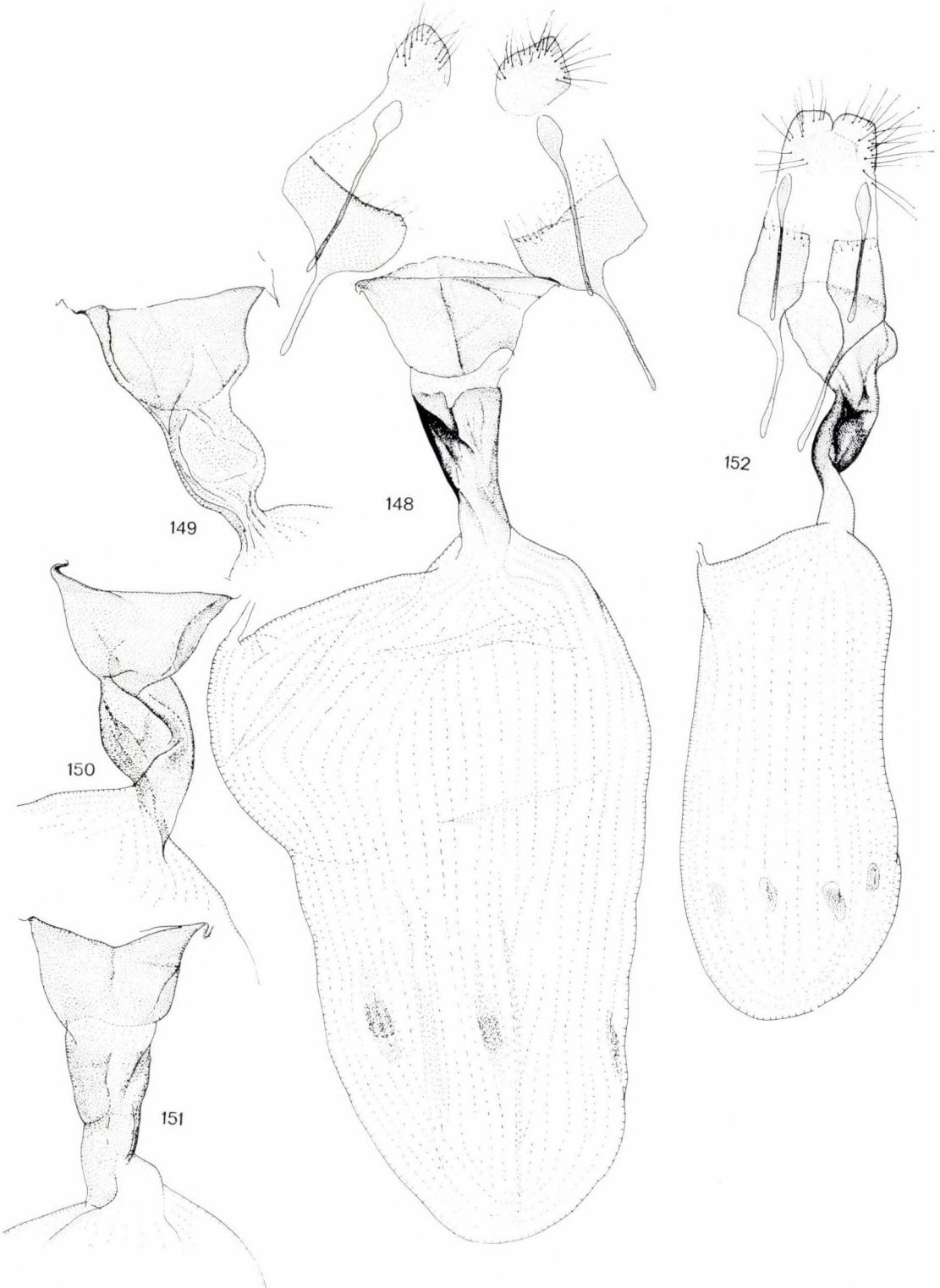
Eugnorisma depuncta arenoflavida (SCHAWERDA, 1934) stat. n.
(Plate V: 78)

Int. Ent. Zeitschrift, **28** (1934): 425. (= *E.pontica consenescens* auct.). — Type-locality: Spain, Albarracin.

E x a m i n e d m a t e r i a l : Type, female, Aragonia, Albarracin, 4. IX. 1933, leg. Predota, coll. SCHAWERDA (NHMW). Further material: 1 ♂, 1 ♀, Hispania, Ucles (coll. HNHM); 1 ♂, Albarracin, Sept. 1926, coll. BARTHA (HNHM); 1 ♀, from same locality, coll. BARTHA



Figs 146—147. 146 = *Eugnorisma* (*E.*) *asad* BOURSIN, Afghanistan. 147 = *E.* (*E.*) *semiramis farsica* BOURSIN, Iran, Kasri-Shirin



Figs 148—152. 148 = *Eugnorisma* (*M.*) *pontica* STAUDINGER, Pontus. 149 = *E.* (*M.*) *pontica deserta* ssp. n. Paratype, Ai-Dere. 150 = *E.* (*M.*) *pontica anis* ssp. n. Paratype, Armenia. 151 = *E.* (*M.*) *pontica zaghros* ssp. n. Paratype, Iran, Derbend. 152 = *E.* (*M.*) *heuristica* sp. n. Paratype, E Anatolia

Figs 153—154. 153 = *Eugnorisma* (*M.*) *depuncta* LINNAEUS, Hungary. 154 = *E.* (*M.*) *rafidain* BOURSIN, E Anatolia

(HNHM); 2 ♂, Madrid (NHMW); 2 ♂, San Ildefonso, Segovia, coll. HACKER; 4 ♂, Villamantiqua de Tajo (Madrid), coll. HACKER; 1 ♂, 1 ♀, S-Spain, Sierra Morena, Sta. Elena, coll. HACKER. Slides Nos: 2024 HACKER, 829, 906 RONKAY (males); 989 RONKAY, 3783 VARGA (females).

D e s c r i p t i o n : Alar expanse 34—37 mm, length of fore wing 15—16 mm. Ground colour of fore wing light ochreous grey in pastel shade, dark pattern strongly reduced. Subbasal line consists of two blackish spots, antemedial line oblique upper part with blackish brown spots on outer side, lower part obsolescent. Orbicular spot large, more or less elongate and oblique, reniform elliptical their outlines whitish. Filling of reniform light plumb-grey, claviform spot usually absent. Postmedial line double, pale, except its costal part, subterminal line slightly sinuous with triangular spot at costa. Terminal line whitish with small dark spots. Cilia nearly unicolorous. Hind wing white with fine ochreous shine, patternless. Underside of wings ochreous white, pattern strongly reduced, cellular lunule upper part of transversal line and dark spots of antemedial line slightly can be seen.

D i s t r i b u t i o n : Central Spain.

This subspecies very strongly differs in its appearance from the nominate *depuncta* but the configuration of genitalia of both sexes (Figs 112—114): is identical with those of the nominate race.

Acknowledgement. We would like to express our gratitude to Mrs. E. VARTIAN (Vienna), Dr. F. KASY (Vienna), Dr. W. DIERL (Munich), Prof. Dr. H. J. HANNEMANN (Berlin), Dr. D. STÜNING (Bonn), Mr. H. HACKER (Staffelstein), Dr. K. MIKKOLA (Helsinki), Mrs. E. M. ANTONOVA and A. V. SVIRIDOV (Moscow), Dr. I. L. SUKHAREVA and Dr. V. I. KUZNETSOV (Leningrad) for their kind help.

Acta Zoologica Hungarica 33 (1—2), pp. 263—267 (1987)

ON THE RELATIONSHIPS OF THE EIGHT ARADID SUBFAMILIES (HETEROPTERA)

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(Received 5 March, 1986)

Apomorphy or plesiomorphy of several characters is investigated, and a cladogram is constructed for the known eight subfamilies of the family Aradidae. On the basis of evidences revealed by different studies a new classification of the family is suggested.

In the past flat bugs traditionally belonged to two families: Dysodiidae and Aradidae. USINGER and MATSUDA (1959) treated them as a single family and described eight subfamilies stating: "There are eight major groups within the Aradidae proper. While these are not exactly equivalent in degree of distinctness, they are as nearly so as most higher categories of a given level. Therefore, the elevation of one or several but not all of these to family rank would distort the actual relationships." They figured the relationships of the subfamilies as follows (Fig. 1).

Since USINGER and MATSUDA several studies were made on Aradidae but only a few gave information relevant on the family level. ŠTYS (1969) found that species of the genus *Aradus* have free labrum, while species of the genera *Aneurus* and *Mezira* have clypeolabrum. On the basis of this character he doubted the homogeneity of the family. CHANG and PENDERGRAST (1976) investigated the stylets in the family and found three types: the "clockwise type" (Aradinae, Calisiinae, Tretocoris), the "figure of eight type" (*Chinamyersia*) and the "anticlockwise type" (Prosympiestinae, Isoderminae, Aneurinae, Mezirinae, Carventinae). MONTEITH (1980) treated the relationships of the four chinamyersiine genera, describing the "macropterous line" (*Chinamyersia*, *Gnostocoris*) and the "apterous line" (*Tretocoris*, *Kumaressa*), but preserved their position in the same subfamily. JACOBS (1980) studied the relationships practically on family level. VÁSÁRHELYI (1986) described three basic types of the pulvillus in the family one with lack of pulvillus (Aradinae), one with large, apically or subapically laminate distipulvillus (Calisiinae, Isoderminae) and the third type with not laminate, lobe-like pulvillus and variously reduced pulvillus, respectively.

In the course of studies on Aradidae several still unpublished data were collected either in connection with the above-mentioned body parts or on

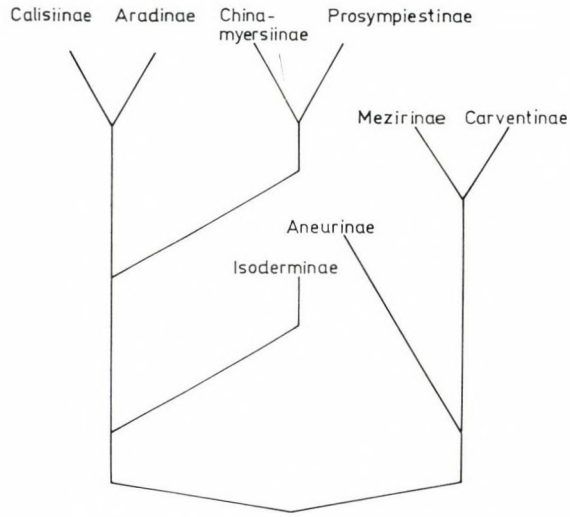

Fig. 1. Phylogenetic diagram of USINGER and MATSUDA (1959) showing relationships of subfamilies of Aradidae

other characters. I could study the labrum on materials of each subfamilies, and found that Aradinae and Calisiinae (many species) as well as Chinamyersiinae (*Chinamyersia cinerea* MYERS et CHINA, 1928, *Tretocoris* sp. L_5) have free labrum, while Prosympiestinae (*Prosympiestus constrictus* USINGER et MATSUDA, 1959, *Adenocoris brachypterus* USINGER et MATSUDA, 1959), Isoderminae (*Isodermus planus* ERICHSON, 1842, *I. gayi* SPINOLA, 1852), Aneurinae, Carventinae and Mezirinae (many species of each) have clypeolabrum i.e. fused clypeus and labrum. The rostrum of *Aneurus* species is three-jointed in

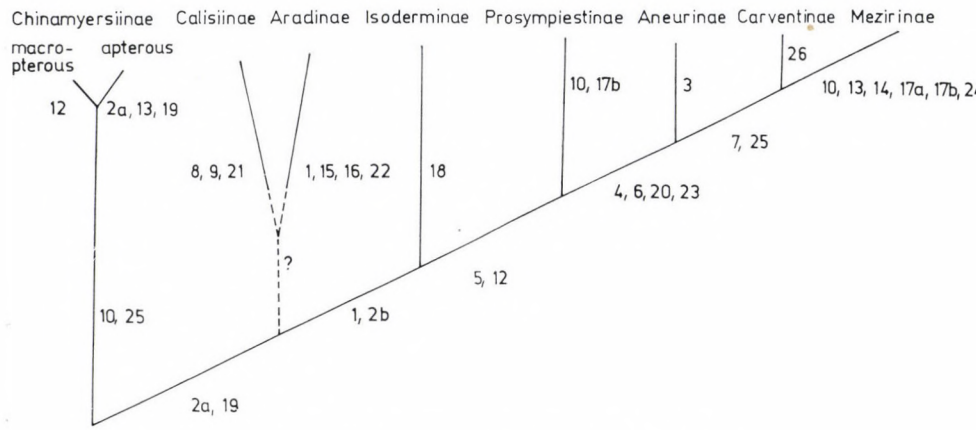

Fig. 2. Cladogram of the Aradid subfamilies

Table 1

Character states investigated

plesiomorphous	*apomorphous*
1. Labrum free	labrum fused with clypeus
2. Stylets coiled in a "figure of eight"	stylets coiled either in clockwise (2a) or in anticlockwise (2b) direction
3. Rostrum 4-jointed	rostrum 3-jointed
4. Rostrum long, surpassing the hind border of head	rostrum short, not reaching beyond head (also in the subgenus *Quilnus* of the genus *Aradus*)
5. Rostrum free at base	rostrum enclosed by bucculae at base
6. Genae not large	genae large, often surpassing clypeus (occurs also in *Isodermus*, cf. HEISS, 1981)
7. Rostral atrium open	rostral atrium closed
8. Antennal joint IV not the longest, other joints various in length	antennal joint IV tends to be the longest, joints I—III tend to be subequilongous
9. Scutellum of macropterous form not covering most of the abdomen	scutellum of macropterous form large, covering most of the abdomen
10. Metathoracic scent gland opening slit-like	metathoracic scent gland opening large, often with large evaporative area
11. Pulvillus present	pulvillus absent
12. Pulvillus laminate	pulvillus lobe-like
13. Pulvillus lobe-like	pulvillus reduced to bristle-like, hair-like or peg-like structure
14. Empodium and parempodium present	empodium and parempodium may be absent
15. Empodium bifurcated	empodium pentangular
16. Parempodium long	parempodium short
17. Parempodium a typical mechanical sensory seta	parempodia may be either long, widened and flattened apically (*Clavicornia*, 17a) or long, adherently, helically curved, appearing together as a single median curled seta (*Kormilevia*, *Neadenocoris*, 17b)
18. Wings not deciduous	wings deciduous
19. One lateral apodemal impression (glabrous area) on tergites 3—7 (1 : 1 : 1 or 1 : 1 : 0)	two lateral apodemal impressions on tergites 3—7 (2 : 1 : 1)
20. One midlateral apodemal impression on tergites 3—7 (2 : 1 : 1)	two midlateral apodemal impressions on tergites 3—7 (2 : 2 : 1)
21. Lateral edge of dorsolaterotergites with a single row of granules	lateral edge of dorsolaterotergites with double row of granules
22. Ventral opaque area exposed on abdomen of adults	ventral opaque area sank into the longitudinal furrow on the adult (VÁSÁRHELYI, 1982)
23. Opening of the larval abdominal scent glands equally developed	opening of the first gland more developed than the others
24. First larval abdominal scent gland opening without ejaculating channel	first larval abdominal scent gland opening with two ejaculating channels
25. Larval abdominal scent gland openings on hind margin of tergites 3—5	larval abdominal scent gland openings positioned backwards (hind margin of tergites 3—5 is deflected backwards medially)
26. Body uncovered	body mostly covered by incrustation

all developmental stadia. (It may be a neotenic character, since an increase in number of rostral joints during early larval development was observed in *Neuroctenus* sp.) Aradid bugs as well as other heteropterans have subequilongous, short basal antennal joints and a long apical joint in the first larval instar. The approximate proportions (in per cent of the total length) in Aradidae are 20 : 20 : 20 : 40 (VÁSÁRHELYI, 1985). The neotenic tendency of antennal joint IV to be the longest and joints I—III to be short and subequilongous, is apomorphic too. In several taxa of Mezirinae the first larval abdominal scent gland opening is developed, formed by two ejaculating channels and surrounding evaporative area covered by flaked cuticle. In other taxa and in Carventinae and Aneurinae, the first opening is more developed than the others (the third is often missing, at least in the earlier larval instars), but without ejaculating channel. The most plesiomorphous state is, when all three openings are about equal, and not placed backwards.

It is recognized that some of the above-mentioned characters still need investigation and there are several other attributes unknown on the family level, especially the genitalia. However, a cladogram is constructed for the eight subfamilies considered by USINGER and MATSUDA and since then by all other taxonomists of the group. The number at the branching points refer to the occurrence of the apomorphous variety of the character in Table 1.

It is clearly seen that some subfamilies have a mosaic pattern of character states (heterobathmy). There are two characters circumscribing a group of five subfamilies: fusion of labrum and clypeus and the anticlockwise direction of the coiled stylets, respectively. The group of Isoderminae, Prosympiestinae, Aneurinae, Carventinae, Mezirinae, and the group of Chinamyersiinae, Aradinae, Calisiinae should be considered as sister-groups. The consideration of the apomorphy or plesiomorphy of a given pattern of dorsal apodemal impressions or the lack of pulvillus may affect the ranking of the latter three. The present analysis emphasizes growing number of dorsal apodemal impressions, which took place in both groups. If we consider the pretarsus of *Aradus* to be plesiomorphous, as it probably would be correct (cf. GOEL and SCHAEFER, 1970, and SCHUH, 1976 concerning pulvillus), then the following evolutionary sequence can be given: lack of pulvillus — laminate distipulvillus — lobe-like pulvillus — bristle-like pulvillus — pulvillus reduced to a small peg. Then Aradinae would be the outermost on the left side as a sister-group of all the others, and parallel evolution of characters 2, 10, 13, 19, 25 could be at least partly evaluated on the right way. This would then affect the position of the Aradoidea within the Pentatomomorpha.

The cladogram is published in the hope that it may be stimulating, and any comments on it are greeted. I am much indebted to Mr. E. HEISS and Dr. P. ŠTYS for their observations on parts of my analysis.

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NEUE UND BEKANNTE GLOSSOSCOLECIDEN-ARTEN AUS SÜDAMERIKA. 2. (OLIGOCHAETA: GLOSSOSCOLECIDAE)

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(Eingegangen am 27. März 1986)

Representatives of genera belonging to the family Glossoscolecidae are reported from Paraguay, Argentina and Brasil. *Holoscolex mahunkai* sp. n. and *Fimoscolex angai minor* ssp. n. from Paraguay are new for science.

In der Zeit vom 25. XII. 1965—7. I. 1966 wurden von den Teilnehmern der Ungarischen Bodenzoologischen Expedition (Prof. Dr. J. Balogh, Dr. I. Andrássy, Dr. I. Loksa, Dr. S. Mahunka und Dr. A. Zicsi) sowie von denen des Instituto de Higiene y Fomento de la Producción Animal, Santiago de Chile (Prof. Dr. F. di Castri, Dr. W. Hermosilla, Dr. R. Covarrubias und Dr. E. Hajek) Aufsammlungen verschiedener Bodentier-Gruppen in Paraguay, Argentinien und Brasilien durchgeführt. Ebenfalls von Teilnehmern der Ungarischen Bodenzoologischen Expedition (Prof. Dr. J. Balogh, Dr. S. Mahunka und Dr. A. Zicsi) wurden in Brasilien (13. IX. 1966—16. IX. 1966) weitere verschiedene Bodentier-Gruppen gesammelt. An dieser Stelle sollen die Ergebnisse der Regenwurm-Sammlungen bekanntgegeben werden. Aus anderen Aufsammlungen stammen noch einige Regenwürmer aus diesen Ländern, die uns von Herrn Prof. Dr. H. Franz (Wien), von den Herrn Dr. V. Mahnert und Dr. Cl. Vaucher (Naturhistorisches Museum, Genf) und von Dr. Z. Tomsic (Argentinien) zur Bestimmung überlassen wurden.

Für die Überlassung des Materials sprechen wir den oben erwähnten Herren auch an dieser Stelle unseren besten Dank aus.

GLOSSOSCOLECIDAE Michaelsen, 1900

Gattung *Holoscolex* Cognetti, 1904

Borsten in 8 Längslinien. Männliche Poren paarig, intraclitellial. Chylustaschen 1 Paar im Bereich des 11. und 12. Segmentes. Geschlechtsapparat holoandrisch und metagyn. Testikelblasen fehlen. Samensäcke kurz.

Die Gattung *Holoscolex* wurde aufgrund einer Art, *H. nemorosus* Cog., 1904 aus Ekuador aufgestellt. Nur neuerdings sind weitere Taxa bekannt

geworden: *H. caramuru* RIGHI, 1975 und *H. nemorosus tacoa* RIGHI, 1978 beide aus Brasilien.

Im vorliegenden Material sind wir auf 4 Exemplare gestoßen, die einwandfrei in die Gattung *Holoscolex* eingereiht werden können, aber mit den bisher beschriebenen Arten nicht identisch sind. Die Tiere sind beim Acaray-Wasserfall in Paraguay, in äußerst feuchtem, sandigem Boden gesammelt worden.

Holoscolex mahunkai sp. n.

Länge des Holotypus 114 mm, Durchmesser 5 mm, Segmentzahl 115. Bei den übrigen Tieren Länge 110—120 mm, Durchmesser 4,5—5,3 mm, Segmentzahl 111—114.

Farbe rötlichbraun.

Kopflappen rüsselförmig ausstülpbar. Kopf proepilobisch. Borsten eng gepaart. Borsten *ab* = *bc*; *aa* etwas größer als *bc*. Borsten *aa* : *ab* : *bc* : *cd* = 7,75 : 1,25 : 6,25 : 1,25. Borsten ab vom 10. und 15.—17. sowie am 24. Segment von Drüsenpapillen umgeben. Borsten des 24. Segmentes zu Geschlechtsborsten umgewandelt. Borsten vom 3. Segment beginnend. Nephridialporen im 3. Segment beginnend in der Borstenlinie *cd*. Weibliche Poren am hinteren Rand des 14. Segmentes, oberhalb der Borstenlinie *b*. Männliche Poren zwischen dem 19./20. Segment, von außen nicht zu erkennen. Gürtel beim Holotypus vom 15.—1/4 25. Bandförmige Pubertätsstreifen vom 2/3 19.—1/2 23 Segment. Bei den Paratypen Gürtel auch vom 15.—24. Segment, Pubertätsstreifen vom 2/3 19.—1/2 24. Segment.

Dissepimente 8/9—11/12 schwach verdickt. Vordere Dissepimente fehlen, sind durch den mächtigen Muskelmagen im 6. und 7. Segment verschoben. Kalkdrüsen im 11. und 12. Segment. Herzen vom 7.—11. Segment. 2 Paar Hoden und Samentrichter im 10. und 11. Segment, frei. 2 Paar mächtige Samensäcke im 11. und 12. Segment, lappenförmig. Ovarien im 13. Segment. Typhlosolis im 25. Segment beginnend. 3 Paar Samentaschen im 6., 7. und 8. Segment, die letzteren bedeutend größer als die vorderen. Die Samentaschen bestehen aus einem langen gebogenen oder gewundenen Stiel und einer großen Ampulle. Samentaschenporen in Intersegmentalfurche 6/7—8/9 in Höhe der Borstenlinie *cd*.

Die neue Art unterscheidet sich von den bisher beschriebenen Arten in erster Linie durch die Größendimensionen, durch die Lage des Gürtels und der Pubertätsstreifen. Ferner unterscheidet sie sich noch durch die Zahl und Form der Samentaschen von den bisher bekannten Arten.

Die neue Art wird zu Ehren von Dr. S. MAHUNKA, Teilnehmer der Ungarischen Bodenzoologischen Expedition, für die unermüdliche Hilfe beim Sammeln des Materials, mit bestem Dank, benannt.

Fundort: Paraguay, Holotypus AF/246, Acaray Wasserfall, in sehr feuchtem, sandigem Boden, Puerto Presidente Stroessner, 4. I. 1966, leg. S. MAHUNKA u. A. ZICSI Paratypen AF/221, 3 Ex., Fundort wie beim Holotypus.

Gattung *Andioscolex* MICHAELSEN, 1927

Borsten in 8 Längslinien angeordnet. Männliche Poren paarig. Chylustaschen 1 Paar im Bereich des 11. und 12. Segmentes. Kompositenschlauchtaschen. Geschlechtsapparat metandrisch und metagyn. Testikelblasen vorhanden. Kopulationstaschen fehlen. Samentaschen 2 oder 1 Paar.

Andioscolex perrieri perrieri (COGNETTI, 1904)

Glossoscolex perrieri perrieri COGNETTI, 1904, Bull. Musei Zool. Anat. comp. R. Univ. Torino, **19** (474): 17.

Leider liegt uns nur ein einziges zerschnittenes Exemplar vor. Da es sich um eine kleine Art handelt, die nur über 40 Segmente verfügt, mußte es beim Sezieren mit größter Vorsicht behandelt werden. Diese Art wurde seit der Erstbeschreibung, die ebenfalls aufgrund eines unvollständigen Exemplares erfolgte, nicht wieder erwähnt. Wir geben anhand unseres Stückes einige Ergänzungen der Beschreibung an.

Bei unserem Tier erstreckt sich der Gürtel vom 15.—22. Segment, die Pubertätsstreifen liegen am 1/2 17.—1/2 19. Segment. Männliche Poren wurden auf Intersegmentalfurche 17/18 erkannt. Samentaschenporen auf Intersegmentalfurche 8/9 und 9/10.

Aufgrund der inneren Merkmale stimmt unser Tier bis auf die Form der Samensäcke mit der Beschreibung von Cognetti überein. Bei unserem Tier konnten keine, sich weit nach hinten hinziehende Samensäcke (bei Cognetti bis ins 35. Segment) erkannt werden. Die Form der Samentaschen stimmt mit der von Cognetti angegebenen Abbildung überein.

Fundort: Paraguay, AF/210, Asuncion, Botanischer Garten, 2. I. 1966, leg. A. ZICSI.

Gattung *Fimoscolex* MICHAELSEN, 1900

Borsten mindestens am Vorderkörper in 8 Längslinien. Männliche Poren unpaarig, intraclitellial. Chylustaschen 1 Paar im Bereich des 11. u. 12. Segmentes, Kompositenschlauchtaschen. Geschlechtsapparat metandrisch, metagyn. Testikelblasen vorhanden. Samensäcke lang, unter Durchbrechung der Dissepimente mehrere Segmente nach hinten reichend. Samentaschen fehlen.

Fimoscolex angai minor ssp. n.

Länge des Holotypus 77 mm, Durchmesser 1,1 mm, Segmentzahl 196. Bei den Paratypen Länge 45—55 mm, Durchmesser 1 mm, Segmentzahl 189—201.

Farbe: pigmentlos.

Kopflappen vollkommen eingezogen, Kopf proepilobisch ?. Borsten vom 4. Segment beginnend, sehr eng gepaart. Borsten *ab* = *cd*; *aa* 3mal so groß

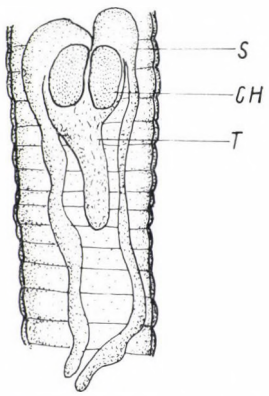

Abb. 1. *Fimoscolex angai minor* ssp. n. Geschlechtsapparat S = Samensäcke, Ch = Chylustaschen, T = Unpaarige Testikelblase

wie *bc*. Borsten verlaufen mehr oder weniger in der Medianlinie oder etwas dorsal davon. Weibliche Poren im 14. Segment, oberhalb der Borstenlinie *ab*. Männlicher Porus dicht hinter Intersegmentalfurche 16/17, im vorderen Viertel des 17. Segmentes auf einem ovalen Geschlechtsfeld, daß sich beim Holotypus vom 16.—18. Segment, bei den Paratypen vom 1/2 16.—1/2 18. Segment hinzieht. Das Geschlechtsfeld ist bei den einzelnen Tieren verschieden kräftig ausgebildet.

Innere Organisation. Dissepimente 6/7—10/11 mäßig verdickt.

Darm. Ein großer Muskelmagen im 6. Segment. 1 Paar dick, eiförmige Chylustaschen im 12. Segment dorsallateral und dorsal dem Oesophagus angelehnt, stiellos. Es sind Schlauchtaschen, ohne deutliches Zentrallumen.

Letztes Paar Herzen im 11. Segment.

Männliche Geschlechtsorgane. 1 Paar große Hoden und Samentrichter ventral im 11. Segment. Diese Organe sind von einer großen Testikelblase umgeben, die sich vereinigen und in einem langen unpaarigen Zapfen münden (Abb. 1), der beim Holotypus bis ins 18. Segment reicht. Bei den Paratypen ist dieser Zapfen etwas kürzer. Hinten gehen die Testikelblasen in je einen dünnen, am Ende zurückgebogenen Samensack über, der beim Holotypus bis

ins 23. Segment reicht. Bei den Paratypen verschieden lang, aber kürzer als beim Holotypus. Zwei dicke Samenleiter entspringen an der Grenze der Samensäcke und Testikelblasen und ziehen sich in schwachen unregelmäßigen Windungen an der Leibeswand entlang (können auch von außen erkannt werden) und münden seitlich in eine langgestreckte, das 16.—18. Segment einnehmende Bursa copulatrix ein, die an Größe dem von außen sichtbaren Geschlechtsfeld entspricht. Ovarien normal, Eitrichter in der Vorderwand des 13/14. Segmentes gelegen. Eileiter in der Mitte des 14. Segmentes ausmündend. Samentaschen fehlen.

Die neue Unterart steht der Stammform *angai* Righi, 1971 am nächsten, unterscheidet sich jedoch von dieser durch die bedeutend kleineren Dimensionen (Segmentzahl bei der Unterart um 200 herum), durch die zapfenförmig nach hinten stehende Ausbildung der Testikelblase, durch die Länge der Samensäcke und durch die Lage der Nephridialporen.

Fundort: Paraguay. Holotypus AF/216, Puerto Presidente Franco, 28. XII. 1965, leg. A. Zicsi. Paratypen AF/220, 2 Ex., Fundort wie beim Holotypus.

Gattung *Glossoscolex* F. S. Leuk, 1835

Normale Borsten in 8 Längslinien. Männliche Poren paarig. Chylustaschen 1 Paar im Bereich des 11. u. 12. Segmentes, Kompositenschlauchtaschen. Geschlechtsapparat metandrisch und metagyn. Testikelblasen vorhanden. Kopulationstaschen vorhanden. Sämentaschen fehlen.

Glossoscolex bergi (Rosa, 1900)

Es liegen uns von zwei Fundorten mehrere gut erhaltene adulte, praeadulte und juvenile Exemplare dieser seit der Erstbeschreibung aus Argentinien nicht wieder gemeldeten Art vor. Obwohl die Beschreibung anhand eines einzigen Exemplares erfolgte, konnten unsere Exemplare mit Sicherheit identifiziert werden. Da wir keine Abweichung von der Originalbeschreibung nachweisen konnten, beschränken wir uns auf die Angabe der weiblichen Poren auf dem 14. Segment in der Borstenlinie *b* unterhalb der Nephridialporen, die von Rosa seinerzeit nicht erkannt wurden.

Fundorte: Brasilien, AF/217, 2 + 11 juv. Ex.; AF/219, 2 juv. Ex.; AF/225, 1 juv. Ex. Foz do Igaçu, 5—6. I. 1966, leg. Zicsi u. Mahunka; Paraguay, AF/215, 4 + 14 juv. Ex., Puerto Presidente Franco, 28. XII. 1965, leg. Zicsi.

Glossoscolex matogrossensis Righi, 1984

Aus Brasilien vom Foz do Igaçu liegen uns mehrere gut erhaltene adulte und juvenile Exemplare vor, die mit der Originalbeschreibung im wesentlichen

übereinstimmen. Die einzige Abweichung von der Erstbeschreibung fanden wir in der Lage der weiblichen Poren, die bei unseren Exemplaren nicht auf Papillen sitzen, sondern in schlitzförmigen Vertiefungen liegen.

Fundort: Brasilien, AF/228, 4 + 4 juv. Ex., Foz do Igaçu; AF/226, 2 Ex., Foz do Igaçu, 5—6. I. 1966, leg. ZICSI.

Glossoscolex uruguayensis CORDERO, 1943

Aus Argentinien liegen uns 2 sehr gut erhaltene Tiere zur Bestimmung vor, die in allen wesentlichen Merkmalen mit der von Cordero beschriebenen Art übereinstimmen. Da wir kein Vergleichmaterial von den verschiedenen Unterarten RIGHI's besitzten, können wir uns zu diesen nicht äußern. Bei unseren Exemplaren sind die Borsten erst hinter dem Gürtel zu erkennen. Herzen hingegen wurden im 7.—10. Segment erkannt.

Fundort: Argentinien, AF/209, 2 Ex., Prov. Entre Rios, IX. 1963, leg. Dr. M. ZELICH.

Gattung *Pontoscolex* SCHMARDA, 1861

Pontoscolex corethrurus (FR. MÜLLER, 1857)

Diese zirkumtropisch weitverbreitete Art war am häufigsten im Material vorhanden. In einigen Kennzeichen weichen unsere Tiere von der allgemein angegeben Beschreibung ab (MICHAELSEN, 1918), doch reichen diese nicht zur Aufstellung einer Unterart aus.

Fundorte: Paraguay, AF/211, 59 adulte + juvenile Exemplare, 2. I. 1966, leg. ZICSI; AF/214, 25 Ex., Puerto Presidente Franco, 28. XII. 1965, leg. ZICSI; AF/220, 6 Ex., Puerto Presidente Stroessner, 4. I. 1966, leg. ZICSI; AF/247, 5 Ex., Prov. Central Colonia Thomson San Lorenzo, 4. XI. 1985, leg. MAHNERT u. VAUCHER. 10 Ex. + zahlreiche juv. werden in der Sammlung des Naturhistorischen Museums, Genf aufbewahrt. Argentinien: AF/230, 3 Ex., San Pedro de Jujuy, 24. II. 1962, leg. TOMSIC. — Brasilien, AF/222, 7 Ex.; AF/224, 2 Ex., Foz do Igaçu, 29. XII. 1965, 6. I. 1966, leg. ZICSI; AF/242, 35 Ex., Porto Velho, 16. XI. 1966, leg. ZICSI; AF/245, 17 Ex., Manaus, 15. XI. 1966, leg. ZICSI; AF/232, 2 Ex., AF/233, 2 Ex., AF/234, 4 Ex., AF/239, 10 Ex., Westlich von Belém, Capitao Poco, Estación experimental de Embrapa, 19—27. VI. 1983, leg. H. FRANZ.

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THE SUPERFAMILY DORYLAIMOIDEA (NEMATODA) — A REVIEW. FAMILIES THORNIIDAE AND THORNENEMATIDAE

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(Received 20 November, 1986)

In the course of a series dealing with the taxonomy of the Dorylaimoidea the genera and species of the families Thorniidae DE CONINCK, 1965 and Thornenematidae SIDDIQI, 1969 are taken into account. Eleven genera are surveyed and fifty-nine species enumerated and presented in keys. One new genus, *Lagenonema* gen. n. (Thornenematidae) is established and four new species are described: *Nygolaimoides fraternus*, *N. pusillus* (Thorniidae), *Indodorylaimus africanus* and *Lagenonema tropicum* (Thornenematidae) spp. n. Several new combinations are proposed as well.

In this paper, which is the first in a series presenting the families, genera and species of the nematode superfamily Dorylaimoidea DE MAN, 1876 (order Dorylaimida PEARSE, 1942), a picture on the present taxonomic status of the families Thorniidae DE CONINCK, 1965 and Thornenematidae SIDDIQI, 1969 is given. Eleven genera and fifty-nine species are discussed.

The subfamily Thorniinae was erected within the family Dorylaimidae by DE CONINCK (1965) for the genera *Thorneella* and *Thornia*. SIDDIQI (1969) raised it to family rank and ordered *Thornia*, *Thorneella* (? syn. *Willinema*) and *Meylonema* into it. ANDRÁSSY (1976) regarded it as a family containing the genera *Thorneella*, *Thornia* (syn. *Nygolaimoides*) and *Willinema*.

The other family, Thornenematidae, was established by SIDDIQI (1969) for the genera *Thornenema*, *Mesodorylaimus*, *Drepanodorylaimus*, *Prodorylaimus*, *Afrodorylaimus* and *Lenonchium*. ANDRÁSSY (1976) restricted the family to the genera *Indodorylaimus*, *Lenonchium*, *Sicaguttur* and *Thornenema*. BAQRI and JANA (1980) enumerated seven genera in the Thornenematidae and grouped them in two subfamilies: Thornenematinae (*Sicaguttur*, *Thornenema*, *Jairajpuria*) and Medalinematinae (*Willinema*, *Timminema*, *Indodorylaimus*, *Medalinema*).

Family THORNIIDAE DE CONINCK, 1965

Dorylaimoidea. Small to moderately long nematodes, between 0.5 and 2 mm. Cuticle smooth and thin. Head continuous with neck, lips amalgamated, both circles of labial papillae shifted close to each other. Labial framework not sclerotized. Spear straight, rather weak, not quite cylindrical: a little swollen in its middle and narrowed before posterior end. Guiding ring thin.

Oesophagus expanded in or behind its middle. Prerectum short. Female genital organ amphidelphic, vulva generally equatorial. Testes two, spermatozoa spindle-shaped. Spicula of two types: either simple, short and straight (alaimoid) or longer and arched (dorylaimoid). Gubernaculum present but small. Adcloacal pair of genital papillae present, supplement one or none. Tail in both sexes similar, cylindrical, at most three anal body widths long, broadly rounded.

The family may be characterized by the shape and structure of head, the shape of spear, the paired gonads, the short and rounded tail in both sexes and the peculiarities in the copulatory organs of males. The representatives of Thorniidae show some ancestral characters and perhaps form a connecting link between the older and younger types of the Dorylaimoidea. Rare nematodes, predominantly aquatic.

Two subfamilies with three genera and seventeen species may be ordered here. The largest number of species occur in Europe (12 species), whilst Asia is represented by 2, Africa by 2, North America by 3 and South America by 1 species.

Subfamily *THORNIINAE* De Coninck, 1965

Thorniidae. Head thornioid, i.e. both circles of labial papillae standing quite near one the other. Spear not cylindrical as discussed above. Spicula either alaimoid or dorylaimoid; one supplement present or absent.

This subfamily represents the true *Thornia*-type. Two genera (with fifty-five species) belong here.

Nygolaimoides Meyl in Andrássy, 1960
Thornia Meyl, 1954
Timminema Khan, 1978

Key to genera of Thorniinae

1 Spicula simple and almost straight; supplements completely absent .... **Thornia** Meyl
— Spicula arched, dorylaimoid; one supplement present . **Nygolaimoides** Meyl in Andrássy

Genus **Thornia** Meyl, 1954

Syn. *Timminema* Khan, 1978.

Thorniidae, Thorniinae. Body between 0.5 and 2 mm, cylindrical, hardly narrowing to both ends. Cuticle smooth, generally thin. Head continuous with adjacent body, lips amalgamated, both circles of labial papillae close to each

other. Amphids elongate-caliciform, 1/4—1/3 as wide as corresponding body, with distinct fibres. Spear thin and weak, 5 to 15 μm long, shorter than cephalic diameter or nearly equal with that, not regularly cylindrical, sharply pointed on its tip. Guiding ring simple, thin. Oesophagus expanded in or behind its middle, its posterior part mostly surrounded by a thin sheath. Female prerectum 1—3 anal body widths long. Cardia simple. Vulva nearly equatorial (in 42—59%). Female genital organ amphidelphic. Vagina not sclerotized but strongly swollen. Testes two. Spicula simple and short, nearly straight, not dorylaimoid, shorter than anal body diameter. Gubernaculum very thin. Adcloacal pair of papillae small, inconspicuous. Supplements completely lacking. Copulatory muscle bundles weak and few in number. Tail in both sexes rounded, somewhat varying in length: shorter than anal diameter to thrice as long as the latter, in males often a little shorter or longer than in females. Both sexes nearly equally common in occurrence.

Type-species: *Dorylaimus steatopygous* THORNE & SWANGER, 1936 = *Thornia steatopyga* (THORNE & SWANGER, 1936) MEYL, 1954.

Thornia can be separated from *Nygolaimoides*, the other genus of the subfamily, by the simple, ancestral type of the spicula, the absence of ventromedial supplementary papillae, the weakly developed copulatory muscles and the non-sclerotized vagina.

Rather rare animals, predominantly inhabiting aquatic biotopes, both fresh and salt, occasionally occurring in terrestrial habitats, too. They are distributed in Europe, Asia, Africa, North and South America.

Eleven species:

T. goffarti (MEYL, 1953) MEYL, 1954
Dorylaimus goffarti MEYL, 1953
T. hirschmannae ANDRÁSSY, 1966
Dorylaimus steatopygous apud HIRSCHMANN, 1952
T. juvenilis (DE CONINCK, 1935) MEYL, 1954
Dorylaimus juvenilis DE CONINCK, 1935
T. magna PAETZOLD, 1958
T. regiusi magna PAETZOLD, 1958
T. parathermophila (MEYL, 1953) MEYL, 1954
Dorylaimus parathermophilus MEYL, 1953
T. pithecusana MEYL, 1954
T. propinqua (PAESLER, 1941) ANDRÁSSY, 1957
Tylencholaimus propinquus PAESLER, 1941
Thornia regiusi MEYL, 1955
T. rhopalocercoides (SCHNEIDER, 1937) MEYL, 1954
Dorylaimus rhopalocercoides SCHNEIDER, 1937
T. steatopyga (THORNE & SWANGER, 1936) MEYL, 1954
Dorylaimus steatopygous THORNE & SWANGER, 1936
T. steineri (SCHNEIDER, 1925) ANDRÁSSY, 1957
Tylencholaimus steineri SCHNEIDER, 1925
Thorneella steineri (SCHNEIDER, 1925) GOODEY, 1963
T. thermophila (MEYL, 1953) MEYL, 1954
Dorylaimus thermophilus MEYL, 1953

Key to species of Thornia

1 Spear 10—15 μm long, about as long as or longer than labial diameter 2
— Spear 5—6 μm long, much shorter than labial diameter 5

2 Female tail about 1.5 times as long as anal body diameter, tail of male somewhat longer than that of female. — ♀: L = 0.79 mm; a = 27; b = 3.9; c = 36; V = 49%; c' = 1.3. ♂: L = 0.59 mm; a = 28; b = 3.3; c = 26; c' = 1.5 (Zaire) ... **juvenilis** (De Coninck)
— Female tail 2—3 times as long as anal body diameter, tail of male somewhat shorter than that of female 3

3 Female tail 3—3.5 anal diameters long. — ♀: L = 0.84 mm; a = 30; b = 4.5; c = 14; V = 45%; c' = 3.0—3.5. ♂: L = 0.72 mm; a = 33; b = 3.5; c = 16; c' = 3 (Sumatra) ... **rhopalocercoides** (Schneider)
— Female tail 2 anal diameters long 4

4 Body at level with anus slightly depressed, tail therefore a little swollen; spear 10—12 μm long. — ♀: L = 0.86—1.48 mm; a = 34—44; b = 4.0—5.5; c = 20—28; V = 42—47%; c' = 1.6—2.0. ♂: L = 1.03—1.18 mm; a = 37—43; b = 3.9—4.8; c = 31—35; c' = 1.6—1.9 (Holland, Federal and Democratic Germany, Czechoslovakia, Hungary, India) ..... **propinqua** (Paesler)
— Body at level with anus not depressed, tail not swollen; spear 15 μm long. — ♀: L = 0.9—1.4 mm; a = 30—43; b = 4—5; c = 24—34; V = 48—50%; c' = 1.8—2. ♂: L = 1.2 mm; a = 36; b = 4.3; c = 25; c' = 1.6—1.7 [Holland, Switzerland, Hungary, Italy, Soviet Union (Russia), United States (Virginia, Utah), Paraguay] ..... **steatopyga** (Thorne & Swanger)

5 Tail shorter than anal diameter 6
— Tail in both sexes distinctly longer than anal diameter (1.3—3 times) 7

6 Head slightly offset; spicula 2/3 anal diameter in length. — ♀: L = 0.70—1.12 mm; a = 32—33; b = 3.8—4.6; c = 77—86; V = 56—59%; c' = 0.7. ♂: L = 0.87—1.12 mm; a = 35—51; b = 3.7—4.6; c = 61—86; c' = 0.7 (Italy) ..... **pithecusana** Meyl
— Head not offset; spicula 1/2 anal diameter in length. — ♀: unknown. ♂: L = 1.12 mm; a = 33; b = 4; c = 37; c' = 0.7 (Federal Germany) ..... **steineri** (Schneider)

7 Large species, about 2 mm. — ♀: L = 1.84—2.0 mm; a = 46—49; b = 5.0—6.4; c = 41—45; V = 48—49%; c' = 1.8. ♂: L = 1.85 mm; a = 51; b = 5.6; c = 35; c' = 1.8—1.9 (Democratic Germany) ..... **magna** Paetzold
— Smaller species 8

8 Tail in both sexes 2.5—3 anal diameters long; cuticle, especially in posterior third of body, densely granulated. — ♀: L = 0.79—1.18 mm; a = 29—35; b = 3.9—5.3; c = 17—24; V = 47—50%; c' = 2.5—3. ♂: L = 0.66—0.90 mm; a = 30—36; b = 3.8—4.7; c = 17—23; c' = 2.5—3 [Italy, Soviet Union (Russia)] ..... **parathermophila** (Meyl)
— Tail at most two anal diameters long; cuticle not granulated 9

9 Bigger species, 1 mm or more; tail about two anal diameters long. — ♀: L = 1.14—1.68 mm; a = 37—42; b = 4.2—5.3; c = 24—28; V = 55—58%; c' = 2. ♂: L = 1.03—1.41 mm; a = 37—40; b = 4.4—4.9; c = 22—26; c' = 2—2.2 (Federal Germany, Hungary) ..... **hirschmannae** Andrássy
— Smaller species, 0.5—0.7 mm; tail about 1.5 anal diameters long 10

10 Head slightly offset; spicula 12—13 μm long. — ♀: L = 0.55—0.65 mm; a = 21—26; b = 3.5—4.4; c = 25—32; V = 44—49%; c' = 1.4—1.5. ♂: L = 0.50—0.59 mm; a = 24—28; b = 3.4—3.6; c = 24—28; c' = 1.3—1.5 (Italy) ..... **thermophila** (Meyl)
— Head not offset; spicula 23—25 μm long. — ♀: L = 0.56—0.72 mm; a = 20—24; b = 3.9—4.5; c = 28—36; V = 43—48%; c' = 1.6—1.7. ♂: L = 0.56—0.69 mm; a = 22—27; b = 3.5—4.4; c = 29—32; c' = 1.1—1.2 (Czechoslovakia, Italy) ..... **goffarti** (Meyl)

Remarks. In 1978 KHERA described a new genus, *Timminema*, with its type and single species, *T. pakistanicum* KHERA, 1978. This genus is most probably identical with *Thornia*. It has a short, cylindrical body, a truncate, not offset head, amalgamated lips, a short and simple spear, an amphidelphic female genital organ and a short, rounded tail. Unfortunately the description of *T. pakistanicum* is rather meagre, the species cannot be identified therefore with certainty. Thus, *Thornenema pakistanicum* (KHERA, 1978) comb. n. must be regarded as a species inquirenda.

Genus **Nygolaimoides** MEYL in ANDRÁSSY, 1960

Thorniidae, Thorniinae. Body 0.7 to 1.6 mm long, cylindrical. Cuticle smooth. Head not offset in any manner, lips amalgamated, both circles of labial papillae close to each other. Amphids elongate-caliciform, 1/4—1/3 as wide as corresponding body diameter, with distinct fibres. Spear rather weak, 9 to 15 μm long, shorter or a little longer than labial diameter, *Thornia*-like. Guiding ring simple, thin. Oesophagus expanded posterior to its middle, without a sheath. Cardia with three small glands. Prerectum in females 1.5—2.5 times as long as anal body width, in males beginning near level with the supplement. Vulva equatorial or post-equatorial (in 51 to 61%), its lips slightly sclerotized; vagina not spherical. Female genital organ amphidelphic. Testes two, spermatozoa spindle-shaped. Spicula dorylaimoid, arched, longer than anal body diameter. Gubernaculum short and thick. Adcloacal pair of papillae well developed, the one of them never levelling exactly with the other. One large supplement anterior to the spicula present. Copulatory muscles strong. Tail in both sexes shorter than anal body diameter, broadly rounded, in males provided with transverse muscle bundles. Males generally nearly as common as females.

Type-species: *Dorylaimus borborophilus* DE MAN, 1876 = *Nygolaimoides borborophilus* (DE MAN, 1876) MEYL in ANDRÁSSY, 1960.

The genus *Nygolaimoides* is an interesting intermediate form. It has some ancestral, *Nygolaimus*-like structures (cardial glands, gubernaculum) but in other relations it seems to be more *Dorylaimus*-like (spear, guiding ring). As for the shape of head, the arrangement of labial papillae as well as for the muscle bundles in male tail the genus has some reminiscences of the *Mermis*-type, too. On the other hand, however, it is unique in the structure of the single supplement and in the arrangement of the adcloacal papillae. When revising the Nygolaimidae, HEYNS (1968) did not regard *Nygolaimoides* as a true representative of the family and left it out of consideration. ANDRÁSSY (1976) went on, and synonymized *Nygolaimoides* directly with *Thornia*.

The species of *Nygolaimoides* agree in general appearance, shape of the head, amphids and spear as well as in the characteristic arrangement of the labial papillae so far with the species of the genus *Thornia* that there is no doubt whatever that they have to be ordered in one and the same family, the Thorniidae. Especially the females are very uniform in morphological charac-

ters. The males represent already different types. The males of *Nygolaimoides* have dorylaimoid spicula, a true supplementary organ and well-developed copulatory muscles so that they can be easily distinguished from males of *Thornia*. To separate the females at the generic level is more difficult. The vagina of *Thornia* species is strongly swollen, spheroid and not sclerotized, in *Nygolaimoides*, however, never spherical and slightly sclerotized on its lips; the posterior enlarged portion of oesophagus is surrounded by a fine (but not always conspicuous) sheath in *Thornia*, whilst such a structure is absent in *Nygolaimoides*; cardial glands are apparently absent in *Thornia* but present — though rather weakly developed — in *Nygolaimoides*.

The *Nygolaimoides* species prefer saprobic habitats but also limnic forms occur among them. They are restricted to Europe and Africa.

Four species:

N. borborophilus (DE MAN, 1876) MEYL in ANDRÁSSY, 1960
Dorylaimus borborophilus DE MAN, 1876
Nygolaimus borborophilus (DE MAN, 1876) THORNE & SWANGER, 1936
N. fraternus sp. n.
N. gubernaculifer (ANDRÁSSY, 1957) comb. n.
Thornia gubernaculifera ANDRÁSSY, 1957
Dorylaimus meyli PAETZOLD, 1958, nec ANDRÁSSY, 1958 syn. n.
Thornia dorylaimoides PAETZOLD, 1959
N. pusillus sp. n.

Key to species of Nygolaimoides

1 Body small, 0.7 mm; vulva in 60% of body length. — ♀: L = 0.66—0.70 mm; a = 24—26; b = 4.1—4.3; c = 54—57%; c' = 0.7. ♂ unknown (Congo Republic) ... **pusillus** sp. n.
— Body larger, 1 to 1.6 mm; vulva nearly equatorial 2

2 Adcloacal papillae comparatively far from each other, supplement unusually large, 10—12 μm, plain; copulatory muscles numerous, 27—30 pairs. — ♀: L = 1.13—1.92 mm; a = 21—30; b = 3.8—4.6; c = 51—72; V = 52—55%; c' = 0.7—0.8. ♂: L = 1.06—1.45 mm; a = 25—39; b = 4.1—5.0; c = 34—46; c' = 0.9—1.0 (Holland, Federal Germany, Austria, Hungary, Poland) ..... **borborophilus** (DE MAN)
— Adcloacal papillae close to each other, supplements smaller, 5—7 μm, mammiform; copulatory muscles less numerous, 15—19 pairs 3

3 Spicula 22—23 μm long, conoid in its distal part; distal portion of vagina enlarged. — ♀: L = 1.03—1.10 mm; a = 27—29; b = 4—5; c = 55—60; V = 51—52%; c' = 0.8. ♂: L = 1.10—1.26 mm; a = 30—48; b = 6—8; c = 60; c' = 0.9—1.0 (Federal Germany, Hungary) ..... **gubernaculifer** (ANDRÁSSY)
— Spicula 30—32 μm long, nearly cylindrical in its distal part; distal portion of vagina not enlarged. — ♀: L = 1.08—1.21 mm; a = 26—27; b = 3.8—3.9; c = 77—86; V = 54—55%; c' = 0.5—0.6. ♂: L = 1.05—1.10 mm; a = 28—30; b = 4.0—4.2; c = 42—45; c' = 0.8—0.9 (Hungary) ..... **fraternus** sp. n.

Subfamily *THORNEELLINAE* subfam. n.

Thorniidae. Head dorylaimoid, both circles of labial papillae well separated. Spear and spicula dorylaimoid as well. Supplements none.

One genus (with two species).

Genus **Thorneella** ANDRÁSSY, 1960

Thorniidae, Thorneellinae. Body small, 1.1 to 1.5 mm. Cuticle smooth. Head continuous with neck, lips not separated, labial papillae dorylaimoid, both circles farther from each other than in the two former genera. Amphids caliciform, with small aperture, nearly half as wide as corresponding body. Spear dorylaimoid, straight, 12 to 26 μm, as long as or longer than labial diameter; aperture occupying 1/3 of its length. Guiding ring thin, nearer to anterior end than one-head width. Oesophagus enlarged in or behind its middle. Prerectum short. Female genital organ amphidelphic. Vulva nearly equatorial. Testes two. Spicula dorylaimoid, about twice as long as anal body diameter; gubernaculum apparently absent. Adcloacal papillae small, at the same level, supplements completely absent. Tail in both sexes equal in form, short and rounded.

Type-species: *Dorylaimus teres* THORNE & SWANGER, 1936 = *Thorneella teres* (THORNE & SWANGER, 1936) ANDRÁSSY, 1960.

The taxonomic position of this genus is still unclarified. The two species ordered here have not been found and examined since their description (1936). In my opinion they may be ranged among the Thorniidae where they represent a further evolutionary step. The absence of any supplementary organs in males may be estimated as an ancient — *Thornia*-like — character but the shape of the spicula and spear is already dorylaimoid. In shape and structure of the head and the labial papillae the genus went on and is truly dorylaimoid.

The *Thorneella* species, as far as known, live in wet soil, both continental and littoral, and are distributed in North and Central America.

Two species:

T. aculeata (COBB in THORNE & SWANGER, 1936) ANDRÁSSY, 1960
Dorylaimus aculeatus COBB in THORNE & SWANGER, 1936
T. teres (THORNE & SWANGER, 1936) ANDRÁSSY, 1960
Dorylaimus teres THORNE & SWANGER, 1936

Key to species of Thorneella

1 Spear almost twice as long as cephalic diameter. — ♀: L = 1.1 mm; a = 27; b = 3.9; c = 59; V = 46%; c' = 0.7. ♂ unknown (Jamaica) ..... **aculeata** (COBB in THORNE & SWANGER)

— Spear nearly as long as cephalic diameter. — ♀: L = 1.5 mm; a = 31; b = 4.7; c = 50; V = 51%; c' = 0.8. ♂: L = 1.3 mm; a = 37; b = 4.7; c = 52; c' = 0.8 (United States: New Hampshire) ..... **teres** (THORNE & SWANGER)

Thornia propinqua (PAESLER, 1941) ANDRÁSSY, 1957
(Fig. 1A—E)

Hungarian population: ♀: L = 1.23 mm; a = 38; b = 4.6; c = 30; V = 45%; c' = 1.9.
♂: L = 1.05 mm; a = 43; b = 3.9; c = 35; c' = 1.6.
Indian population: ♂: L = 1.03 mm; a = 42; b = 4.0; c = 31; c' = 1.8.
L_4: L = 0.87 mm; a = 39; b = 4.2; c = 31; c' = 1.9.

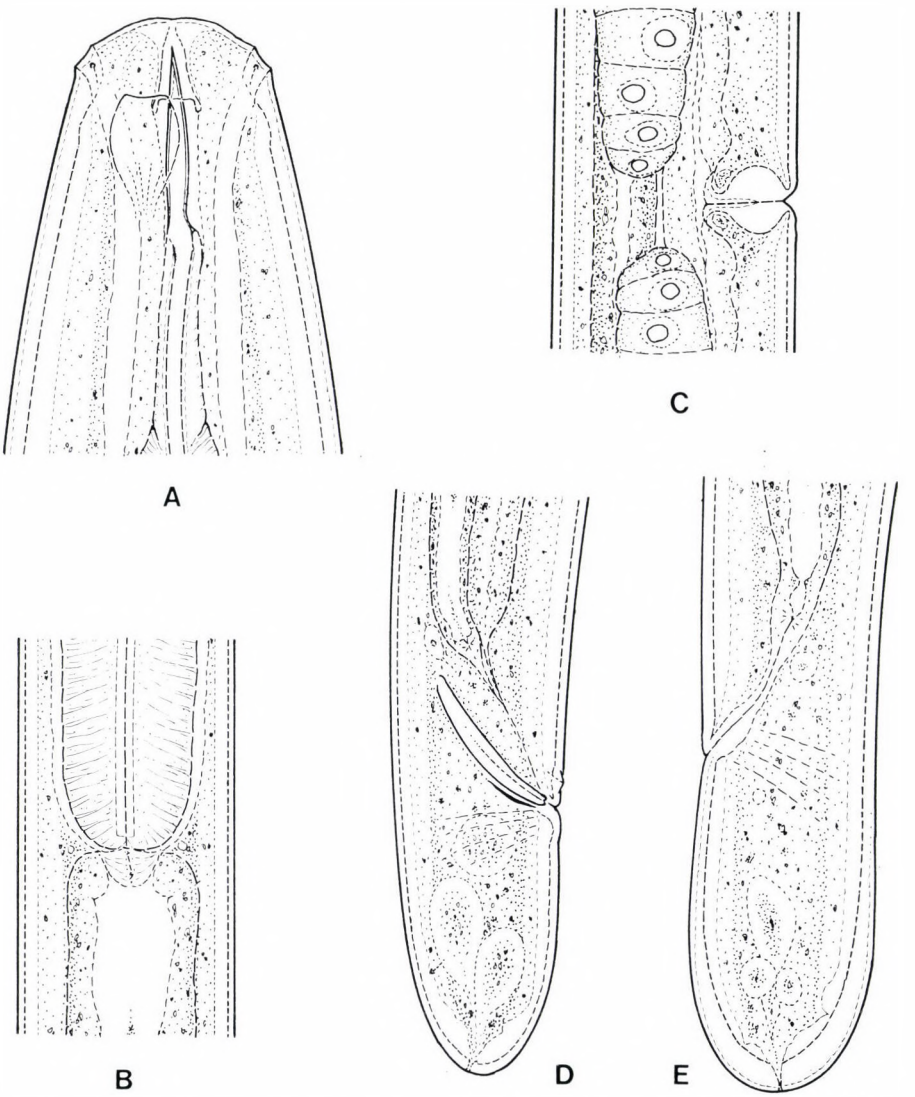

Fig. 1. *Thornia propinqua* (PAESLER, 1941) ANDRÁSSY, 1957. A = anterior end (×2200); B = cardial region (×1100); C = vulval region (×1100); D = male tail (×1100); E = female tail (×1100)

Body cylindrical, hardly narrowing to both ends, 32 (♀) or 24 (♂) μm wide on its middle. Cuticle very thin, 0.8—1.0 μm on mid-body, smooth; at level with spear about as thick as the latter. Head rounded, not offset, lips indistinct, arrangement of labial papillae characteristic for the genus. Body at posterior end of oesophagus 2.2—2.3 times as wide as head. Amphid elongate, 8 μm long, narrower than half the width of corresponding body; its aperture 4—5 μm from anterior body end.

Spear 10—12 μm long, as long as or a little shorter than labial diameter, 3—4% of oesophagus, straight, sharply pointed on its tip and somewhat swollen in its posterior half. Aperture about 1/4 of spear length. Guiding ring around the middle of spear or a little more forward. Oesophagus 260—270 μm long, widened in 51—52% of its length. Its anterior part is surrounded by a cellular tissue, its posterior part by a thin sheath. (This sheath is very thin and smooth and not identical with the spiral, muscular sheath of the Belondiroidea.) Cardia small. Prerectum 1.5—2 times as long as anal diameter.

Vulva transverse, vagina spheroid with a short shaft. Gonads paired, each 5—6 times as long as body width. Distance between vulva and anus 15 times as long as tail. This latter 40 μm long, 1.9 times anal diameter, a little swollen in its mid-region, with two pairs of small papillae.

Testes paired. Spermatozoa very large, 10—12 μm, half as long as body width, spindle-shaped. Spicula almost straight, 18—20 μm long, about equal with anal diameter in length, simple. Gubernaculum very thin, 1/3 of spicula length. Adcloacal papillae small. Supplement none but one pair of weakly developed submedial papillae about two spicula lengths before the cloacal opening present. Tail 1.8 times as long as anal body diameter, bearing three pairs of small papillae.

Localities: Aggtelek, in the vicinity of the Baradla Cave, marshy soil, August, 1984. — Hyderabad, India, paddy field, February 1986.

I have no doubt that the present species is identical with PAESLER's *propinqua*, it agreed very well with the original description and measurements. The male was unknown hitherto. The Hungarian and Indian animals completely agree with one another.

In 1957 I synonymized *Thornia regiusi* MEYL, 1955 with this species. MEYL accepted then this proposition. Now I am of the same opinion: the descriptions of PAESLER and MEYL, on the one hand, and that of the present animals, on the other hand, refer to one and the same species.

Nygolaimoides borborophilus (DE MAN, 1876) MEYL in ANDRÁSSY, 1960 (Fig. 2A—H)

♀: L = 1.32—1.57 mm; a = 24—30; b = 4.1—4.6; c = 62—72; V = 52—54%; c' = 0.7—0.8.

♂: L = 1.35—1.45 mm; a = 30—39; b = 4.1—4.3; c = 44—46; c' = 0.9—1.

Body cylindrical, male slenderer (35—45 μm wide) than female (43—57 μm wide). Cuticle 2.5—3 μm thick on mid-body and 5—6 μm thick on female tail, smooth; at level with spear as thick as or a little thicker than spear. Head 16—17 μm wide, continuous with adjacent body, lips amalgamated, labial papillae close to each other. Body at posterior end of oesophagus 2.8—3 times as wide as head. Amphids caliciform, with distinct fibres in their posterior half, 1/4 as wide as corresponding body. Amphidial apertures 8—9 μm posterior to body end. Both sides of body with large subcuticular glands.

Spear 12—13 μm, 0.7—0.8 times as long as labial diameter, or 3.5—4% of oesophageal length, respectively, *Thornia*-like; aperture nearly half the length of spear. Guiding ring thin, around the anterior third of spear, oesophagus 320—340 μm long, enlarged in 57—60% of its length. Cardia connected with three flattened glands. Female prerectum 2—2.5 times as long as anal body width, rectum hardly shorter. Distance between posterior end of oesophagus and vulva 1.2—1.5 times longer than oesophagus.

Vulva transverse, vagina 22—24 μm long, almost 1/2 of corresponding body width; outer border of vaginal lips sclerotized. Female gonads amphidelphic, each branch 3—5 times as long as body diameter. Distance vulva-anus 28—32 times as long as tail. Tail 19—22 μm, 0.7—0.8 times as long as anal body width, 1.4—1.6% of body length, cylindrical with broadly rounded tip.

Tail of male somewhat longer than that of female: 30—33 μm, 0.9—1 anal diameter, a little bent ventrally, with two pairs of large papillae. Precloacal copulatory muscles well developed, consisting of 27—30 pairs; tail also provided with 5—6 pairs of transverse muscle bundles. Spicula more or less dorylaimoid, 40—43 μm, longer than tail. Lateral guiding pieces present, 12—13 μm long. Gubernaculum short but thick, 5—6 μm.

Very characteristic are the copulatory papillae. The elements of the adcloacal pair are rarely arranged at the same level (one out of ten cases) but the one of them — mostly the right one — is shifted ahead so that they are removed from the cloacal opening at a distance of 6—9 and 16—21 μm, respectively. Supplementary organ one, unusually large, 10—12 μm, plain, at a distance of 70—80 μm from the cloaca. Spermatozoa spindle-shaped, 11—12 μm long, 1/4 as long as body diameter. Male prerectum beginning anterior to the supplement.

Locality: Nagy Zúgó Hill in the Mátra Mountains between Parád and Domoszló, Hungary, detritus and dung from a deer-feeder, July, 1983.

This species was described in 1876 by DE MAN from the Netherlands and re-discovered in 1954 by MEYL in Italy. My specimens agree well with the descriptions of both authors with the little exception that DE MAN's animals were somewhat longer (♀: 1.92 mm, ♂: 1.25 mm) whereas MEYL's nematodes somewhat shorter (♀: 1.1—1.2 mm, ♂: 1.1—1.2 mm). *Nygolaimoides borborophilus* is definitely a dung-inhabiting nematode.

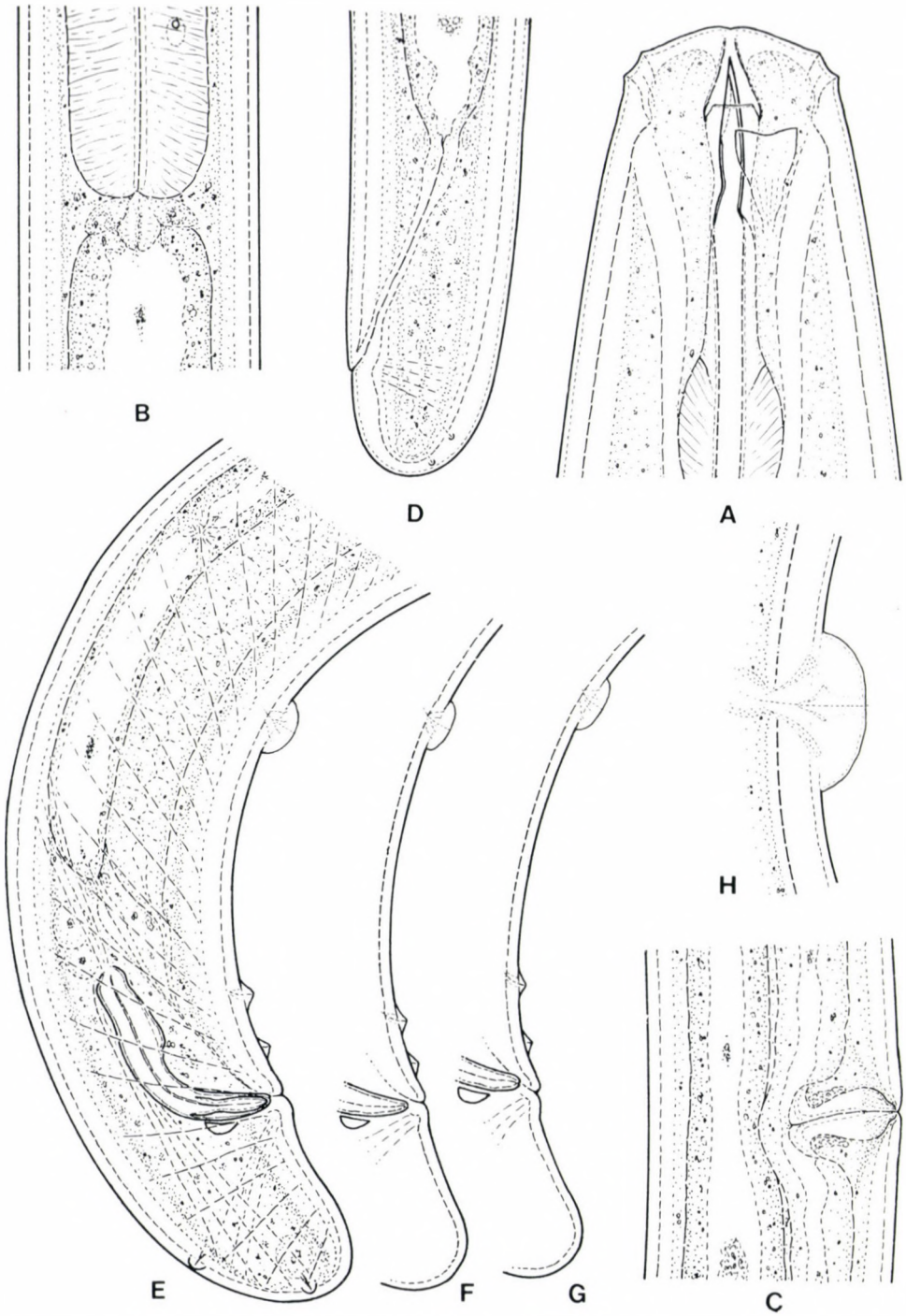

Fig. 2. *Nygolaimoides borborophilus* (DE MAN, 1876) MEYL in ANDRÁSSY, 1960. A = anterior end (×1800); B = cardial region (×760); C = vulval region (×760); D = posterior end of female (×760); E—G = posterior ends of three males (×760); H = supplement (×220)

Nygolaimoides fraternus sp. n.
(Fig. 3A—F)

Type population: ♀: L = 1.08—1.21 mm; a = 26—27; b = 3.8—3.9; c = 77—86; V = 54—55%; c' = 0.5—0.6.
♂: L = 1.05—1.10 mm; a = 28—30; b = 4.0—4.2; c = 42—45; c' = 0.8—0.9.
Balatonszemes' population: ♂: L = 1.10—1.17 mm; a = 30—33; b = 4.6; c = 42—43; c' = 0.9.

Body cylindroid, moderately slender, female 40—44 μm, male 36—38 μm wide on mid-body. Cuticle thin, 1.4—1.6 μm thick on mid-body and 4 μm thick on female tail; at level of spear about twice as thick as spear. Head 13—14 μm wide, not offset, lips amalgamated, both circles of papillae close to one another. Amphids 5—7 μm behind anterior body end, 1/4 as wide as corresponding body. Subcuticular glands inconspicuous.

Spear 9—10 μm, 0.7 times as long as labial diameter, 3—4% of oesophageal length, *Thornia*-like; aperture almost 1/2 of spear length. Guiding ring thin, at the first third of spear length. Oesophagus 276—310 μm long in female and 258—263 μm long in male, in 57—61% expanded. Cardia with three small and flattened glands. Distance between posterior end of oesophagus and vulva 1.1—1.2 times longer than oesophagus. Rectum as long, prerectum 1.5—2 times as long as anal diameter.

Female gonads paired. Vagina 16—17 μm long, vaginal lips with sclerotized outer border. Distance vulva-anus 33—38 times as long as tail. The latter 13—14 μm, 0.5—0.6 times as long as anal body width, hardly more than 1% of body length, with two pairs of small papillae.

Male tail 23—26 μm, 0.8—0.9 times as long as anal body width, bearing two pairs of papillae. Spermatozoa 8 μm long, spindle-shaped, only about 1/5 of body diameter. Copulatory muscles well expressed, consisting of 17—19 pairs; male tail also showing some transverse muscle bundles (4 or 5 pairs). Spicula 30—32 μm long, similar to those of the former species. Lateral guiding pieces present. Gubernaculum small, 5 μm. Adcloacal papillae nearly level with one another. Supplement one, 5—6 μm, mammiform, located at a distance of 52—55 μm from the cloaca. Prerectum beginning a little before the supplement.

Holotype: male on slide No. H-5946 in the collection of the author.
Type-locality: Békés, Hungary, detritus below rotten corn-stalks, September, 1963. — Other locality: Balatonszemes, Hungary, soil around grass roots, October, 1963.

Nygolaimoides fraternus sp. n. is closely related to *N. borborophilus* (DE MAN, 1876) MEYL in ANDRÁSSY, 1960. It may be distinguished from that by the following characters: body a little shorter, cuticle thinner, spear shorter (9—10 vs. 12—13 μm), subcuticular glands smaller, rectum shorter, tail in both sexes shorter (♀: 13—14 vs. 19—22 μm; ♂: 23—24 vs. 30—33 μm), spicula

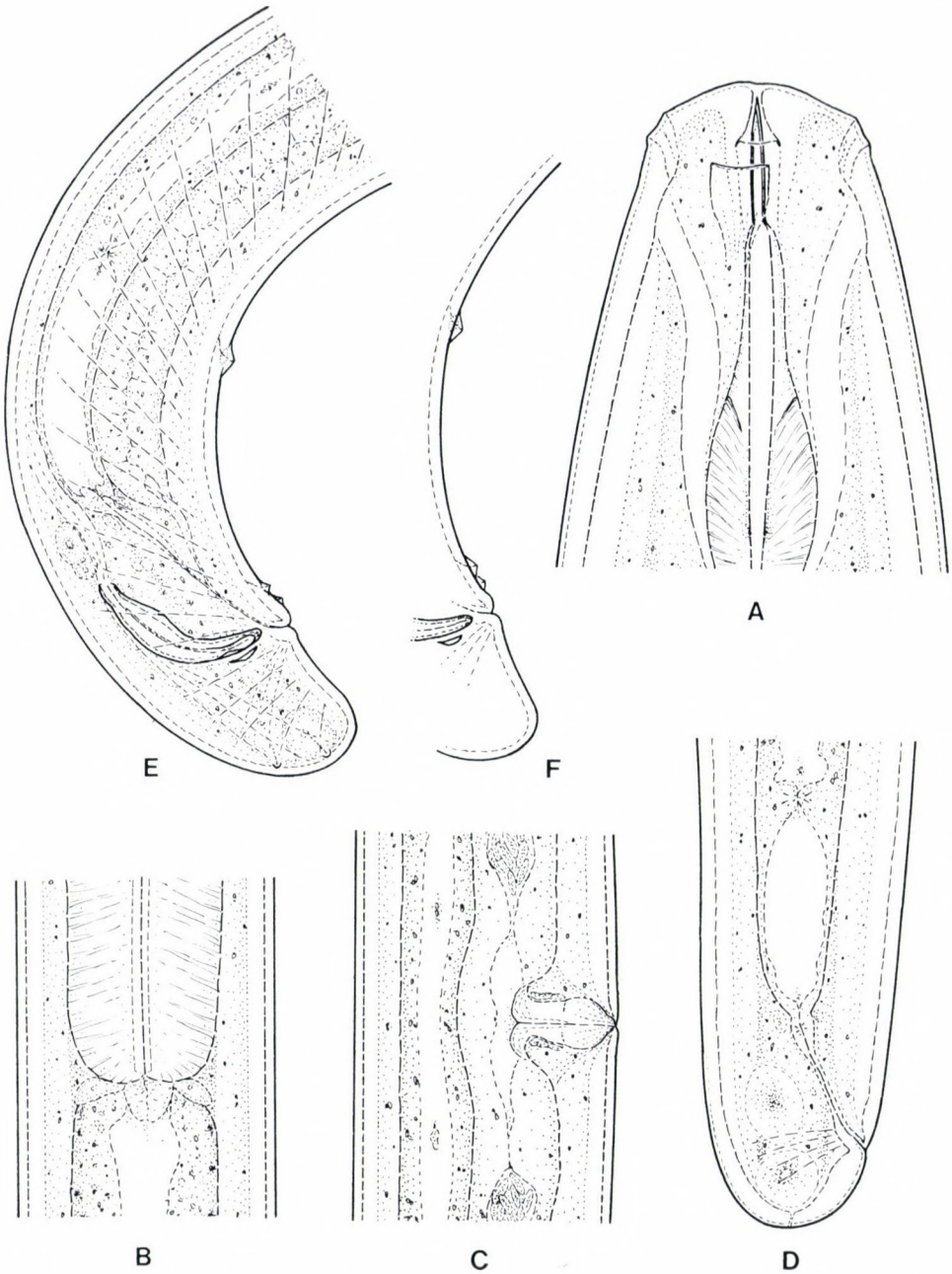

Fig. 3. *Nygolaimoides fraternus* sp. n. A = anterior end (×2200); B = cardial region (×760); C = vulval region (×760); D = posterior end of female (×760); E—F = posterior ends of two males (×760)

smaller (30—32 vs. 40—43 μm), supplements smaller (5—6 vs. 10—12 μm) and mammiform, not plain, copulatory muscles less in number (17—19 vs. 27—30 pairs). Besides, the adcloacal papillae are not separated like in the other species. While *N. borborophilus* is a dung nematode *N. fraternus* inhabits the soil.

Nygolaimoides gubernaculifer (ANDRÁSSY, 1957) comb. n.
(Fig. 4A—C)

After re-examining the type specimens I found that *Nygolaimoides gubernaculifer* differs from the foregoing two species as follows: the spicula are shorter (22—23 μm vs. 30—32 and 40—43 μm, respectively) and conoid — not cylindroid — in their distal part, and the vagina shows wing-like swellings in its distal half.

Adcloacal papillae practically at one and the same level. Supplement 6—7 μm large, located 66—70 μm from cloaca. Spear 10—11 μm long (not 15 μm as erroneously published in the original description).

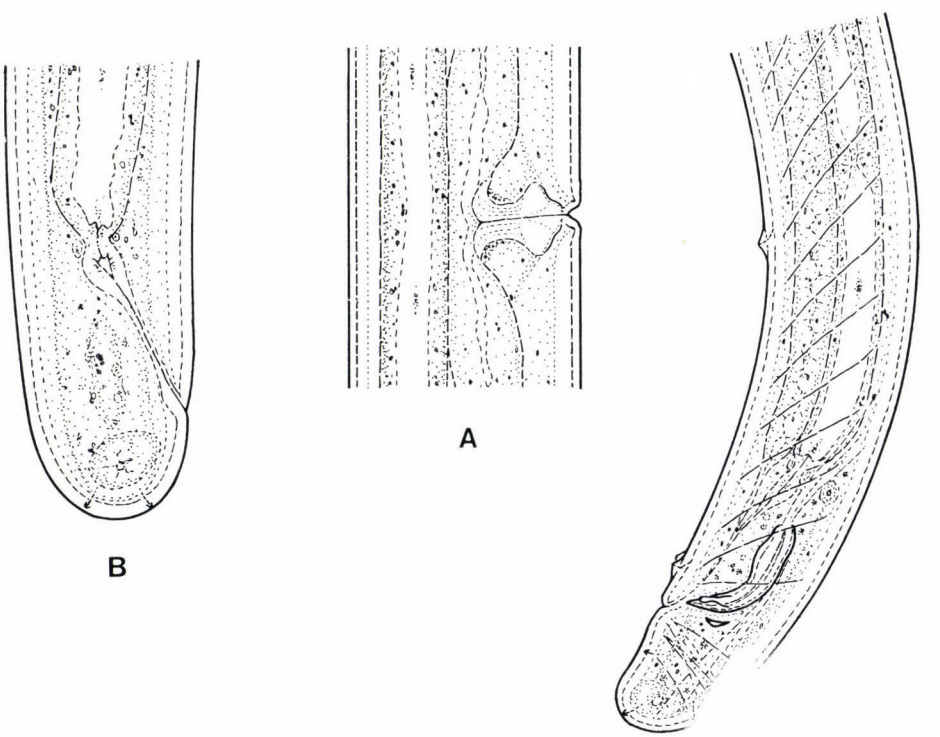

Fig. 4. *Nygolaimoides gubernaculifer* (ANDRÁSSY, 1957) comb. n. A = vulval region (×760); B = posterior end of female (×760); C = posterior end of male (×760)

In 1958 PAETZOLD described a nematode species under the name *Dorylaimus meyli*. It was, however, not conspecific with *Dorylaimus meyli* ANDRÁSSY, 1958 [now: *Mesodorylaimus meyli* (ANDRÁSSY, 1958) ANDRÁSSY, 1959] which I described in the same year but a few months earlier than PAETZOLD. Owing to the homonymy the German author renamed his nematode as *Thornia dorylaimoides* PAETZOLD, 1959. Well, this species completely agrees with *Nygolaimoides gubernaculifer*, among others, it has a short (23 μm) and distally conoid spicula just like *gubernaculifer*. Both species are conspecific, and since *gubernaculifer* was published earlier, *dorylaimoides* must be regarded as a junior synonym.

It shall be noted still that *Nygolaimoides gubernaculifer* differs from *N. borborophilus* and *N. fraternus* also ecologically: it lives in limnic habitats.

Nygolaimoides pusillus sp. n.
(Fig. 5A—D)

♀: L = 0.66—0.70 mm; a = 24—26; b = 4.1—4.3; c = 54—57; V = 60—61%; c' = 0.7.

Body short and plump, cylindrical, 26—28 μm wide on its middle. Cuticle very thin, 0.8—1 μm on mid-body, hardly thickened on tail; level with spear only about 1/3 as thick as the latter. Subcuticle extremely finely annulated in anterior body. Head 12—13 μm wide, not offset, lips and labial papillae typical for the genus. Body at proximal end of oesophagus 2.1—2.2 times as wide as head. Amphids 6—7 μm from anterior body end, elongate-caliciform, 6—8 μm long, 1/3 as wide as corresponding body.

Spear comparatively thick, 12—13 μm, as long as labial diameter, 7—8% of oesophageal length, *Thornia*-like; aperture occupying 1/3 of spear length. Guiding ring thin, around the first third of spear. Oesophagus 160—165 μm long, in 61—64% expanded. Cardia simple. Distance between posterior end of oesophagus and vulva 1.4—1.6 times longer than oesophagus. Rectum as long as, prerectum 2—2.5 times longer than anal body width.

Vulva transverse, vagina small and narrow, hardly swollen in its anterior end. Female genital organ amphidelphic, uterus packed with unusually small spermatozoa measuring hardly 2 μm or only 1/15 of corresponding body width. Distance vulva-anus 20—22 times as long as tail. Tail 12—13 μm, 0.7 times as long as anal diameter, less than 2% of entire length of body, broadly rounded.

Males were not found.
Holotype: female on slide No. 10865 in the collection of the author.
Type-locality: Sibiti, Congo Republic, soil around grass roots, October 1963.

In absence of males this species shall be provisionally ordered in the genus *Nygolaimoides*. It seems to belong more to this genus than to *Thornia*

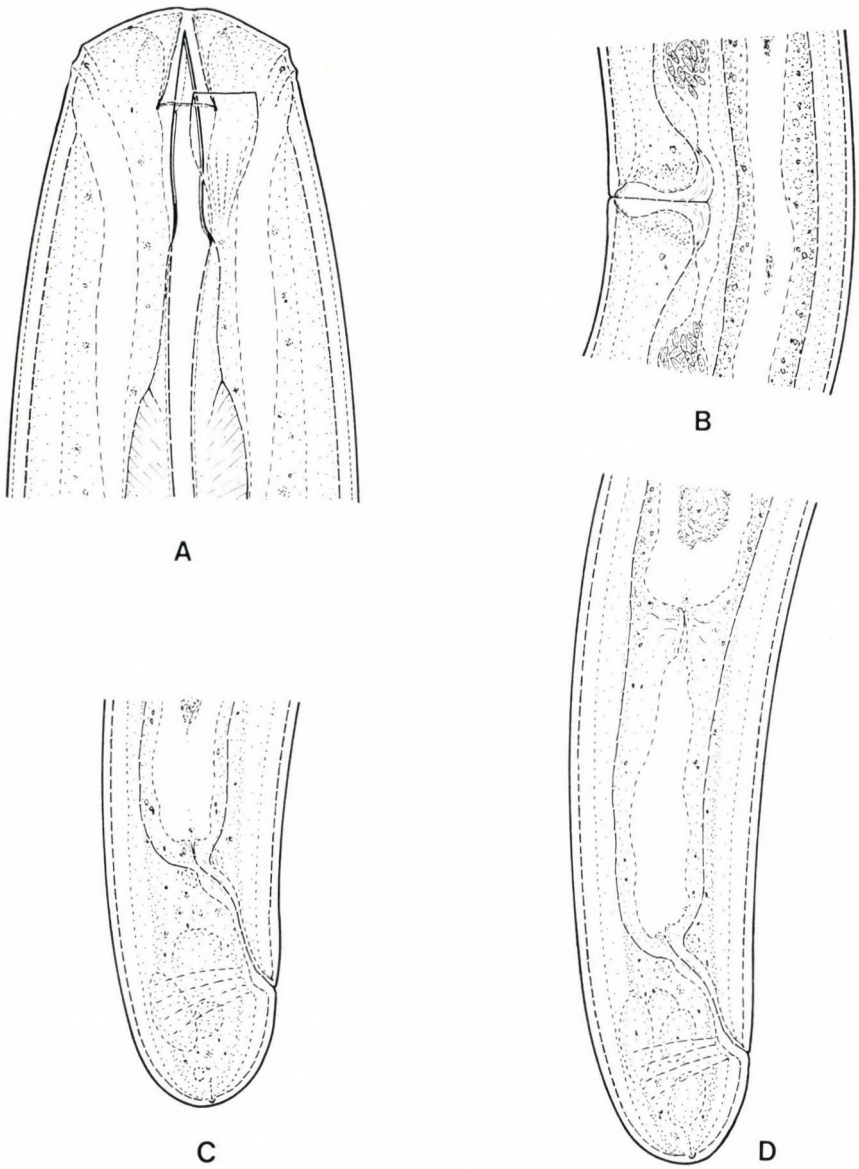

Fig. 5. *Nygolaimoides pusillus* sp. n. A = anterior end (×2200); B = vulval region (×1100); C—D = posterior ends of two females (×1100)

since the posterior part of oesophagus is not surrounded by a sheath, cardia simple, vagina has a simple shape and slightly sclerotized lips. *Nygolaimoides pusillus* sp. n. differs from the other three species of the genus in having a short body (the others are longer than 1 mm), a very thin cuticle and a vulva located further back (in the others the vulva is equatorial, in 49—55% of body

length). Otherwise the new species can be easily distinguished by its short body and tail as well as by the comparatively long spear from the species of *Thornia*, too.

Family THORNENEMATIDAE Siddiqi, 1969

Dorylaimoidea. Predominantly small nematodes, between 0.5 and 2.3 mm. Cuticle smooth or finely striated transversally. Lips amalgamated, labial framework often sclerotized. A postlabial, subcuticular sclerotization — collare* — generally present. Spear straight, moderately long, dorylaimoid. Guiding ring thin. Oesophagus expanded posterior to middle, mostly in its posterior third. Prerectum moderately long. Female genital organ rarely amphidelphic of pseudodidelphic, in most of cases mono-opisthodelphic, with or without anterior uterine sac. Vulva predominantly pre-equatorial. Testes two, spermatozoa spindle-shaped. Spicula dorylaimoid, gubernaculum absent. A pair of precloacal papillae and a ventromedial row of supplements present; these latter spaced and few in number (2 to 11). Tail various in shape and length, either similar in both sexes, attenuated or short, rounded, or dissimilar, in females attenuated to filiform, in males short and rounded.

The family may be characterized in having a comparatively short body, amalgamated lips, a common sclerotization of labial framework and collare, an inclination to an opistho-monodelphic genital organ in females (about 90 per cent of the species are monodelphic) and spaced supplements restriced in number.

Two subfamilies with eight genera and forty-two species may be ranged here. Most of the species are Asian (22) and African (20); Europe is represented by 5, North America by 6, South America by 2 and Australia by 4 species.

Subfamily *THORNENEMATINAE* Siddiqi, 1969

Thornenematidae. Labial sclerotization and collare in about 90 per cent of species present. Female genital organ amphidelphic, pseudodidelphic or, mostly, mono-opisthodelphic. Female tail always elongate, male tail elongate or short.

The members of Thorniinae can be distinguished from those of Willinematinae in having an elongate to filiform tail in females.

Six genera (with 30 species) belong here.

Indodorylaimus Mehdi Ali & Prabha, 1974
Lagenonema gen. n.
Medalinema Baqri & Jana, 1980
Mehdinema Baqri & Jana, 1980, preocc.

* Collare (Latin) = a collar or a necklace.

Opisthodorylaimus AHMAD & JAIRAJPURI, 1982
Sicaguttur SIDDIQI, 1971
Thornenema ANDRÁSSY, 1959
Jairajpuria BAQRI & JANA, 1980 syn. n.

Key to genera of Thornenematinae

1 Both female and male tails attenuated to filiform 2
— Female tail attenuated, male tail short, rounded 3

2 Female gonads amphidelphic ..... **Medalinema** BAQRI & JANA
— Female gonad opisthodelphic ..... **Indodorylaimus** MEHDI ALI & PRABHA

3 Labial framework simple, not sclerotized, collare absent .....
Opisthodorylaimus AHMAD & JAIRAJPURI
— Labial framework and collare sclerotized 4

4 Female gonads amphidelphic ..... **Sicaguttur** SIDDIQI
— Female gonads opisthodelphic 5

5 Cephalic region abruptly narrowed, anterior body bottle-shaped .... **Lagenonema** gen. n.
— Cephalic region gradually narrowed, anterior body not bottle-shaped .....
Thornenema ANDRÁSSY

Genus **Medalinema** BAQRI & JANA, 1980

Syn. *Mehdinema* BAQRI & JANA, 1980.

Thornenematidae, Thornenematinae. Body 1.3—1.9 mm long. Cuticle thin, smooth or with very fine transverse striation. Lips amalgamated, labial region narrow and offset by a slight depression. Labial framework and collare generally well sclerotized. Amphids caliciform. Spear moderately long, 12—17 μm, as long to nearly twice as long as labial width; aperture occupying about 1/3 of spear length. Guiding ring thin, one-head diameter from anterior body end. Oesophagus expanded near 60% of its length. Prerectum in females 2—4 times as long as anal body diameter, in males originating within the range of supplements. Female genital organ amphidelphic, vulva well pre-equatorial, in 35 to 44% of body length. Spicula fairly massive. Supplements well spaced, 6—9 in number, the hindmost of them located before spicula. Tail in both sexes similar, elongate-filiform, 5—11 times as long as anal diameter, with finely rounded tip. Females and males nearly equally common.

Type-species: *Mehdinema prabhae* BAQRI & JANA, 1980 = *Medalinema prabhae* (BAQRI & JANA, 1980) BAQRI & JANA, 1980.

Medalinema is very similar to *Indodorylaimus* MEHDI ALI & PRABHA, 1974 but the female gonads are paired and the supplements more numerous (6—9 vs. 4). It differs from the other amphidelphic genus of the subfamily, *Sicaguttur* SIDDIQI, 1971, in having elongate tails both in females and males.

The species of *Medalinema* inhabit soil around roots and are restricted to India in their occurrence.

Three species:

M. coomansi (BAQRI & JANA, 1980) BAQRI & JANA, 1980
Mehdinema coomansi BAQRI & JANA, 1980
M. indicum (MEHDI ALI & PRABHA, 1974) BAQRI & JANA, 1980
Sicaguttur indicum MEHDI ALI & PRABHA, 1974
Mehdinema indicum (MEHDI ALI & PRABHA, 1974) BAQRI & JANA, 1980
M. prabhae (BAQRI & JANA, 1980) BAQRI & JANA, 1980
Mehdinema prabhae BAQRI & JANA, 1980
Sicaguttur sartum apud MEHDI ALI & PRABHA, 1974

Key to species of Medalinema

1 Collare not sclerotized; anterior ovary less developed than posterior. — ♀: L = 1.3—1.6 mm; a = 31—40; b = 5.6—6.7; c = 9—12; V = 37—44%; c' = 5—7. ♂: L = 1.3—1.5 mm; a = 31—39; b = 6.0—6.5; c = 10—12; c' = 4.7—5.2; PO: 7—9 (India) ..... **coomansi** (BAQRI & JANA)
— Collare distinctly sclerotized; both ovaries equally developed 2

2 Female tail 8—11 times as long as anal body width; supplements 9. — ♀: L = 1.5—1.8 mm; a = 37—43; b = 5.2—6.0; c = 5.0—9.1; V = 35—42%; c' = 8—11. ♂: L = 1.5—1.6 mm; a = 29—30; b = 5.4—6.0; c = 6.4—7.0; PO: 9 (India) ..... **prabhae** (BAQRI & JANA)
— Female tail 5—6 times as long as anal body diameter; supplements 6. — ♀: L = 1.4—1.9 mm; a = 31—42; b = 5.0—6.3; c = 8—12; V = 37—41%; c' = 5—6. ♂: L = 1.5 mm; a = 28—32; b = 5.5—6.0; c = 11; PO: 6 (India) ..... **indicum** (MEHDI ALI & PRABHA)

Genus **Indodorylaimus** MEHDI ALI & PRABHA, 1974

Thornenematidae, Thornenematinae. Body 0.9 to 1.8 mm long. Cuticle thin, smooth or finely striated. Lips amalgamated, lip region narrow and offset by a shallow or deep depression. Labial framework and collare sclerotized. Amphids cup-shaped, with arched aperture. Spear moderate, 12 to 20 μm, 1.4—2 times as long as cephalic diameter; aperture occupying about 1/3 of spear length. Guiding ring simple, thin, located 1—1.5 head diameters from anterior body end. Oesophagus near in 60% of its length expanded. Prerectum in females 2—3, in males 3—4 times as long as anal body width, in males beginning within the range of supplements. Female genital system monoopisthodelphic; anterior uterine sac either very short or well developed. Vulva far pre-equatorial, in 40—44% of body length, transverse. Spicula comparatively slender, slightly bent. Supplements 1 to 4, well spaced, the hindmost located before spicula or level with those. Tail in both sexes similar, filiform, 7—11 times as long as anal body diameter, with finely rounded terminus. Females and males about equally common.

Type-species: *Indodorylaimus wickeni* apud MEHDI ALI & PRABHA, 1974 = *Indodorylaimus elongatus* BAQRI, 1982.

The genus is distinctive in having a monodelphic female genital organ and similarly long tails in both sexes.

The representatives of *Indodorylaimus* are soil inhabitants and known from India (3 species) and Africa (1 species).

Four species:

I. africanus sp. n.
I. elongatus BAQRI, 1982
Indodorylaimus wickeni apud MEHDI ALI & PRABHA, 1974
I. kanhobia THOMBRE, JOSHI & FAROOQUI, 1980
I. saccatus AHMAD & JAIRAJPURI, 1985

Key to species of Indodorylaimus

1 Anterior uterine sac well developed, 2–3 times as long as body width 2
— Anterior uterine sac strongly reduced, shorter than half a body width 3

2 Spear 15–17 μm long; vulva far ahead (in 33–36%); supplements 4. — ♀: L = 1.2–1.4 mm; a = 34–39; b = 5.6–6.0; c = 5.5–6.0; V = 33–36%; c' = 10–11. ♂: L = 1.3–1.4 mm; a = 37–38; b = 5.4–6.2; c = 5.7–6.2; c' = 9–10; PO: 4 (India) ..... **saccatus** AHMAD & JAIRAJPURI
— Spear 12–13 μm long; vulva further back (in 40–44%); supplements 1 or 2. — ♀: L = 0.96–0.98 mm; a = 33–35; b = 5.4–5.8; c = 6.3–6.7; V = 40–44%; c' = 7.5–8.8. ♂: L = 1.02–1.05 mm; a = 34–39; b = 4.7–5.4; c = 6.9–7.9; c' = 6.4–7.6; PO: 1–2 (Ivory Coast) ..... **africanus** sp. n.

3 Spear 12–13 μm long; body 0.9–1.2 mm. — ♀: L = 1.0–1.2 mm; a = 23–31; b = 5.7–7.0; c = 5.4–7.0; V = 33–41%; c' = 7–10. ♂: L = 0.9–1.1 mm; a = 5.0–5.5; c = 6.8–7.0; c' = 6–8; PO: 4 (India) ..... **elongatus** BAQRI
— Spear 18–20 μm long; body 1.4–1.8 mm. — ♀: L = 1.5–1.8 mm; a = 37–44; b = 5.7–6.6; c = 5.3–6.8; V = 30–38%; c' = 8–9. ♂: L = 1.4–1.7 mm; a = 25–27; b = 5.4–5.6; c = 6.0–8.8; c' = 7–8; PO: ? (India) ... **kanhobia** THOMBRE, JOSHI & FAROOQUI

Remarks. *Indodorylaimus elongatus.* — When MEHDI ALI and PRABHA (1974) established their new genus, they assigned *Thornenema wickeni* YEATES, 1970 as type-species and provided it with the new generic name as *Indodorylaimus wickeni* (YEATES, 1970) MEHDI ALI & PRABHA, 1974. In revising the family Thornenematidae, BAQRI and JANA (1980) compared the type specimens of *T. wickeni* sensu YEATES originating from England with those of *I. wickeni* sensu MEHDI ALI & PRABHA from India and concluded that the Indian population was not conspecific with the English one. They proposed to obtain the specific name *wickeni* in combination with *Indodorylaimus* as a "nomen novum". Two years later (1982) BAQRI went back to this problem and turned to the International Commission on Zoological Nomenclature with the proposition to obtain the generic name *Indodorylaimus* as valid and to accept *I. elongatus* BAQRI, 1982 (= *Thornenema wickeni* = *Indodorylaimus wickeni* apud MEHDI ALI & PRABHA, 1974) as type-species for the genus. Although SIDDIQI (1984) queried BAQRI's proposition, I do feel it to be correct and not contrary to the rules of the nomenclature.

Indodorylaimus kanhobia. — Although the description of the male is meagre, this species seems to be valid.

Genus **Sicaguttur** SIDDIQI, 1971

Thornenematidae, Thornenematinae. Body 1.2 to 1.9 mm long, moderately slender. Cuticle smooth or with very fine transverse striation. Head not or slightly set off, lips not separated. Labial framework sclerotized, collare distinct, rod-like. Spear straight, 16—19 μm, less than 1.5 times as long as labial diameter. Guiding ring thin, nearer to anterior body end than one-head width. Oesophagus expanded somewhat posterior to its middle (in 55—58%). Female prerectum 2.5—3 times as long as anal body width, male prerectum beginning at level of the anteriormost supplement or a little further ahead. Female genital organ amphidelphic. Vulva pre-equatorial, in 34—40% of body length. Testes two. Spicula dorylaimoid. Supplements 7—10, well spaced. Tail showing sexual dimorphism: in females long (7—11 anal diameters), in males short and rounded.

Type-species: *Sicaguttur sartum* SIDDIQI, 1971.

This genus is very similar to *Thornenema* ANDRÁSSY, 1959 but the female gonads are paired and the number of supplements is higher (7—10 vs. 3—6). It differs from *Medalinema* BAQRI & JANA, 1980, the other amphidelphic genus of the subfamily, in having a sexual dimorphism in tail.

Terrestrial animals known from India.

One species:

S. sartum SIDDIQI, 1971
Sicaguttur longicaudatum BAQRI & JANA, 1980 **syn. n.**

— ♀: L = 1.2—1.9 mm; a = 30—38; b = 5.4—6.7; c = 6—10; V = 34—40%; c' = 7—11
♂: L = 1.4—1.7 mm; a = 29—35; b = 5.7—6.5; c = 49—68; PO: 7—10 (India) ..... **sartum** SIDDIQI

Remarks. BAQRI and JANA (1980) redescribed *Sicaguttur sartum* SIDDIQI, 1971 and presented a new species, *S. longicaudatum* BAQRI & JANA, 1980. The latter differs only in minute characters from the former: "in having a continuous lip region, differently shaped amphids, a small disc at oesophago-intestinal junction and a differently shaped vagina". If we compare the descriptions of BAQRI and JANA with the original paper of SIDDIQI, we can state that these differences hardly exist. *Sicaguttur longicaudatum* is therefore a junior synonym of *S. sartum*.

Genus **Lagenonema** gen. n.

Thornenematidae, Thornenematinae. Body small, 0.6 to 0.9 mm long. Cuticle smooth or very finely striated. Anterior end of body bottle-shaped, abruptly narrowing to a cylindroid truncate head; lips amalgamated, lip region about half the width of adjacent body. Labial framework sclerotized, spatulate, collare well sclerotized, comparatively long. Amphids small, 1/4 or 1/3 of corresponding body width. Spear straight but distally slighly concave on its ventral side, 9—15 μm, 1.5—2 times as long as cephalic diameter. Aperture small, occupying 1/5—1/4 of spear length. Guiding ring thin. Oesophagus

expanded in 55—65% of its length. Female prerectum 1.5—2.5 times as long as anal body width. Vulva pre-equatorial or equatorial, in 33 to 52%. Female gonad mono-opisthodelphic, anterior uterine sac practically absent. Tail 3 to 15 anal diameters long, tapering gradually to the finely rounded tip, or first hemispheroid then digitate to filiform. Males unknown.

Type-species: *Thornenema caudatum* JAIRAJPURI, AHMAD & DHANACHAND, 1979 = *Lagenonema caudatum* (JAIRAJPURI, AHMAD & DHANACHAND, 1979) comb. n.

Lagenonema comes close to *Thornenema* ANDRÁSSY, 1959 but differs from that in the abruptly narrowed, bottle-shaped anterior region, the spatulate cephalic framework, the ventrally concave spear and the smaller amphids. Besides, the *Lagenonema* species seem to be monosexual whilst the *Thornenema* species are bisexual.

Terricolous animals, inhabiting soil around roots. They have been observed in Europe (1 species), Asia (3 species), Africa (2 species) and Australia (1 species).

λάγηνος (Greek) = the bottle, referring to the shape of the anterior end of body.

Five species:

L. caudatum (JAIRAJPURI, AHMAD & DHANACHAND, 1979) comb. n.
Thornenema caudatum JAIRAJPURI, AHMAD & DHANACHAND, 1979
L. longicaudatum (JAIRAJPURI, AHMAD & DHANACHAND, 1979) comb. n.
Thornenema longicaudatum JAIRAJPURI, AHMAD & DHANACHAND, 1979
L. loofi (JAIRAJPURI, AHMAD & DHANACHAND, 1980) comb. n.
Thornenema loofi JAIRAJPURI, AHMAD & DHANACHAND, 1980
Thornenema thienemanni apud JAIRAJPURI, 1966
L. tropicum sp. n.
Thornenema loofi apud COOMANS & CARBONELL, 1982
L. wickeni (YEATES, 1970) comb. n.
Thornenema wickeni YEATES, 1970

Key to species of Lagenonema

1 Tail long, filiform, 13—15 times as long as anal body width. — ♀: L = 0.67—0.74 mm; a = 26—31; b = 4.3—4.7; c = 3—4; V = 33—41%; c' = 13—15. ♂ unknown (India, Malaysia) ..... **longicaudatum** (JAIRAJPURI, AHMAD & DHANACHAND)
— Tail shorter, 3 to 9 times as long as anal body width 2

2 Tail in anterior part hemispheroid, in posterior part digitate, almost cylindrical; spear 13—15 μm long. — ♀: L = 0.6—0.9 mm; a = 22—31; b = 35—47; c = 8—10; V = 43—52%; c' = 3—4. ♂ unknown (India, Malaysia) ..... **caudatum** (JAIRAJPURI, AHMAD & DHANACHAND)
— Tail not so abruptly tapering between its anterior and posterior part; spear 8—12 μm long 3

3 Body 0.8—0.9 mm, tail 6—9 anal diameters long. — ♀: L = 0.8—0.9 mm; a = 25—36; b = 3.7—4.7; c = 4.8—7.8; V = 39—44%; c' = 6.5—9. ♂ unknown (England, Ivory Coast) ..... **wickeni** (YEATES)
— Body 0.6—0.7 mm, tail 4—6 anal diameters long 4

4 Cuticle conspicuously thickened behind spear; oesophagus gradually enlarged. — ♀: L = 0.6—0.7 mm; a = 24—26; b = 4.1—4.3; c = 7—8; V = 32—38%; c' = 5—6. ♂ unknown (India) ..... **loofi** (JAIRAJPURI, AHMAD & DHANACHAND)
— Cuticle not thickened behind spear; oesophagus abruptly enlarged. — ♀: L = 0.57—0.59 mm; a = 21—23; b = 4.0—4.1; c = 7.6—8.3; V = 40—41%; c' = 4. ♂ unknown (Ivory Coast, New Guinea) ..... **tropicum** sp. n.

Genus **Thornenema** ANDRÁSSY, 1959

Syn. *Jairajpuria* BAQRI & JANA, 1980 syn. n.

Thornenematidae, Thornenematinae. Body 0.6 to 2 mm long, moderately slender. Cuticle smooth or finely striated transversally. Lips amalgamated, head continuous with neck or more or less offset, fairly truncate. Labial framework sclerotized, collare present. Amphids caliciform, 1/3 to 1/2 as wide as body at the same level. Spear straight, 9 to 16 μm long, as long to twice as long as cephalic diameter; aperture occupying 1/4 to 1/3 of spear length. Guiding ring thin, at most one-head width from anterior body end. Oesophagus expanded post-equatorial, in 51 to 68% of its length. Female prerectum 1.5—5 times as long as anal body diameter, male prerectum beginning within the range of supplements. Vulva mostly pre-equatorial, in 28 to 50% of body length. Female genital organ mono-opisthodelphic. Anterior uterine sac, if present, one to two body diameters long. Testes two. Spicula dorylaimoid. Supplements far spaced, 3 to 6 in number. Tail different in both sexes: in females attenuated to filiform, 4 to 14 anal diameters long, in males short and bluntly rounded. Males known in five species.

Type-species: *Dorylaimus lissus* THORNE, 1939 = *Thornenema lissum* (THORNE, 1939) ANDRÁSSY, 1959.

Thornenema can be separated from *Sicaguttur* SIDDIQI, 1971 and *Opisthodorylaimus* AHMAD & JAIRAJPURI, 1982, the other genera within the subfamily Thornenematinae showing a sexual dimorphism in tail, in having a monodelphic gonad and a sclerotized labial framework and collare, respectively. It is closely related to *Lagenonema* gen. n. but the anterior end is not bottle-shaped, the cephalic framework is punctate, the spear not concave ventrally and the amphids are larger; besides, *Thornenema* seems to be bisexual.

The genus *Jairajpuria* BAQRI & JANA, 1980 is in my opinion identical with *Thornenema*. Neither in the shape of the head and amphids nor in the length of the anterior uterine sac is any appreciable difference between them.

The species of *Thornenema* inhabit terrestrial biotopes, predominantly the soil around roots. They are distributed in Europe, Asia, Africa, North America and Australia.

Nine species may be ordered here:

T. baldum (THORNE, 1939) ANDRÁSSY, 1959
Dorylaimus baldus THORNE, 1939
Thornenema paradoxum SIDDIQI, 1965
T. laevicapitatum (COBB in THORNE & SWANGER, 1936) ANDRÁSSY, 1959
Dorylaimus laevicapitatus COBB in THORNE & SWANGER, 1936
T. lissum (THORNE, 1939) ANDRÁSSY, 1959
Dorylaimus lissus THORNE, 1939
Thornenema qaiseri SAUER, 1981 syn. n.
T. maraouense COOMANS & CARBONELL, 1982
T. mauritianum (WILLIAMS, 1959) BAQRI & JAIRAJPURI, 1967
Chrysonema mauritianum WILLIAMS, 1959
Thornenema viriosum WILLIAMS, 1964
Thornenema filiforme SIDDIQI, 1965
Thornenema delhiense PRASAD & CHAWLA, 1965
Thornenema africanum ANDRÁSSY, 1965
T. oryzae (AHMAD & JAIRAJPURI, 1982) comb. n.
Jairajpuria oryzae AHMAD & JAIRAJPURI, 1982
T. paraconurus (HEYNS, 1963) GOSECO, FERRIS & FERRIS, 1976
Dorylaimoides paraconurus HEYNS, 1963
T. samsoeni COOMANS & CARBONELL, 1982
T. shamimi (BAQRI & JANA, 1980) comb. n.
Jairajpuria shamimi BAQRI & JANA, 1980

Key to species of Thornenema

1 Anterior uterine sac present, one to two body diameters long 2
— Anterior uterine sac absent or if present, much shorter than one body diameter ... 5

2 Anterior uterine sac 1.5—2.5 times as long as corresponding body width; female tail 5—10 anal widths long 3
— Anterior uterine sac as long as corresponding body width; female tail 4—5 anal widths long 4

3 Spear 15—16 μm long; head continuous with neck; supplements 6. — ♀: L = 1.3—1.6 mm; a = 36—38; b = 4.5—4.8; c = 7.2—9.0; V = 39—42%; c' = 7—10. ♂: L = 1.4—1.5 mm; a = 36—38; b = 4.3—5.0; c = 56—63; PO: 6 (Ivory Coast) .....
samsoeni COOMANS & CARBONELL
— Spear about 10 μm long; head offset by a depression; supplements 3—4. — ♀: L = 0.87—0.92 mm; a = 21—33; b = 3.7—4.2; c = 6.9—9.8; V = 42—44%; c' = 5—7. ♂: L = 0.76—0.87 mm; a = 28—32; b = 3.5—4.3; c = 43—54; PO: 3—4 (Ivory Coast) .....
maraouense COOMANS & CARBONELL

4 Head cap-like, offset by a constriction; vulva in 44—50% of body length. — ♀: L = 0.64—0.77 mm; a = 24—31; b = 4.4—5.1; c = 10—18; V = 44—50%; c' = 3.7—4.6. ♂: L = 0.62—0.76 mm; a = 25—31; b = 4.4—5.5; c = 27—38; PO: 3—4 (India) .....
shamimi (BAQRI & JANA)
— Head truncate, not cap-like, offset by a depression; vulva in 39—42% of body length. — ♀: L = 0.72—0.85 mm; a = 30—32; b = 5.2 4.3; c = 10—12; V = 39—42%; c' = 4—5. L = 0.69—0.80 mm; a = 29—30; b = 4.6—5.0; c = 28—40; PO: 4—5 (India) .....
oryzae (AHMAD & JAIRAJPURI)

5 Female tail 10—14 times as long as anal body diameter. — ♀: L = 1.0—1.7 mm; a = 32—46; b = 4.1—5.8; c = 5—9; V = 28—37%; c' = 10—14. ♂ unknown [Soviet Union (Moldavia, Georgia), India, Malaysia, Ghana, Mauritius, Costa Rica, Australia] .....
mauritianum (WILLIAMS)
— Female tail 3 to 9 times as long as anal body diameter 6

6 Body 2 mm long; spear about twice as long as labial width. — ♀: L = 2.0 mm; a = 39; b = 5.2; c = 11; V = 38%; c' = 5. ♂ unknown (Jamaica) .....
laevicapitatum (COBB in THORNE & SWANGER)
— Body 1.4 mm or shorter; spear as long as or only slightly longer than labial width .. 7

7 Lip region continuous with adjacent body. — ♀: L = 1.2—1.3 mm; a = 29—36; b = 5.0—5.1; c = 6.7—9.0; V = 32—33%; c' = 8—9.6. ♂ unknown [Soviet Union (Moldavia), Malaysia, United States (South Carolina)] ..... **lissum** (THORNE)
— Lip region offset by a slight depression 8

8 Anterior uterine sac, if rudimentary, present, about half the width of body; body 1.3—1.4 mm. — ♀: L = 1.3—1.4 mm; a = 35—38; b = 4.9—5.0; c = 8.2—9.4; V = 36—38%; c' = 7. ♂ unknown (South Africa) ..... **paraconurus** (HEYNS)
— Anterior uterine sac practically absent; body 0.9—1.2 mm. — ♀: L = 0.9—1.2 mm; a = 24—34; b = 4.4—5.7; c = 6—10; V = 30—37%; c' = 5—9. ♂: L = 0.84—0.90 mm; a = 26—29; b = 4.1—5.2; c = 32—40; PO: 5—6 [Soviet Union (Moldavia, Georgia), India, Malaysia, Sumatra, Mauritius, Australia] ..... **baldum** (THORNE

Remarks. *Thornenema lissum.* — On the basis of its description *Thornenema qaiseri* SAUER, 1981 cannot be separated from *T. lissum*: they seem to be conspecific.

In addition to the species listed above, three further species have been described under the generic name *Thornenema* which, however, do not belong, to this genus or even to the family Thornenematidae. *Thornenema curvicaudatum* ALTHERR & DELAMARE DEBOUTTEVILLE, 1972 was described on the basis of two immature specimens; owing to the angular lips and the ventrally curved conoid tail it may be concluded that this species belongs to the genus *Eudorylaimus* (and is a species inquirenda). *Thornenema uniforme* DEMENTEVA, 1972 and *T. uralicum* NESTEROV, 1976 most probably belong to the genus *Dorylaimoides*: the shape of head and spear, the far back enlarged oesophagus as well as the shape of spicula in the latter species all correspond to the characters of *Dorylaimoides*. Their new combinations are: *Dorylaimoides uniformis* (DEMENTEVA, 1972) comb. n. and *D. uralicus* (NESTEROV, 1976) comb. n.

Genus **Opisthodorylaimus** AHMAD & JAIRAJPURI, 1982

Thornenematidae, Thornenematinae. Body 0.7—2.3 mm long, moderately slender to slender. Cuticle fairly thick, smooth or finely striated. Lips amalgamated, head not or hardly offset. Labial sclerotization and collare absent. Amphids infundibuliform. Spear short and thick, 10—21 μm, as long as or a little longer than labial diameter; aperture occupying 1/3 of spear length or so. Guiding ring simple, located less than one-head diameter behind anterior body end. Oesophagus expanded in its middle or posterior to that. Female prerectum short, 1.5—3 anal diameters, male prerectum beginning within the range of supplements. Vulva longitudinal or transverse, in 33—52% of body length. Female reproductive organ either mono-opisthodelphic — with or without anterior uterine sac — or pseudomono-opithodelphic or didelphic with anterior ovary reduced, much less developed than posterior one. Spicula dorylaimoid. Testes two, spermatozoa spindle-shaped. Supplements 5—11, widely or closely spaced; precloacal space about 1.5 times as long as spicula. Tail with sexual dimorphism: in females attenuated to filiform, 2 to 25 anal body widths long, in males short and conoid-rounded. Males rare, known in three species only.

Type-species: *Opisthodorylaimus maqsoodi* AHMAD & JAIRAJPURI, 1982.

Opisthodorylaimus is unique within the subfamily Thornenematinae in having no sclerotized framework and collare. Nevertheless, I prefer to put it in the Thornenematidae and not in the family Dorylaimidae, since the latter

large group (with about 250 species) is very uniform in that that the female genital organ is amphidelphic and never shows a tendency to reduce the anterior ovary. Besides the mono-opisthodelphic reproductive system, *Opisthodorylaimus* well corresponds to the criteria of the Thornenematidae in having a simple rounded head with amalgamated lips.

Soil inhabiting nematodes; they have been reported from Europe, Asia, Africa, North and South America and Australia.

Eight species:

O. baqrii CARBONELL & COOMANS, 1986
O. caudatus AHMAD & JAIRAJPURI, 1982
O. cavalcantii (LORDELLO, 1955) CARBONELL & COOMANS, 1986
Dorylaimus cavalcanti LORDELLO, 1955
Thornenema cavalcanti (LORDELLO, 1955) ANDRÁSSY, 1959
O. chamoliensis AHMAD & JAIRAJPURI, 1982
O. filicaudatus CARBONELL & COOMANS, 1986
O. maqsoodi AHMAD & JAIRAJPURI, 1982
O. paracavalcantii CARBONELL & COOMANS, 1986
O. sylphoides (WILLIAMS, 1959) CARBONELL & COOMANS, 1986
Dorylaimus sylphoides WILLIAMS, 1959
Thornenema sylphoides (WILLIAMS, 1959) ANDRÁSSY, 1960

Key to species of Opisthodorylaimus

1 Female genital organ pseudodidelphic or didelphic (with reduced anterior ovary) or if monodelphic, anterior uterine sac present 2
— Female genital organ monodelphic, anterior uterine sack lacking 5

2 Female tail 14—25 anal diameters long; larger species, 1.7—2.3 mm. — ♀: L = 1.7—2. mm; a = 42—64; b = 5.4—6.3; c = 3.5—6.0; V = 35—38%; c' = 14—25. ♂ unknown [France, Italy, Soviet Union (Georgia), Iraq, Mauritius] ..... **sylphoides** (WILLIAMS)
— Female tail 2—8 anal diameters long; smaller species, 0.9—1.4 mm 3

3 Female didelphic but anterior ovary less developed than posterior; males common. — ♀: L = 1.3—1.4 mm; a = 34—39; b = 4.1—4.6; c = 16—23; V = 48—52%; c' = 2.5—3. ♂: L = 1.2—1.3 mm; a = 32—38; b = 3.9—4.3; c = 40—58; PO: 5—6 (Uganda) ..... **paracavalcantii** CARBONELL & COOMANS
— Female pseudodidelphic or monodelphic 4

4 Anterior uterine sac 2—3 times as long as body width; tail 6.5—8 anal body widths long. — ♀: L = 1.2—1.4 mm; a = 38—47; b = 4.0—5.3; c = 8.3—11.5; V = 42—44%; c' = 6.5—8. ♂ unknown (Cameroon) ..... **baqrii** CARBONELL & COOMANS
— Anterior uterine sac shorter than one body width (or female pseudodidelphic with reduced anterior branch); tail 2—5 anal body widths long. — ♀: L = 0.9—1.3 mm; a = 24—36; b = 3.5—4.8; c = 10—16; V = 40—47%; c' = 2—5. ♂: L = 1.2 mm; a = 34; b = 4.5; c = 50; PO: 5 [Soviet Union (Georgia, Azerbajzhan), India, Indonesia, Malaysia, Nigeria, Cameroon, Ivory Coast, Zaire, Kenya, South Africa, United States (South Carolina), Venezuela, Brazil, Australia] ..... **cavalcantii** (LORDELLO)

5 Female tail filiform, 20—30 times as long as anal diameter; body 0.7—0.8 mm. — ♀: L = 0.7—0.8 mm; a = 30—37; b = 4.1—5.1; c = 2.3—2.6; V = 33—38%; c' = 20—30. ♂ unknown (Ivory Coast) ..... **filicaudatus** CARBONELL & COOMANS
— Female tail at most 12 times as long as anal diameter; body 1.2—1.6 mm 6

6 Female tail short, 4—5 anal diameters, dorsally curved. — ♀: L = 1.5—1.6 mm; a = 31—44; b = 4.0—4.6; c = 11—15; V = 44—48%; c' = 4—5. ♂ unknown (India) ..... **caudatus** AHMAD & JAIRAJPURI
— Female tail longer, 10—12 anal diameters, straight 7

7 Vulva longitudinal. — ♀: L = 1.2 mm; a = 30—34; b = 4.3—4.6; c = 5; V = 36—40%; c' = 11—12. ♂ unknown (India) ..... **chamoliensis** AHMAD & JAIRAJPURI
— Vulva transverse. — ♀: L = 1.2—1.4 mm; a = 28—35; b = 4.0—4.5; c = 4.0—6.8; V = 40—45%; c' = 8.5—12. ♂: L = 1.1—1.2 mm; a = 26—27; b = 3.8—4.1; c = 32—33; PO: 10—11 (India, Korea) ..... **maqsoodi** AHMAD & JAIRAJPURI

Subfamily *WILLINEMATINAE* subfam. n.

Thornenematidae. Cephalic sclerotization and collare present or absent. Female genital organ opisthodelphic. Both female and male tail short, rounded.

The members of this subfamily are characterized by the bluntly rounded short tail in both sexes.

Two genera (with 12 species).

Sclerolabia CARBONELL & COOMANS, 1986
Willinema BAQRI & JAIRAJPURI, 1967

Key to genera of Willinematinae

1 Labial framework sclerotized, collare present ..... **Sclerolabia** CARBONELL & COOMANS
— Labial framework not sclerotized, collare absent ..... **Willinema** BAQRI & JAIRAJPURI

Genus **Sclerolabia** CARBONELL & COOMANS, 1986

Thornenematidae, Willinematinae. Body small, 0.3 to 1.4 mm, cylindroid. Cuticle smooth or finely annulated. Lips amalgamated or somewhat separated, head continuous with neck or offset by a depression. Cephalic framework and collare well sclerotized. Amphids stirrup-shaped. Spear 7 to 16 μm long, as long as or a little longer than labial diameter; aperture occupying 1/4 or 1/3 of spear length. Guiding ring thin, located about one-head width behind anterior body end. Oesophagus expanded posterior to its middle (to 70% of its length). Prerectum in females 1.5—3 times as long as anal body width, that in males originating within the range of supplements. Vulva transverse, nearly equatorial, in 43—56% of body length. Female genital organ mono-opisthodelphic, with anterior uterine sac. Testes two, spicula dorylaimoid. Spermatozoa elliptical. Supplements few, 2—5, well spaced. Tail in both sexes similar, short and hemispheroid. Males rare or not known.

Type-species: *Sclerolabia camerunensis* CARBONELL & COOMANS, 1986.

This genus comes close to *Willinema* BAQRI & JAIRAJPURI, 1967, the labial framework and collare are, however, conspicuously sclerotized.

The species of *Sclerolabia* live in the soil around roots and are distributed in Asia, Africa, Central and South America.

Five species:

S. africana CARBONELL & COOMANS, 1986
S. camerunensis CARBONELL & COOMANS, 1986
S. indica (BAQRI & JAIRAJPURI, 1967) CARBONELL & COOMANS, 1986
Willinema indicum BAQRI & JAIRAJPURI, 1967
S. jamaicensis CARBONELL & COOMANS, 1986
S. minima CARBONELL & COOMANS, 1986

Remarks. CARBONELL and COOMANS gave their genus the name "*Sclerolabia*" (sclero + labia, Latin = sclerotized lips), i.e. they used the Latin word "labium" (= a lip) in plural form. The Rules declare, however, that a generic name must be used as a noun in singular number (nominativus singularis) or must be handled as such. Well, I propose to retain the name *Sclerolabia* (instead of "*Sclerolabium*") and regard it as a singular "artificial" word of feminine gender.

In 1976 NESTEROV described a new genus, *Laurophragus* (with type-species *Laurophragus lauri* NESTEROV, 1976), from Moldavia, Soviet Union. Although he placed it into the family Axonchiidae, it much resembles the genus *Sclerolabia*. The labial framework (and collare?) is sclerotized, the female genital organ opisthodelphic and the tail is short and rounded. Merely the shape of the spear seems to be different from the *Sclerolabia*-type. It is possible, however, that NESTEROV's drawing is somewhat inaccurate and the spear of *Laurophragus* corresponds to that of *Sclerolabia*. If so, the genus of NESTEROV would be identical with the genus of CARBONELL and COOMANS and would have a priority nomenclaturally.

Key to species of Sclerolabia

1 Anterior uterine sac as long as or longer than corresponding body width; bisexual form. — ♀: L = 0.64—0.72 mm; a = 23—29; b = 4—5; c = 34—46; V = 48—53%; c' = 0.8—1. ♂: L = 0.65—0.76 mm; a = 26—32; b = 4.0—4.5; c = 31—45; PO: 2—5 (Cameroon) ..... **camerunensis** CARBONELL & COOMANS
— Anterior uterine sac distinctly shorter than corresponding body width; monosexual forms 2

2 Lip region continuous; collare thick; body longer than 1 mm. — ♀: L = 1.3—1.4 mm; a = 40—42; b = 4.8—5.0; c = 56—69; V = 43—45%; c' = 0.8. ♂ unknown (Jamaica) ..... **jamaicensis** CARBONELL & COOMANS
— Lip region separated from adjacent body by a depression; collare thin; body shorter than 1 mm 3

3 Spear 9—11 μm long; body 0.8—0.9 mm. — ♀: L = 0.76—0.90 mm; a = 28—37; b = 4.0—5.7; c = 41—50; V = 45—52%; c' = 1. ♂ unknown (India) ..... **indica** (BAQRI)
— Spear 7—8 μm long; body 0.6 mm or shorter 4

4 Oesophagus expanded in 60% of its length; tail one anal diameter long. — ♀: L = 0.55—0.56 mm; a = 28—29; b = 3.4—3.7; c = 34; V = 46—52%; c' = 0.9—1. ♂ unknown (Cameroon) ..... **africana** CARBONELL & COOMANS
— Oesophagus expanded in 70% of its length; tail longer than one anal diameter. — ♀: L = 0.34—0.38 mm; a = 18—21; b = 3.3—3.7; c = 22—24; V = 49—56%; c' = 1.4—1.7. ♂ unknown (Brazil) ..... **minima** CARBONELL & COOMANS

Genus **Willinema** BAQRI & JAIRAJPURI, 1967

Thornenematidae, Willinematinae. Small animals, 0.5 to 1.3 mm. Cuticle with fine transverse striation. Lips amalgamated, head continuous with neck or slightly offset. Labial framework not sclerotized, collare absent. Amphids

caliciform, in males somewhat bigger than in females. Spear straight, 7 to 16 μm long, as long as or a little longer than labial diameter; aperture occupying 1/5 to 1/3 of spear length. Guiding ring thin, less than one-head width from anterior body end. Oesophagus enlarged posterior to its middle, in 56—68%. Female prerectum 1—4 anal diameters long, male prerectum beginning within the range of supplements. Vulva pre-equatorial or equatorial (in 35—54%). Female genital organ mono-opisthodelphic or pseudomono-opisthodelphic, in the latter case, the anterior gonad is, if not quite completely, developed. Testes two. Spicula dorylaimoid. Supplements far spaced, 2 to 7. Tail in both sexes similar, short and rounded, mostly as long as anal body width.

Type-species: *Labronema parvum* WILLIAMS, 1959 = *Willinema parvum* (WILLIAMS, 1959) BAQRI & JAIRAJPURI, 1967.

Willinema is, together with *Opisthodorylaimus* AHMAD & JAIRAJPURI, 1982, that genus in the family Thornenematidae which does not possess a collare and a sclerotized labial framework.

Soil inhabiting nematodes, distributed in Asia, Africa, North and South America.

Seven species:

W. eburnense CARBONELL & COOMANS, 1985
W. laopangense CARBONELL & COOMANS, 1985
W. nanum CARBONELL & COOMANS, 1985
W. opisthodelphus (THORNE & SWANGER, 1936) ANDRÁSSY, 1986
Dorylaimus opisthodelphus THORNE & SWANGER, 1936
Eudorylaimus opisthodelphus (THORNE & SWANGER, 1936) ANDRÁSSY, 1959
W. paraparvum CARBONELL & COOMANS, 1985
W. parvum (WILLIAMS, 1959) BAQRI & JAIRAJPURI, 1967
Labronema parvum WILLIAMS, 1959
Eudorylaimus parvus (WILLIAMS, 1959) ANDRÁSSY, 1959
Thornenema parvum (WILLIAMS, 1959) WILLIAMS, 1961
W. sulphasae (TULAGANOV, 1949) ANDRÁSSY, 1986
Dorylaimus sulphasae TULAGANOV, 1949
Eudorylaimus sulphasae (TULAGANOV, 1949) ANDRÁSSY, 1959

Key to species of Willinema

1 Female genital organ pseudomonodelphic, anterior branch 5—6 times as long as body diameter, with a poorly developed ovary. — ♀: 1.14—1.26 mm; a = 30—44; b = 4.7—4.8; c = 51—62; V = 44—47%; c' = 0.8—0.9. ♂: L = 1.20—1.33 mm; a = 33—39; b = 4.7—5.2; c = 48—57; c' = 0.9—1; PO: 5—7 (Cameroon) ..... **paraparvum** CARBONELL & COOMANS
— Female genital organ monodelphic, anterior branch at most 3 times as long as body diameter, without any ovary 2

2 Body 1.3 mm long. — ♀: L = 1.3 mm; a = 45; b = 5.2; c = 45; V = 42%; c' = 1.2. ♂ unknown (United States: Utah) ..... **opisthodelphus** (THORNE & SWANGER)
— Body 0.5 to 1 mm long 3

3 Anterior uterine sac 1—3 body widths long 4
— Anterior uterine sac half-a-body width long or shorter 5

4 Body longer, 0.8—1 mm; spear 13—14 μm; supplements 5. — ♀: L = 0.88—0.98 mm; a = 25—28; b = 4.0—4.4; c = 38—43; V = 45—51%; c' = 0.9—1. ♂: L = 0.84—0.90 mm; a = 25—30; b = 4.0—4.4; c = 37—39; c' = 0.9—1; PO: 5 (Ivory Coast) ..... **eburnense** CARBONELL & COOMANS

— Body shorter, 0.4—0.5 mm; spear 9—10 μm; supplements 2—4. — ♀: L = 0.45—0.52 mm; a = 24—28; b = 3.3—3.9; c = 29—36; V = 48—53%; c' = 1—1.3. ♂: L = 0.46—0.48 mm; a = 26—30; b = 3.3—3.7; c = 29—36; c' = 1—1.3; PO: 2—4 (Ivory Coast) ..... **nanum** CARBONELL & COOMANS*

5 Spear 16 μm long; vaginal sclerotization triangular. — ♀: L = 0.92—1.10 mm; a = 28—32; b = 3—4; c = 44—54; V = 45—48%; c' = 0.8—1.3. ♂ unknown (Mauritius) ..... **parvum** (WILLIAMS)

— Spear 11—13 μm long; vaginal sclerotization elliptical. — ♀: L = 0.8—0.9 mm; a = 33—37; b = 4; c = 45—54; V = 45—46%; c' = 0.8—0.9. ♂ unknown (Cameroon) ..... **laopangense** CARBONELL & COOMANS

Remarks. *Willinema opisthodelphus.* — *Dorylaimus opisthodelphus* THORNE & SWANGER, 1936 belongs to the genus *Willinema.* The shape of head, spear and tail, the opisthodelphic female gonad and the cuticular striae being "more prominent than usual" all correspond well to the criteria of this genus.

Willinema sulphasae. — Although TULAGANOV (1949) has described his *Dorylaimus sulphasae* as being amphidelphic, the illustrations and the position of the vulva (in 35%) well indicate that *sulphasae* does bear a single, opithodelphic genital organ. It seems to be also in its general appearance a representative of the genus *Willinema.*

Indodorylaimus africanus sp. n.
(Fig. 6A—F)

♀: L = 0.96—0.98 mm; a = 33—35; b = 5.4—5.8; c = 6.3—6.7; V = 40—44%; c' = 7.5—8.8.

♂: L = 1.02—1.05 mm; a = 34—39; b = 4.7—5.4; c = 6.9—7.9; c' = 6.4—7.6.

Female somewhat shorter than male. Body 26—29 μm wide. Cuticle on entire body finely but distinctly annulated, 1.5 μm thick on mid-body, 2.2—2.5 μm thick behind spear and 4.5—5 μm thick on tail. Head 7—8 μm wide, anterior body end bottle-shaped. Lips amalgamated, labial region only half as wide as body level with collare. Body at posterior end of oesophagus 3.5—4 times as wide as head. Amphids 5—6 μm from anterior body end, pocket-shaped, less than half as wide as corresponding body; amphidial aperture arched. Labial framework sclerotized, collare well developed, longer than labial width.

Spear straight, 12—13 μm, 1.5 times as long as labial diameter, 7% of oesophageal length. Aperture occupying about 1/3 of spear length. Guiding ring weak, at middle of spear. Oesophagus 170—180 (♀) or 193—216 (♂) μm long, in 60—62% of its length expanded. Lumen of posterior part of oesophagus strongly sclerotized. Cardia short, tongue-shaped. Female prerectum 3.5—3.3 times, rectum 1.5 times as long as anal body width.

Vulva pre-equatorial, transverse with slightly cuticularized lips. Vagina spheroid, 15 μm long. Distance between proximal end of oesophagus and vulva

* *Thornenema sulphasae* (TULAGANOV) belongs also here (see Remarks). ♀: L = 0.57 mm; a = 28; b = 4.7; c = 28; V = 35%; c' = 1.3. ♂ unknown (Soviet Union: Uzbegistan).

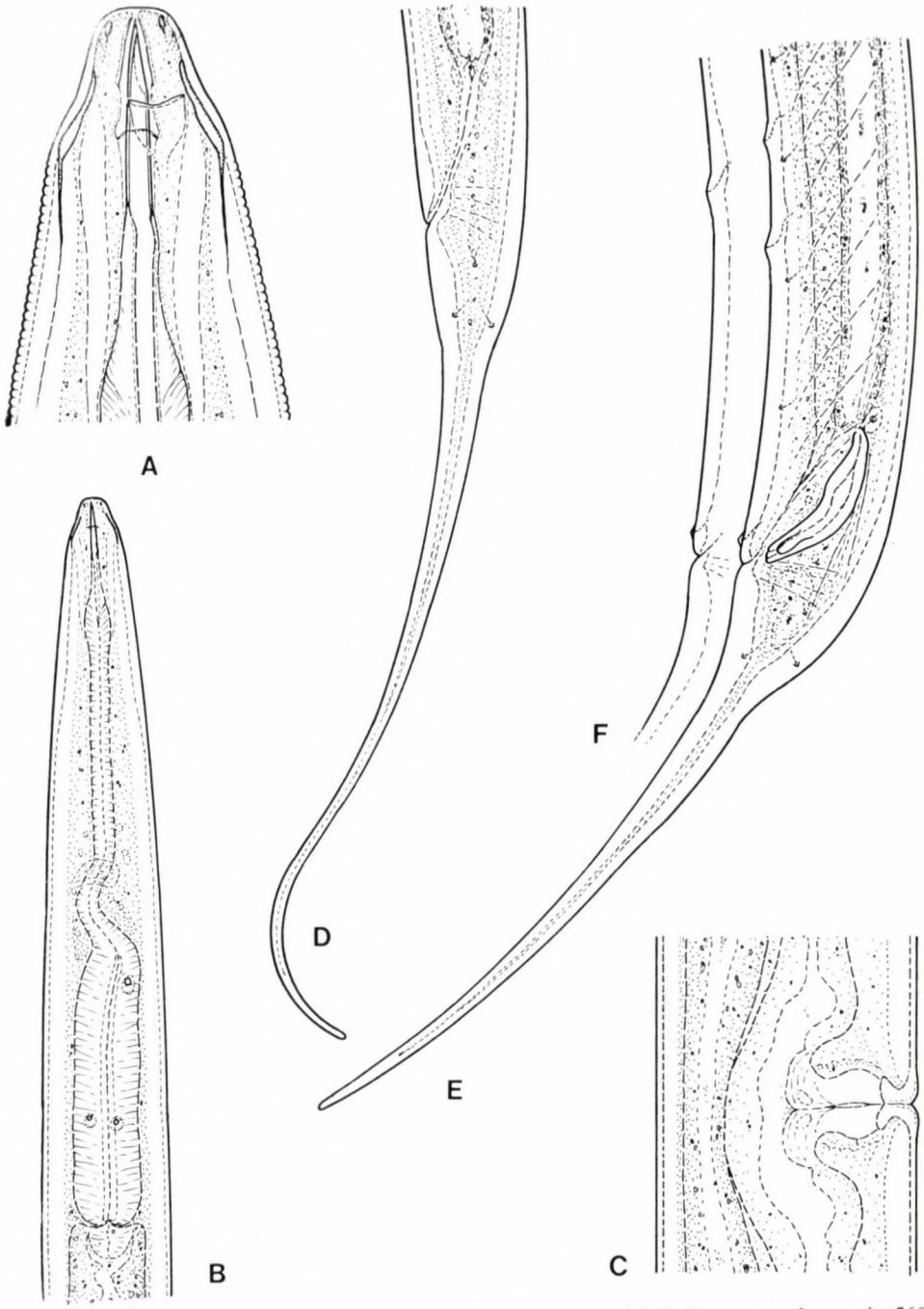

Fig. 6. *Indodorylaimus africanus* sp. n. A = anterior end (×2200); B = oesophagus (×560); C = vulval region (×1100); D = female tail (×760); E—F = posterior ends of two males (×760)

1.2—1.5 times longer than oesophagus. Female genital organ mono-opisthodelphic, posterior branch 5.2—6.6 times as long as body width. Anterior uterine sac well developed, 84—92 μm long, 2.8—3.2 times as long as corresponding body diameter. Anterior uterine sac packed with spermatozoa, posterior one vacant.

Distance vulva-anus 2.6—2.7 times as long as tail. Tail first rounded then attenuated, filiform, 146—154 μm, 7.5—8.8 times as long as anal body width or 15—16% of entire length of body, respectively. Posterior 11—12% of tail length "empty". Tip of tail finely rounded.

Male tail 128—152 μm, 6.4—7.6 times as long as anal body diameter, 12—14% of body length, similar in shape to the female tail. Spermatozoa spindle-shaped, fairly large. Spicula dorylaimoid, 29—31 μm long. Testes two. Supplements one or two, rather weak, at a distance of 66 μm or 55 and 72 μm, respectively, from cloacal opening. Adcloacal papillae present.

Holotype: male on slide A-5329 in the collection of the author.
Type-locality: in the vicinity of Abidjan, Ivory Coast, soil around roots.

Two of the three *Indodorylaimus* species that have been described hitherto have short, rudimentary anterior uterine sac, shorter than corresponding body width; this sac of the third species, *I. saccatus* AHMAD & JAIRAJPURI, 1985 is, however, well developed, about three times as long as body diameter. *Indodorylaimus africanus* sp. n. comes close to the latter species but differs from that as follows: the body is shorter (1 vs. 1.2—1.4 mm), the cephalic region more strongly narrowed, the spear shorter (12—13 vs. 15—17 μm), collare stronger, the vulva shifted farther back (40—44 vs. 34—36%) ,the tail shorter and supplements are less numerous (1—2 vs. 4).

This is the first species that has been found outside of India or even Asia.

Lagenonema tropicum sp. n.
(Fig. 7A—E)

♀: L = 0.57—0.59 mm; a = 21—23; b = 4.0—4.1; c = 7.6—8.3; V = 40—41%; c' = 4.

Body 25—26 μm wide. Cuticle smooth, on mid-body 0.8—1 μm, on tail 5 μm thick. Head very narrow, 4.5—5 μm, about half as wide as adjacent body. Lips amalgamated. Body at posterior end of oesophagus 5.5—6 times as wide as head. Labial framework and collare sclerotized. Amphids 5—6 μm from anterior end of body, about 1/4 as wide as corresponding body.

Spear 8 μm long, almost twice head diameters, 5—6% of oesophageal length; straight. Aperture occupying about 1/4 of spear length. Guiding ring very thin. Oesophagus 142—145 μm long, suddenly enlarged in 64—65% of its length. Cardia short, tongue-like. Rectum as long as, prerectum 1—1.6 times longer than anal body diameter.

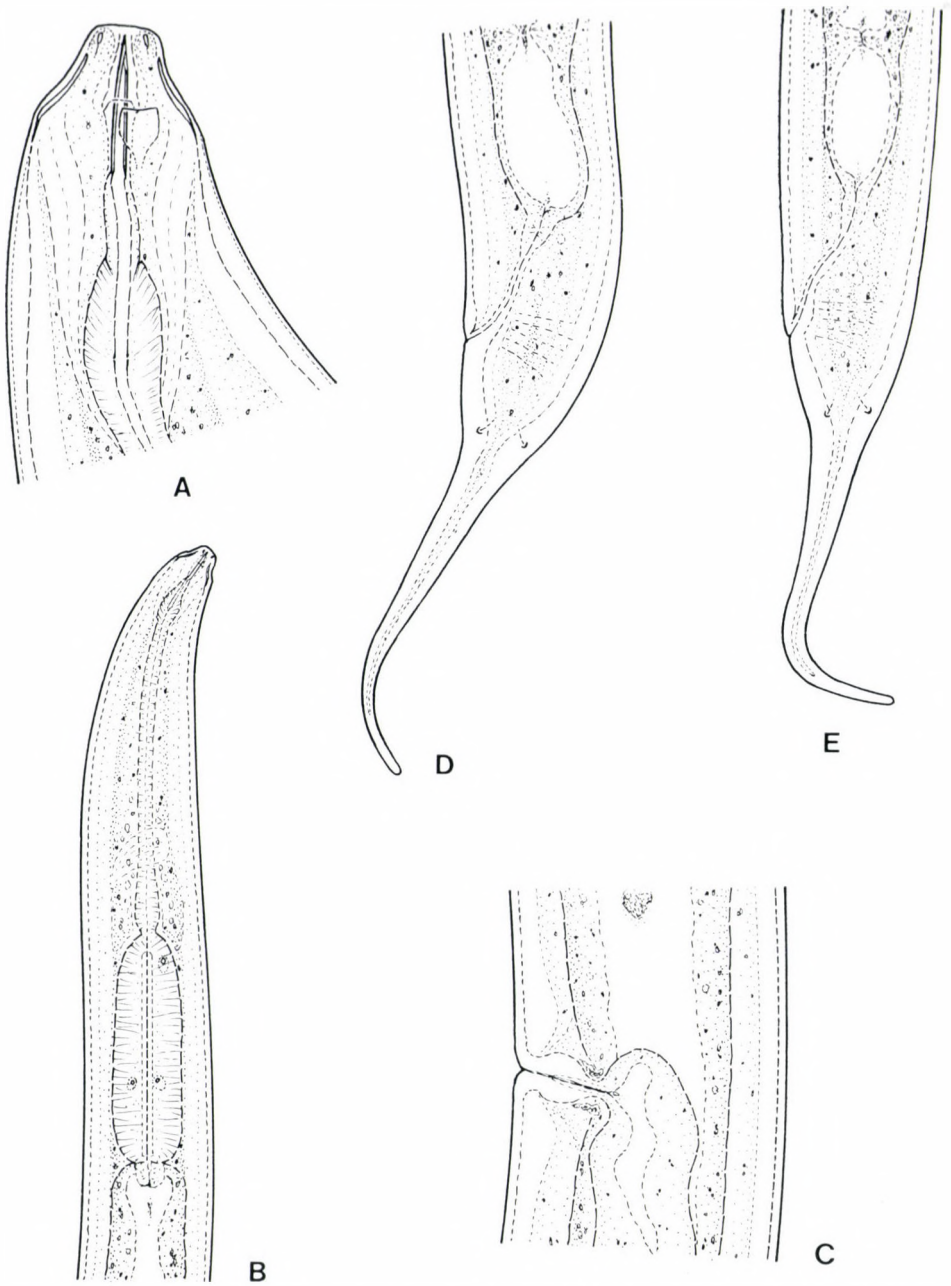

Fig. 7. *Lagenonema tropicum* sp. n. A = anterior end (×2200); B = oesophagus (×560); C = vulval region (×1100); D—E = posterior ends of two females (×760)

Distance between posterior end of oesophagus and vulva shorter (0.6—0.7 times) than oesophagus. Vulva transverse, not sclerotized, vagina piriform, slightly directed backward. Female gonad mono-opisthodelphic, 4—4.5 times as long as body width. Anterior uterine sac practically absent.

Distance vulva-anus 3.6—3.8 times as long as tail. Tail 70—77 μm, 4 anal body diameters long, 12—13% of entire length of body, first rounded then elongate-digitiform with finely rounded terminus. Posterior 15% of tail length "empty".

Males were not found.

Holotype: female on the slide No. 9070 in the collection of the author. Paratypes: two females and a juvenile.
Type-locality: Gogol River, Papua New Guinea, humus from a primary rain forest, September 1969.

Of the four known species of the genus *Lagenonema* this new species comes closest to *L. loofi* (JAIRAJPURI, AHMAD & DHANACHAND, 1980) comb. n. It differs from that in the following characters: the cuticle is hardly thickened behind the spear, the amphids are smaller and other shaped, the oesophagus is suddenly expanded, the vulva located farther back (32—37% in *loofi*) and the tail is somewhat shorter (5—6 anal body widths in *loofi*).

The species of COOMANS and CARBONELL described as "*Thornenema loofi*" from the Ivory Coast agrees very well with our new species, it is a little shorter only (0.46—0.49 mm). It differs just in the same characters from the "true" *loofi* like the New Guinean form.

Opisthodorylaimus maqsoodi AHMAD & JAIRAJPURI, 1982
(Fig. 8A—D)

♀: L = 1.20—1.26 mm; a = 33—35; b = 4.0—4.3; c = 6.5—6.8; V = 42—43%; c' = 8.5—9.

Body 36 μm wide on the middle. Cuticle smooth, 1.5 μm thick on mid-body, subcuticle finely striated. Cuticle level with spear thinner than the latter. Head 12 μm wide, not offset, lips amalgamated. Body at posterior end of oesophagus three times as wide as head. Amphids close to anterior body end (3—4 μm behind that), wider than half body diameter.

Spear fairly strong, 18 μm, 1.5 times as long as labial width, 6% of oesophageal length. Aperture occupying more than 1/3 spear length. Guiding ring thin. Oesophagus 310—316 μm long, in 59—60% expanded. Cardia heart-shaped. Rectum 1.6, prerectum 1.8 times as long as anal body width.

Vulva transverse with well-sclerotized lips; vagina 17 μm long. Gonad opisthodelphic, anterior sac of uterus absent. Distance between posterior end of oesophagus and vulva shorter than oesophagus, 6—7 body diameters.

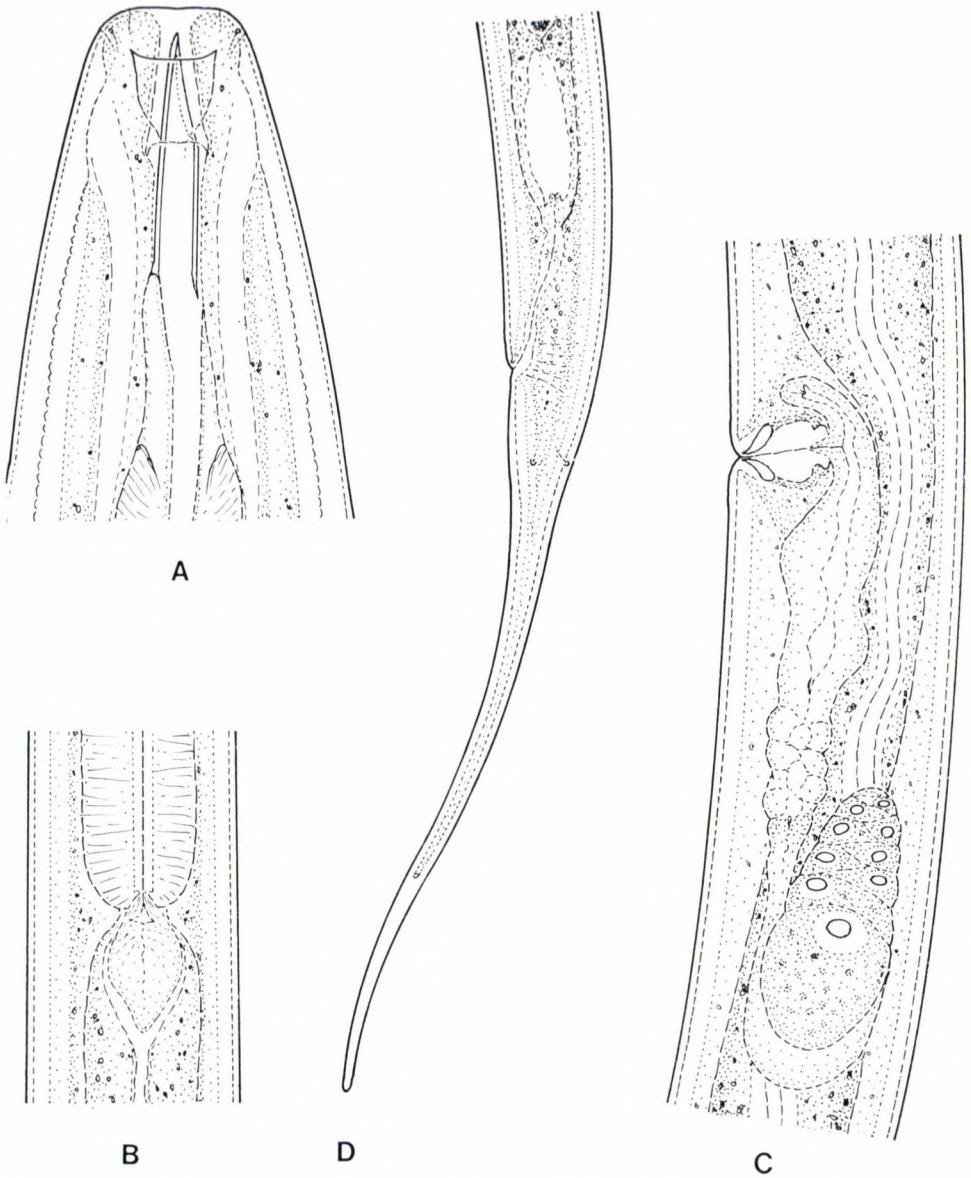

Fig. 8. *Opisthodorylaimus maqsoodi* AHMAD & JAIRAJPURI, 1982. A = anterior end (×1800); B = cardial region (×760); C = female genital region (×760); D = female tail (×560)

Tail 180—185 μm, 8.5—9 times as long as anal body width, 14—15% of entire length of body. Tip of tail finely rounded. Last 30—32% of tail length "empty". Distance vulva-anus 2.8—2.9 times as long as tail.

Locality: De-sang san, Prov. South Phenang, Korea, litter from a small forest, June 1970.

The present specimens well agree with the original description. Only some minor differences are to be found: the head is completely continuous with the neck, the amphids are shifted farther ahead and the tail is somewhat shorter. This is the first datum for the genus outside of India.

Species of the families Thorniidae and Thornenematidae

aculeatus, Dorylaimus	**Thorneella** *a.*
africana, Sclerolabia	**Sclerolabia** *a.*
africanum, Thornenema	= *Thornenema mauritiense*
africanus, Indodorylaimus	**Indodorylaimus** *a.*
baldus, Dorylaimus	**Thornenema** *b.*
baqrii, Opisthodorylaimus	**Opisthodorylaimus** *b.*
borboroph ilus, Dorylaimus	**Nygolaimoides** *b.*
borborophilus, Nygolaimus	**Nygolaimoides** *b.*
camerunensis, Sclerolabia	**Sclerolabia** *c.*
caudatum, Thornenema	**Lagenonema** *c.*
caudatus, Opisthodorylaimus	**Opisthodorylaimus** *c.*
cavalcantii, Dorylaimus	**Opisthodorylaimus** *c.*
cavalcantii, Thornenema	**Opisthodorylaimus** *c.*
chamoliensis, Opisthodorylaimus	**Opisthodorylaimus** *c.*
coomansi, Mehdinema	**Medalinema** *c.*
coomansi, Medalinema	**Medalinema** *c.*
curvicaudatum, Thornenema	inqu.
delhiense, Thornenema	= *Thornenema mauritianum*
dorylaimoides, Thornia	= *Nygolaimoides granulifer*
eburnense, Willinema	**Willinema** *e.*
elongatus, Indodorylaimus	**Indodorylaimus** *e.*
filicaudatus, Opisthodorylaimus	**Opisthodorylaimus** *f.*
filiforme, Thornenema	= *Thornenema mauritianum*
fraternus, Nygolaimoides	**Nygolaimoides** *f.*
goffarti, Dorylaimus	**Thornia** *g.*
gubernaculifera, Thornia	**Nygolaimoides** *g.*
hirschmannae, Thornia	**Thornia** *h.*
indicum, Willinema	**Sclerolabia** *i.*
indicum, Mehdinema	**Medalinema** *i.*
indicum, Sicaguttur	**Medalinema** *i.*
jamaicensis, Sclerolabia	**Sclerolabia** *j.*
juvenilis, Dorylaimus	**Thornia** *j.*
kanhobia, Indodorylaimus	**Indodorylaimus** *k.*
laevicapitatus, Dorylaimus	**Thornenema** *l.*
laopangense, Willinema	**Willinema** *l.*
lissus, Dorylaimus	**Thornenema** *l.*
longicaudatum, Sicaguttur	= *Sicaguttur sartum*
longicaudatum, Thornenema	**Lagenonema** *l.*
loofi, Thornenema	**Lagenonema** *l.*
magna, Thornia	**Thornia** *m.*
maqsoodi, Opisthodorylaimus	**Opisthodorylaimus** *m.*
maraouense, Thornenema	**Thornenema** *m.*
mauritianum, Chrysonema	**Thornenema** *m.*
mauritianus, Eudorylaimus	**Thornenema** *m.*
meyli, Dorylaimus	= *Nygolaimoides gubernaculifer*
minima, Sclerolabia	**Sclerolabia** *m.*
nanum, Willinema	**Willinema** *n.*
opisthodelphus, Dorylaimus	**Willinema** *o.*
opisthodelphus, Eudorylaimus	**Willinema** *p.*
oryzae, Jairajpuria	**Thornenema** *o.*
pak istanicum, Willinema	inqu.
pakistanicum, Thornenema	inqu.
paracavalcantii, Opisthodorylaimus	**Opisthodorylaimus** *p.*
paraconurus, Dorylaimoides	**Thornenema** *p.*

paradoxum, Thornenema ..... = *Thornenema baldum*
paraparvum, Willinema ..... **Willinema** *p.*
parathermophilus, Dorylaimus ..... **Thornia** *p.*
parvum, Labronema ..... **Willinema** *p.*
parvum, Thornenema ..... **Willinema** *p.*
parvus, Eudorylaimus ..... **Willinema** *p.*
pithecusana, Thornia ..... **Thornia** *p.*
prabhae, Mehdinema ..... **Medalinema** *p.*
propinquus, Tylencholaimus ..... **Thornia** *p.*
pusillus, Nygolaimoides ..... **Nygolaimoides** *p.*
qaiseri, Thornenema ..... = *Thornenema lissum*
regiusi, Thornia ..... = *Thornia propinqua*
regiusi magna, Thornia ..... **Thornia** *m.*
rhopalocercoides, Dorylaimus ..... **Thornia** *r.*
saccatus, Indodorylaimus ..... **Indodorylaimus** *s.*
samsoeni, Thornenema ..... **Thornenema** *s.*
sartum, Sicaguttur ..... **Sicaguttur** *s.*
shamimi, Jairajpuria ..... **Thornenema** *s.*
steatopygous, Dorylaimus ..... **Thornia** *s.*
steineri, Thorneella ..... **Thornia** *s.*
steineri, Tylencholaimus ..... **Thornia** *s.*
sulphasae, Dorylaimus ..... **Willinema** *s.*
sulphasae, Eudorylaimus ..... **Willinema** *s.*
sylphoides, Dorylaimus ..... **Opisthodorylaimus** *s.*
sylphoides, Thornenema ..... **Opisthodorylaimus** *s.*
teres, Dorylaimus ..... **Thorneella** *t.*
thermophilus, Dorylaimus ..... **Thornia** *t.*
tropicum, Lagenonema ..... **Lagenonema** *t.*
viriosum, Thornenema ..... = *Thornenema mauritianum*
wickeni, Thornenema ..... **Lagenonema** *w.*

Addendum

After closing the manuscript CARBONELL and COOMANS enriched their fine series on Thornenematidae with two further publications dealing with the genera *Sicaguttur*, *Medalinema* and *Thornenema* (1986, 1987). In these papers as well as in the present article there can be found good agreements (e. g. the synonymization of *Jairajpuria* with *Thornenema)* but some discrepancies, too (e. g. the taxonomic position of *Medalinema)*. VAN REENEN and HEYNS (1986) described a new species of *Medalinema (M. mopanicum)*, whilst in the paper of KHAN and SAEED (1986) a new species of *Thornenema (Th. shahi)* is described, and *Chrysonema dubium* is transferred to *Thornenema* and *Eudorylaimus udaipurensis* to *Sclerolabia* as new combinations.

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15N DYNAMICS IN GRASSLAND COMMUNITIES II. INVESTIGATIONS OF THE CONSUMER SUBSYSTEM IN A SANDY GRASSLAND*

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The nitrogen uptake by various Arthropoda groups was investigated by the 15N isotope dilution method under field conditions. On the basis of the parameters of the isotope uptake curves differences can be found between two groups of the herbivores and the omnivores and carnivores separable from each other. The 15N uptake rates of the populations living in the grass layer is remarkably higher than of those living in the litter layer. The uptake rate is discussed as a measure of the rate constant of the compartment models.

Nitrogen is the most important element in grasslands which greatly affects the structure and functions of these systems (RISSER and PARTON, 1982, WOODMANSEE et al., 1978). Recently the interest in the effects of N increased and therefore some N budgets have been constructed to model the N dynamic processes of the whole system. Generally, the animals were neglected from these budgets, because most of the nitrogen is cycled among the soil-plant-microorganism subsystems. The problem of the role of consumers in the nitrogen budgets of the Nort American grasslands was investigated and the large ungulates were found to have significant effects on the nitrogen flows (WOODMANSEE et al., 1978). The importance of arthropods in these systems is, however, scarcerly known.

In the nitrogen budgets of ecosystems the animals have frequently been left out of consideration (REUSS and INNIS, 1977). In other cases the parameters of the consumer compartment were not measured, only estimated (PENDLETON et al., 1983, WOODMANSEE et al., 1978). In models constructed for meadows with more or less intensive agricultural activity the consumer subsystems were taken into consideration, too. Since the aim of these models was to obtain knowledge on how human activity can effectively influence the milk and meat production, in the consumer compartment the cattle and/or other mammals were considered, but not the arthropods (HAKAMATA and HIRASHIMA, 1978, RISSER and PARTON, 1982).

In the compartmental models the estimation of the rates and rate constants is based conventionally on mass balance equations (COBELLI et al., 1979). This is the case in the above-mentioned papers, too. There is a possibility to estimate the parameters of the intercompartmental material flows

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with the isotope dilution method. But 15N has not been used to follow nitrogen in the consumer subsystems of grassland ecosystems. Therefore, the purpose of this paper is to investigate the 15N flows in the consumer subsystem of a sandy grassland community, to determine the 15N uptake curves, uptake rates (rate constants) and 15N utilization efficiency for those arthropods most important in the examined grassland.

M e t h o d s. The methods of the field experiments and the procedures used for chemical analyses were treated in the first part of this paper (MOLNÁR et al., 1983).

The isotope uptake curves were determined by the maximum likelihood method. It was taken into consideration, that the variance of the data is great because of individual variability. Therefore, only Verhulst-Brody and simple logistic curves were fitted.

The establishing of the rate constants with isotope dilution method is performed by two wide-spread methods. The first one is when the rate of the isotope fraction loss is measured (SHIPLEY and CLARK, 1972). In the given experiments and circumstances this method was not correct. The second method is based on the calculation of the rate of 15N at. % measured on the given day and of 15N at. % of the saturation level. This calculation has to be done on every sampling day and the rate constants can be estimated from the slope of these points (SVÁB, 1981). This method is theoretically correct, but it is not used in this paper for two reasons. 1. In this case the duration of the experiments and the number of data used for the linear regression analysis can be subjectively established, and so the value of the maximal isotope uptake rate may be changed by 10—20%. 2. This method is not sensitive enough.

Therefore, the best method, in my opinion, for estimating the 15N uptake rate is the calculation of the differential quotient. The advantages are the following: 1. It can be calculated unambiguously. 2. The values can be compared independently from the types of the curves. 3. It is sensitive for small changes of the parameters of the curve. 4. It can be interpreted as optimum uptake rate.

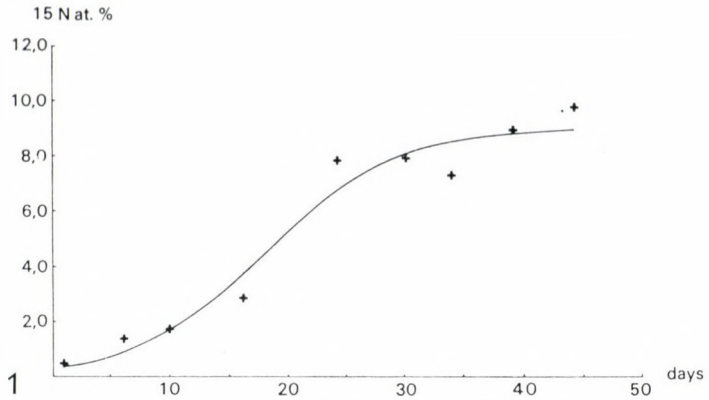
The differential quotial quotients of the first degree of the equations of the Verhulst-Brody and simple logistic curves are:

a) Verhulst—Brody curve: $y' = Aace^{cx}$

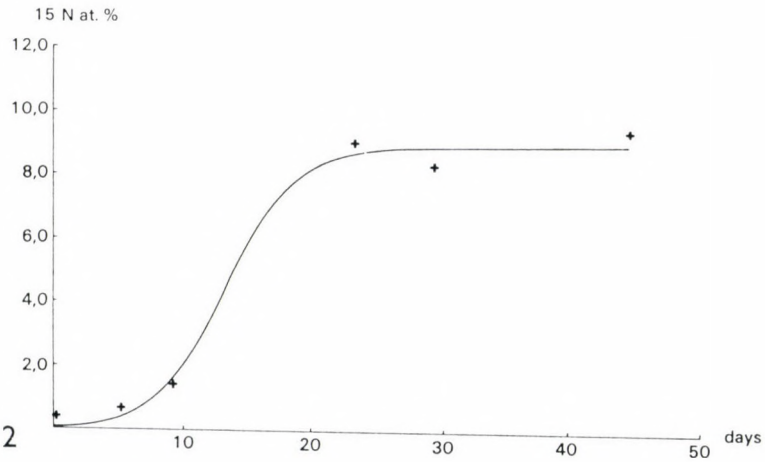
b) simple logistic curve: $y' = \frac{Aace^{cx}}{(1 + ae^{cx})^2}$

where A = 15N at. % saturation level, c = relative uptake rate, a = constant.

Figs 1—3. 1 = Fitted uptake curve of Acridida in 1977; 2 = fitted uptake curve of the *Montana montana* in 1977; 3 = fitted uptake curve of *Lasius aliaenus* in 1977


15 N at. %
12,0
10,0
8,0
6,0
4,0
2,0
10
20
30
40
50
days

1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8,0
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4,0
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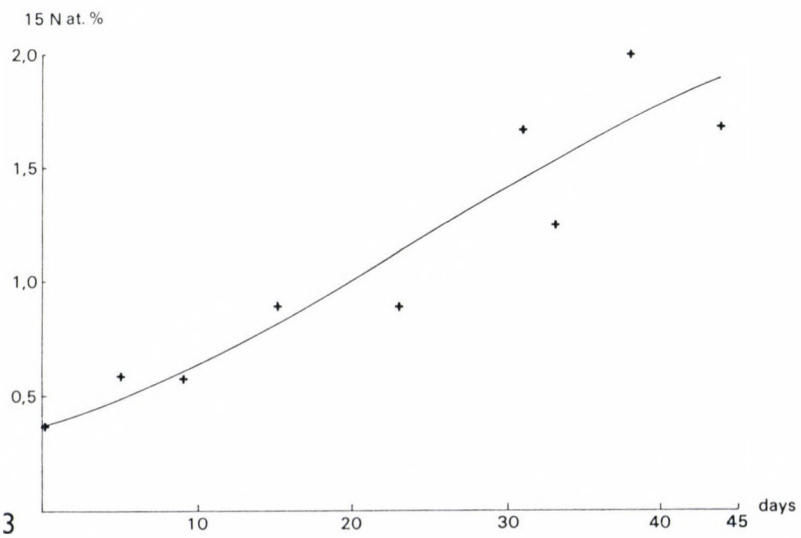
30
40
50
days

2


15 N at. %
2,0
1,5
1,0
0,5
10
20
30
40
45
days

3

In the case of the Verhulst-Brody curve the uptake rate is given by the differential quotient of the first degree of the x value at $y = 0$, whereas, in the case of the simple logistic curve at $y = A/2$.

The Spearman's rank correlation estimations were made by SVÁB (1981).

Results. The 15N excess in animals can be described by sigmoid curves (Figs 1—8). Auchenorrhyncha is an exception, where the fitting of an

Table 1

Parameters of the curves fitted to the 15N at. % excess in different compartments and years

Taxon	Saturation level (A ± 95%*)	Relative uptake rate (c)	Significance of fitting (p)
1977			
Acridida	8.95 (8.0—10.0)	—0.181	0.001
Araneidea	4.54 (2.7— 6.4)	—1.392	0.05
Auchenorrhyncha	8.41 (7.3— 9.6)	—0.089	0.01
Lasius alienus	2.31 (0.8— 3.8)	—0.073	0.01
Montana montana	8.96 (6.9—11.0)	—0.363	0.001
1978			
Acridida	6.77 (4.8— 8.8)	—0.130	0.001
Araneidea	1.77 (—)	—0.103	—
Auchenorrhyncha	2.84 (2.5— 3.2)	—0.188	0.001
Lasius alienus	0.72 (0.6— 0.9)	—0.198	0.05
Montana montana	3.44 (3.0— 3.9)	—0.209	0.001
Heteroptera	2.69 (2.2— 3.2)	—0.367	0.001

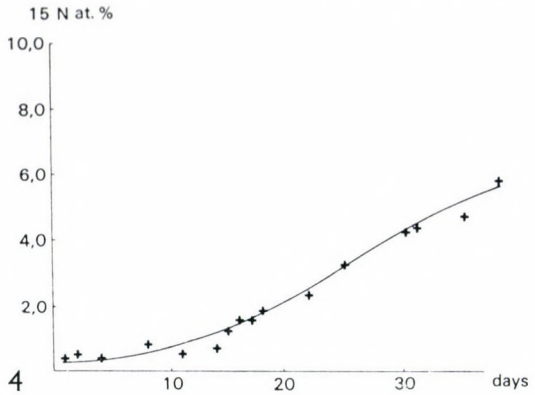
* Interval of confidence

Verhulst-Brody curve was the most correct (Figs 9—10). In 1977 the highest saturation level was given by the herbivorous Acridida and Auchenorrhyncha and the omnivorous (BAKONYI, 1980) *Montana montana*. The lowest saturation level was measured in *Lasius aliaenus*. The Araneidea showed an intermediate level. The results were similar in 1978, too (Table 1).

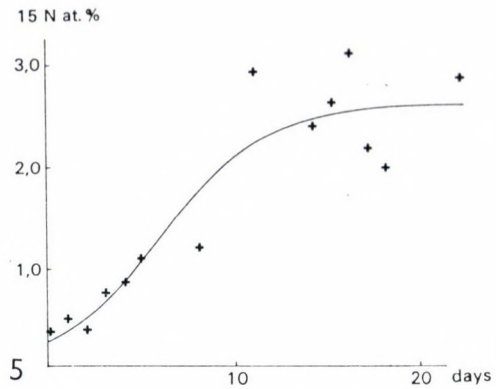
There were great differences among the saturation levels in the various taxa. The 15N at. % saturation level was relatively high in Acridida in both years. Contrasting the saturation level of 1977 with that of 1978, it was remarkably less in Auchenorrhyncha and *Montana montana*. The values given by the Auchenorrhyncha and Heteroptera were almost the same (Table 1).

Because the 15N isotope content of the fertilizer was different in the two years of the experiments, the isotope uptake rates in the same taxon

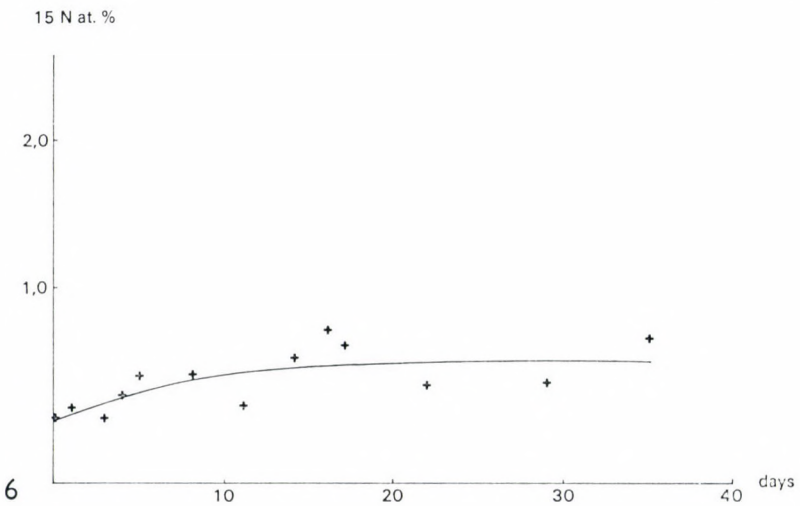
Figs 4—7. 4 = Fitted uptake curve of Acridida in 1978; 5 = fitted uptake curve of Heteroptera in 1978; 6 = fitted uptake curve of *Lasius aliaenus* in 1978; 7 = fitted uptake curve of *Montana montana* in 1978


15 N at. %
10,0
8,0
6,0
4,0
2,0
10
20
30
days

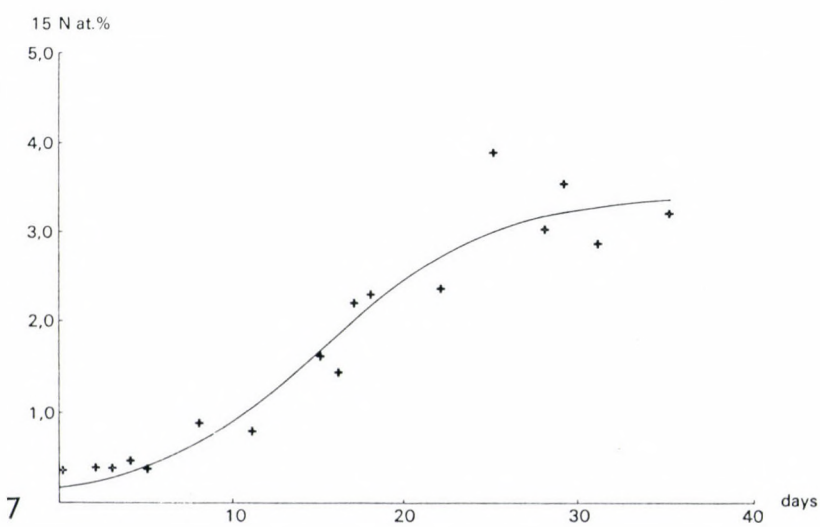
4


15 N at. %
3,0
2,0
1,0
10
20
days

5


15 N at. %
2,0
1,0
10
20
30
40
days

6


15 N at. %
5,0
4,0
3,0
2,0
1,0
10
20
30
40
days

7

Table 2

The 15N uptake rates of different compartments (at. %/day)

Taxon	1977	1978
Acridida	0.404	0.220
Auchenorrhyncha	0.752	0.533
Araneidea	0.445	0.085
Heteroptera	—	0.247
Lasius alienus	0.042	0.036
Montana montana	0.814	0.180

Table 3

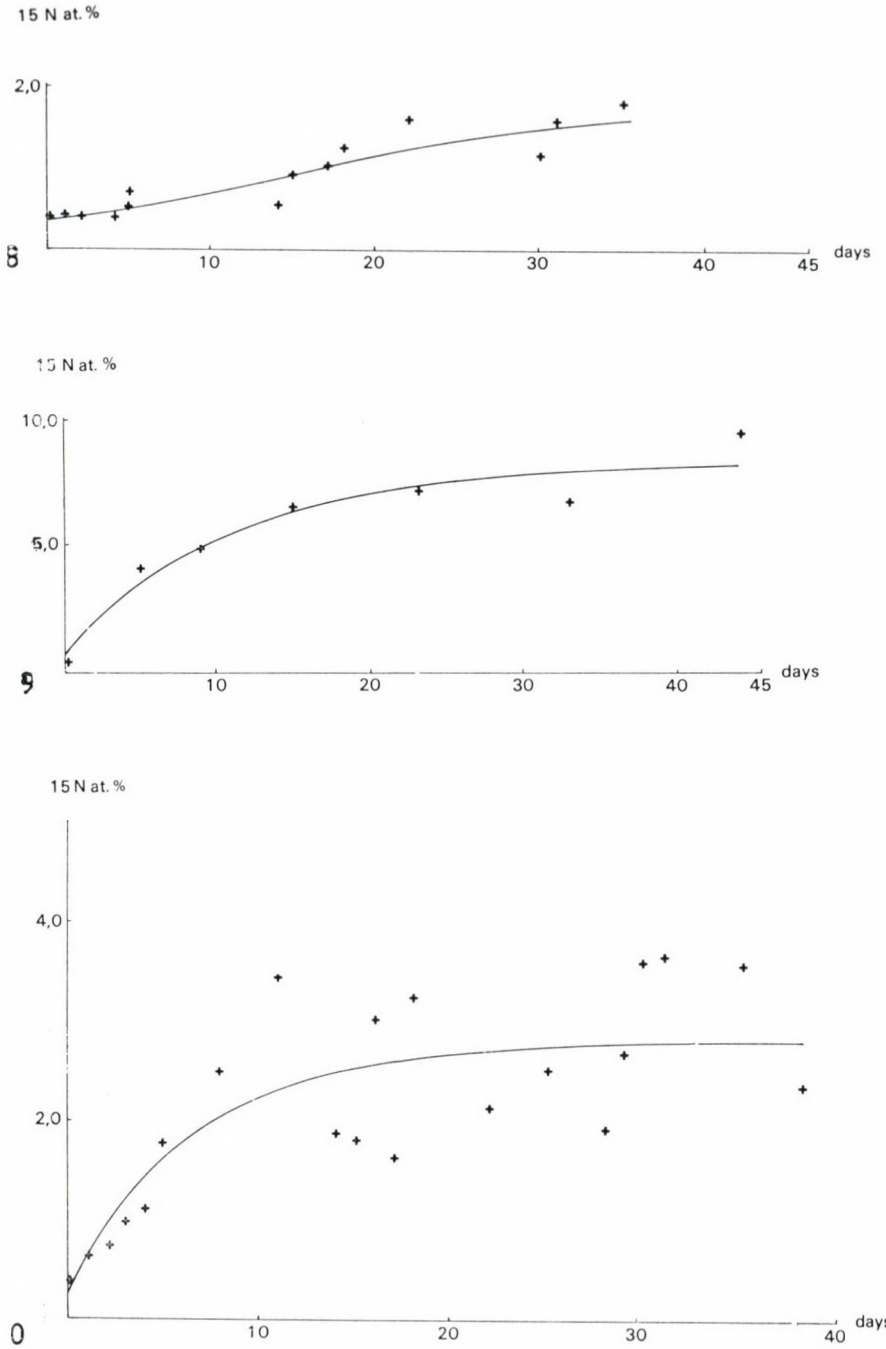
The average 15N at. % in various consumer compartments

Taxon	15N at. %	Number of sample
Anisoplia segetum	0.72	3
Cicindela soluta	0.67	3
Creoleon lugdinense	0.73	4
Crypticus quisquilius	1.23	5
Galeruca pomonae	1.84	4
Heteroptera	8.29	3
Mantis religiosa	8.27	5

cannot be compared with each other by their absolute values. But they can be compared with each other by the sequence of 15N uptake rate (Table 2). In 1977 the 15N uptake rate was the greatest in Auchenorrhyncha and *Montana montana*. The value of the uptake rate was only the half of this in Acridida, the same as in Araneidea, and one order less in *Lasius aliaenus*. In 1978 compared with the year before the 15N uptake rate of Araneidea and *Montana montana* greatly decreased in comparison to the other groups. Otherwise the sequence, Auchenorrhyncha, Acridida, *Lasius aliaenus*, was the same and the rates compared to each other were rather similar. In Heteroptera the uptake rate of the isotope was similar to the Acridida and not to the Auchenorrhyncha.

The rank of the saturation levels had thoroughly correlated in the two years ($r = 0.93$; $p = 0.01$). But the rank of the maximal differential quotients was different.

In 1977 the 15N at. % excess was measured in some species sampled only sporadically (there were only some specimens of these species in the experimental cage) (Table 3). These data, however, display remarkable tendency. In the grass layer the 15N at. % excess of the Heteroptera (*Menaccarus arenicola* and Lygaeida sp.), feeding on plant sap, was high already from the middle of the experiment. It was similar also in *Mantis religiosa*, which is



Figs 8—10. 8 = Fitted uptake curve of Araneidea in 1978; 9 = fitted uptake curve of Auchenorrhyncha in 1977; 10 = fitted uptake curve of Auchenorrhyncha in 1978

a predator and is living in the same place. In the detritivorous *Crypticus quisquilius* living on the soil layer the 15N accumulation was slow. In the predacious *Cicindela soluta* and *Creoleon lugdunense* living on the soil layer, no isotope excess could be measured at that time.

D i s c u s s i o n. The rate constant or the material flow between two compartments often has been estimated by the isotope dilution method. This is a conventional procedure in physiological studies. In compartmental models developed for the simulation of the nitrogen dynamics of food chains or of whole grassland ecosystems, however, the 15N isotope dilution method has never been used for the estimation of the rate constant or the material flow between the compartments.

From the values of the uptake rates and saturation levels of 15N uptake curves it is possible to establish the trophic position of a population under field conditions. As SHURE (1970) has pointed out, great care and the exact knowledge of the circumstances are necessary for this method. Examinations with 32P isotope on old fields proved, that after marking the plants the isotope activity peak is measurable soon in the primary consumers. In predators the isotope uptake is slower and the activity peak is remarkably lower. The intermediate position of the peak indicates omnivorous feeding type. The uptake curves of the populations of the detritivorous food chain are definitely lower than those measured in the populations of the herbivorous food chain (ODUM and KUENZLER, 1963, SHURE, 1973, WIEGERT et al., 1967). The results of the present examinations are more or less similar to these results mentioned above. Among the primary consumers, insects having sucking mouthparts (Auchenorrhycha, Heteroptera) reached the saturation level sooner than those having chewing mouthparts (Acridida) and the isotope uptake rate was higher, too. MARPLES (1966) has got similar result in a salt marsh ecosystem. The fact, that the feeding type of *Montana montana* is omnivorous was obtained not only with the examination of the 15N uptake curve but also with the analysis of the gut content (BAKONYI, 1980). The ant, *Lasius aliaenus* in Festuca vaginatae plant associations feeds on various Arthropoda groups but the most important one is, in all probability, the Araneidea (GALLÉ, 1981). On the basis of the 15N uptake curves received from the examinations this feeding type seems to be possible. The carnivorous trophic position of Araneidea living in the grass layer and the detritivorous and carnivorous trophic position of the consumer populations living in the litter layer fit in with the very different parameters of the 15N uptake curves of the above-mentioned groups.

The values of the uptake rates depend on the isotope content of the fertilizer. This fact was established already by WILLIAMS and FISHER (1985), too. In most taxa the change in the values of the uptake rates is not directly proportional with the change of the isotope content of the fertilizer. Therefore, a simple correction is not possible and the data of the two years cannot

be compared by their absolute values. Comparing the form of the uptake curves, the values of the uptake rates and the relative uptake rates show, that the slope of the curves is represented better by the uptake rates.

It can be concluded, that the trophic position of several consumer populations in the food chains can be determined on the basis of the parameters of the 15N uptake curves. The isotope uptake rate can be used for estimating the constant rates of the compartmental models.

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A NEW OUTLINE OF THE FAMILY LOHMANNIIDAE BERLESE, 1916 (ACARI, ORIBATEI)

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Authors reviewed 25 genera, including 140 valid species of the family Lohmanniidae in comprehensive keys with 163 original drawings.

The first known species of the family Lohmanniidae was described by HALLER (1884) as *Michaelia paradoxa*. Since the name *Michaelia* had already been in use for a mite of an other group, consequently, MICHAEL (1898) replaced the name by *Lohmannia* and he added simultaneously the species *Angelia murcioides* BERLESE, 1896 to the genus. The following species of the family was described by CANESTRINI (1897) as *Hermannia rubescens* from New Guinea, collected by L. BIRÓ, the famous Hungarian explorer.

It was GRANDJEAN (1950) who published the first summary of the family. In this, he mentioned 15 species; eleven of them have been previously described by several authors, while four others were discussed by GRANDJEAN as new species. Furthermore, he reviewed the family on completely new morphological and phylogenetical bases, increasing the number of genera from two to six. Interestingly enough one species: *Lohmannia brevipes* BANKS, 1947 is missing from GRANDJEAN's work discussing the species of the family Lohmanniidae in 1950. Apparently, this reference somehow escaped his attention. This work of GRANDJEAN, similarly to many of his others, gave sound basis for further taxonomic research of the family. Accordingly, our knowledge was substantially increased concerning the family Lohmanniidae.

In the second summary, published by J. BALOGH (1961), a total of 12 genera and 28 species were discussed. Subsequent to this work, numerous species have been described from various parts of the world, and several publications treating the Lohmanniidae of some biogeographical regions or of smaller areas, appeared in various journals. As an example we mention the comprehensive work of WALLWORK (1962) discussing the representatives of the family found in Ghana. This work is exemplary in its descriptions and the quality of its illustrations. A similar endeavour is that of CORPUZ-RAROS (1979) on the Lohmanniidae of the Philippine Islands, which published valuable ecological references of 11 species. Of similarly high quality works are those of SENGBUSCH (1982a, 1982b, 1984a, 1984b) on the Micronesian Lohmanniidae

in which excellent examples are given how to compare descriptions of different quality and of different nature, and how the conclusions can be used in taxonomic papers.

In the present work, which is the third summary of the family Lohmanniidae, we present identification keys for the 140 valid species and 25 genera, complemented with some further data and figures that are necessary in identification. Following this, we give a catalogue of Lohmanniidae and references of literature in which data and figures are found of the species described so far. Obviously, the identification tables are sufficient only for an overall survey of the family and for quick identification. In case we come up against the slightest of doubt, then we should directly turn our attention to the original description. This may easily be done with the simultaneous usage of the catalogue and the literature references.

The most important morphological features of the Lohmanniidae, which are indispensible in identification, we considered to be known. However, to

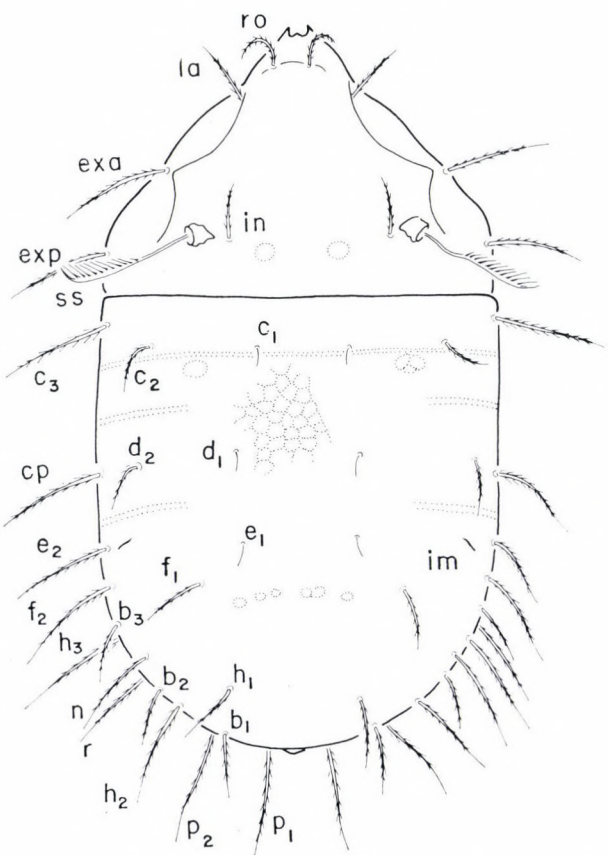
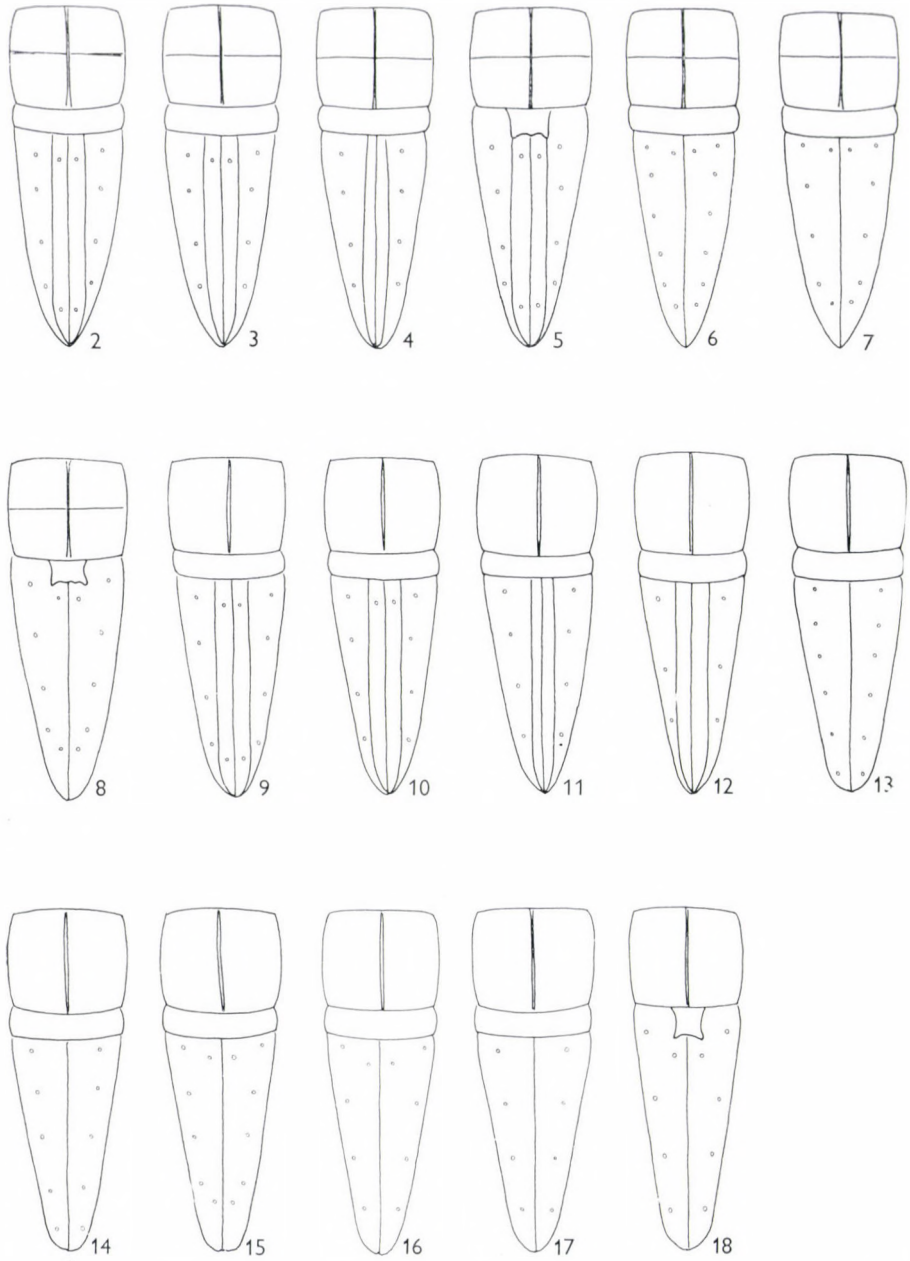


Fig. 1. Prodorsal and notogastral nomenclature for Lohmanniidae



Figs 2—18. Rough illustration of the anogenital region. 2 = *Thamnacarus*, *Lohmannia* (11142) 3 = *Carolohmannia* (11141); 4 = *Meristolohmannia* (11140); 5 = *Papillacarus*, *Vepracarus*, *Lepidacarus* (11042); 6 = *Heptacarus* (10152); 7 = *Nesiacarus*, *Xenolohmannia* (10142); 8 = *Cryptacarus* (10042); 9 = *Mixacarus*, *Phyllolohmannia* (01142); 10 = *Ulolohmannia* (01141); 11 = *Meristacarus* (01140); 12 = *Austracarus* (01130); 13 = *Strinatacarus* (00160); 14 = *Torpacarus* (00150); 15 = *Annectacarus*, *Paulianacarus*, *Millotacarus* (00142); 16 = *Haplacarus* (00141); 17 = *Javacarus*, *Euryacarus* (00140); 18 = *Dendracarus* (00041)

make the work easy we give a short summary of the notogastral chaetotaxy and some diagrammatic figures to show the differentiation of the genital and anal regions. Finally, in order to easily compare the 25 valid genera, we propose a code-table based on six morphological characteristics.

Code numbers of genera

	1	2	3	4	5	6
Thamnacarus GRANDJEAN, 1950	1	1	1	4	2	1
Lohmannia MICHAEL, 1898	1	1	1	4	2	0
Carolohmannia NORTON et al., 1978	1	1	1	4	1	0
Meristolohmannia BALOGH et MAHUNKA, 1966	1	1	1	4	0	0
Papillacarus KUNST, 1959	1	1	0	4	2	1
Vepracarus AOKI, 1965	1	1	0	4	2	1
Lepidacarus CSISZÁR, 1961	1	1	0	4	2	1
Heptacarus PIFFL, 1963	1	0	1	5	2	1
Nesiacarus CSISZÁR, 1961	1	0	1	4	2	1
Xenolohmannia BALOGH et MAHUNKA, 1969	1	0	1	4	2	1
Cryptacarus GRANDJEAN, 1950	1	0	0	4	2	1
Mixacarus BALOGH, 1958	0	1	1	4	2	0
Phyllolohmannia gen. nov.	0	1	1	4	2	0
Ululohmannia MAHUNKA, 1987	0	1	1	4	1	0
Meristacarus GRANDJEAN, 1934	0	1	1	4	0	0
Austracarus J. BALOGH et P. BALOGH, 1983	0	1	1	3	0	0
Strinatacarus MAHUNKA, 1977	0	0	1	6	0	0
Torpacarus GRANDJEAN, 1950	0	0	1	5	0	0
Annectacarus GRANDJEAN, 1950	0	0	1	4	2	1
Paulianacarus BALOGH, 1960	0	0	1	4	2	0
Millotacarus BALOGH, 1960	0	0	1	4	2	0
Haplacarus WALLWORK, 1962	0	0	1	4	1	0
Javacarus BALOGH, 1961	0	0	1	4	0	0
Euryacarus WOOLLEY, 1966	0	0	1	4	0	0
Dendracarus BALOGH, 1960	0	0	0	4	1	1

1: Transverse suture	1 = present, 0 = absent
2: Anal and adanal plates	1 = separated, 2 = fused
3: Preanal plate	1 = wide, 2 = narrow
4: Number of adanal setae	from 3 to 6
5: Number of anal setae	from 0 to 3
6: Pygidial neotrichy	1 = present, 0 = absent

Key to genera

1 (22) Genital plates with transversen suture.
2 (15) Anal and adanal plates at least in their anterior part separated.
3 (10) Preanal plate broad.
4 (5) Pygidial neotrichy present — **Thamnacarus** GRANDJEAN, 1950
5 (4) Pygidial neotrichy absent.
6 (7) Anal setae absent — **Meristolohmannia** BALOGH et MAHUNKA, 1966
7 (6) One or two pairs of anal setae present.
8 (9) One pair of anal setae present — **Carolohmannia** NORTON et al., 1978
9 (8) Two pairs of anal setae present — **Lohmannia** MICHAEL, 1898
10 (3) Preanal plate narrow.
11 (12) Notogastral setae phylliform or spoon-shaped — **Lepidacarus** CSISZÁR, 1961

12 (11) Notogastral setae setiform, ramified or ciliate.
13 (14) Pygidial setae setiform, ciliate; weak pygidial neotrichy (8 to 17 pairs of neotrichial setae) **Papillacarus** KUNST, 1959
14 (13) Pygidial setae ramified or arboriform; strong pygidial neotrichy (20 to 50 pairs of neotrichial setae) **Vepracarus** AOKI, 1965
15 (2) Anal and adanal plates fused.
16 (17) Preanal plate narrow **Cryptacarus** GRANDJEAN, 1950
17 (16) Preanal plate broad.
18 (19) Five pairs of adanal setae present **Heptacarus** PIFFL, 1963
19 (18) Four pairs of adanal setae present.
20 (21) Ano-adanal plates broad, much broader than genital plates. Preanal plate covered by ano-adanal plates **Xenolohmannia** BALOGH et MAHUNKA, 1969
21 (20) Ano-adanal plates narrow, never broader than genital plates. Preanal plate uncovered **Nesiacarus** CSISZÁR, 1961
22 (1) Genital plates without transverse suture.
23 (30) Anal and adanal plates separated.
24 (25) Three pairs of adanal setae present **Austracarus** J. BALOGH et P. BALOGH, 1983
25 (24) Four pairs of adanal setae present.
26 (27) Anal setae absent. Anal plates narrow, band-like **Meristacarus** GRANDJEAN, 1934
27 (26) One or two pairs of anal setae present.
28 (29) One pair of anal setae present **Ululohmannia** MAHUNKA, 1987
29 (28) Two pairs of anal setae present.
30 (31) All dorsal setae setiform, simple. One or more transverse bands interrupted **Mixacarus** BALOGH, 1958
31 (30) Prodorsal setae *exa*, *le* and *ro* extremely broad, almost kidney-shaped. All transverse bands of notogasters complete **Phyllolohmannia** gen. n.
32 (23) Anal and adanal plates fused.
33 (46) Preanal plate broad.
34 (35) Six pairs of adanal setae present **Strinatacarus** MAHUNKA, 1974
35 (34) Five or four pairs of adanal setae present.
36 (37) Five pairs of adanal setae present **Torpacarus** GRANDJEAN, 1950
37 (36) Four pairs of adanal setae present.
38 (43) One or two pairs of anal setae present.
39 (40) One pair of anal setae present **Haplacarus** WALLWORK, 1962
40 (39) Two pairs of anal setae present.
41 (42) Notogastral setae setiform. Areae porosae on prodorsum and notogaster well developed **Paulianacarus** BALOGH, 1960
42 (41) Notogastral setae slightly dilated, phylliform. Areae porosae absent **Millotacarus** BALOGH, 1960
43 (38) Anal setae absent.
44 (45) Sensillus with long, pectinate branches. Notogastral setae blade-shaped. Notogaster longer than wide **Javacarus** BALOGH, 1961
45 (44) Sensillus with short cilia. Notogastral setae setiform. Notogaster as long as wide **Euryacarus** WOOLLEY, 1966
46 (33) Preanal plate narrow.
47 (48) One pair of anal setae present. Neotrichial setae on notogaster partly arboriform **Dendracarus** BALOGH, 1960
48 (47) Two pairs of anal setae present. Neotrichial setae setiform **Annectacarus** GRANDJEAN, 1950

Thamnacarus GRANDJEAN, 1950

Genital plates with transverse suture. Anal and adanal plates separated. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present. Notogaster and epimeral region with neotrichy.

Type-species: *Lohmannia deserticola* GRANDJEAN, 1934

Four species.

Key to species

1 (2) Sensillus clavate, very wide, with rounded tip. Notogastral setae accumbent, somewhat bacilliform, densely ciliate. Strong neotrichy present mainly in pygidial and epimeral regions. 32 pairs of notogastral setae. Epimeral setal formula: *6—8—3—4*. L: 504 μm; W: 222 μm. — North Africa: Morocco (Pl. 1: A—B)
deserticola (GRANDJEAN, 1934)

2 (1) Sensillus very finely incrassate, apically pointed.

3 (4) Lamellar setae about twice longer than rostral setae. Marginal setae of notogaster longer than medial setae. Weak notogastral neotrichy present in pygidial and epimeral regions. 25 pairs of notogastral setae. Epimeral setal formula: *6—(7—8)—3—4*. L: 530 μm; W: 240 μm. — Soviet Union: Tadzhikistan, Ethiopia (Pl. 1: C)
elongatus KRIVOLUTSKY, 1971

4 (3) Lamellar and rostral setae of the same length. No appreciable length difference among marginal and medial setae of notogaster.

5 (6) Rostrum convexly rounded in front. Notogastral setae extraordinarily long: c_1 much longer than distance between c_1—d_1. L:460—520 μm; W: 200—220 μm. — Soviet Union, Turkmenia (Pl. 1: D) **longisetosus** BULANOVA-ZACHVATKINA, 1978

6 (5) Rostrum concavely rounded in front. Notogastral setae shorter: c_1 as long as distance c_1—d_2. L: 480—500 μm; W: 200 μm. — Soviet Union, Turkmenia (Pl. 2: A)
smirnovi BULANOVA-ZACHVATKINA, 1978

Meristolohmannia BALOGH et MAHUNKA, 1966

Genital plates with transverse suture. Anal and adanal plates separated. Preanal plate wide. Anal setae absent, four pairs of adanal setae present. Notogaster and epimeral region without neotrichy. Anal plates narrow, band-like.

Type-species: *Meristolohmannia meristacaroides* BALOGH et MAHUNKA, 1966

Two species.

Key to species

1 (2) Sensillus with 10—11 short branches. Setae *exa* long, as long as *le* and *in*. L: 897—984 μm; W: 459—500 μm. — Australia, Queensland (Townsville) (Pl. 3: B—C)
meristacaroides BALOGH et MAHUNKA, 1966

2 (1) Sensillus with 4—5 branches. Setae *exa* shorter than setae *le* and *in*. L: 940—980 μm; W: 620—540 μm. — China, Tingusany (Pl. 3: A)
chinensis (BULANOVA-ZACHVATKINA, 1960)

Carolohmannia NORTON et al., 1978

Genital plates with transverse suture. Anal and adanal plates separated. Preanal plate broad. One pair of anal, four pairs of adanal setae present. Notogaster and epimeral region without neotrichy.

Type-species: *Lohmannia* (*Carolohmannia*) *carolensis* NORTON et al. 1978

One species.

— — Sensillus pectinate, with approximately 12 pectinations. Prodorsal setae *in*, *le* and *ro* long, setiform, ciliate, *exa* and *exp* dilated, phylliform, short. Two pairs of setae on

mentum setiform, two pairs phylliform. Four pairs of epimeral setae phylliform, rest of setae setiform. Anal setae much shorter than adanal setae. L: 966—1025 μm; W: 567—631 μm. — USA: North Caroline (Pl. 2: B—C)
carolensis (NORTON et al., 1978)

Lohmannia MICHAEL, 1898

Genital plates with transverse suture. Anal and adanal plates separated. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present. Notogaster and epimeral region without neotrichy.

Type-species: *Michaelia paradoxa* HALLER, 1884. (Typus auxiliaris: *Lohmannia lanceolata* GRANDJEAN, 1950)

Seventeen species (and some species inquirenda).

Key to species

1 (4) Setae *exp* setiform and long, as long as setae c_3 and d_3.
2 (3) Setae *exp* as long as setae *exa*. Notogastral setae on their basal half fusiform, incrassate, verticillately ciliate. L: 865 μm; W: 320 μm. — Yugoslavia (Pl. 4: A)
regalis BERLESE, 1923
3 (2) Setae *exp* about twice longer than setae *exa*. Notogastral setae on their basal half only slightly fusiform, unilaterally or bilaterally ciliate. L: 902 μm; W: 374 μm. — Greece (Pl. 4: B) **reticulata** SELLNICK, 1931
4 (1) Setae *exp* resembling a willow leaf, ellipsoid or circular, much shorter than setae c_3 and d_3.
5 (6) Setae *exp* resembling a willow leaf, long, narrow, denticulate; about ten times longer than wide. Setae *exa* curved, exteriorly denticulate, of the same length as *exp*. Notogaster with polygonate structure; notogastral setae setiform. L: 930—950 μm; W: 430—465 μm. — Korea (Pl. 4: D) **coreana** CHOI, 1985
6 (5) Setae *exp* ellipsoid or circular, at most twice or thrice longer than wide.
7 (14) Setae *exp* ellipsoid, twice to thrice longer than wide.
8 (9) Surface of body without polygonale structure. L: 830 μm; W: 325 μm. [At first view very similar to *L. lanceolata* GRANDJEAN, 1950, but a) *exp* thrice longer than wide, b) *exa* very slightly dilated, c) *ro* very slightly dilated. *L. lanceolata*: a) *exp* circular about as long as wide, b) *exa* almost like a willow leaf, c) *ro* dilated shaped as a willow leaf.] — Peru (Pl. 4: C) **similis** BALOGH, 1962
9 (8) Surface of body with polygonate structure (three very similar species).
10 (11) Notogastral setae long: setae c_1 only a little shorter than distance $c_1—d_1$. L: 1030—1080 μm; W: 560—600 μm. — Japan, Okinawa (Pl. 5: A)
corallium NAKATAMARI, 1982
11 (10) Notogastral setae shorter: setae c_1 almost twice shorter than distance $c_1—d_1$.
12 (13) Setae *ro* dilated, shaped as a willow leaf. 3rd and 8th transverse bands of notogaster continuous. L: 942—972 μm; W: 460—493 μm. — Java (Pl. 5: B)
javana javana BALOGH, 1961
13 (12) Setae *ro* very slightly dilated. 3rd and 8th transverse bands of notogaster interrupted. L: 850—890 μm; W: 410—425 μm. — Korea (Pl. 5: C)
javana interrupta CHOI, 1985
14 (7) Setae *exp* almost circular, only a little longer than wide.
15 (18) Notogastral setae setiform with pointed tip; never phylliformly dilated.
16 (17) Notogastral setae long: distance $c_1—d_1$ less than twice longer than setae c_1. L: 840—880 μm; W: 410—430 μm. — Panama, Peru (Pl. 5: D)
lanceolata GRANDJEAN, 1950
17 (16) Notogastral setae short: distance $c_1—d_1$ more than twice longer than setae c_1. L: 840 μm; W: 405 μm. — Curacão (Pl. 6: A) **bifoliata** WILLMANN, 1931

18 (15) Notogastral setae at least partly dilated, phylliform.
19 (24) Notogastral setae — excepting c_3, d_3, e_2, f_2 — broadly phylliform.
20 (21) Notogastral setae c_1 very wide: as wide as setae *exp*. All genital setae slightly dilated, phylliform. L: 840 μm; W: 414 μm. — Tunisia (Pl. 6: B)
hungarorum MAHUNKA, 1980
21 (20) Notogastral setae c_1 elongately phylliform, much narrower than setae *exp*. 4—5 pairs of genital setae in the median row setiform.
22 (23) Notogastral setae with a midrib and with a sharp, pointed tip. 1st and 2nd genital setae in the median row phylliform, 3rd to 6th setiform. L: 931—980 μm; W: 429—454 μm. — Greece (Pl. 6: C) **loebli** MAHUNKA, 1974
23 (22) Notogastral setae without midrib and with an obtuse, blunt tip. 1st to 5th genital setae in the median row setiform, 6th phylliform. L: 792—886 μm; W: 389—443 μm. — USA: S. Carolina (Pl. 7: A—B) **banksi** NORTON et al., 1978
24 (19) Notogastral setae — at least partly — narrowly phylliform, like a willow leaf.
25 (26) Notogastral setae feather-like, short, curved. Setae *in*, *le* and *ro* of the same type, *exa* shorter, *exp* circular, with ciliate margin. Anal and adanal setae similar to notogastral setae; epimeral and genital setae short and broad, finely ciliate. L: 1149 μm; W: 636 μm. — Micronesia: Saipan Is. (Pl. 6: D) **pinnigera** SENGBUSCH, 1984
26 (25) Notogastral setae not feather-like.
27 (28) Notogaster with polygonate structure. Notogastral setae c_1, c_2, e_1, f_1 phylliform, long, rest of setae much longer. Sensillus with 5 gradually shortened branches. Epimeral setae and some genital setae phylliform. L: 1104 μm; W: 486 μm. — Réunion (Pl. 7: D)
embryonalis MAHUNKA, 1978
28 (27) Notogaster without polygonate structure. Sensillus with more than 5 branches (three similar species; needing comparison).
29 (30) Notogastral setae p_1 as long as or only a little longer than c_1. L: 840—900 μm; W: 410—440 μm. — Soviet Union, Spain, Argentina (Pl. 7: C)
turcmenica BULANOVA-ZACHVATKINA, 1960
30 (29) Notogastral setae p_1 about twice longer than c_1.
31 (32) Notogastral setae p_1 shorter and broader than p_2. Infracapitulum with 2 pairs of phylliform setae. 6 pairs of medial genital setae setiform. L: 794—826 μm; W: 389—410 μm. — Antilles, Marie-Galante (Pl. 8: A) **jornoti** MAHUNKA, 1985
32 (31) Notogaster setae p_1 and p_2 of the same length, both narrow, almost setiform. Infracapitulum with 3 pairs of phylliform setae. 1st to 5th pairs of medial genital setae phylliform, 6th setiform. L: 839—898 μm; W: 407—422 μm. — Paraguay (Pl. 8: B)
juliae MAHUNKA, 1984

Lepidacarus CSISZÁR, 1961

Genital plates with transverse suture. Anal and adanal plates separated. Preanal plate narrow. Two pairs of anal, four pairs of adanal setae present. Pygidium with weak neotrichy. Epimeral region with strong neotrichy. Prodorsal and notogastral setae phylliform or spoon-shaped.

Type-species: *Lepidacarus ornatissimus* CSISZÁR, 1961

One species.

— — Sensillus bacilliform, with short cilia. Surface of body densely tuberculate. Prodorsa and notogastral setae densely spinulate. Four pairs of spoon-shaped setae on mentum. Epimeral setal formula: *1a—7—3—3*. Setation of epimera I: 4 + 6. Epimeral setae phylliform, spinulate. One pair of setae on epimera I very large, elongate. One pair of genital setae very large, phylliform. Adanal setae spoon-shaped or phylliform. L: 468 μm; W: 261 μm. — Indonesia, Philippines, New Caledonia (Pl. 8: C—D)
ornatissimus CSISZÁR, 1961

Papillacarus KUNST, 1959

Genital plates with transverse suture. Anal and adanal plates separated. Preanal plate narrow. Two pairs of anal, four pairs of adanal setae present. Pygidium with weak neotrichy. Epimeral region with weak neotrichy. Pygidial setae setiform, ciliate.

Type-species: *Lohmannia murcioides* BERLESE, 1986, var. *aciculata* BERLESE, 1905

Nine species.

Key to species

1 (6) Notogastral setae c_1, d_1 and e_1 smooth.
2 (3) Prodorsal setae short: sensillus twice longer than setae *exp*. Setae c_3 only a little longer than setae c_2. Notogastral setae densely ciliate. Surface of body with indistinct polygonate structure. Epimeral setae partly smooth, partly ciliate. Epimeral setal formula: *7—4—3—4*. L: 500 μm; W: 220 μm. — Spain (Pl. 9: A)
chamartinensis PÉREZ-IÑIGO, 1967
3 (2) Prodorsal setae long: sensillus only a little longer than setae *exp*. Setae c_3 much longer than setae c_2.
4 (5) In the hexagon f_1—f_1—h_1—h_1—p_1—p_1 only one pair of neotrichial setae present. Anterior margin of rostrum not undulate. Notogastral setae densely ciliate. Epimeral setal formula: *9—4—3—4*. Setation of epimera I: 4 + 5. L: 510—563 μm; W: 288—300 μm. — India (Pl. 9: B) **simplirostratus** BHATTACHARYA, et al., 1974
5 (4) In the hexagonal area f_1—f_1—h_1—h_1—p_1—p_1 3—4 pairs of neotrichial setae present. Anterior margin of rostrum undulate. Notogastral setae sparsely ciliate. Epimeral setal formula: *8—4—3—4*. Setation of epimera I: 4 + 4. L: 533—611 μm; W: 270—305 μm. — Thailand (Pl. 9: C) **undirostratus** AOKI, 1965
6 (1) Notogastral setae c_1, d_1 and e_1 ciliate.
7 (10) Notogastral setae c_2 twice longer than c_1.
8 (9) Notogastral setae with long cilia; neotrichial setae on pygidium almost plumose. Surface of notogaster sparsely spinulate. L: 502—559 μm; W: 234—283 μm. — Greece (Pl. 9: D) **ondriasi** MAHUNKA, 1974
9 (8) Notogastral setae with short cilia; neotrichial setae on pygidium with short cilia. Surface of notogaster densely spinulate. L: 610 μm; W: 324 μm. — Europe (Pl. 10: A)
aciculatus (BERLESE, 1904)
10 (7) Notogastral setae c_2 only a little longer than c_1.
11 (14) Notogastral setae c_3 twice or more than twice longer than c_2.
12 (13) Setae *exp* long: setae c_3 only a little longer than *exp*. Setae f_1 twice longer than e_1. L: 516—518 μm; W: 246—263 μm. — Tunisia (Pl. 10: B)
pseudoaciculatus MAHUNKA, 1980
13 (14) Setae *exp* short: setae c_3 twice longer than *exp*. Setae f_1 as long as e_1. L: 536 μm; W: 248 μm. — Soviet Union, Dagesthan (Pl. 10: C)
pavlowskii (BULANOVA-ZACHVATKINA, 1960)
14 (11) Notogastral setae c_3 less than twice longer than c_2.
15 (16) Notogaster sparsely spinulate. 8 pairs of neotrichial setae on notogaster. Epimeral setal formula: *8—4—3—4*. L: 614 μm; W: 305 μm. — Argentina (Pl. 10: D)
spinosus ALZUET, 1972
16 (15) Notogaster densely punctate. 13 pairs of neotrichial setae on notogaster. Epimeral setal formula: *9—4—3—4*. L: 538 μm; W: 254 μm. — Ghana (Pl. 11: A—B)
angulatus WALLWORK, 1962

Vepracarus AOKI, 1965

Genital plates with transverse suture. Anal and adanal plates separated (exceptionally only on their anterior part). Preanal plate narrow. Two pairs of

anal, four pairs of adanal setae present. Pygidium with strong neotrichy; neotrichial setae arboriform or ramified.

Type-species: *Cryptacarus hirsutus* AOKI, 1961

Nine species.

Key to species

1 (4) Notogastral setae c_1 and d_1 smooth. 10—12 crescent-shaped tubercles between arboriform pygidial setae near to posterior border of notogaster.

2 (3) Interlamellar setae as long as the long marginal setae on notogaster. Setae f_1 and h_1 long: only a little shorter than long marginal setae. Branches of arboriform pygidial setae of the same length. Epimeral setal formula: *9—5—5—3*. L: 506 μm; W: 288 μm. — Philippines (Pl. 11: C) **ramirezae** CORPUZ-RAROS, 1979

3 (2) Interlamellar setae much shorter than the long marginal setae on notogaster. Setae f_1 and h_1 short: thrice or more than thrice shorter than the long marginal setae. Branches of arboriform pygidial setae asymmetric; their axial branch much longer than the others. Epimeral setal formula: *8—5—3—4*. L: 471—476 μm; W: 241—249 μm. — Thailand (Pl. 12: A—B) **ogawai** AOKI, 1965

4 (1) Notogastral setae c_1 and d_1 ciliate or plumose. Crescent-shaped tubercles on notogaster absent.

5 (6) Setae c_1 and d_1 with 2 or 3 fine branches on one side. Sensillus pectinate, with about 16 very long branches. Arboriform setae of 3 types: those covering the widest portion anteriorly, between setae e_1 and h_1, are relatively thin, with about 3 short branches on each side of the basal half of seta; 2 rows of larger setae, whose 6—8 pairs of long branches all arise from a common base and increase in length from outer toward median side; and a single row of large, closely set setae bordering pygidium and are generally resembling the second type, but branches longer and more compressed together. Epimeral setal formula: *8—4—3—3*. L: 488 μm; W: 251 μm. — Philippines (Pl. 12: D) **cruzae** CORPUZ-RAROS, 1979

6 (5) Setae c_1 and d_1 with 2—3 branches on both sides.

7 (8) Five pairs of very long marginal setae: c_3, *cp*, f_2, h_2, p_2; they are more than four times longer than pygidial setae. Interlamellar setae with three long branches. L: 487—627 μm; W: 226—294 μm. — Java, Philippines (Pl. 13: B) **ramosus** (BALOGH, 1961)

8 (7) No great differences between the lengths of marginal and pygidial setae; the long ones only twice, exceptionally thrice, longer than pygidial setae.

9 (12) Body setae short: in sequence of anal and adanal setae none extending beyond the insertion point of next one. Two similar species.

10 (11) Prodorsal setae and the long marginal setae branched only basally; their apical half smooth, without cilia. L: 363—423 μm; W: 169—187 μm. — Japan, India, Philippines, Tahiti, Tongatapu I. (Pl. 12: C) **hirsutus** (AOKI, 1961)

11 (10) Prodorsal and the long marginal setae branched over their entire length. L: 410—452 μm; W: 171—216 μm. — Soviet Union; Abkhazia (Pl. 37: B) **abchasicus** (TARBA, 1985)

12 (9) Body setae longer: in sequence of anal and adanal setae every seta extending beyond the insertion point of next one.

13 (14) Adanal setae with about 2—4 long branches on each side of their basal half; apical half smooth. Anal and adanal plates separated only on their anterior part, posteriorly fused. Some posteromarginal setae about twice longer than pygidial setae. L: 380—384 μm; W: 152—156 μm. — Antilles; St. Lucia (Pl. 13: A) **incompletus** MAHUNKA, 1985

14 (13) Adanal setae with about 3—5 branches on each side scattered over their entire length. Anal and adanal plates separated throughout their length.

15 (16) Setae *exa*, *exp* and *in* short: distance *exa—exp* more than twice longer than *exa*: distance *in—in* about thrice longer than *in*. Horn-like projections present in front of setae *exa*. L: 342—349 μm; W: 134—141 μm. — India, Tripura (Pl. 37: C) **cornutus** SARKAR et SUBIAS, 1984

16 (15) Setae *exa* and *in* very long: distance *exa—exp* as long as *exa*; distance *in—in* less than twice longer than *in*. L: 418—434 μm; W: 169—187 μm. — Korea (Pl. 13: C) **koreanus** MAHUNKA, 1973

Cryptacarus GRANDJEAN, 1950

Genital plates with transverse suture. Anal and adanal plates fused. Preanal plate narrow. Two pairs anal, four pairs of adanal setae present. Notogaster and epimeral region with neotrichy.

Type-species: *Cryptacarus promecus* GRANDJEAN, 1950

Four species.

Key to species

1 (2) Notogastral setae c_1, d_1, e_1 and f_1 very fine and smooth. Rest of setae of *c*, *d*, *e*, *f* and *h* rows bilaterally with 2—3 pairs of long cilia. Neotrichial pygidial setae ramified, arboriform, short. End of notogaster with densely arranged, large tubercles. Epimeral setal formula: *6—4—3—3*. L: 334—341 μm; W: 150 μm. — Java (Pl. 13: D)
tuberculatus CSISZÁR, 1961

2 (1) Notogastral setae c_1, d_1, e_1 and f_1 ciliate or ramifying.

3 (4) Sensillus incrassate, fusiform, outer side with about 30 longer, inner side with 15 short cilia. Notogastral setae of *c*, *d*, *e*, *f* and *h* rows setiform with short cilia, pygidial setae short, ramified, arboriform. Epimeral setal formula: *7—4—3—4*. L: 410—435 μm; W: 160—180 μm. — Soviet Middle Asia, Spain, Algeria, Soudan (Pl. 14: A—B)
promecus GRANDJEAN, 1950

4 (3) Sensillus incrassate with long setiform tip. Notogastral setae of *c*, *d*, *e*, *f* and *h* rows with long branches; almost plumose.

5 (6) Notogastral setae short: c_1 much shorter than distance $c_1—d_1$; anal setae not longer than distance $an_1—an_2$. L: 349 μm; W: 142 μm. — India, Bengal (Pl. 14: C)
dendrisetosus BHATTACHARYA, et al., 1974

6 (5) Notogastral setae longer: c_1 almost as long as distance $c_1—d_1$; anal setae longer than distance $an_1—an_2$. L: 349—370 μm; W: 148—160 μm. — Malaysia (Pl. 14: D)
schauenbergi MAHUNKA, 1977

Heptacarus PIFFL, 1963

Genital plates with transverse suture. Anal and adanal plates fused. Preanal plate broad. Seven pairs of ano-adanal setae present; two pairs in medial, five pairs in lateral row. Pygidium with weak or strong neotrichy: 27—60 pairs of notogastral setae present. Epimeral region with weak neotrichy.

Type-species: *Heptacarus notoneotrichus* PIFFL, 1963

8 species, some needing revision.

Key to species

1 (4) Notogaster with weak neotrichy: altogether less than 40 pairs of notogastral setae present.

2 (3) Very weak pygidial neotrichy: no marginal neotrichy between setae f_2 and p_1. Altogether 7 pairs of notogastral setae in marginal position. 27 pairs of notogastral setae present. Notogastral setae with very short, dense cilia. L: 580 μm; W: 300 μm. — Egypt, Abu Monqar I., W. Coast of Red sea (Pl. 14: E) **notoneotrichus** PIFFL, 1963

3 (2) Weak pygidial neotrichy: marginal neotrichy between setae f_2 and p_1. Altogether 12 pairs of notogastral setae in marginal position. More than 27 pairs of notogastral

setae present. Notogastral setae with longer cilia. L: 786—810 μm; W: 396—421 μm. — Indonesia, Sumbawa (Pl. 15: A) **piffli** MAHUNKA, 1977

4 (1) Notogaster with strong neotrichy: more than 60 pairs of notogastral setae present.

5 (6) Strong neotrichy over entire notogaster. Sensillus with approximately 20 elongated pectinations on margin, and 6 or 7 smaller pectinations at apex and on the opposite margin of elongated pectinations. L: 485—488 μm; W: 250—252 μm. — USA, South Texas (Pl. 15: B) **graminosus** (MCDANIEL, et al., 1979)

6 (5) Strong neotrichy over pygidial, weak neotrichy over frontal half of notogaster.

7 (8) All notogastral setae of the same length; sparsely ciliate, almost plumose. Surface of body with fine polygonal structure. L: 525 μm; W: 225 μm. — Iraq (Pl. 15: C—D) **supertrichus** PIFFL, 1967

8 (7) Notogastral heterotrichy: frontal half partly with shorter, pygidial part with longer setae.

9 (10) Setae c_4 (i.e. marginal setae of row *c*) thrice longer than setae c_1 and c_2. Surface of body with indistinct polygonate structure. L: 542—567 μm; W: 259—283 μm. — Antilles, Marie Galante, Les Galets (Pl. 16: A) **neotropicus** MAHUNKA, 1985

10 (9) Setae c_4 twice longer than setae c_1 or c_2.

11 (12) Surface of body with polygonate structure. Polygons small and close together. First anal seta almost as long as last adanal one. L: 745—754 μm; W: 356—369 μm. — Indonesia, Komodo (Pl. 16: B) **reticulatus** MAHUNKA, 1985

12 (11) Surface of body without polygonate structure. First anal seta much shorter than last adanal one.

13 (14) Setae c_4 only a little longer than setae c_3. Sensillus with approximately 15 pectinations. Surface of body with more or less uniform punctate or porose microsculpture. L: 588 μm; W: 280 μm. — Tchad (Pl. 16: D) **hirsutus** WALLWORK, 1964

14 (13) Setae c_4 almost twice longer than setae c_3. Sensillus with approximately 20 pectinations. Surface of body with very small, light, shallow pits. L: 540 μm; W: 260 μm. — Western Samoa, Apia (Pl. 16: C) **plumosus** (HAMMER, 1973)

Xenolohmannia BALOGH et MAHUNKA, 1969

Genital plates with transverse suture. Anal and adanal plates used. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present. Anal and adanal setae sometimes originating in the same longitudinal row. Weak notogastral neotrichy present. The united ano-adanal plates broad, much broader than genital plates.

Type-species: *Xenolohmannia discrepans* BALOGH et MAHUNKA, 1969

Three species.

Key to species

1 (2) All notogastral setae short, setiform. Notogaster with irregular wrinkles. Sensillus pectinate, with some lateral branches of unequal lengths. Notogaster with three pairs of transverse bands consisting of pori; also some smaller fields of pori near lateral margins present. About 21 pairs of notogastral setae present. L: 663 μm; W: 428 μm. — Brazil, Amazonia (Pl. 18: A) **discrepans** BALOGH et MAHUNKA, 1969

2 (1) Most of notogastral setae or all of them long flagellate.

3 (4) Notogastral heterotrichy: three pairs of setae in row *c*, two or three pairs of setae in row short, setiform; rest of setae long, flagellate. Sensillus with 7—9 branches. Notogaster punctate. 20—21 pairs of notogastral setae present. L: 680—696 μm; W: 429—440 μm. — Brazil, Amazonia (Pl. 17: B—C) **capillata** BALOGH et MAHUNKA, 1978

4 (3) Notogastral homotrichy: all notogastral setae long, filiform or flagellate. 19—20 pairs of notogastral setae present. Sensillus with 5—6 branches. L: 931—988 μm; W: 615—656 μm. — Columbia (Pl. 17: A) **comosa** P. BALOGH, 1984

Nesiacarus Csiszár, 1961

Genital plates with transverse suture. Anal and adanal plates fused. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present; weak pygidial neotrichy present.

Type-species: *Nesiacarus reticulatus* Csiszár, 1961

Three species.

Key to species

1 (2) Notogastral setae c_1, c_2 and d_1 not very short: setae c_3 less than twice longer than c_1, c_2 and d_1. Notogaster punctate. Sensillus with 10—12 branches, from 3rd to 8th branch very long. L: 492 μm; W: 230 μm. — Paraguay (Pl. 18: C—D)
australis Balogh et Mahunka, 1981

2 (1) Notogastral setae c_1, c_2 and d_1 very short, setae c_3 about thrice or more than thrice longer.

3 (4) Notogaster with fine reticulate structure. Conspicuous points in corners of reticulations. Sensillus with 7—8 branches. Setae c_1, c_2 and d_1 very short, smooth, d_2 slightly longer, smooth. All other notogastral setae ciliate. Setae f_1 and h_2 shorter than rest of notogastral setae. L: 480—490 μm; W: 217—223 μm. — Indonesia, Java (Pl. 18: B)
reticulatus Csiszár, 1961

4 (3) Notogaster with dense granulation. Sensillus with 10—12 branches. Setae c_1, c_2, d_1, e_1, f_1 and f_2 much shorter than marginal setae. L: 520 μm; W: 236 μm. — Tahiti, Papeete (Pl. 19: A)
granulatus Hammer, 1972

Austracarus Balogh et Balogh, 1983

Genital plates without transverse suture. Anal and adanal plates separated. Preanal plate wide. Anal setae absent, three pairs of adanal setae present. Notogastral and epimeral region without neotrichy. Anal plates narrow, band-like.

Type-species: *Austracarus reductus* J. Balogh et P. Balogh, 1983

Two species.

Key to species

1 (2) First pair of genital setae in the lateral row extremely long, as long as length of genital plates. Epimeral setae *3c* and *4c* very fine and smooth. L: 1046—1189 μm; W: 623—754 μm. — Australia, North Queensland (Pl. 19: B—C)
reductus J. Balogh et P. Balogh, 1983

2 (1) First pair of genital setae in the lateral row of the same length as the rest of setae in that row. Epimeral setae *3c* and *4c* thick and plumose. L: 1170 μm; W: 760 μm. — Tahiti: Papeete (Pl. 19: D)
tahitiensis (Hammer, 1972)

Meristacarus Grandjean, 1934

Genital plates without transverse suture. Anal and adanal plates separated. Preanal plate wide. Anal setae absent, four pairs of adanal setae pres-

ent. Notogaster and epimeral region without neotrichy. Anal plates narrow, band-like.

Type-species: *Meristacarus porcula* GRANDJEAN, 1934

Thirteen species.

Key to species

1 (6) Strong notogastral heterotrichy present: setae c_1, c_2, d_1, d_2, e_1, e_2 very short; the longest marginal setae at least thrice longer.
2 (3) The short notogastral setae c_1, c_2, d_1, d_2 shaped as a willow leaf. L: 1010—1030 μm; W: 554—567 μm. — New Guinea (Pl. 20: A) **biroi** BALOGH, 1961
3 (2) All notogastral setae setiform.
4 (5) Setae *exa* and *exp* very short: as long as setae c_1 and d_1. Setae d_3 and f_1 of the same length. L: 675—709 μm; W: 446—452 μm. — Java (Pl. 20: B) **heterotrichus** CSISZÁR, 1961
5 (4) Setae *exa* and *exp* at least twice longer than c_1 and c_2. Setae d_3 twice longer than f_1. L: 768 μm; W: 439 μm. — New Caledonia (Pl. 20: C) **douhereti** J. BALOGH et P. BALOGH, 1983
6 (1) Notogastral setae homotrichous.
7 (8) Notogastral setae partly thick, rod-shaped, their proximal half smooth, distal half unilaterally and densely ciliate, tip often bent ventrally. L: 1120 μm; W: 720 μm. — Java (Pl. 20: D) **bogorensis** HAMMER, 1980
8 (7) All notogastral setae setiform with pointed tip.
9 (18) 4th and 5th dorsal, transverse bands of notogaster broken in the middle and joined on each side to form a loop.
10 (13) Notogastral setae smooth.
11 (12) Notogastral setae shorter: distance c_3—cp longer than c_3. The 7th and 8th transverse bands of notogaster entire. L: 803—820 μm; W: 460—513 μm. — Africa (Pl. 21: D) **africanus africanus** BALOGH, 1958
12 (11) Notogastral setae longer: distance c_3—cp shorter than c_3. 7th and 8th transverse bands of notogaster interrupted in the middle and joined on each side to form a loop. L: 896 μm; W: 559 μm. — Annobón I. (Africa) (Pl. 21: A) **africanus annobonensis** PÉREZ-IÑIGO, 1968
13 (10) Notogastral setae ciliate.
14 (15) The loop of the 4th and 5th transverse bands interrupted. The median end of the incomplete 4th straight and somewhat longer than that of the 5th. Notogastral setae with short smooth proximal part and with smooth, pointed tip. The middle part of notogastral setae with short, coarse ciliae. The sculpture of the integument between setae e_1 peculiar. L: 1150 μm; W: 630 μm. — Java (Pl. 21: B—C) **sundensis** HAMMER, 1980
15 (14) The loop of the 4th and 5th transverse bands entire. Notogastral setae with very short, sparse cilia almost over their whole length (two very similar forms).
16 (17) Notogastral setae shorter: c_1 never reaching the margin of notogaster. L: 940—1090 μm; W: 585—742 μm. — Central and South America, W. Africa, Philippines (Pl. 22: D) **porcula** GRANDJEAN, 1934
17 (16) Notogastral setae longer: c_1 reaching the margin of notogaster. L: 867—964 μm; W: 510—599 μm. — Central America: Dominican Republic (Pl. 22: A) **longisetosus** MAHUNKA, 1978
18 (9) 4th and 5th dorsal, transverse bands of notogaster entire.
19 (20) Notogastral setae smooth. L: 854—918 μm; W: 560—620 μm. — Philippines (Pl. 22: B) **tuloyus** CORPUZ-RAROS, 1979
20 (19) Notogastral setae ciliate.
21 (22) Areae porosae of different sizes; from very small to large; the larger ones on the prodorsum irregularly divided by straight lines. L: 1000—1040 μm; W: 540—560 μm. — New Guinea (Pl. 22: C) **rubescens** (CANESTRINI, 1897)
22 (21) Areae porosae of normal size. Two similar forms.
23 (24) Transverse bands of notogaster evanescent. L: 994—1122 μm; W: 547—667 μm. — Thailand (Pl. 23: A) **madagascarensis obscurus** AOKI, 1965
24 (23) Transverse bands of notogaster well visible. L: 1025—1220 μm; W: 650—682 μm. — Madagascar (Pl. 23: B) **madagascariensis madagascariensis** BALOGH, 1961

Ululohmannia MAHUNKA, 1987

Genital plates without transverse suture. Anal and adanal plates separated. Preanal plate broad. One pair of anal, four pairs of adanal setae, present. Notogaster and epimeral region without neotrichy. Notogastral setae heterotrichous.

Type-species: *Austracarus cristatus* MAHUNKA, 1984

One species.

— — Sensillus with 6 long pectinations. Prodorsal setae setiform, smooth; setae *exp* much shorter than rest of prodorsal setae. Setae c_1, c_2, d_1, d_2, e_1, e_2 and f_1 very short and fine; other notogastral setae long, setiform, smooth. The one pair of genital setae originating on the posterior half of anal plates. L: 943—980 μm; W: 540—550 μm. — E. Africa: Tanzania (Pl. 23: C—D) **cristata** (MAHUNKA, 1984)

Mixacarus BALOGH, 1958

Genital plates without transverse suture. Anal and adanal plates separated. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present. Notogaster without neotrichy. All setae setiform, simple. One or more transverse bands interrupted.

Type-species: *Mixacarus integer* BALOGH, 1958

Six species.

Key to species

1 (6) Notogastral outline arched. Transverse bands and circular areae porosae present. (3 very similar species.)

2 (3) Notogastral setae c_1 and d_1 twice longer than f_1. L: 830—891 μm; W: 493—554 μm. — South America: Peru **neotropicus** BALOGH, 1962

3 (2) Notogastral setae c_1 and d_1 as long as f_1.

4 (5) Transverse band s_4 interrupted. Epimeral setal formula: *3—1—3—4*. L: 801—878 μm; W: 493—539 μm. — Ghana (Pl. 24: A—B) **chapmani** WALLWORK, 1962

5 (4) Transverse bands s_4 and s_5 interrupted. Epimeral setal formula: *4—1—4—4*. L: 800 μm; W: 450 μm. — West Africa (Pl. 24: C) **integer** BALOGH, 1958

6 (1) Notogastral outline parallel-sided in anterior half, gradually converging in posterior half. Transverse bands present, circular areae porosae absent or evanescent.

7 (8) Six pairs of very short, smooth medial, 4 pairs of long, ciliate lateral genital setae. Sensillus with 8 branches. L: 650—688 μm; W: 328—346 μm. — Korea (Pl. 24: D) **vanhonggui** MAHUNKA, 1973

8 (7) Seven pairs of shorter medial, 3 pairs of longer lateral genital setae, all smooth. Sensillus with 8—13 branches. Three similar species.

9 (10) Setae *exp* short, shorter than *exa*; setae c_3 twice or more than twice longer than *exp*. Notogastral bands s_6 and s_9 complete. s_8 incomplete. Sensillus with 9—13 branches. L: 617—685 μm; W: 336—376 μm. — USA: N. and S. Carolina (Pl. 25: B) **brevipes** (BANKS, 1947)

10 (9) Setae *exp* long, longer than *exa*; setae c_3 less than twice longer than *exp*. Notogastral band s_8 complete. Sensillus with 8—9 branches.

11 (12) Setae *exp* as long as c_3. Two complete notogastral bands on posterior part of notogaster: s_6 and s_8. L: 620—660 μm; W: 320—340 μm. — Soviet Union, Turkmenia (Pl. 38: A—B) **zhuzhikovi** BULANOVA-ZACHVATKINA, 1979

12 (11) Setae *exp* shorter than c_3. Three complete notogastral bands on posterior part of notogaster: s_6, s_8 and s_9. L: 617—685 μm; W: 605—635 μm; W: 300—320 μm. — Japan (Pl. 25:A) **exilis** AOKI, 1970

Phyllolohmannia gen. n.

Genital plates without transverse suture. Anal and adanal plates separated. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present. Notogaster without neotrichy. All setae phylliform or fungiform, broad. All transverse bands complete.

Type-species: *Mixacarus hamanni* BALOGH, 1961

Only these two species.

Key to species

1 (2) Prodorsal setae *exa*, *le* and *ro* extremely broad, almost kidney-shaped, finely granulate. Setae *exp* broadly phylliform. Most of the notogastral setae shaped as a willow leaf granulate. Two pairs of setae on infracapitulum, broadly leaf-shaped, almost circular. Rest of ventral setae resembling a willow leaf. L: 1384 μm; W: 824 μm. The largest species of the family. — Indonesia, Java (Pl. 25: C—D) **hammanni** (BALOGH, 1961)

2 (1) All prodorsal and notogastral setae fungiform or umbelliform, with some irregularly radiating lines. L: 738 μm; W: 440 μm. — Vietnam (Pl. 37: A) **foliifera** (GOLOSOVA, 1984)

Strinatacarus MAHUNKA, 1974

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate broad. Six pairs of ano-adanal setae in a longitudinal row. Notogaster without neotrichy; epimeral region with weak neotrichy.

Type-species: *Strinatacarus aelleni* MAHUNKA, 1977

Only one species.

— — Notogastral heterotrichy: six pairs of centrodorsal setae: c_1, d_1, e_1, c_2, d_2, f_1 short and smooth, rest of notogastral setae long and sparsely ciliate. Epimeral setal formula: *3—5—1—4*. L: 800—858 μm; W: 405—433 μm. — Madagascar (Pl. 26: A) **aelleni** MAHUNKA, 1977

Torpacarus GRANDJEAN, 1950

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate wide. Anal setae absent, five pairs of adanal setae present. Notogaster and epimeral region without neotrichy. Notogastral heterotrichy: three or more pairs of notogastral setae extremely short and fine. (Setae c_1, d_1, e_1 and sometimes d_2.)

Type-species: *Torpacarus omittens* GRANDJEAN, 1950

Six species.

Key to species

1 (2) Setae c_1, d_1 and e_1 fairly long: c_3, *cp* and e_2 only twice longer than former ones. Basal part of posteromarginal setae dilated and flattened bearing long cilia. Posterior margin of notogaster with some large tubercles. L: 557—586 μm; W: 242—267 μm. — Guatemala (Pl. 26: B) **callipygus** MAHUNKA, 1983

2 (1) Setae c_1, d_1 and e_1 very short: c_3, *cp* and e_2 about four or five times longer than former ones.

3 (6) Only setae c_1, d_1 and e_1 very short and fine; setae c_2 and d_2 at least twice or thrice longer than former ones.

4 (5) Notogaster with 3 transverse lines: *mt*, *n* and *pt*. Some epimeral setae (*1a*, *1c*, *2a*, *3a*, *4a*, *4b*) smooth. L: 600—650 μm; W: 310—320 μm. — Venezuela (Pl. 26; C—D) **omittens omittens** GRANDJEAN, 1950

5 (4) Notogaster without transverse lines. All epimeral setae ciliate. L: 570—595 μm; W: 262—271 μm. — Paraguay (Pl. 27: C) **omittens paraguayensis** BALOGH et MAHUNKA, 1981

6 (3) Four pairs of notogastral setae: c_1, d_1, e_1 and e_2 very short and fine.

7 (8) Setae f_1 very short: d_3 about thrice longer than f_1. L: 628 μm; W: 281 μm. — Ghana (Pl. 27: B) **foveolatus** WALLWORK, 1962

8 (7) Setae f_1 long: as long as d_3.

9 (10) Setae c_2 slightly longer than c_3. Prodorsal and notogastral setae (with the exception of minute setae c_1, d_1, d_2 and e_1) markedly lanceolate. L: 693 μm; W: 339 μm. — Ghana (Pl. 27: D) **magnus** WALLWORK, 1962

10 (9) Setae c_2 shorter than c_3.

11 (12) Sensillus with 8—12 branches. Setae c_3 only a little longer than c_2. Two superficial lines: *mt* and *nt* present on posterior half of notogaster. L: 655 μm; W: 293 μm. — Ghana (Pl. 27: A) **cinctus** WALLWORK, 1962

12 (11) Sensillus with 19 branches. Setae c_3 much longer than c_2. Superficial lines *mt* and *nt* on posterior half of notogaster absent. L: 538—542 μm; W: 229—231 μm. — USA, Texas (Pl. 28: A) **gramineaus** MCDANIEL et al., 1979

Haplacarus WALLWORK, 1962

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate wide. One pair of anal, four pairs of adanal setae present. Notogastral and epimeral region without neotrichy.

Type-species: *Haplacarus foliatus* WALLWORK, 1962

Five species.

Key to species

1 (4) Transverse bands s_5—s_{10} on notogaster complete.

2 (3) Transverse band s_3 incomplete, broken mid-dorsally. Sensillus with 10—12 branches. Notogastral setae foliate, bilaterally ciliate. Aggenital plates triangular, cca. of equal bases. L: 682 μm; W: 329 μm. — Micronesia, Yap Is. (Pl. 28: C—D) **pandanus** SENGBUSCH, 1982

3 (2) Transverse band s_3 complete. Sensillus with 8 branches. Notogastral setae narrowly foliate, slightly dentate. Aggenital plates triangular, longer than broad. L: 720 μm; W: 204 μm. — Java (Pl. 28: B) **javensis** HAMMER, 1980

4 (1) One or two transverse bands (s_7 or s_7 and s_8) incomplete, broken mid-dorsally.

5 (6) Only one transverse band incomplete: s_7. Notogastral setae long: distance c_1—d_1 as long as c_1; distance d_1—e_1 as long as d_1. Setae p_1 incurved. L: 678 μm; W: 323 μm — Ghana, West Africa, Thailand, Philippines (Pl. 29: A) **foliatus** WALLWORK, 1962

6 (5) Two transverse bands: s_6 and s_7 incomplete. Notogastral setae shorter: distance c_1—d_1 longer than c_1; distance d_1—e_1 longer than d_1.

7 (8) Distance *exa—le* longer than *exa*. Setae p_1 incurved. L: 650—769 μm; W: 281—323 μm. — India, Bengal (Pl. 29: B) **bengalensis** BHATTACHARYA et al., 1974

8 (7) Distance *exa—le* as long as *exa*. Setae p_1 straight. L: 554—596 μm; W: 229—261 μm. — Thailand (Pl. 29: C) **pairathi** AOKI, 1965

Paulianacarus BALOGH, 1960

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present. Notogastral and epimeral neotrichy absent.

Type-species: *Paulianacarus levis* BALOGH, 1960

Five species.

Key to species

1 (2) Notogastral setae long: setae c_3 longer, than distance $c_1—c_1$. L: 931—1015 μm; W: 535—579 μm. — India, Kerala (Pl. 30 :A) **simplisetosus** MAHUNKA, 1985

2 (1) Notogastral setae shorter: c_3 as long or shorter than distance $c_1—c_1$.

3 (4) Notogastral setae at least partly phylliform or lanceolate, with median ribs. General appearance like *Haplacarus* or *Javacarus*. L: 550—640 μm; W: 238—260 μm. — India, Tripura (Pl. 38: C—D) **foliatus** SARKAR et SUBIAS, 1984

4 (3) Notogastral setae setiform, without median ribs.

5 (6) Transverse bands of notogaster represented by 9 or 10 protruding incomplete crests. Areae porosae on notogaster evanescent. L: 1160 μm; W: 670 μm. — Madagascar (Pl. 29: D) **rugosus** BALOGH, 1960

6 (5) All transverse bands — or at least 1st to 3rd — normal, band-like.

7 (8) Notogaster with transverse rows of tubercles bearing areae porosae. L: 1134 μm; W: 560 μm. — Madagascar (Pl. 30: B—C) **nodosus** BALOGH, 1960

8 (7) Notogaster without protruding tubercles; areae porosae lying flat on the surface of notogaster or protruding only a little. L: 912 μm; W: 452 μm. ♀ — Madagascar (Pl. 31: C) **levis** BALOGH, 1960

Millotacarus BALOGH, 1960

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate wide. Two pairs of anal, four pairs of adanal setae present. Notogastral and epimeral neotrichy absent. Notogastral setae phylliform. Areae porosae absent.

Type-species: *Millotacarus granulatus* BALOGH, 1960

Only one species.

— — Sensillus with 9—10 branches. Prodorsal and notogastral setae phylliform, straight with long, sharp tip. Prodorsum and notogaster densely granulate. 4th, 5th and 8th transverse bands interrupted. L: 725 μm; W: 295 μm. — Madagascar (Pl. 31: A—B) **granulatus** BALOGH, 1960

Javacarus Balogh, 1961

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate wide. Anal setae absent, four pairs of adanal setae present. Notogastral and epimera$_1$ region without neotrichy.

Type-species: *Javac arus kuehnelti* Balogh, 1961

Six species.

Key to species

1 (2) All prodorsal, notogastral and ventral setae foliate, biciliate. Surface of notogaster with large bosses and reticulum. Sensillus with 10—12 branches. L: 646 μm; W: 362 μm. — Micronesia, Ponape Is. (Pl. 31: D—E) **reticulatus** Sengbusch, 1982

2 (1) Notogastral and prodorsal setae smooth, exceptionally slightly dentate or with some evanescent cilia. Ventral setae setiform, never dilated.

3 (4) Areae porosae absent. Surface of body densely granulate. 9 rows of transverse bands on notogaster, but s_2 and s_3 incomplete. L: 640 μm; W: 304 μm. — Java (Pl. 32: A) **granulatus** Csiszár, 1961

4 (3) Areae porosae present. Surface of body without dense granulation.

5 (6) Most of the notogastral setae lanceolate and dentate (hardly perceptible). Dorsal ones: c_1, c_2, d_1, d_2, h_1, h_2 and ps_1 with a short tip, whereas marginal ones: c_3, d_3, h_3, ps_2 and ps_3 with longer tip and setae longer. First adanal seta (ad_1) thick. L: 640 μm; W: 372 μm. — Java (Pl. 32: B) **porosus** Hammer, 1980

6 (5) All notogastral setae of the same type: with long, sharp, setiform tip. 4 adanal setae of the same type (3 of very similar form).

7 (8) Interlamellar setae extending beyond insertion point of c_1. Surface of body with indistinct foveolae. L: 670 μm; W: 290 μm. — South America, Peru **inexpectatus** Balogh, 1962

8 (7) Interlamellar setae hardly extending to, or not reaching at all, insertion point of c_1. Surface of body either with distinct foveolae or with larger spots.

9 (10) Surface of body with distinct foveolae. Sensillus with 7—8 branches. Notogastral setae lanceolate (without midrib). L: 628—648 μm; W: 304—311 μm. — Java, Malaysia, Philippines, Fiji, Tahiti (Pl. 32: C) **kuehnelti** Balogh, 1961

10 (9) Surface of body with larger spots. Sensillus with 8—11 branches. Notogastral setae foliate (with midrib). L: 650 μm; W: 330 μm. — Tahiti (Pl. 32: D) **kuehnelti** v. **foliatus** Hammer, 1972

Euryacarus Woolley, 1966

Genital plates only with an indistinct vestige of transverse suture. Anal and adanal plates fused. Preanal plate broad. Epimeral and pygidial neotrichy absent.

Type-species: *Euryacarus petalus* Woolley, 1966

Two species.

Key to species

1 (2) Notogastral setae very long: setae c_3 longer than distance c_3—d_3. L: 914—978 μm; W: 603—667 μm. — Costa Rica (Pl. 33: A—B) **pilosus** Mahunka, 1982

2 (1) Notogastral setae c_3 shorter than distance c_3—d_3. L: 840 μm; W: 588 μm. — Guatemala (Pl. 33: C) **petalus** Woolley, 1966

Dendracarus BALOGH, 1960

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate narrow. One pair of anal, four pairs of adanal setae present. Pygidial and epimeral region with neotrichy.

Type-species: *Dendracarus pulchellus* BALOGH, 1960

Only one species.

— — Sensillus with 10—11 branches. Prodorsal setae lanceolate, with long, setiform tip. All setae of prodorsum bilaterally ciliate. Notogastral setae c_1, d_1 and e_1 short, fine, smooth; rest of notogastral setae — excepting the short, arboriform pygidial setae — lanceolate with long, setiform tip, similar to prodorsal setae. Epimeral setal formula: *6—4—3—3* (?). Epimeral setae short, with 2—3 long cilia. L: 594 μm; W: 304 μm. — Madagascar (Pl. 34: A—B) **pulchellus** BALOGH, 1960

Annectacarus GRANDJEAN, 1950

Genital plates without transverse suture. Anal and adanal plates fused. Preanal plate narrow. Two pairs of anal, four pairs of adanal setae present. Notogastral and epimeral region with neotrichy.

Type-species: *Annectacarus mucronatus* GRANDJEAN, 1950

Nine species.

Key to species

1 (2) Setae c_1, d_1 and e_1 of the same type and almost of the same length as the rest of notogastral setae being long, curved, bilaterally ciliate, tapering to an attenuated point. Setae c_1 about half the length of the majority, d_1 about 2/3 length of the majority, and e_1 similar to the others. 21 pairs of notogastral setae present; therefore 5 pairs of secondary pygidial setae (b_1, b_2, b_3, n, r). Subcapitulum with 6 pairs of setae. L: 551—636 μm; W: 351—408 μm. — Micronesia, Mariana Is., Saipan (Pl. 34: C) **granditrichosus** SENGBUSCH, 1984

2 (1) Setae c_1, d_1 and e_1 much shorter than the majority of notogastral setae.

3 (4) Setae c_2, d_2 and f_1 very small, fine and smooth similar to c_1, d and e_1. L: 430—470 μm; W: 214—235 μm. — Panama, Venezuela (Pl. 35: A—B) **mucronatus** GRANDJEAN, 1950

4 (3) Setae c_2, d_2 and f_1 at least twice longer than c_1, d_1 and e_1.

5 (10) Setae c_2, d_2 and f_1 relatively long, 2/3 or subequal to marginal ones (c_3, d_3, f_2) in length.

6 (7) Setae c_1, d_1 and e_1 slightly barbed on one side. Subcapitulum with 4 pairs of setae. L: 491—515 μm; W: 303—333 μm. — Philippines (Pl. 35: C) **mahabaeus** CORPUZ-RAROS, 1979

7 (6) Setae c_1, d_1 and e_1 smooth.

8 (9) 24 pairs of notogastral setae present. Infracapitulum with 4 pairs of setae. L: 478—571 μm; W: 250—281 μm. — South India, Kerala **trivandricus** HAQ, 1978

9 (8) 23 pairs of notogastral setae present. Infracapitulum with 7 pairs of setae. L: 510—563 μm; W: 288—300 μm. — India, West Bengal (Pl. 35: D) **longisetosus** BHATTACHARYA et al., 1974

10 (5) Setae c_2, d_2 and f_1 relatively short, only half or less than half the length of c_3, d_3 and f_2.

11 (12) 22 pairs of notogastral setae present: 4 pairs of neotrichial notogastral setae (b_1—b_4). Marginal setae unilaterally ciliate. L: 510 μm; W: 255 μm. — Tonga, Java (Pl. 36: A) **unilateralis** HAMMER, 1973

12 (11) 21 pair of notogastral setae present (b_1—b_3). Marginal setae bilaterally ciliate.

13 (14) Setae *b* about half the length of marginal setae, ciliate. L: 477—523 μm; W: 251—277 μm. — Ghana (Pl. 36: C) **insculptus** WALLWORK, 1962
14 (13) Setae *b* very small, smooth.
15 (16) Setae *b* as long as c_1, d_1 and e_1. L: 477—501 μm; W: 251—277 μm. — Ghana (Pl. 36: D) **sejugatus** WALLWORK, 1962
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corallium NAKATAMARI, 1982: 97, f. 1—10
L. coreana CHOI, 1985 (p. 333; Pl. 4: D)
coreana CHOI, 1985: 64, f. 1
L. embryonalis MAHUNKA, 1978 (p. 334; Pl. 7: D)
embryonalis MAHUNKA, 1978: 187, f. 16—20
L. hungarorum MAHUNKA, 1980 (p. 334; Pl. 6: B)
hungarorum MAHUNKA, 1980: 124, f. 1—3
hungarorum: BALOGH et MAHUNKA, 1983: 118, Pl. 55: C—E
L. javana javana BALOGH, 1961 (p. 333; Pl. 5: C)
javana BALOGH, 1961a: 26, f. 5—6
L. javana interrupta CHOI, 1985 (p. 333; Pl. 5: C)
javana interrupta CHOI, 1985: 65, f. 2
L. jornoti MAHUNKA, 1985 (p. 334; Pl. 8: A)
jornoti MAHUNKA, 1985a: 124, f. 11—15
L. juliae MAHUNKA, 1984 (p. 334; Pl. 8: B)
juliae MAHUNKA, 1984: 116, f. 10—14
L. lanceolata GRANDJEAN, 1950 (p. 333; Pl. 5: D)
lanceolata GRANDJEAN, 1950: 119, f. 1—3
lanceolata: BALOGH, 1961a: 25, f. 1
L. loebli MAHUNKA, 1974 (p. 334; Pl. 6: C)
loebli MAHUNKA, 1974: 572, f. 1—4
loebli: BALOGH et MAHUNKA, 1983: 119, Pl. 56: F—I
L. murcioides BERLESE, 1896: 78, 7 (p. 00)
murcioides BERLESE, 1896: 78, 7
murcioides: HAMMNEN, 1959: 57
murcioides: BALOGH et MAHUNKA, 1983: 119
L. pinnigera SENGBUSCH, 1984 (p. 334; Pl. 6: D)
pinnigera SENGBUSCH, 1984a: 136, f. 1—2
L. regalis BERLESE, 1923 (p. 333; Pl. 4: A)
re$_{es}$*alis* BERLESE, 1923: 261
regalis: MAHUNKA, 1980: 111, f. 15—17
regalis: BALOGH et MAHUNKA, 1983: 118, Pl. 55: A—B
L. reticulata SELLNICK, 1931 (p. 333; Pl. 4: B)
reticulata SELLNICK, 1931: 703, f. 9—10 (*regalis* var. *reticulata*)
reticulata: MAHUNKA, 1980: 111, f. 15—17
reticulata: BALOGH et MAHUNKA, 1983: 118, Pl. 55: F, G
L. similis BALOGH, 1962 (p. 333; Pl. 4: C)
similis BALOGH, 1962a: 59
L. turcmenica BULANOVA-ZACHVATKINA, 1960 (p. 334; Pl. 7: C)
turcmenica BULANOVA-ZACHVATKINA, 1960: 1842, f. 5, 7 (*lanceolata turcmenica*)
turcmenica: BALOGH et MAHUNKA, 1983: 119, Pl. 56: A—E

Meristacarus GRANDJEAN, 1934 (p. 339)

Meristacarus GRANDJEAN, 1934: 35
Meristacarus: GRANDJEAN, 1950: 118
Meristacarus: BALOGH, 1961a: 28

Meristacarus BALOGH, 1972: 51
Meristacarus: BALOGH et MAHUNKA, 1983

M. africanus africanus BALOGH, 1958 (p. 340; Pl. 21: D)
africanus BALOGH, 1958: 3
africanus: BALOGH, 1961a: 28, f. 20
M. africanus annobonensis PÉREZ-IÑIGO, 1968 (p. 340; Pl. 21: A)
africanus annobonensis PÉREZ-IÑIGO, 1968: 406, f. 1—6
M. biroi BALOGH, 1961 (p. 340; Pl. 20: A)
biroi BALOGH, 1961: 28, f. 22, 22a
M. bogorensis HAMMER, 1980 (p. 340; Pl. 20 :D)
bogorensis HAMMER, 1980: 12, f. 11
M. douhereti J. BALOGH et P. BALOGH, 1983 (p. 340; Pl. 20: C)
douhereti BALOGH et BALOGH, 1983: 304, f. 2
M. heterotrichus CSISZÁR, 1961 (p. 340; Pl. 20: B)
heterotrichus CSISZÁR, 1961: 348, f. 7
M. longisetosus MAHUNKA, 1978 (p. 340; Pl. 22: A)
longisetosus MAHUNKA, 1978: 551, f. 1—2
M. madagascarensis madagascarensis BALOGH, 1961 (p. 340; Pl. 23: B)
madagascarensis BALOGH, 1961: 121, f. 1—2
M. madagascarensis obscurus AOKI, 1965 (p. 340; Pl. 23: A)
madagascarensis obscurus AOKI, 1965: 139, f. 17—18
M. porcula GRANDJEAN, 1934 (p. 340; Pl. 22: D)
porcula GRANDJEAN, 1934: 35, f. 7—10
porcula: BALOGH, 1961a: 28, f. 19
M. rubescens (CANESTRINI, 1897) (p. 340; Pl. 22: C)
rubescens CANESTRINI, 1897: 461 (*Hermannia*)
rubescens: CANESTRINI, 1898: 393, T. 24, f. 1 (*Hermannia*)
rubescens: BALOGH, 1961a: 28, f. 21
M. sundensis HAMMER, 1980 (p. 340; Pl. 21: B—C)
sundensis HAMMER, 1980: 11, f. 10
M. tuloyus CORPUZ-RAROS, 1979 (p. 340; Pl. 22: B)
tuloyus CORPUZ-RAROS, 1979: 328, f. 19—20

Meristolohmannia BALOGH et MAHUNKA, 1966 (p. 332)

Meristolohmannia BALOGH et MAHUNKA, 1966: 553
Meristolohmannia: BALOGH et MAHUNKA, 1983: 126
Meristolohmannia: BALOGH, 1972: 49

M. chinensis (BULANOVA-ZACHVATKINA, 1960) (p. 332; Pl. 3: A)
chinensis BULANOVA-ZACHVATKINA, 1960: 1845, f. 2: 1—4 (*Meristacarus*)
chinensis: BALOGH et MAHUNKA, 1983: 126, Pl. 62: C—D
M. meristacaroides BALOGH et MAHUNKA, 1966 (p. 332; Pl. 3: B—C)
meristacaroides BALOGH et MAHUNKA, 1966: 555, f. 1—2

Millotacarus BALOGH, 1960 (p. 344)

Millotacarus BALOGH, 1960b: 12

M. granulatus BALOGH, 1960 (p. 344; Pl. 31: A—B)
granulatus BALOGH, 1960b: 12, f. 10—12

Mixacarus BALOGH, 1958 (p. 341)

Mixacarus BALOGH, 1958: 4
Mixacarus: BALOGH, 1960a: 90
Mixacarus: BALOGH, 1961a: 27

Mixacarus: BALOGH, 1972: 51
Mixacarus: BALOGH et MAHUNKA, 1983: 125

M. brevipes (BANKS, 1947) (p. 341; Pl. 25: B)
brevipes BANKS, 1947: 128 (*Lohmannia*)
brevipes: NORTON, METZ et SHARMA, 1978: 16, f. 1
M. chapmani WALLWORK, 1962 (p. 341; Pl. 24: A—B)
chapmani WALLWORK, 1962: 458, f. 1—5
M. exilis AOKI, 1970 (p. 342; Pl. 25: A)
exilis AOKI, 1970: 401, f. 9—17
M. integer BALOGH, 1958 (p. 341; Pl. 24: C)
integer BALOGH, 1958: 4
integer: BALOGH, 1960b: 9, f. 1—2
integer: BALOGH, 1961a: 27, f. 15—16
M. neotropicus BALOGH, 1962 (p. 341)
neotropicus BALOGH, 1962a: 61
M. vanhonggui MAHUNKA, 1973 (p. 341; Pl. 24: D)
vanhonggui MAHUNKA, 1973: 49, f. 1—5
M. zhuzhikovi BULANOVA-ZACHVATKINA, 1979 (p. 341; Pl. 38: A)
zhuzhikovi BULANOVA-ZACHVATKINA, 1979: 29, f. A—D

Nesiacarus CISZÁR, 1961 (p. 339)

Nesiacarus CSISZÁR, 1961: 346
Nesiacarus: BALOGH, 1972: 51

N. australis BALOGH et MAHUNKA, 1981 (p. 339; Pl. 18: C—D)
australis BALOGH et MAHUNKA, 1981: 56, f. 7—11
N. granulatus HAMMER, 1972 (p. 339; Pl. 19: A)
granulatus HAMMER, 1972: 14, f. 13
N. reticulatus CSISZÁR, 1961 (p. 339; Pl. 18: B)
reticulatus CSISZÁR, 1961: 346, f. 1—2

Papillacarus KUNST, 1959 (p. 335)

Papillacarus KUNST, 1959: 52
Papillacarus: BALOGH, 1961a: 26
Papillacarus: BALOGH, 1972: 51
Papillacarus: CORPUZ-RAROS, 1979
Papillacarus: BALOGH et MAHUNKA, 1983: 329

P. aciculatus (BERLESE, 1904) (p. 335; Pl. 10: A)
aciculatus BERLESE, 1904: 24, Pl. 2, f. 39 (*Lohmannia*)
murcioides: BERLESE, 1896 (var. *aciculata*)
aciculatus: KUNST, 1959: 52, f. 1
aciculatus: BALOGH et MAHUNKA, 1983: 121, Pl. 58: A—B
P. angulatus WALLWORK, 1962 (p. 335; Pl. 11: A—B)
angulatus WALLWORK, 1962: 470, f. 12—16
P. chamartinensis PREZ-IÑIGO, 1967 (p. 335; Pl. 9: A)
chamartinensis PÉREZ-IÑIGO, 1968: 167, f. 3
P. ondriasi MAHUNKA, 1974 (p. 335; Pl. 9: D)
ondriasi MAHUNKA, 1974: 574, f. 5—9
ondriasi: BALOGH et MAHUNKA, 1983: 121, Pl. 58: A—E
P. pavlowskii (BULANOVA-ZACHVATKINA, 1960) (p. 335; Pl. 10: C)
pavlowskii BULANOVA-ZACHVATKINA, 1960: 1844, Pl. 6, f. 1—2 (*Thamnacarus*)
pavlowskii: BALOGH et MAHUNKA, 1983: 121, Pl. 58: F—G
P. pseudoaciculatus MAHUNKA, 1980 (p. 335; Pl. 10: B)
pseudoaciculatus MAHUNKA, 1980: 126, f. 4—5
pseudoaciculatus: BALOGH et MAHUNKA, 1983: 121, Pl. 57: I—J
P. simplirostratus BHATTACHARYA, BHADURI et RAYCHAUDHURI, 1974 (p. 335; Pl. 9: B)
simplirostratus BHATTACHARYA, BHADURI et RAYCHAUDHURI, 1974

P. spinosus ALZUET, 1972 (p. 335; Pl. 10: D)
spinosus ALZUET, 1972: 188, f. 1—9
P. undirostratus AOKI, 1965 (p. 335; Pl. 9: C)
undirostratus AOKI, 1965: 140, f. 19—20

Paulianacarus BALOGH, 1960 (p. 344)

Paulianacarus BALOGH, 1960b: 8
Paulianacarus: BALOGH, 1961a: 28
Paulianacarus: BALOGH, 1972: 52

P. foliatus SARKAR et SUBIAS, 1984 (p. 344; Pl. 38: C—D)
foliatus SARKAR et SUBIAS, 1984: 26, f. 3—4
P. levis BALOGH, 1960 (p. 344; Pl. 31: C)
levis BALOGH, 1960a: 10, f. 3—4
levis: BALOGH, 1961a: 29, f. 25—26
P. nodosus BALOGH, 1960 (p. 344; Pl. 30: B—C)
nodosus BALOGH, 1960a: 10, f. 6—7
nodosus: BALOGH, 1961a: 29, f. 27—28
P. rugosus BALOGH, 1960 (p. 344; Pl. 29: D)
rugosus BALOGH, 1960a: 12, f. 8—9
rugosus: BALOGH, 1961a: 29, f. 29—30
P. simplisetosus MAHUNKA, 1985 (p. 344; Pl. 30: A)
simplisetosus MAHUNKA, 1985: 373, f. 14—15

Phyllolohmannia gen. n. (p. 342)

Mixacarus: BALOGH (partim), 1961: 27, f. 17—18
Mixacarus: BULANOVA-ZACHVATKINA, 1979: 29

P. foliifera (GOLOSOVA, 1984) (p. 342; Pl. 37: A) comb. n.
foliifer GOLOSOVA, 1984: 619, f. a—e (*Mixacarus*)
P. hammani (BALOGH, 1961) comb. n. (p. 342; Pl. 25: C—D)
hammani BALOGH, 1961a: 27, f. 17—18 (*Mixacarus*)
hammani CORPUZ-RAROS, 1979: 325, f. 14—15 (*Mixacarus*)

Strinatacarus MAHUNKA, 1977 (p. 342)

Strinatacarus MAHUNKA, 1977: 469

S. aelleni MAHUNKA, 1977 (p. 342; Pl. 26: A)
aelleni MAHUNKA, 1977: f. 21—23

Thamnacarus GRANDJEAN, 1950 (p. 331)

Thamnacarus GRANDJEAN, 1950: 118
Thamnacarus: BALOGH, 1961a: 26
Thamnacarus: AOKI, 1971: 127 (lapsus calami)
Asiacarus KRIVOLUTSKY, 1971: 35
Thamnacarus: BALOGH, 1972: 49
Thamnacarus: BALOGH et MAHUNKA, 1983: 122

T. deserticola (GRANDJEAN, 1934) (p. 332; Pl. 1: A—B)
deserticola GRANDJEAN, 1934: 247, f. 4—5 (*Lohmannia*)
deserticola: GRANDJEAN, 1950: 118

deserticola: BALOGH, 1961a: 26, f. 7—8
deserticola: BALOGH et MAHUNKA, 1983: 122, Pl. 59: A

T. elongatus KRIVOLUTSKY, 1971 (p. 332; Pl. 1: C)
elongatus KRIVOLUTSKY, 1971: 35, f. 1
moribei AOKI, 1971: 127, f. 1—6 (*Thamanacarus*)
elongatus: BALOGH et MAHUNKA, 1983: 122, Pl. 59: I
T. longisetosus BULANOVA-ZACHVATKINA, 1978 (p. 332; Pl. 1: D)
longisetosus BULANOVA-ZACHVATKINA, 1978: 919. f. 3—4
longisetosus: BALOGH et MAHUNKA, 1983: 123, Pl. 60: A
T. smirnovi BULANOVA-ZACHVATKINA, 1978 (p. 332; Pl. 2: A)
smirnovi BULANOVA-ZACHVATKINA, 1978: 918, f. 1—2
smirnovi: BALOGH et MAHUNKA, 1983: 123, Pl. 59: D

Torpacarus GRANDJEAN, 1950 (p. 342)

Torpacarus GRANDJEAN, 1950: 126
Torpacarus: BALOGH, 1961a: 30
Torpacarus: BALOGH, 1972: 51

T. callipygus MAHUNKA, 1983 (p. 343; Pl. 26: B)
callipygus MAHUNKA, 1983: 713, f. 6—10
T. cinctus WALLWORK, 1962 (p. 343; Pl. 27: A)
cinctus WALLWORK, 1962: 485, f. 26
T. foveolatus WALLWORK, 1962 (p. 343; Pl. 27: B)
foveolatus WALLWORK, 1962: 479, f. 20—24
T. gramineaus MCDANIEL, NORTON et BOLEN, 1979 (p. 343; Pl. 28: A)
gramineaus MCDANIEL, NORTON et BOLEN, 1979: 626, f. 3—4
T. magnus WALLWORK, 1962 (p. 343; Pl. 27: D)
magnus WALLWORK, 1962: 483, f. 25
T. omittens omittens GRANDJEAN, 1950 (p. 343; Pl. 26: C—D)
omittens GRANDJEAN, 1950: 126, f. 4—5
omittens BALOGH, 1961a: 30, f. 37—38
T. omittens paraguayensis BALOGH et MAHUNKA, 1981 (p. 343; Pl. 27: C)
omittens paraguayensis BALOGH et MAHUNKA, 1981: 56, f. 12—16

Ululohmannia MAHUNKA, 1987 (p. 341)

Austracarus MAHUNKA, 1984: 394 (a junior homonym of *Austracarus* J. BALOGH et P. BALOGH, 1983)

Ululohmannia MAHUNKA, 1987: (in print)
U. cristata (MAHUNKA, 1984) (p. 341; Pl. 23: C—D)
cristatus MAHUNKA, 1984: 394, f. 1—5 (*Austracarus*)

Vepracarus AOKI, 1965 (p. 335)

Vepracarus AOKI, 1965: 142
Vepracarus: BALOGH, 1972: 51
Papillacarus BALOGH et MAHUNKA, 1983: 119 (partim)

V. abchasicus (TARBA, 1985) (p. 336; Pl. 37: B)
abchasicus TARBA, 1985: 1741, f. a—e (*Papillacarus*)
V. cornutus SARKAR et SUBIAS, 1984 (p. 336; Pl. 37: C)
cornutus SARKAR et SUBIAS, 1984: 25, f. 1—2
V. cruzae CORPUZ-RAROS, 1979 (p. 336; Pl. 12: D)
cruza CORPUZ-RAROS, 1979: 20, f. 4
V. hirsutus (AOKI, 1961) (p. 336; Pl. 12: C)
hirsutus AOKI, 1961: 65, f. 2 A—E (*Cryptacarus*)

hirsutus: CORPUZ-RAROS, 1979: 330, f. 21, 24 (*Papillacarus*)
hirsutus: BALOGH et MAHUNKA, 1983: 120, Pl. 57: C—E (*Papillacarus*)
V. incompletus MAHUNKA, 1985 (p. 336; Pl. 13: A)
incompletus MAHUNKA, 1985: 126, f. 6—11
V. koreanus MAHUNKA, 1973 (p. 336; Pl. 13: C)
koreanus MAHUNKA, 1973: 53, f. 6—8
koreanus: BALOGH et MAHUNKA, 1983: 120, Pl. 57: F—H
V. ogawai AOKI, 1965 (p. 336; Pl. 12: A—B)
ogawai AOKI, 1965: 143, f. 21—23
V. ramirezae CORPUZ-RAROS, 1979 (p. 336; Pl. 11: C)
ramirezae CORPUZ-RAROS, 1979: 22, f. 5
V. ramosus (BALOGH, 1961) (p. 336; Pl. 13: B)
ramosus BALOGH, 1961a: 26, f. 11—12 (*Papillacarus*)
ramosus: CORPUZ-RAROS, 1979: 332, f. 23, 26 (*Papillacarus*)

Xenolohmannia BALOGH et MAHUNKA, 1969 (p. 338)

Xenolohmannia BALOGH et MAHUNKA, 1969 (2, f. 1—5)
Xenolohmannia BALOGH, 1972: 49

X. discrepans BALOGH et MAHUNKA, 1969 (p. 338; Pl. 18: A)
discrepans BALOGH et MAHUNKA, 1969: 2, f. 5
X. capillata BALOGH et MAHUNKA, 1978 (p. 338; Pl. 17: B—C)
capillata BALOGH et MAHUNKA, 1978: 274, f. 3 A—C
X. comosa P. BALOGH, 1984 (p. 338; Pl. 17: A)
comosa P. BALOGH, 1984: 35, f. 5 A—B

Although the drawing and the description of HALLER include several errors, it is almost more than certain, that the species belongs to the genus *Lohmannia*. In fact it stands quite close to the species *Lohmannia loebeli* MAHUNKA, 1974, though the two species cannot be identified on the basis of the descriptions. Since the type material of HALLER has been lost, it would be desirable to collect and rediscover the species again close to the type locality and in similar habitat to settle this problem.

Lohmannia murcioides BERLESE, 1896

Murcioides BERLESE, 1896: 78, 7, T. 26 (*Angelia*)

It is obvious that BERLESE's drawing includes some errors, it is almost more than certain that this species belongs to the genus *Lohmannia*. The setiform and long *exp* seta on the drawing is very characteristic, on the basis of which this species belongs to the species group of *regalis* BERLESE, 1923. This group includes two species: *L. regalis* BERLESE, 1923 and *L. reticulata* SELLNICK, 1931. Further investigations are needed to reveal whether *murcioides* (BERLESE, 1896) is identical with one of these two, or is an independent, third species.

Species "incertae sedis" of the family Lohmanniidae

Lohmannia paradoxa (HALLER, 1884)

paradoxa HALLER, 1884: 234, T. 16, f. 5—8 (*Michaelia*)
paradoxa: MICHAEL, 1898: 75
paradoxa: WILLMANN, 1931: 97, f. 16—17
paradoxa: GRANDJEAN, 1950: 96
paradoxa: BALOGH, 1961: 33

Lohmannia texana (BANKS, 1910)

texana BANKS, 1910: 11, f. 11 (*Hypochthonius*)
texana: BALOGH, 1961: 33 ("*Lohmannia*")

On the basis of the description and the drawings, it is quite certain that the species is a true *Lohmannia*, and it is highly likely that it comes quite close to *Lohmannia banksi* NORTON et al., 1978.

Javacarus marginatus (HAMMER, 1973)

marginatus HAMMER, 1973: 12, f. 4 (*Tongacarus*)

The single specimen that was described, in fact, is a juvenile form, consequently, the final number of the genital and anal setae has not developed. According to the description and the figures showing some important characters, the species belongs to the genus *Javacarus*. Only the discovery of the adult form will decide whether this is an independent species or it is a juvenile form of an already known species.

Mixacarus lavariensis (HAMMER, 1977)

lavariensis HAMMER, 1977: 17, f. 9 (*Hamacarus*)

The single specimen that was described is a subadult form with 9 pairs of genital setae. On the basis of the characteristics given in the short diagnosis, the species cannot be separated from *Mixacarus*. The species belongs to the species group *M. exilis* AOKI, 1970. The final status of the species can be decided upon after the discovery of the adults.

? *Meristacarus striatus* (HAMMER, 1980)

striata HAMMER, 1980: 11, f. 9 (*Javalohmannia*)

The species was described on the basis of three young forms having 8 genital setae and an undeveloped anogenital region. The final status of the

species can be fully decided upon only after the discovery of adult specimens. It is quite likely that the genus *Javalohmannia* is a junior synonym of either the genera *Meristacarus* or probably *Meristolohmannia*, and not a valid genus in itself.

Junior synonymy for the generic names of Lohmanniidae (partim)

Angelia BERLESE, 1896 = *Lohmannia* MICHAEL, 1898
Asiacarus KRIVOLUTSKY, 1971 = *Thamnacarus* GRANDJEAN, 1950
Austracarus MAHUNKA, 1984 (nec J. BALOGH et P. BALOGH, 1983) = *Ululohmania* MAHUNKA, 1987
Hamacarus HAMMER, 1977 = *Mixacarus* BALOGH, 1958
Hypochthonius BANKS, 1910 (partim) = *Lohmannia* MICHAEL, 1898
Javalohmannia HAMMER, 1980 = *Meristacarus* GRANDJEAN, 1934
Michaelia HALLER, 1884 = *Lohmannia* MICHAEL, 1898
Neotrichacarus HAMMER, 1973 = *Heptacarus* PIFFL, 1963
Pseudocryptacarus MCDANIEL, NORTON et BOLEN, 1979 = *Heptacarus* PIFFL, 1963
Tongacarus HAMMER, 1973 = *Javacarus* BALOGH, 1961

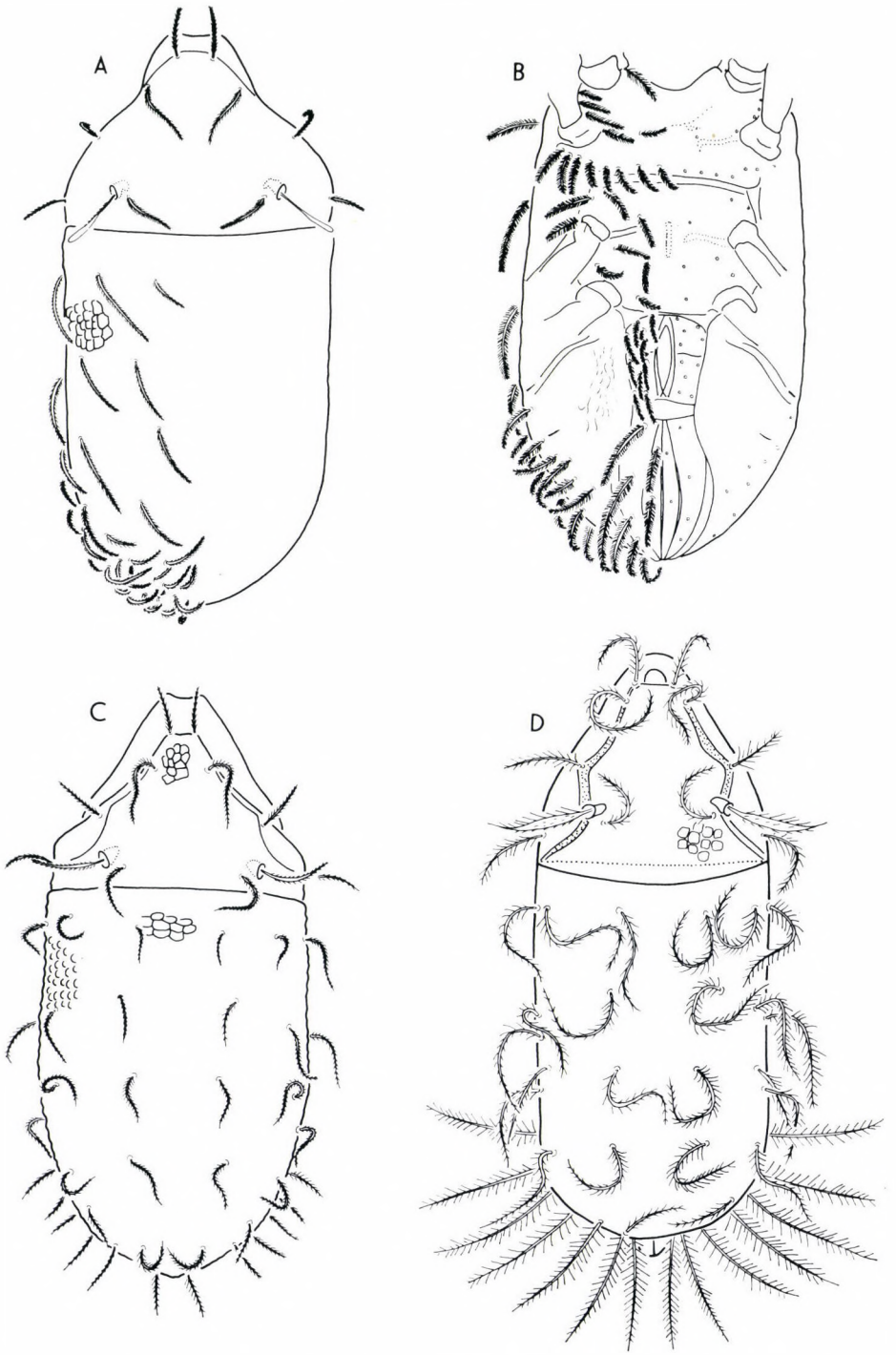

Plate 1. A—B = *Thamnacarus deserticola* (GRANDJEAN, 1934) — C = *T. elongatus* (KRIVOLUTSKY, 1971) — D = *T. longisetosus* (BULANOVA-ZACHVATKINA, 1978)

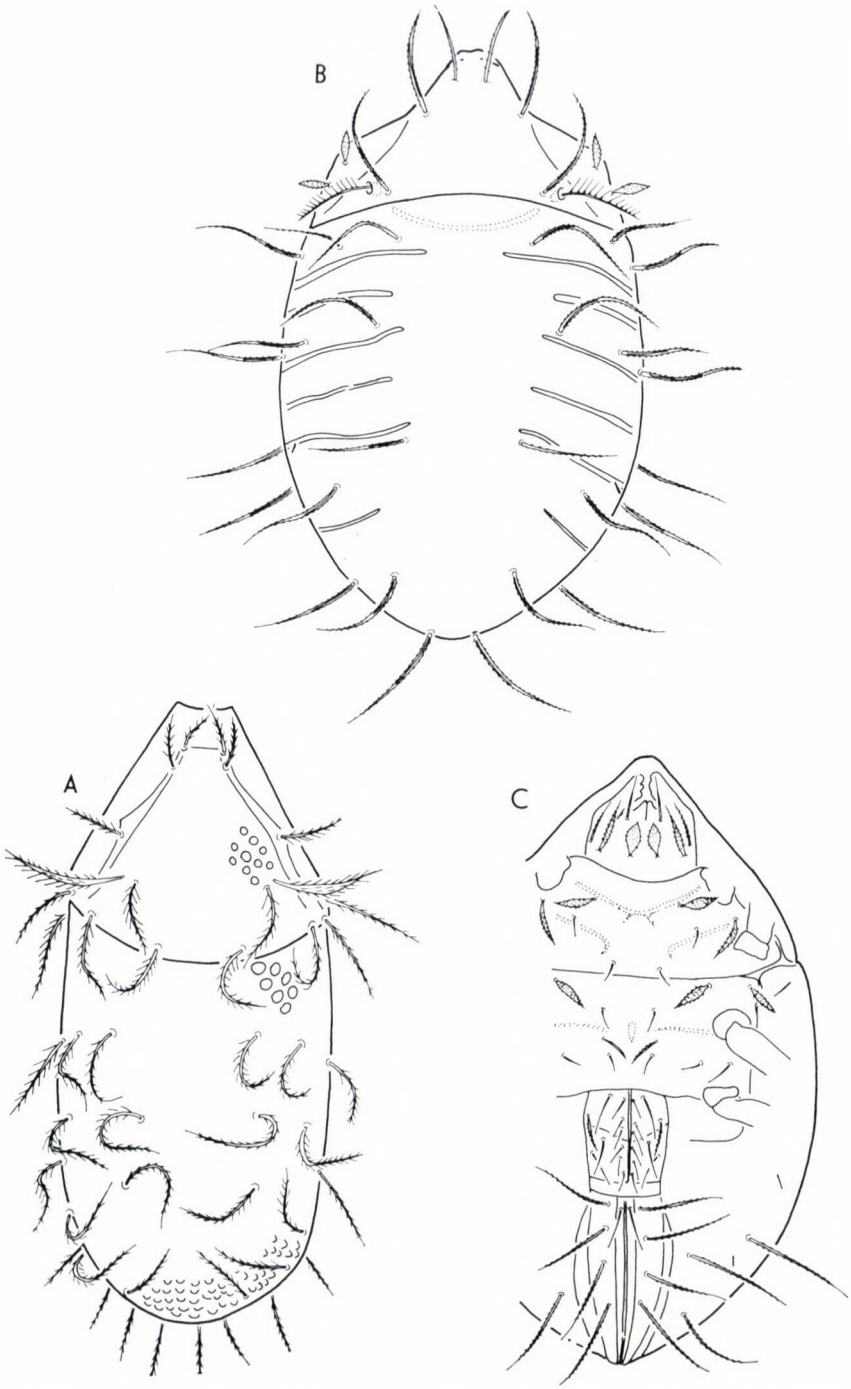

Plate 2. A = *Thamnacarus smirnovi* BULANOVA-ZACHVATKINA, 1978 — B—C = *Carolohmannia carolensis* (NORTON et al., 1978)

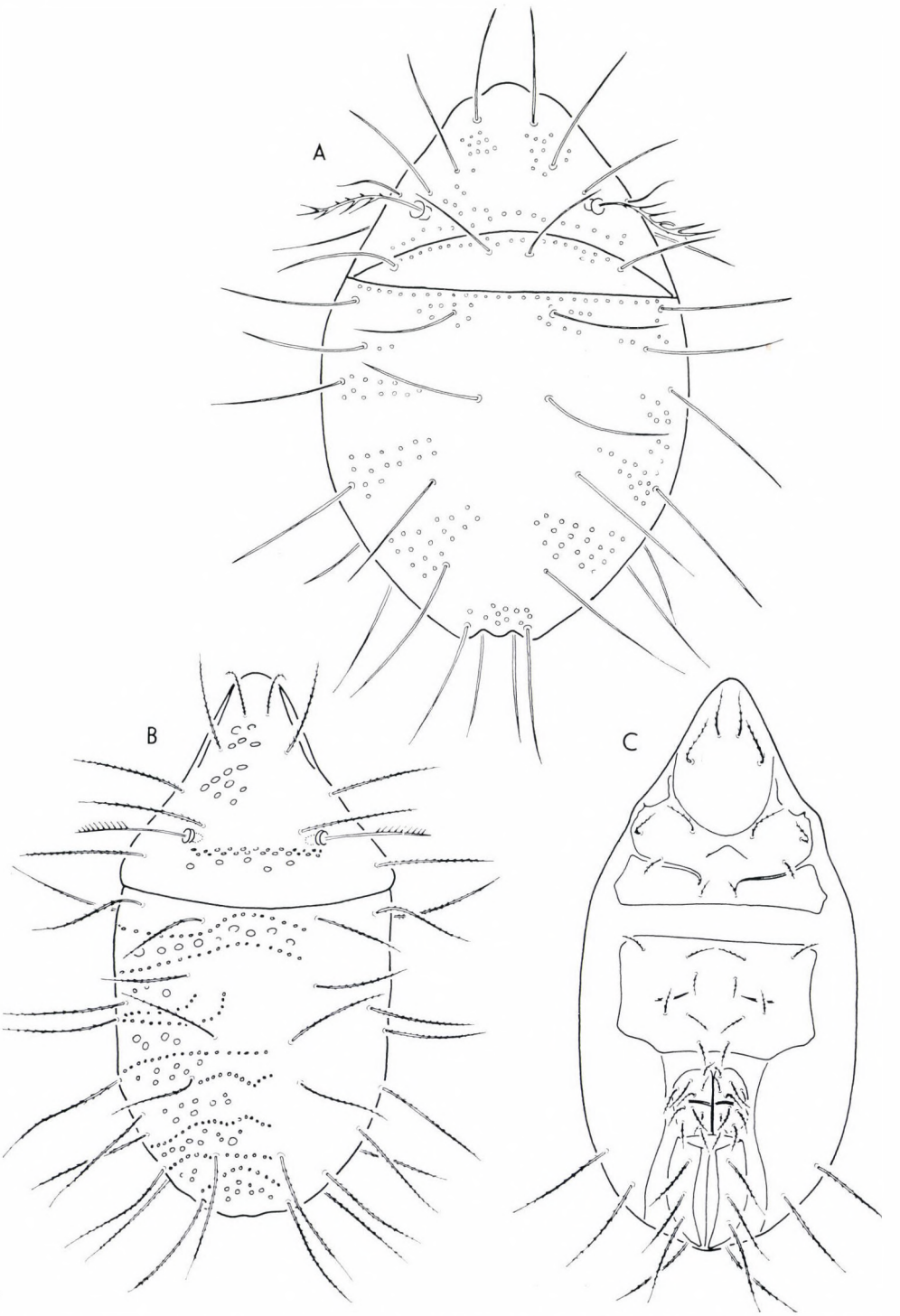

Plate 3. A = *Meristolohmannia chinensis* (BULANOVA-ZACHVATKINA, 1960) — B—C = *M. meristacaroides* BALOGH et MAHUNKA, 1966

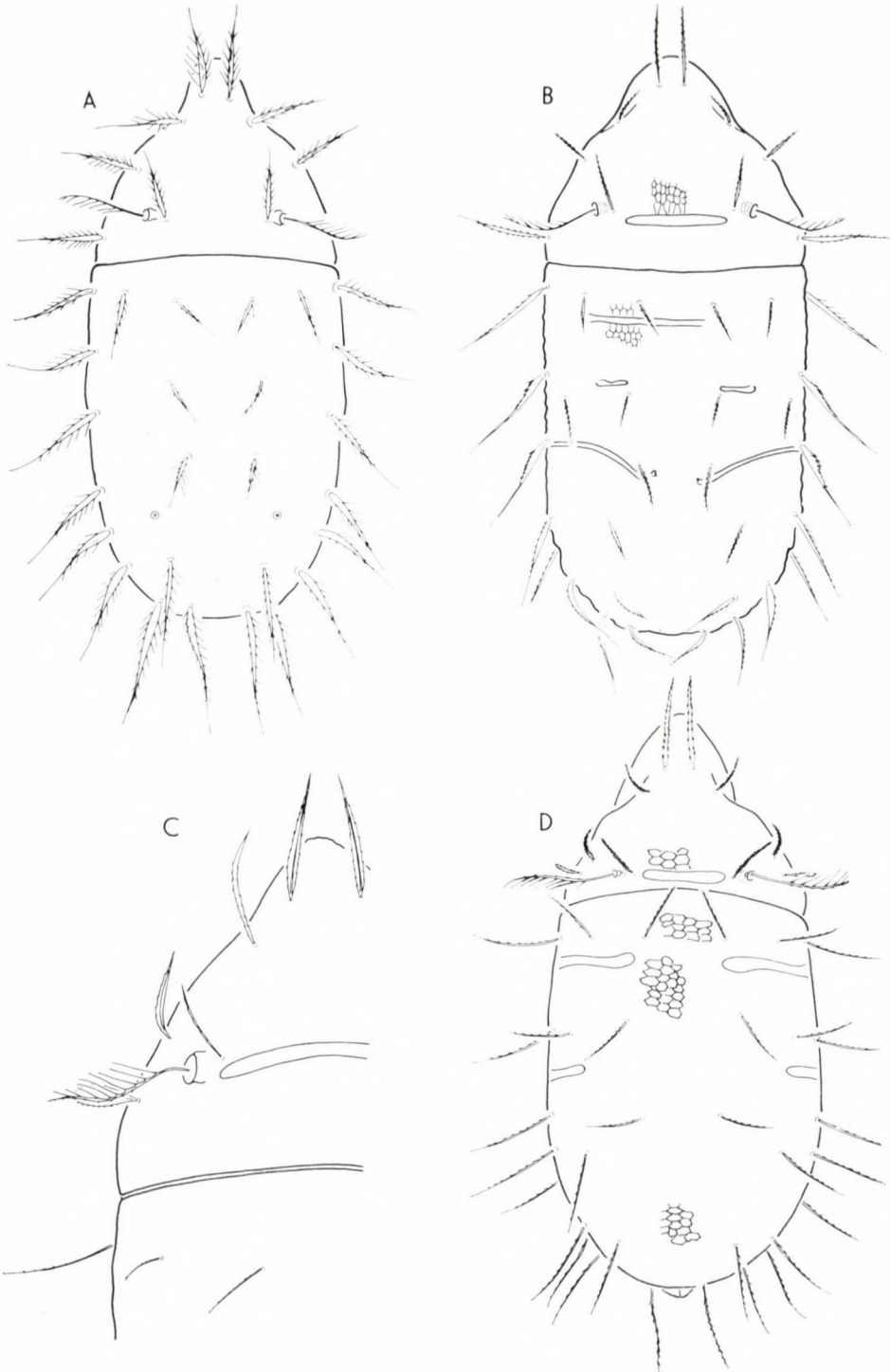

Plate 4. A = *Lohmannia regalis* BERLESE, 1923 — B = *L. reticulata* SELLNICK, 1931 — C = *L. similis* BALOGH, 1962 — D = *L. coreana* CHOI, 1985

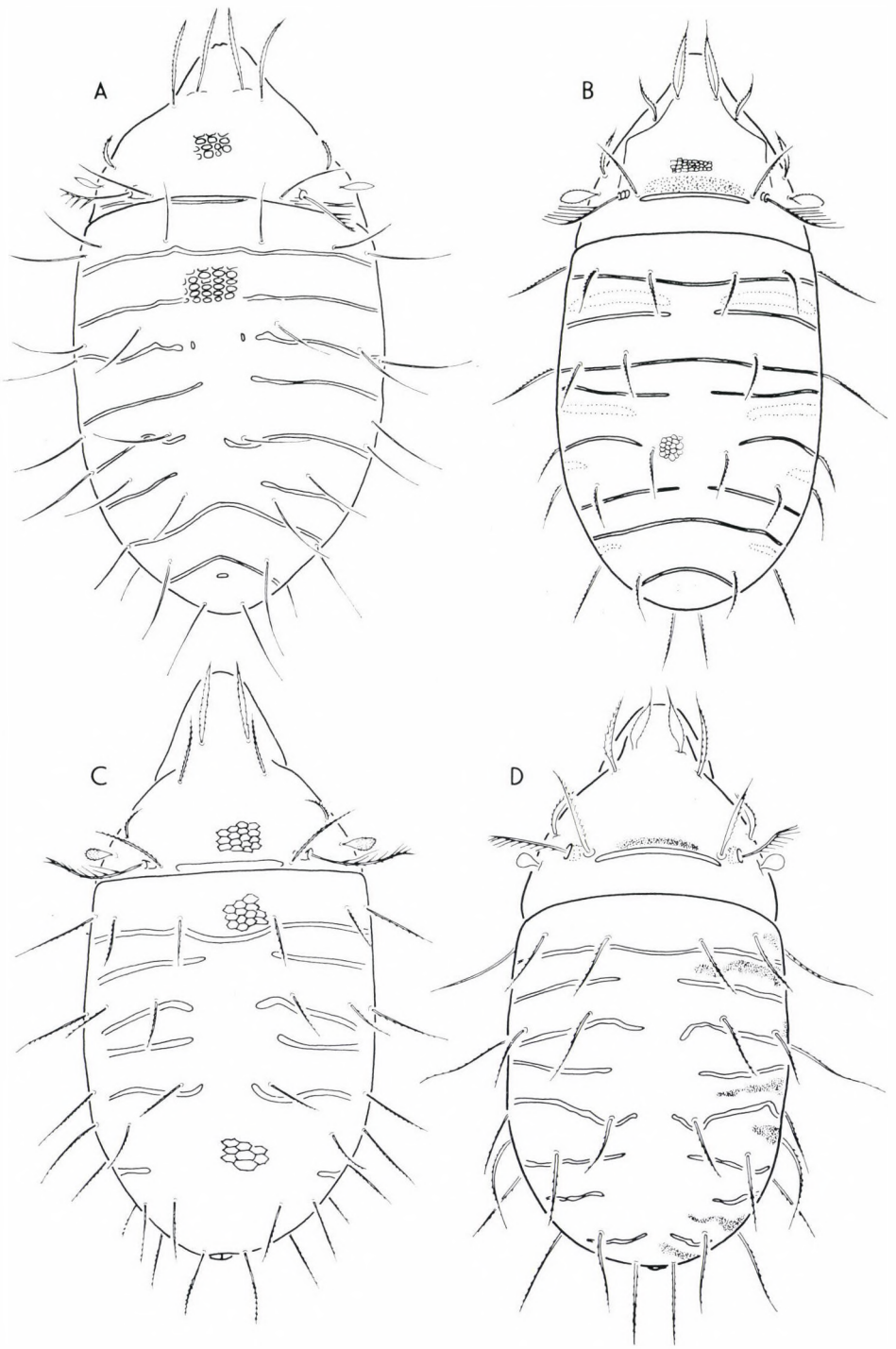

Plate 5. A = *Lohmannia corallium* NAKATAMARI, 1982 — B = *L. javana javana* BALOGH, 1961 — C = *L. javana interrupta* CHOI, 1985 — D = *L. lanceolata* GRANDJEAN, 1950

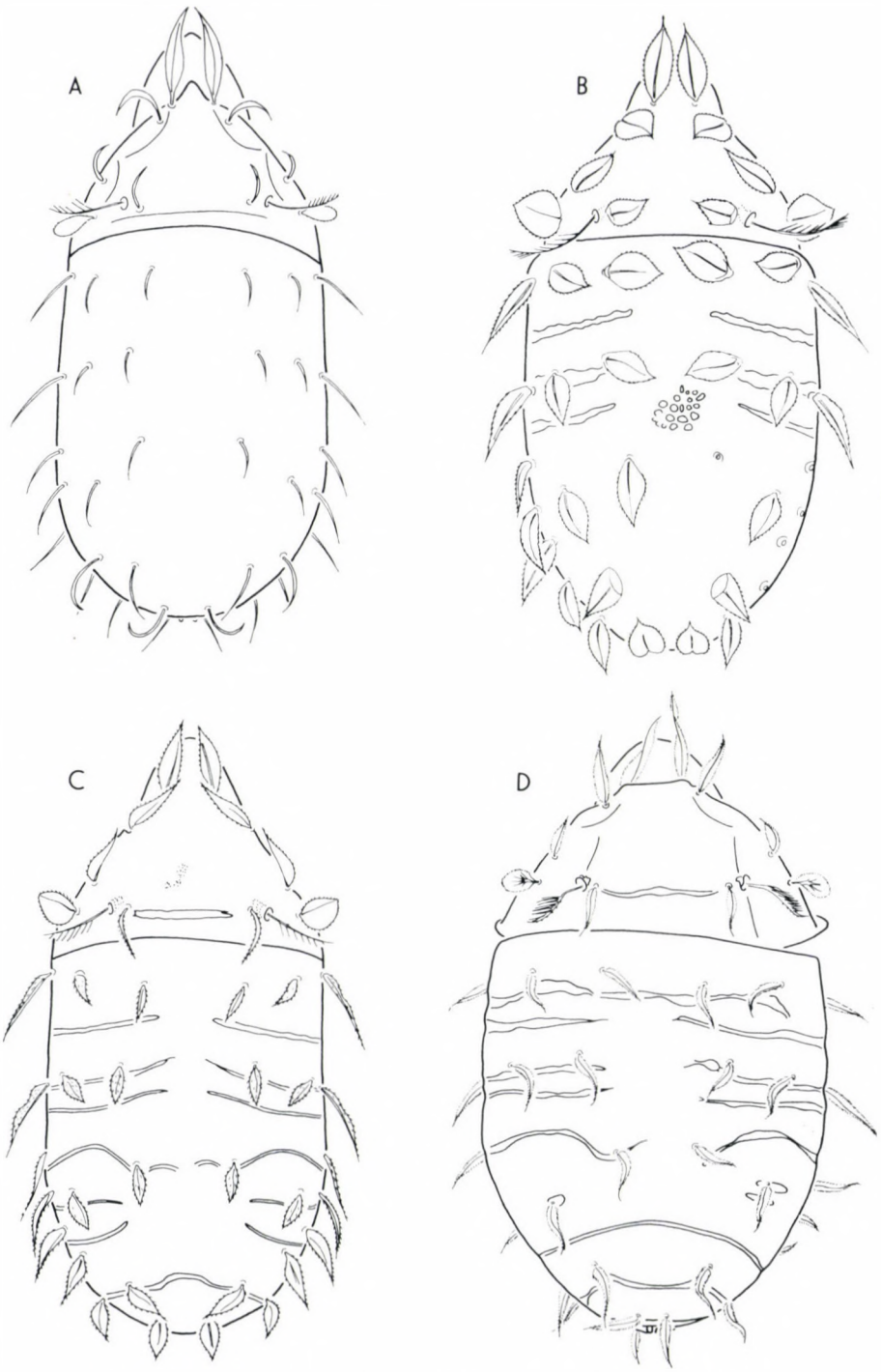

Plate 6. A = *Lohmannia bifoliata* WILLMANN, 1931 — B = *L. hungarorum* MAHUNKA, 1980 — C = *L. loebli* MAHUNKA, 1974 — D = *L. pinnigera* SENGBUSCH, 1984

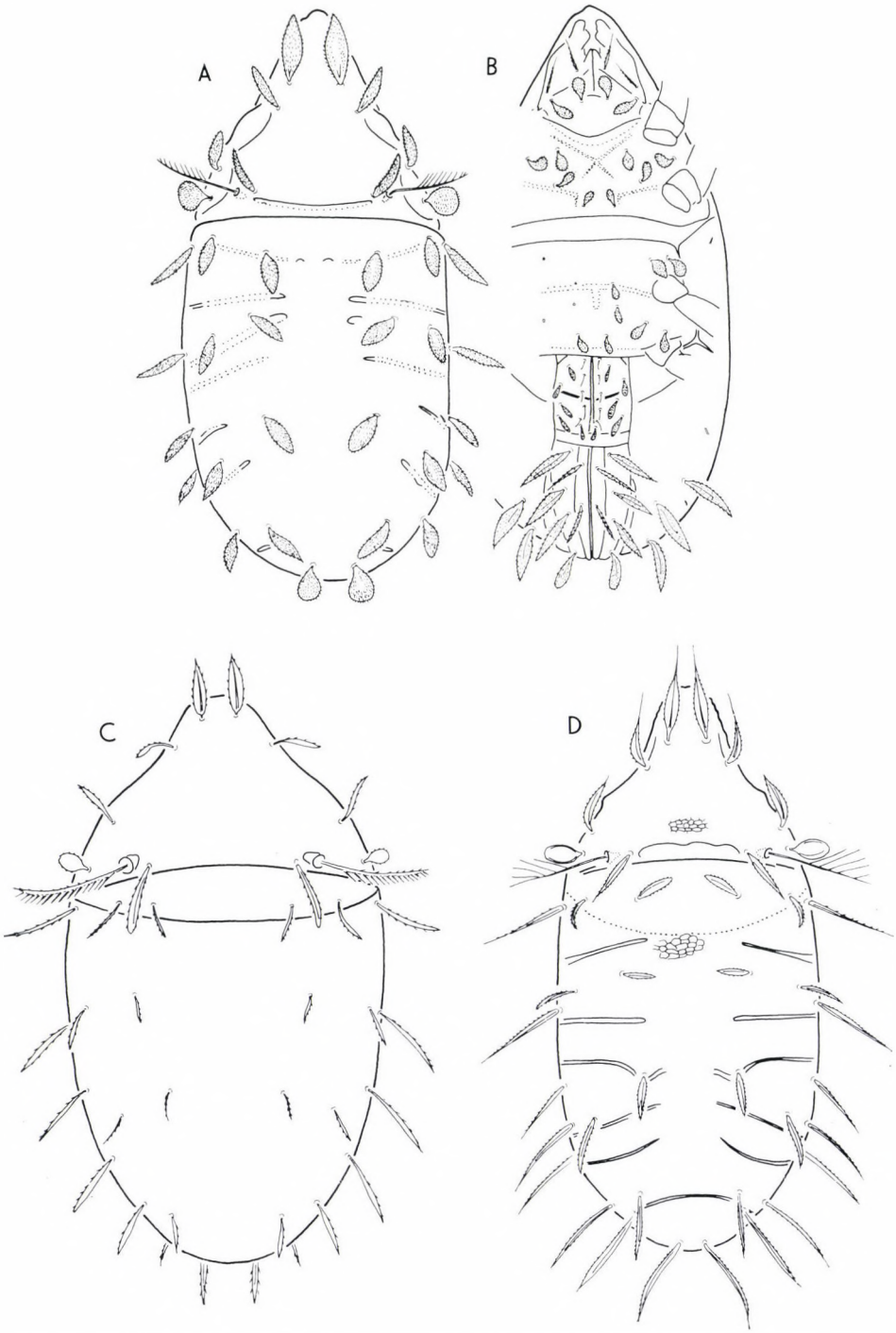

Plate 7. A—B = *Lohmannia banksi* NORTON et al., 1978 — C = *L. turcmenica* BULANOVA-ZACHVATKINA, 1960 — D = *L. embryonalis* MAHUNKA, 1978

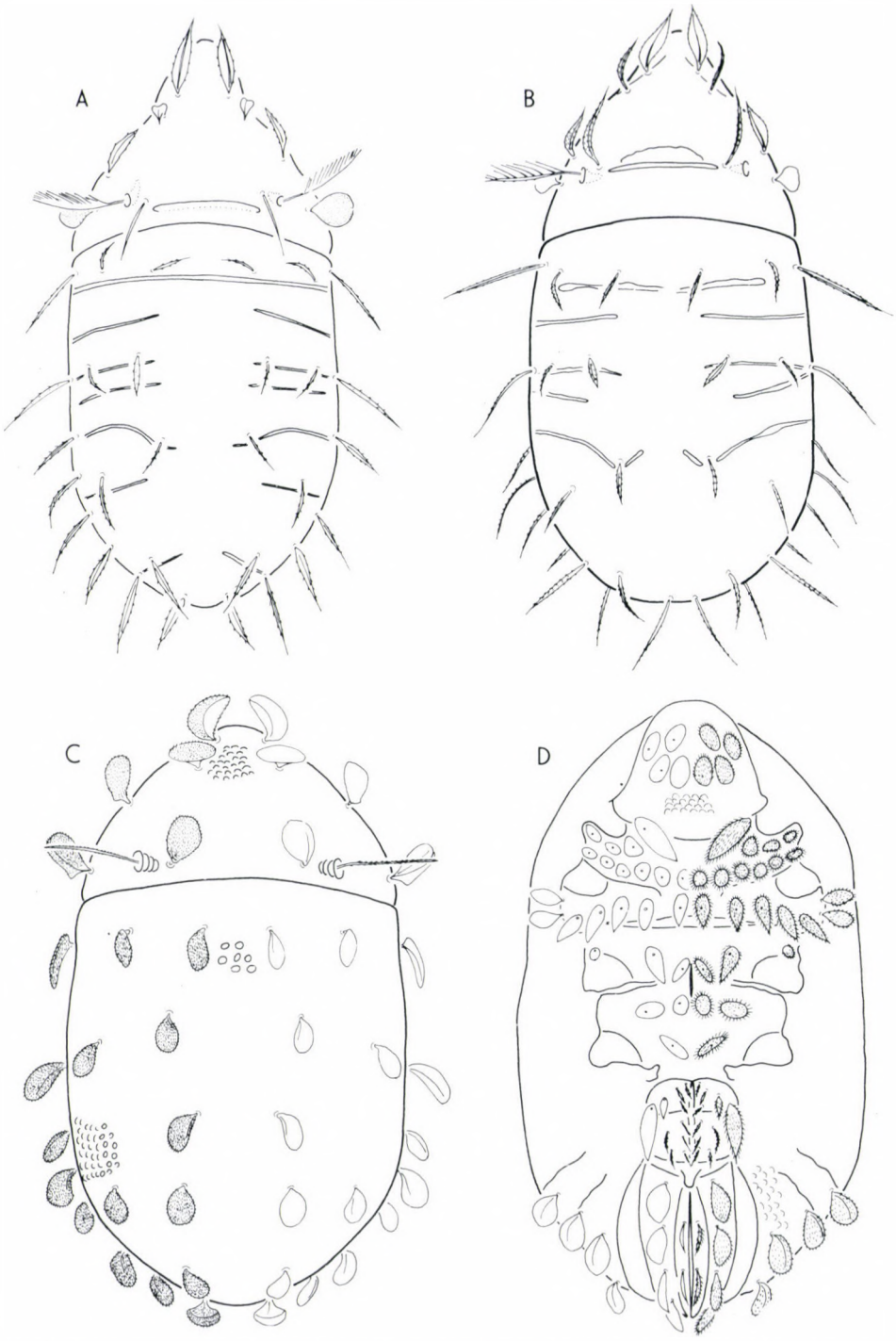

Plate 8. A = *Lohmannia jornoti* MAHUNKA, 1985 — B = *L. juliae* MAHUNKA, 1984 — C—D = *Lepidacarus ornatissimus* CSISZÁR, 1961

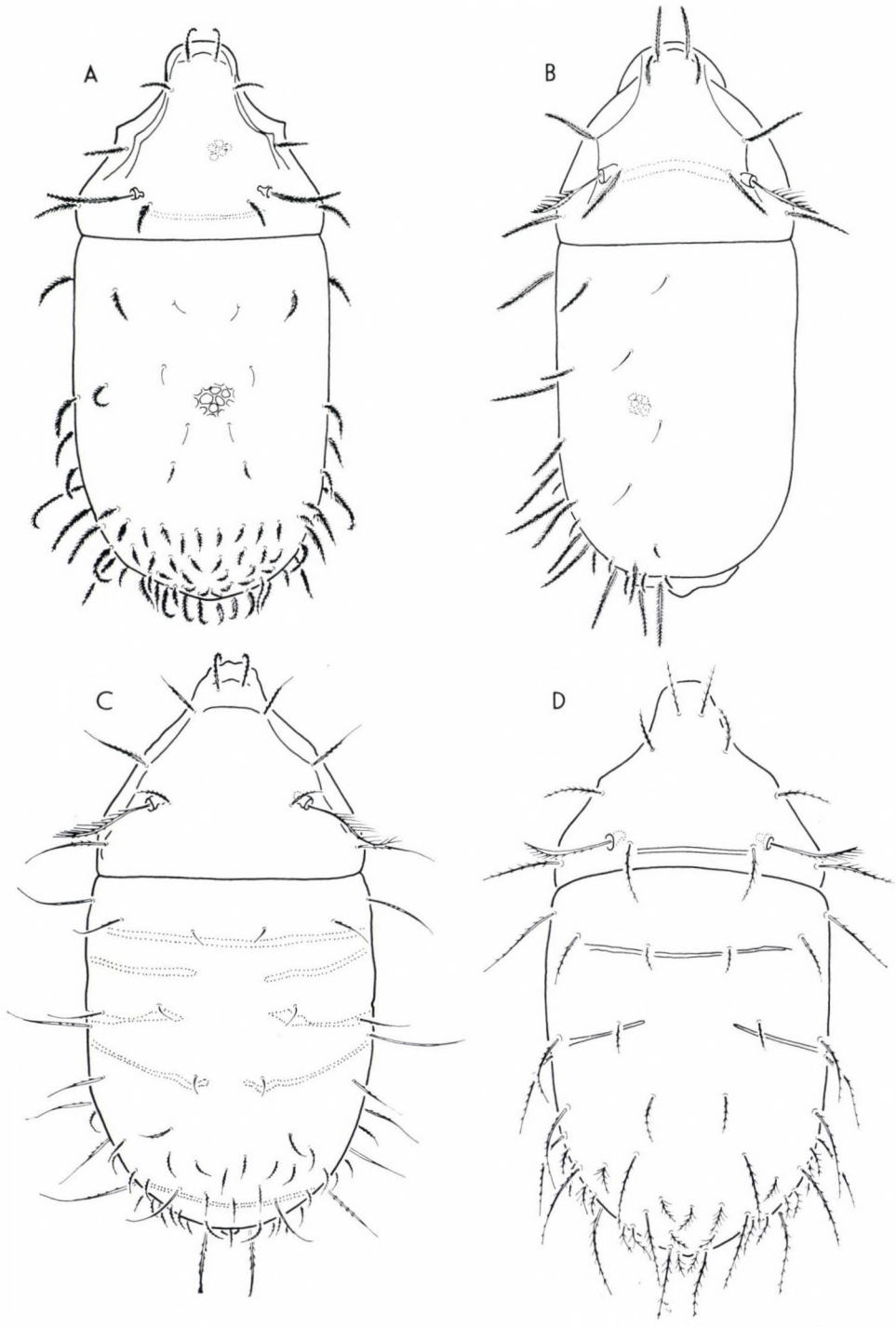

Plate 9. A = *Papillacarus chamartinensis* PÉREZ-IÑIGO, 1967 — B = *P. simplirostratus* BHATTACHARYA et al., 1974 — C = *P. undirostratus* AOKI, 1965 — D = *P. ondriasi* MAHUNKA, 1974

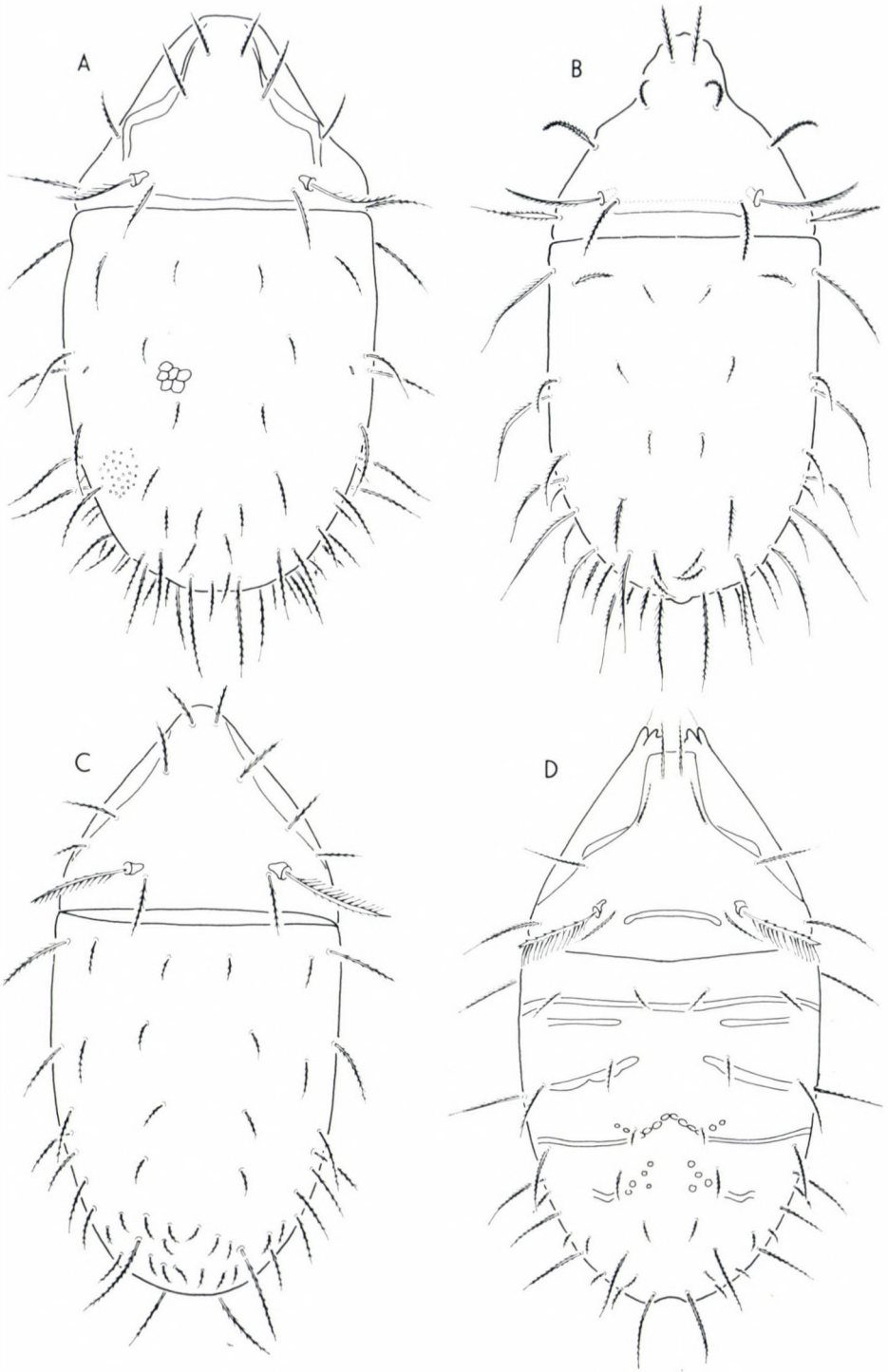

Plate 10. A = *Papillacarus aciculatus* (BERLESE, 1904) — B = *P. pseudoaciculatus* MAHUNKA, 1980 — C = *P. pawlowskii* (BULANOVA-ZACHVATKINA, 1960) — D = *P. spinosus* ALZUET, 1972

Plate 11. A—B = *Papillacarus angulatus* WALLWORK, 1962 — C = *Vepracarus ramirezae* CORPUZ-RAROS, 1979

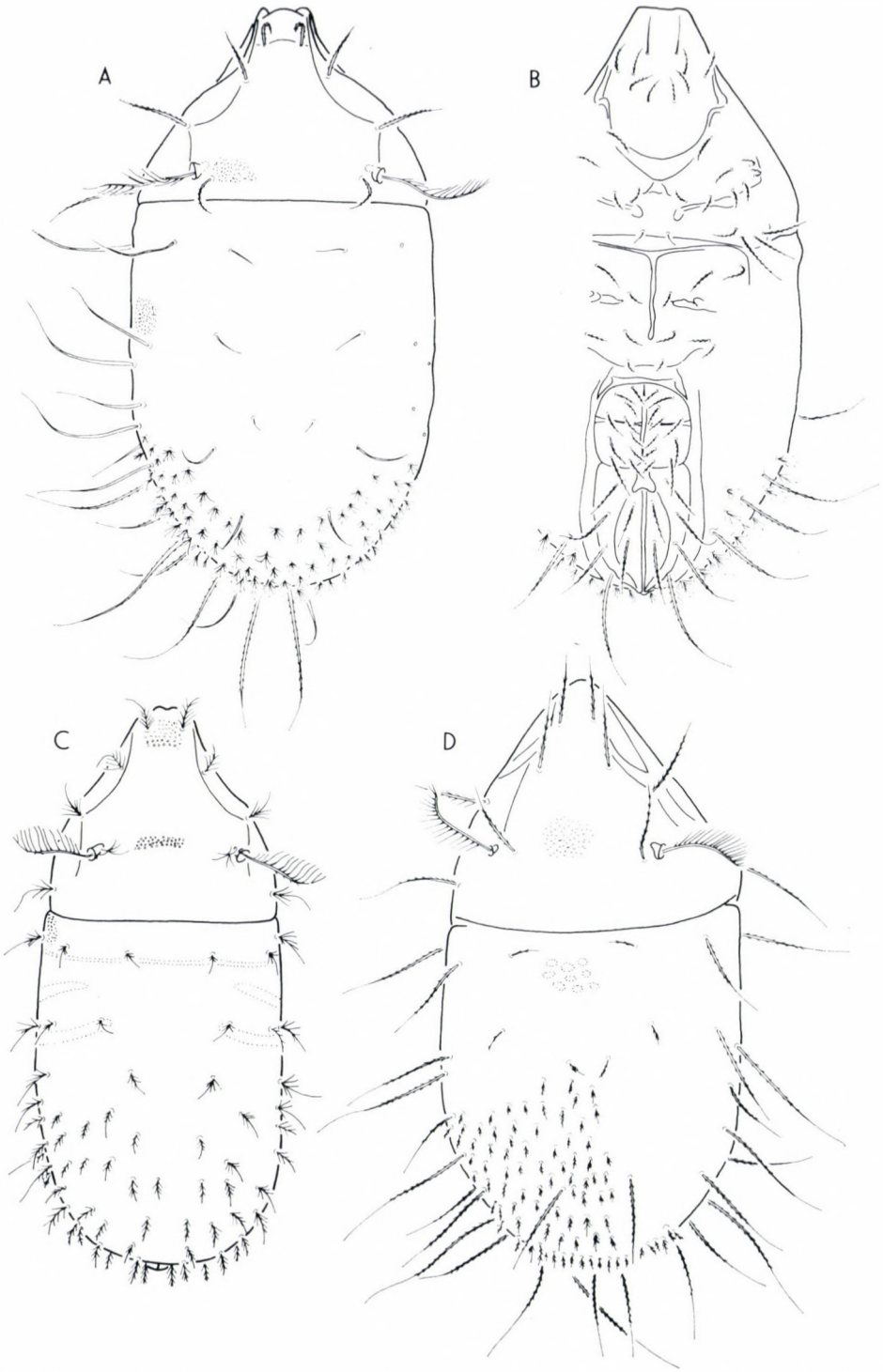

Plate 12. A—B = *Vepracarus ogawai* Aoki, 1965 — C = *V. hirsutus* (Aoki, 1961) — D = *V. cruzae* Corpus-Raros, 1979

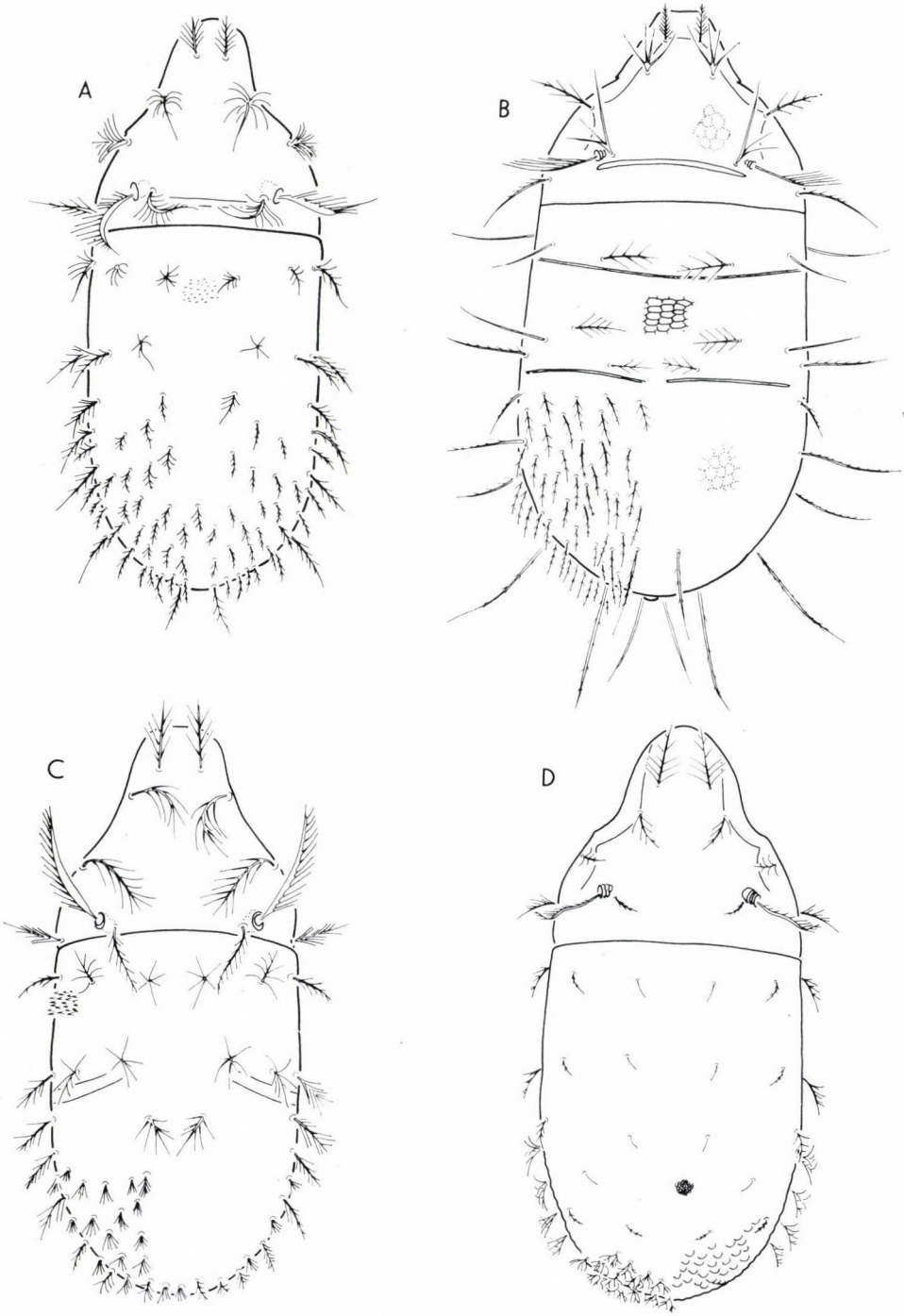

Plate 13. A = *Vepracarus incompletus* MAHUNKA, 1985 — B = *V. ramosus* (BALOGH, 1961) — C = *V. koreanus* MAHUNKA, 1973 — D = *Cryptacarus tuberculatus* CSISZÁR, 1961

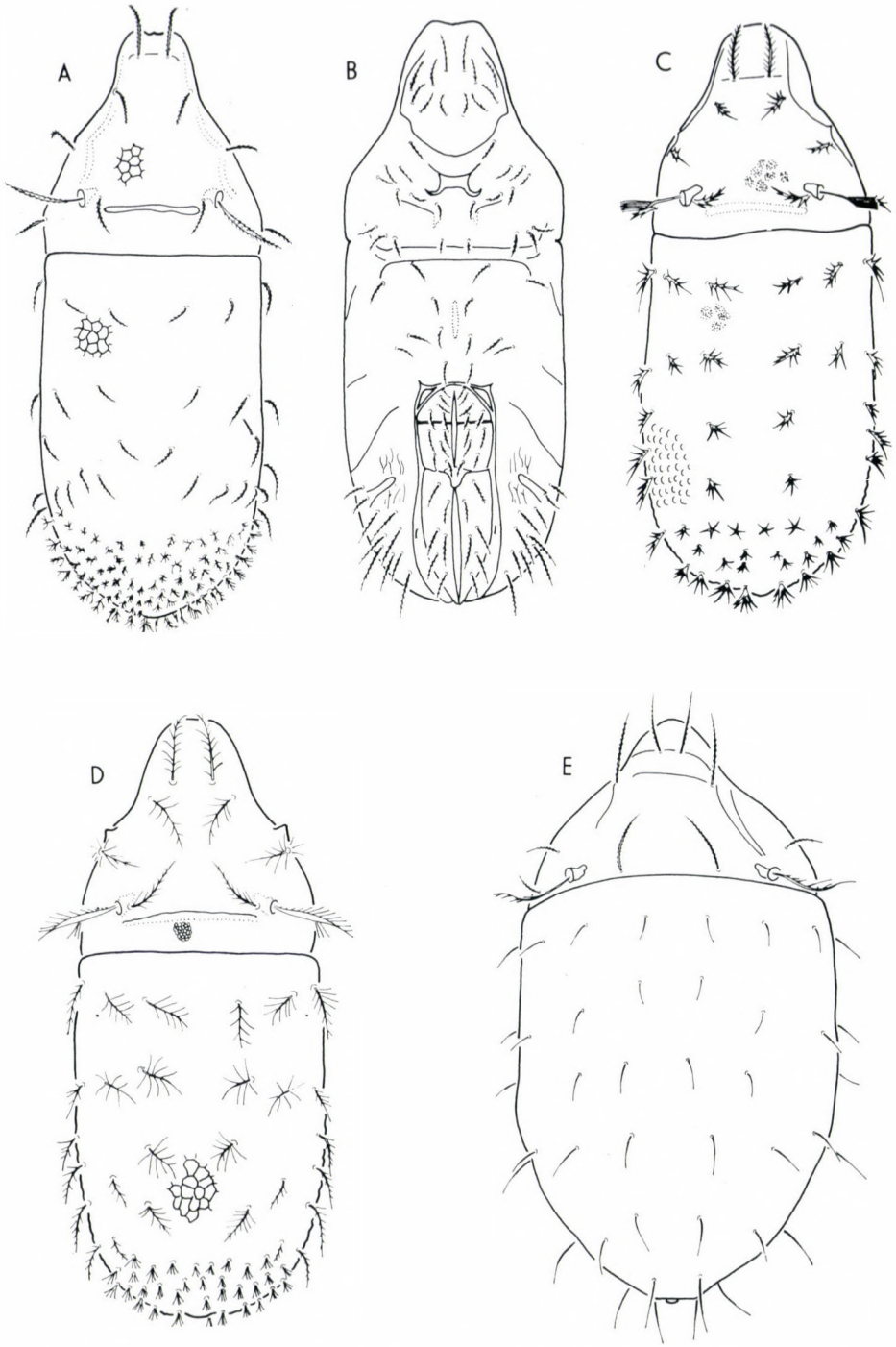

Plate 14. A—B = *Cryptacarus promecus* GRANDJEAN, 1950 — C = *C. dendrisetosus* BHATTACHARYA et al., 1974 — D = *C. schauenbergi* MAHUNKA, 1977 — E = *Heptacarus notoneotrichus* PIFFL, 1963

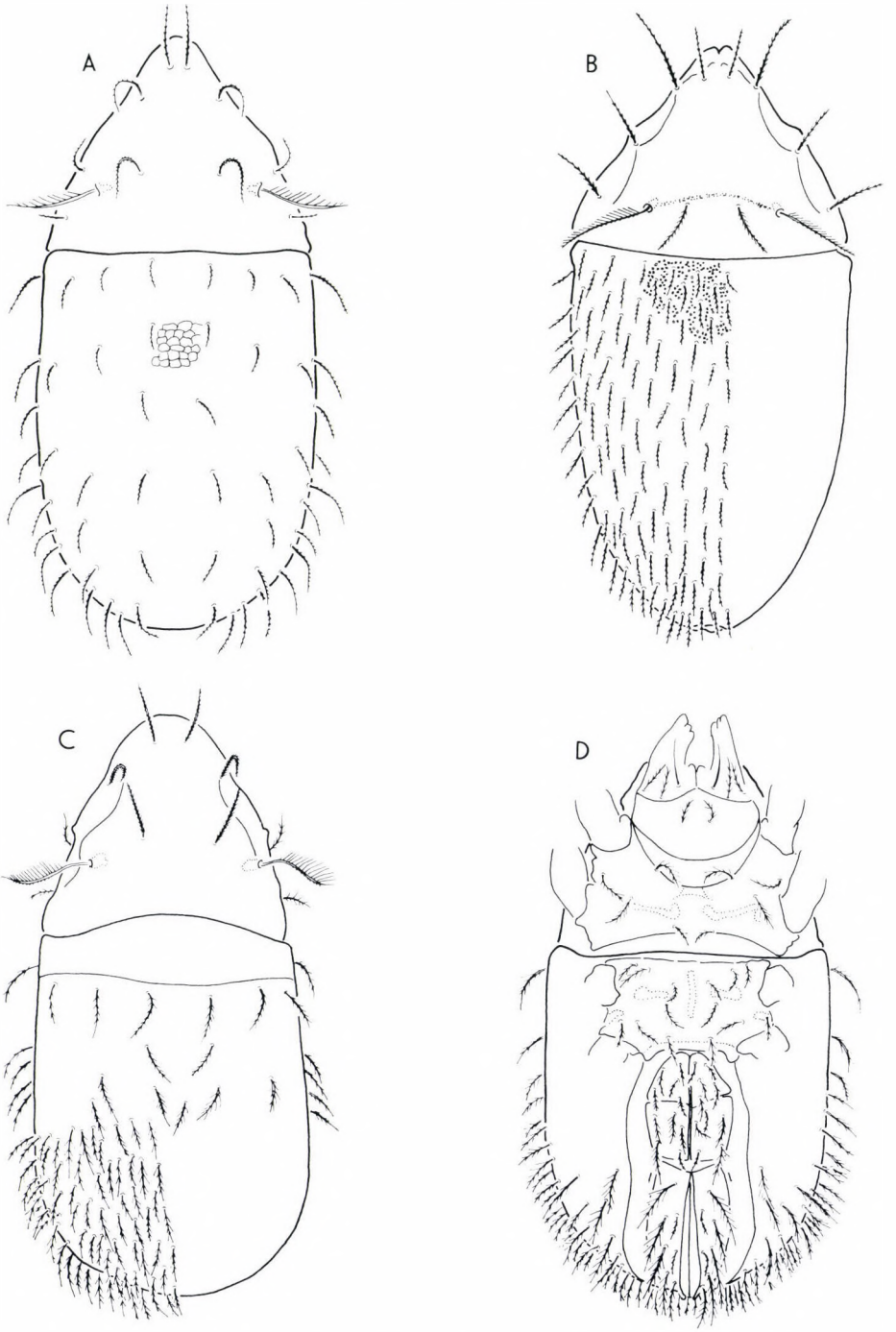

Plate 15. A = *Heptacarus piffli* MAHUNKA, 1977 — B = *H. graminosus* (MCDANIEL et al., 1979) — C—D = *H. supertrichus* PIFFL, 1967

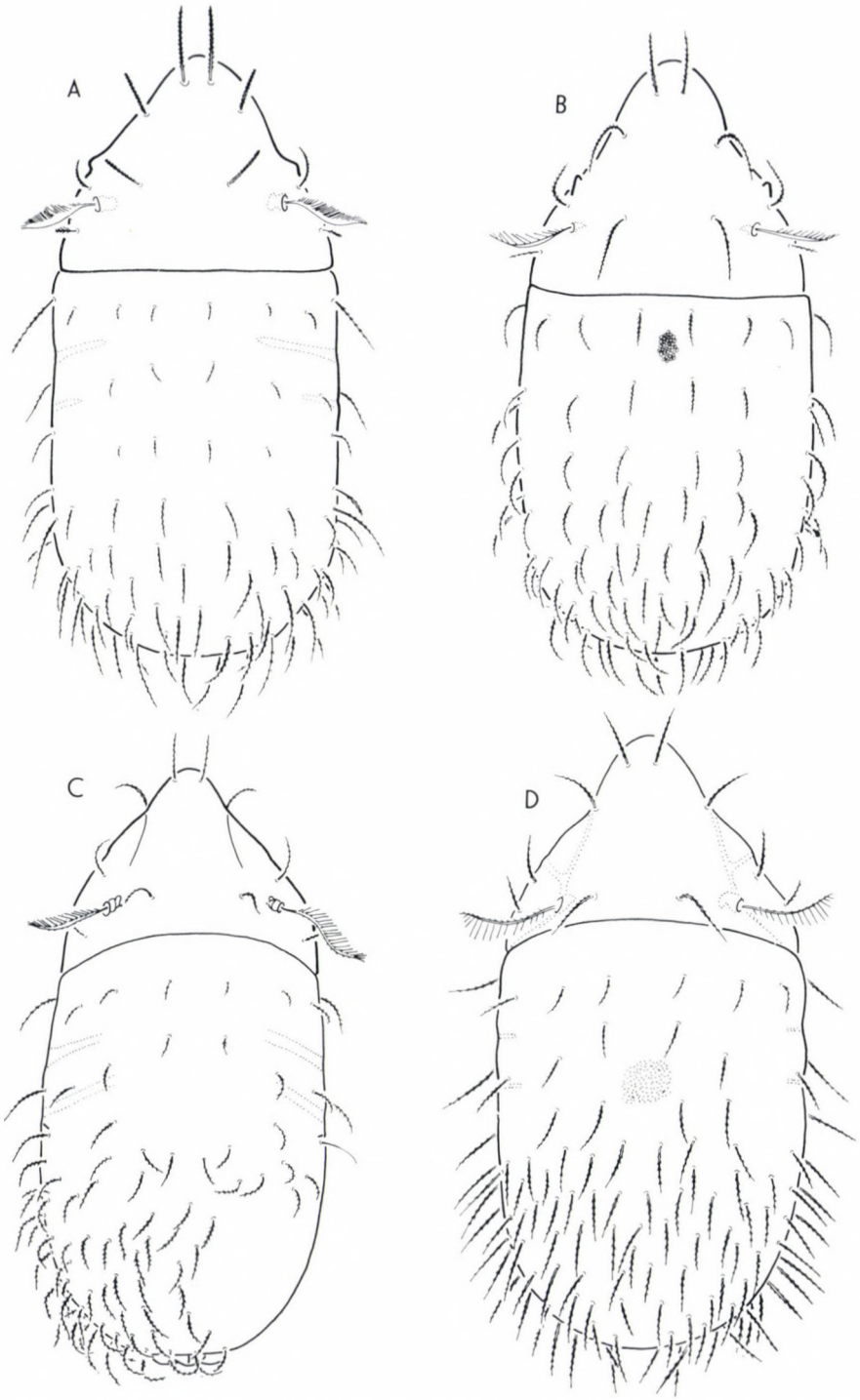

Plate 16. A = *Heptacarus neotropicus* MAHUNKA, 1985 — B = *H. reticulatus* MAHUNKA, 1985 — C = *H. plumosus* (HAMMER, 1973) — D = *H. hirsutus* WALLWORK, 1964

Plate 17. A = *Xenolohmannia comosa* P. BALOGH, 1984 — B—C = *X. capillata* BALOGH et MAHUNKA, 1978

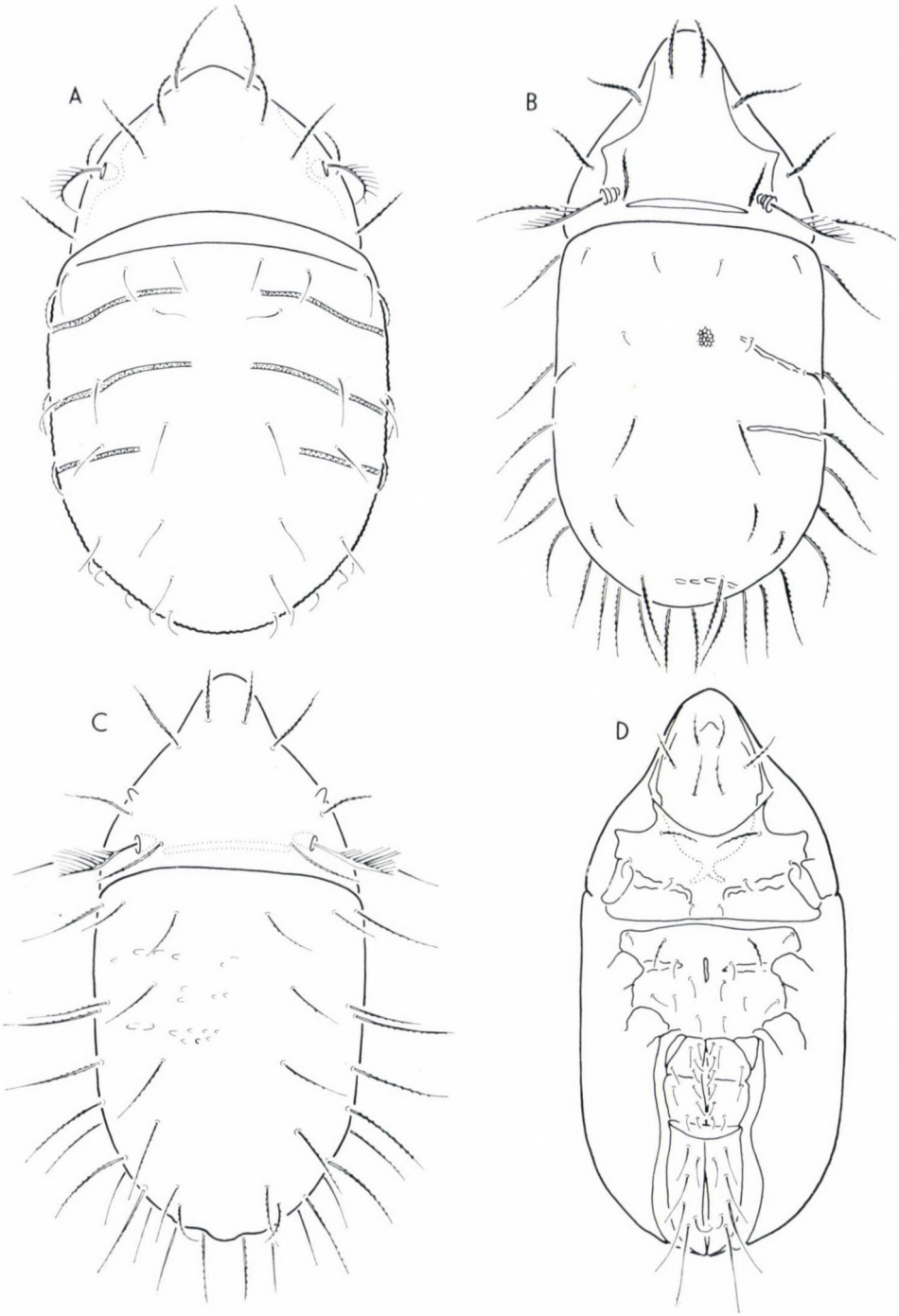

Plate 18. A = *Xenolohmannia discrepans* BALOGH et MAHUNKA, 1969 — B = *Nesiacarus reticulatus* CSISZÁR, 1961 C—D = *N. australis* BALOGH et MAHUNKA, 1981

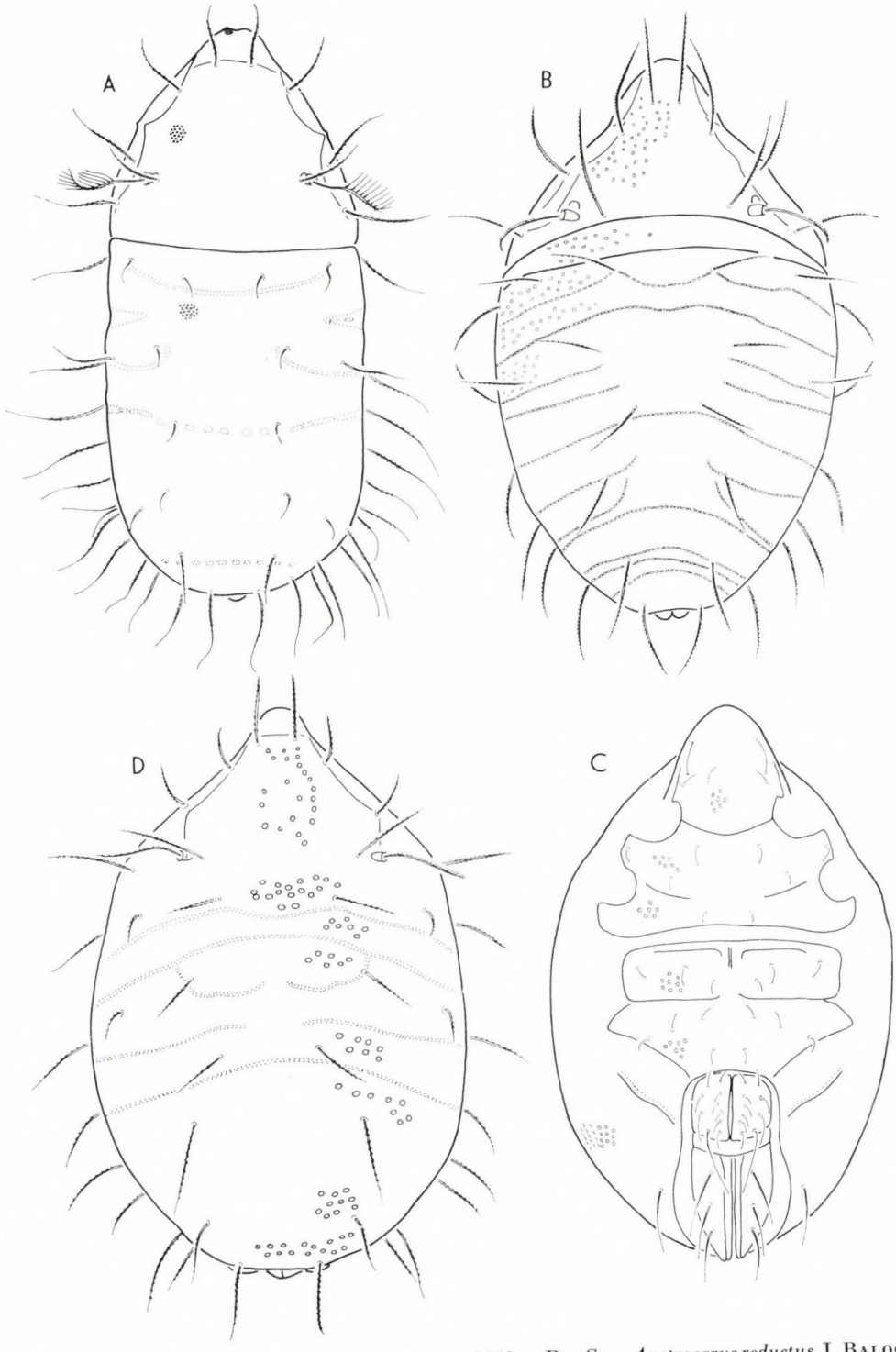

Plate 19. A = *Nesiacarus granulatus* HAMMER, 1972 — B—C = *Austracarus reductus* J. BALOGH et P. BALOGH, 1983 — D = *A. tahitiensis* (HAMMER, 1972)

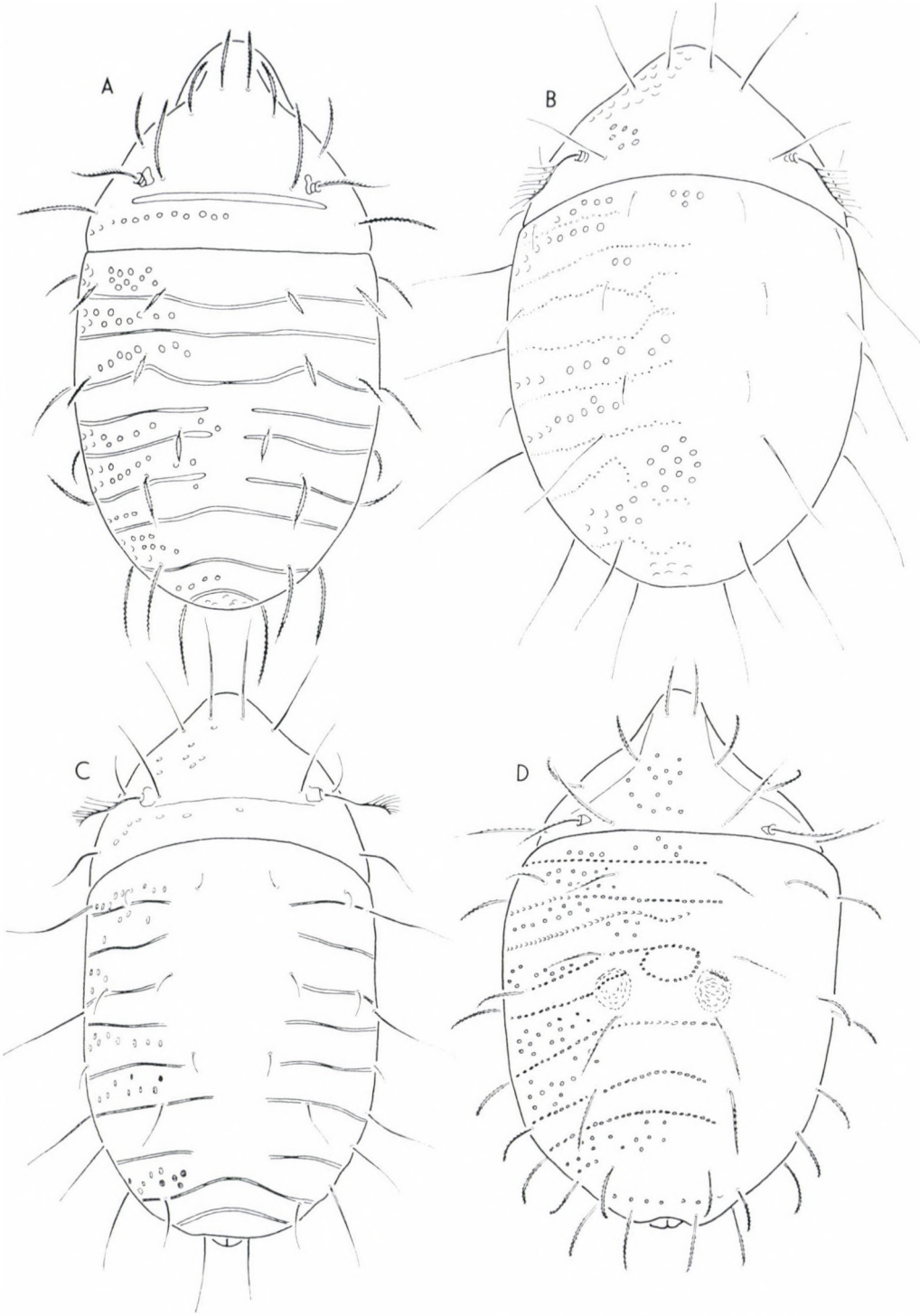

Plate 20. A = *Meristacarus biroi* BALOGH, 1961 — B = *M. heterotrichus* CSISZÁR, 1961 — C = *M. douhereti* J. BALOGH et P. BALOGH, 1983 — D = *M. bogorensis* HAMMER, 1980

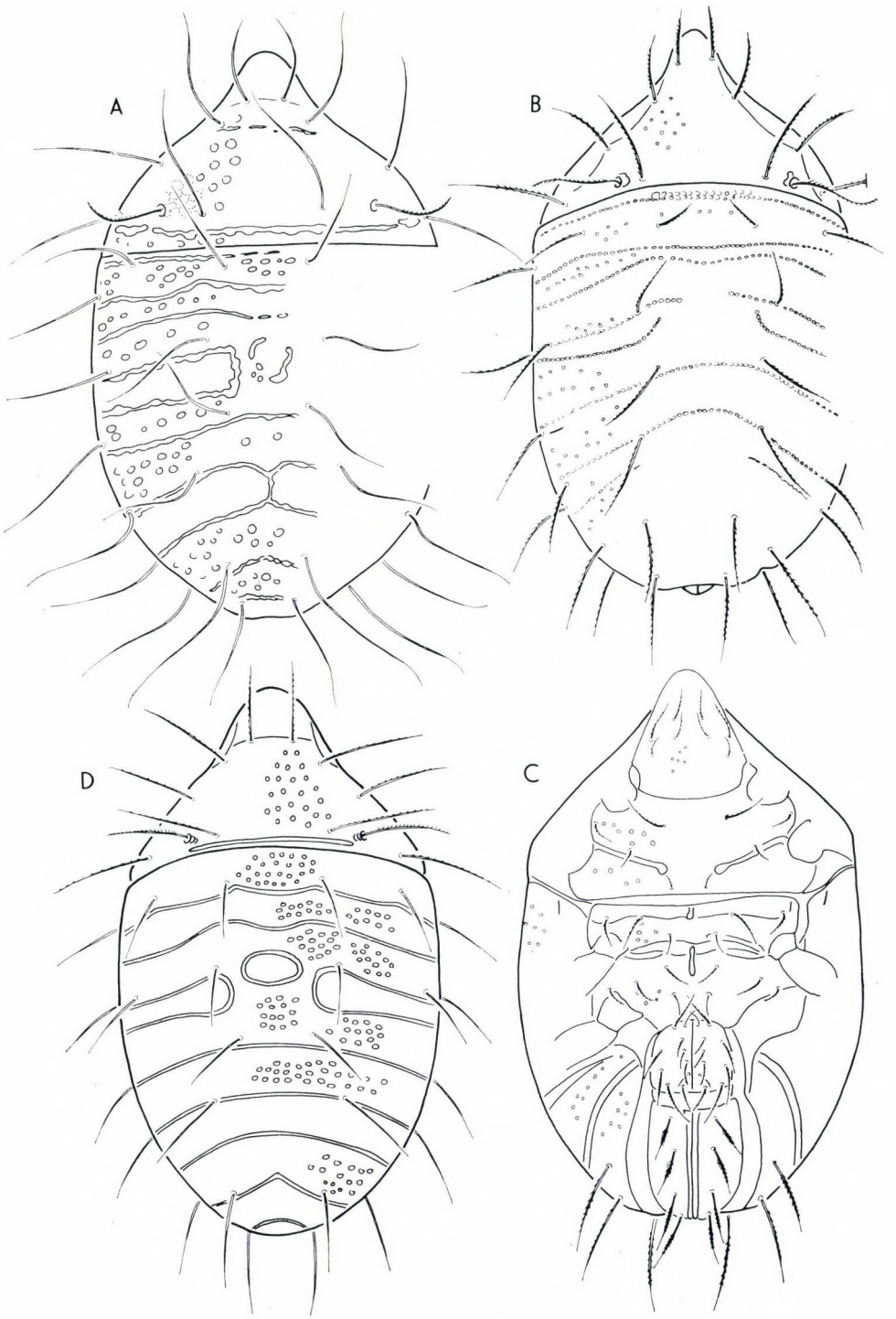

Plate 21. A = *Mersitacarus africanus annobonensis* PÉREZ-IÑIGO, 1968 — B—C = *M. sundensis* HAMMER, 1980 — D = *M. africanus africanus* BALOGH, 1958

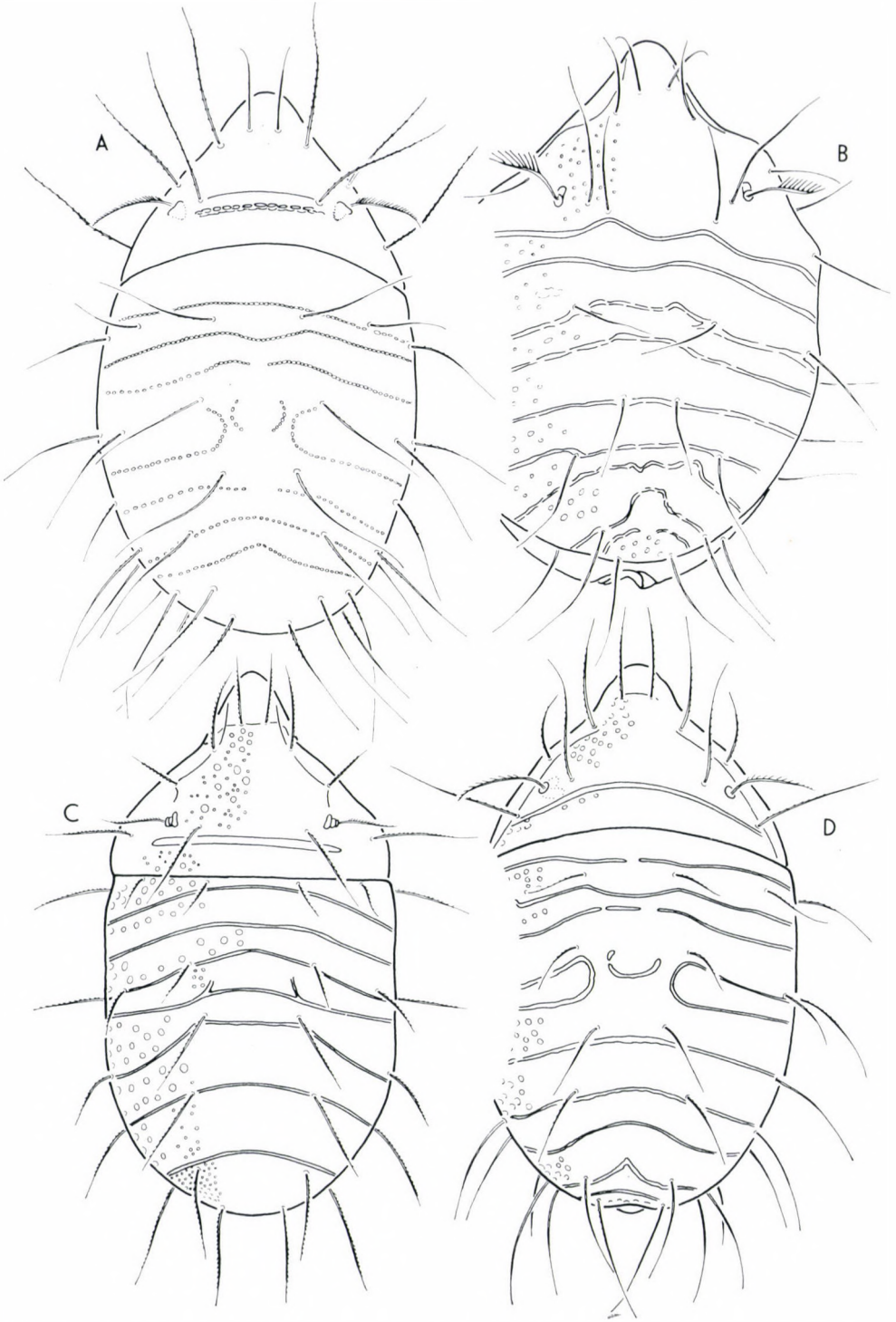

Plate 22. A = *Meristacarus longisetosus* MAHUNKA, 1978 — B = *M. tuloyus* CORPUZ-RAROS, 1979 — C = *M. rubescens* (CANESTRINI, 1897) — D = *M. porcula* GRANDJEAN, 1934

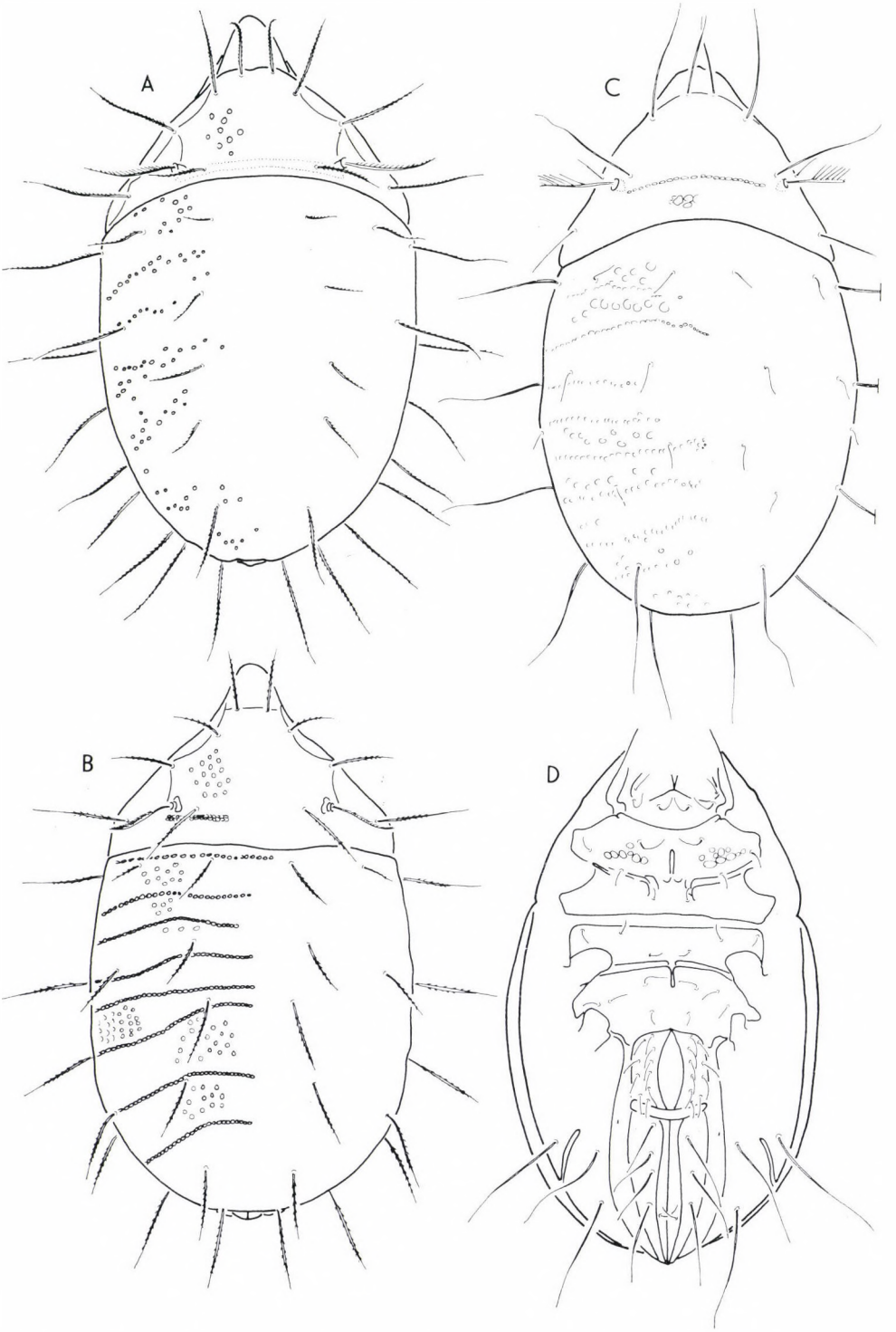

Plate 23. A = *Meristacarus madagascarensis obscurus* AOKI, 1965 — B = *M. madagascarensis madagascariensis* BALOGH, 1961 — C—D = *Ululohmannia cristata* (MAHUNKA, 1984)

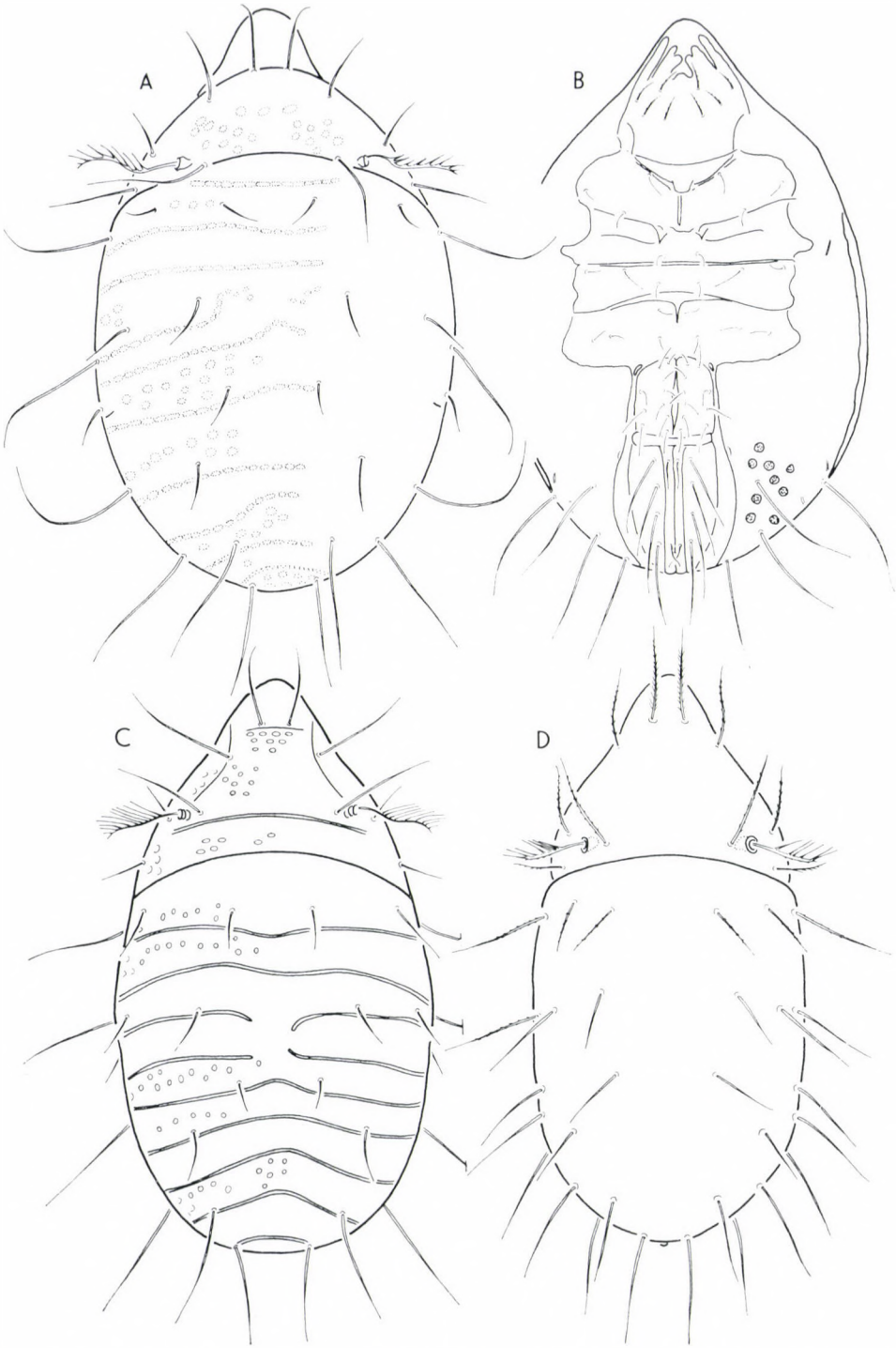

Plate 24. A—B = *Mixacarus chapmani* WALLWORK, 1962 — C = *M. integer* BALOGH, 1958 — D = *M. vanhonggui* MAHUNKA, 1973

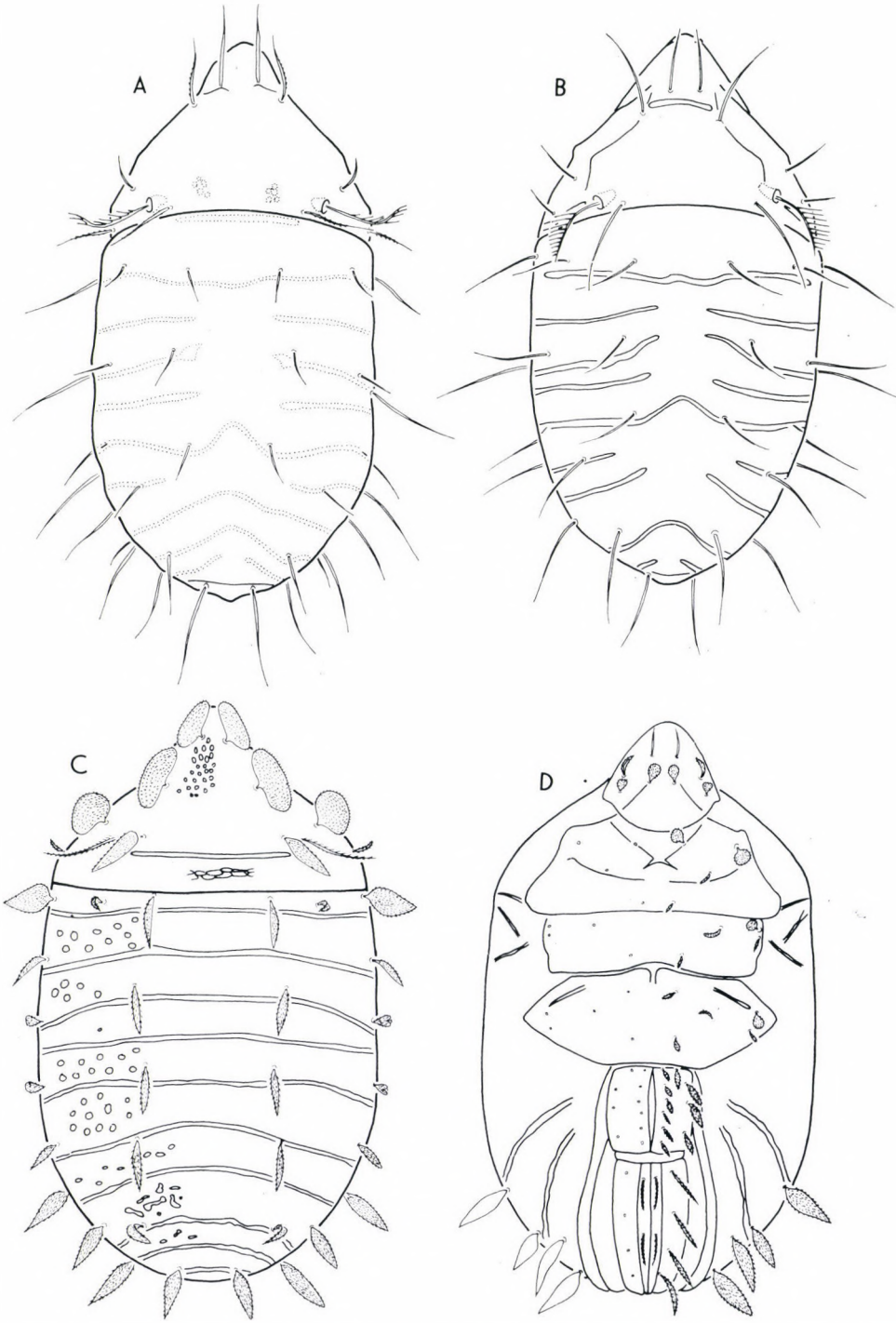

Plate 25. A = *Mixacarus exilis* AOKI, 1970 — B = *M. brevipes* (BANKS, 1947) — C—D = *Phyllolohmannia hamanni* (BALOGH, 1961)

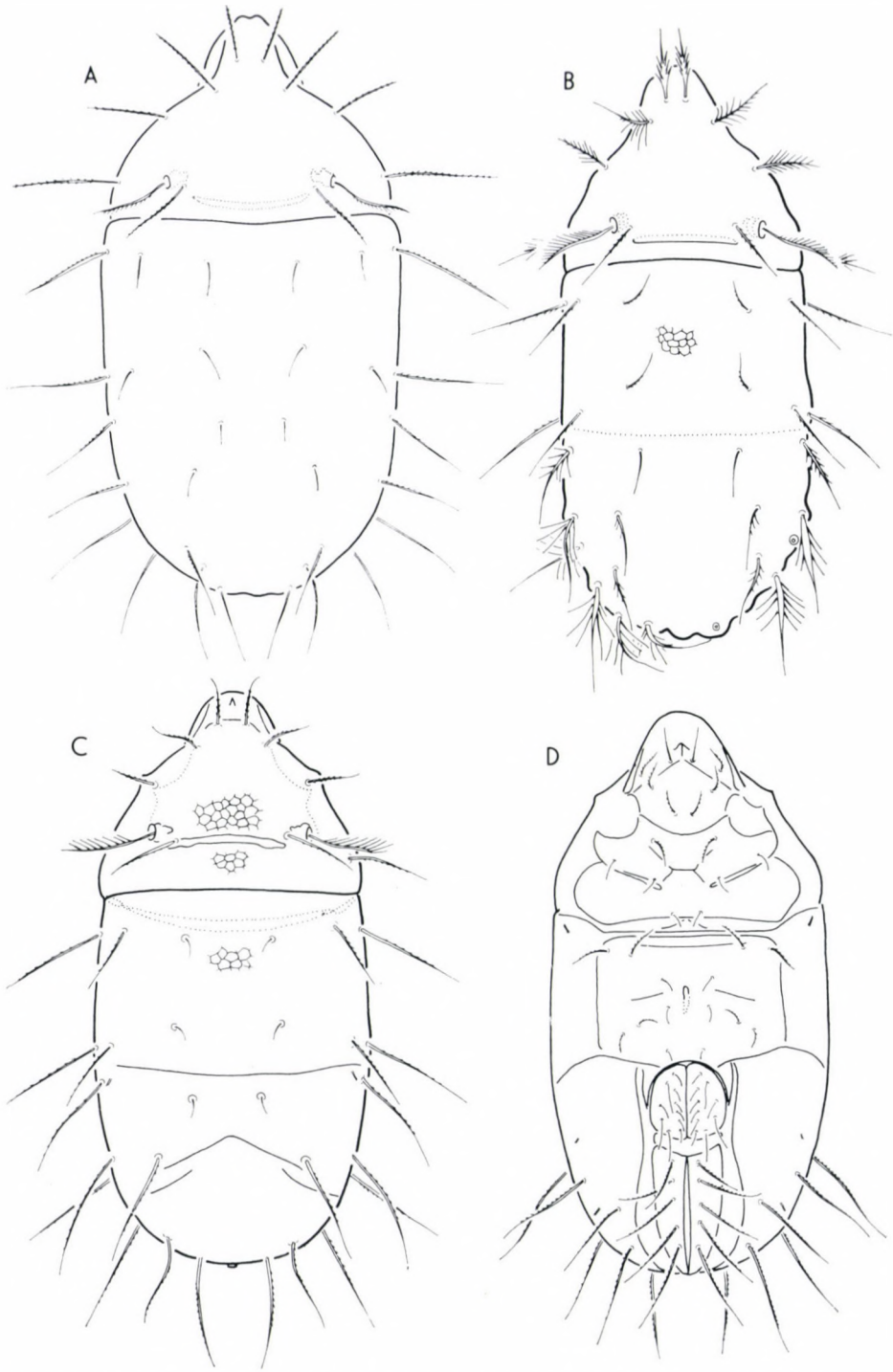

Plate 26. A = *Strinatacarus aelleni* MAHUNKA, 1977 — B = *Torpacarus callipygus* MAHUNKA, 1983 — C–D = *T. omittens omittens* GRANDJEAN, 1950

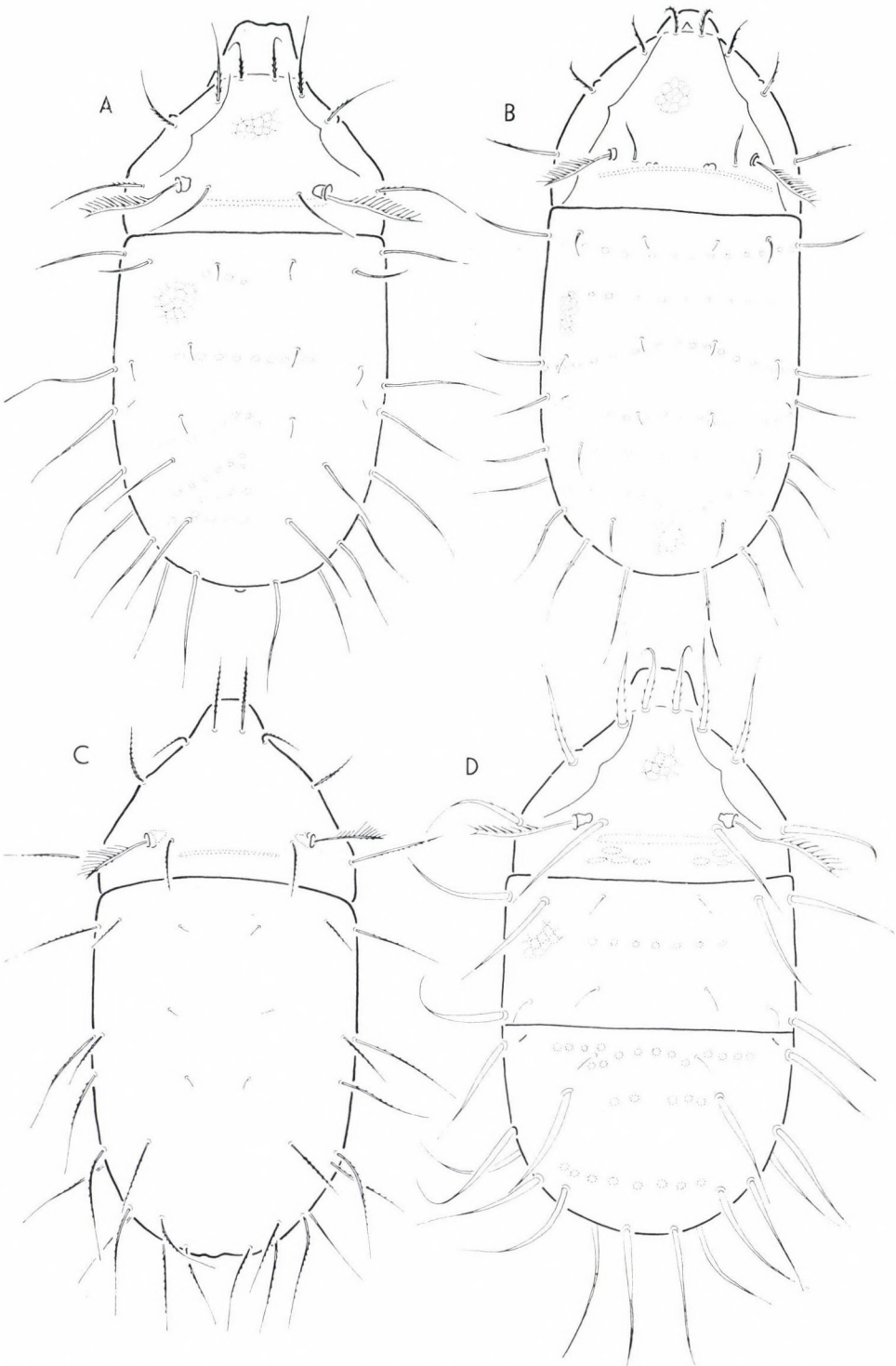

Plate 27. A = *Torpacarus cinctus* WALLWORK, 1962 — B = *T. foveolatus* WALLWORK, 1962 — C = *T. omittens paraguayensis* BALOGH et MAHUNKA, 1981 — D = *T. magnus* WALLWORK, 1962

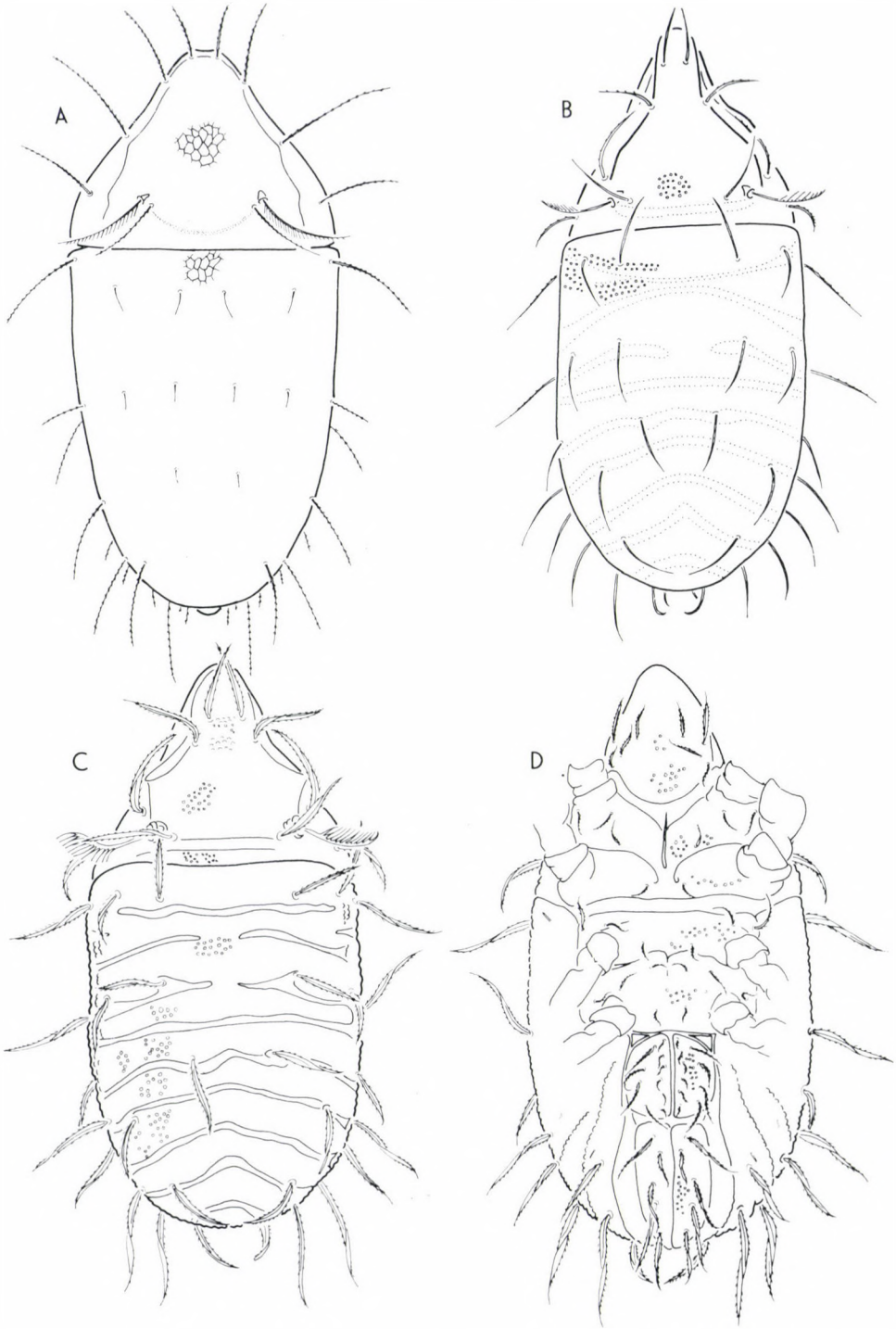

Plate 28. A = *Torpacarus gramineaus* McDaniel et al., 1979 — B = *Haplacarus javensis* Hammer, 1980 — C—D = *H. pandanus* Sengbusch, 1982

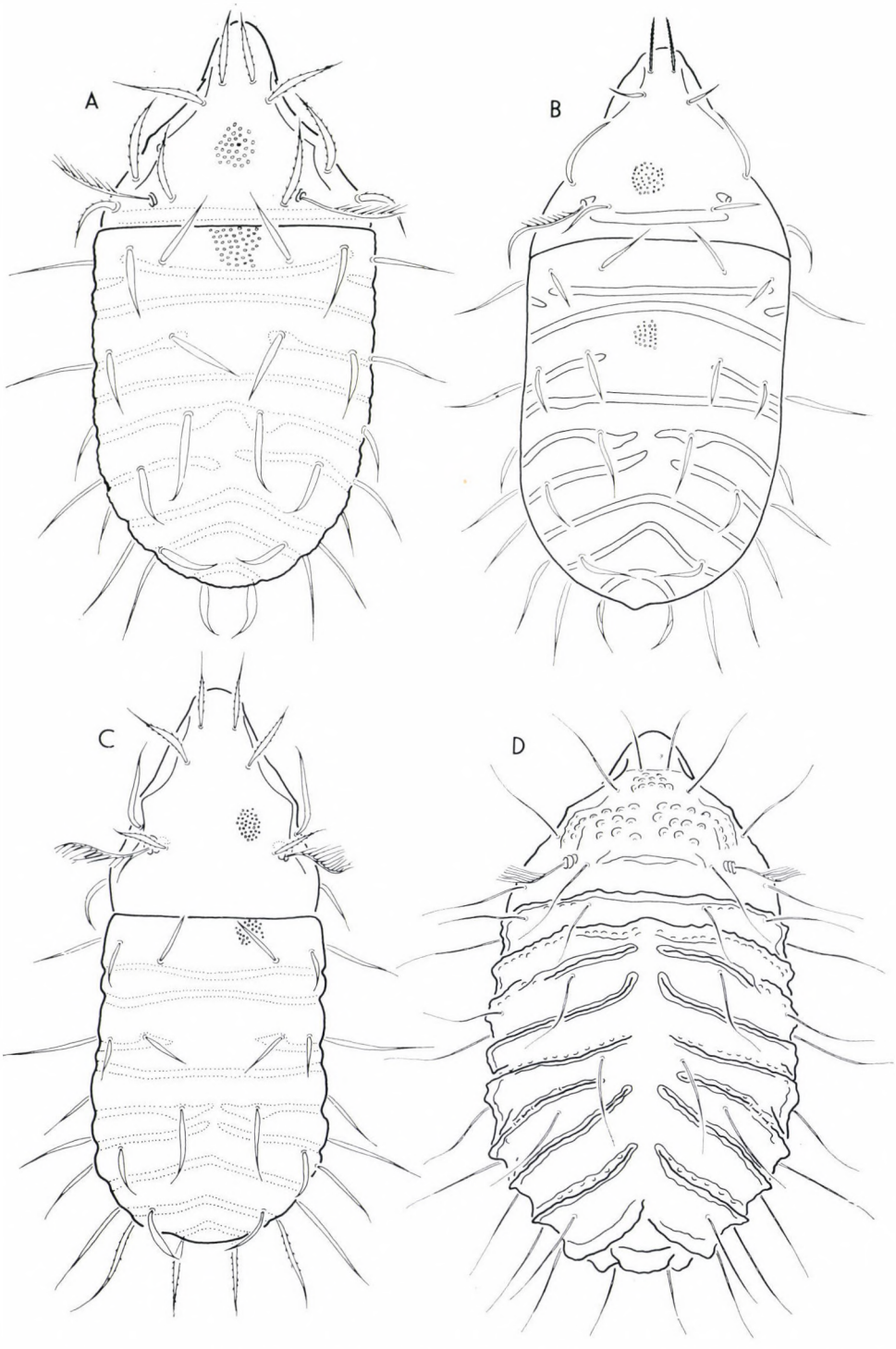

Plate 29. A = *Haplacarus foliatus* WALLWORK, 1962 — B = *H. bengalensis* BHATTACHARYA et al., 1974 — C = *H. pairathi* AOKI, 1965 — D = *Paulianacarus rugosus* BALOGH, 1960

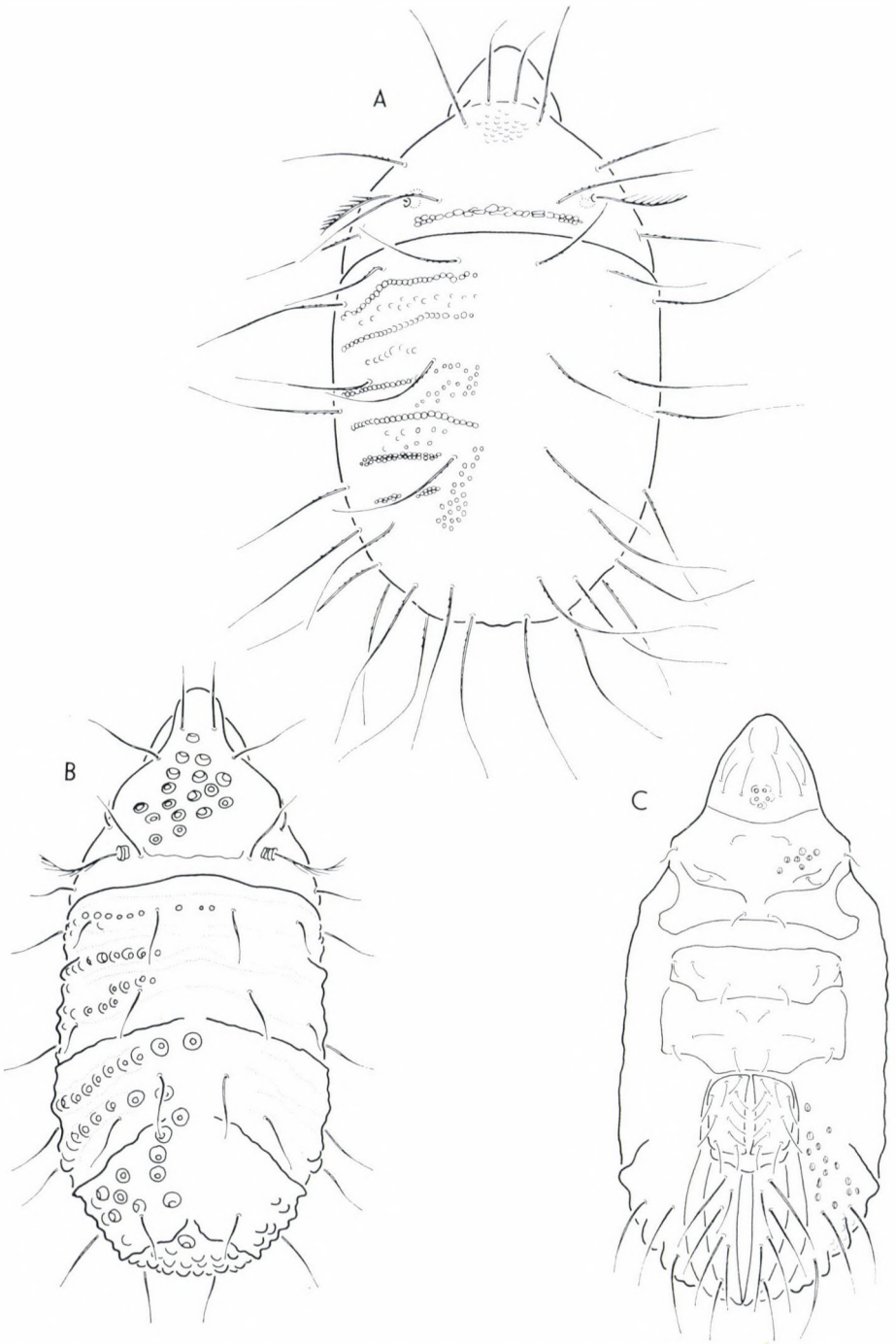

Plate 30. A = *Paulianacarus simplisetosus* MAHUNKA, 1985 — B—C = *P. nodosus* BALOGH, 1960

Plate 31. A—B = *Millotacarus granulatus* BALOGH, 1960 — C = *Paulianacarus levis* BALOGH, 1960 — D—E = *Javacarus reticulatus* SENGBUSCH, 1982

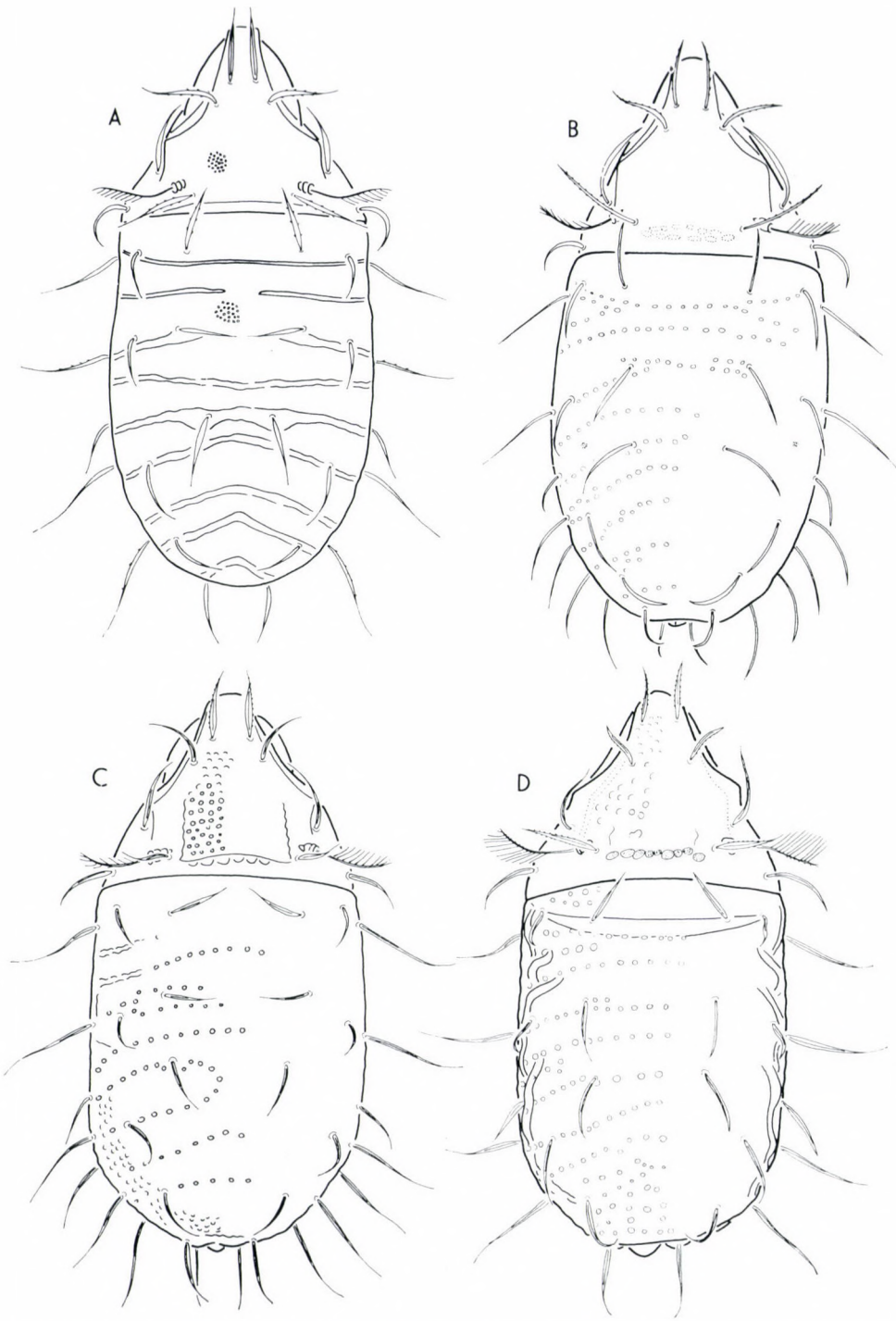

Plate 32. A = *Javacarus granulatus* CSISZÁR, 1961 — B = *J. porosus* HAMMER, 1980 — C = *J. kuehnelti* BALOGH, 1961 — D = *J. kuehnelti* v. *foliatus* HAMMER, 1972

Plate 33. A—B = *Euryacarus pilosus* MAHUNKA, 1982 — C = *E. petalus* WOOLLEY, 1966

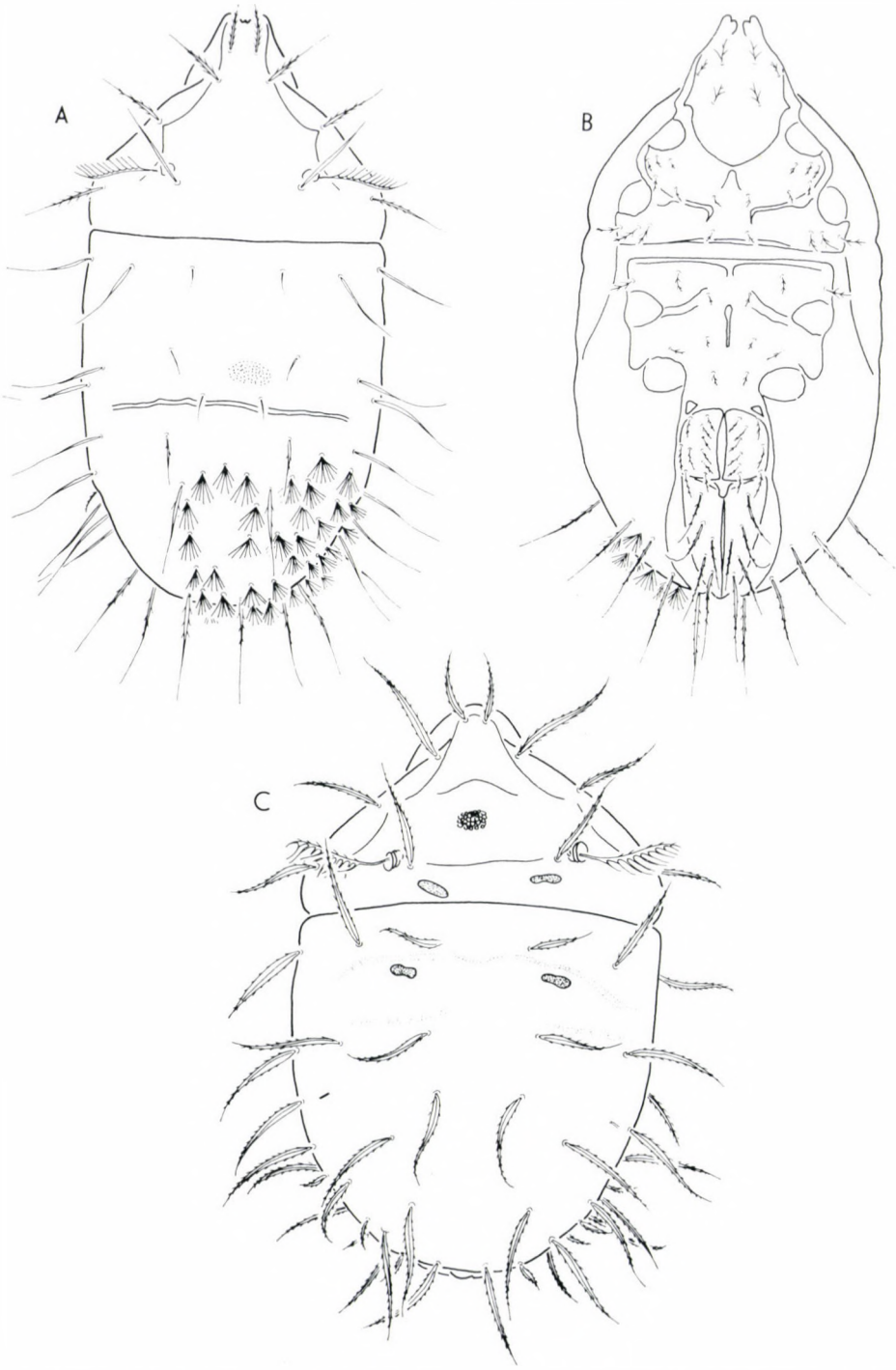

Plate 34. A—B = *Dendracarus pulchellus* BALOGH, 1960 — C = *Annectacarus granditrichosus* SENGBUSCH, 1984

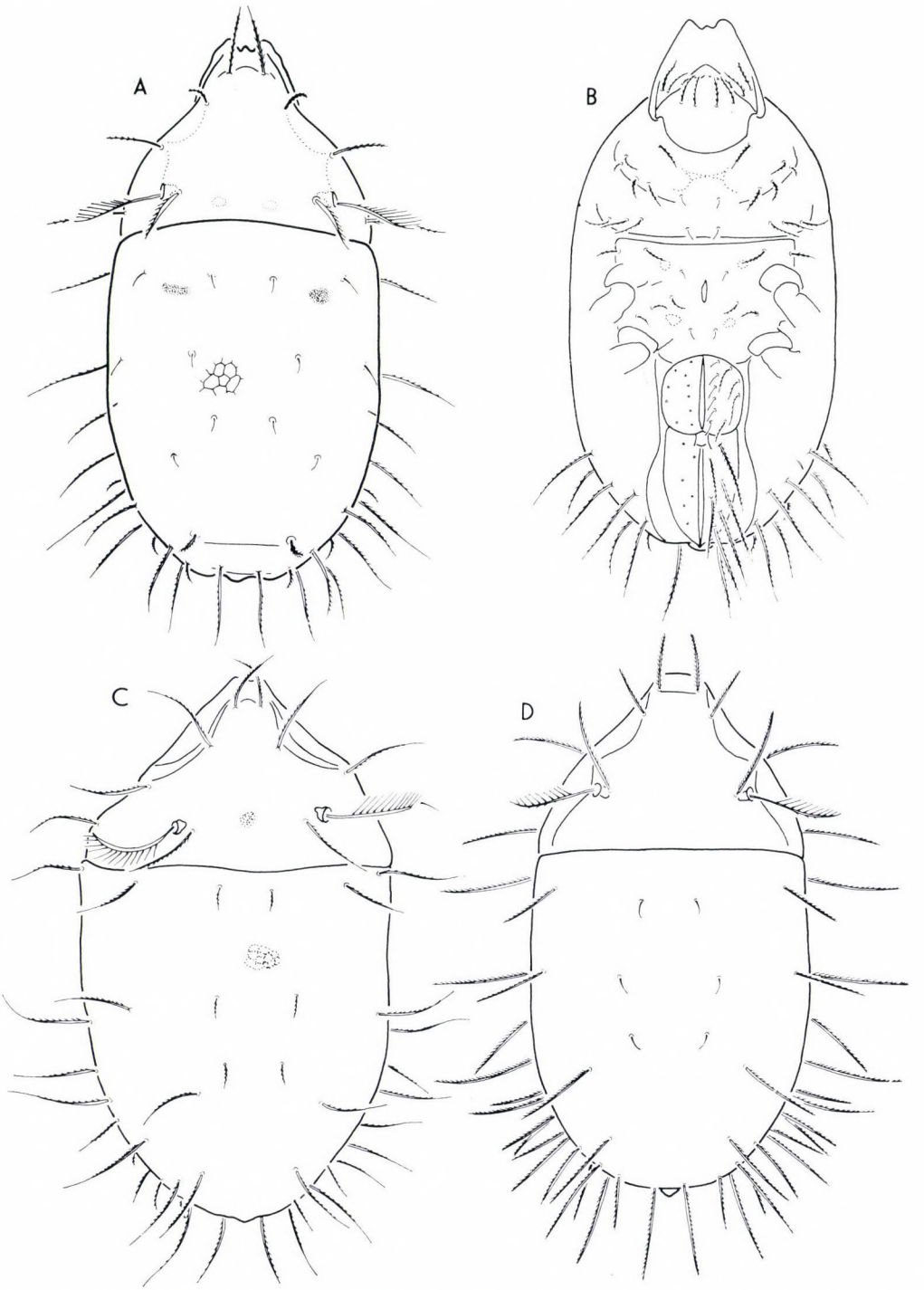

Plate 35. A—B = *Annectacarus mucronatus* GRANDJEAN, 1950 — C = *A. mahabaeus* CORPUZ-RAROS, 1979 — D = *A. longisetosus* BHATTACHARYA et al., 1974

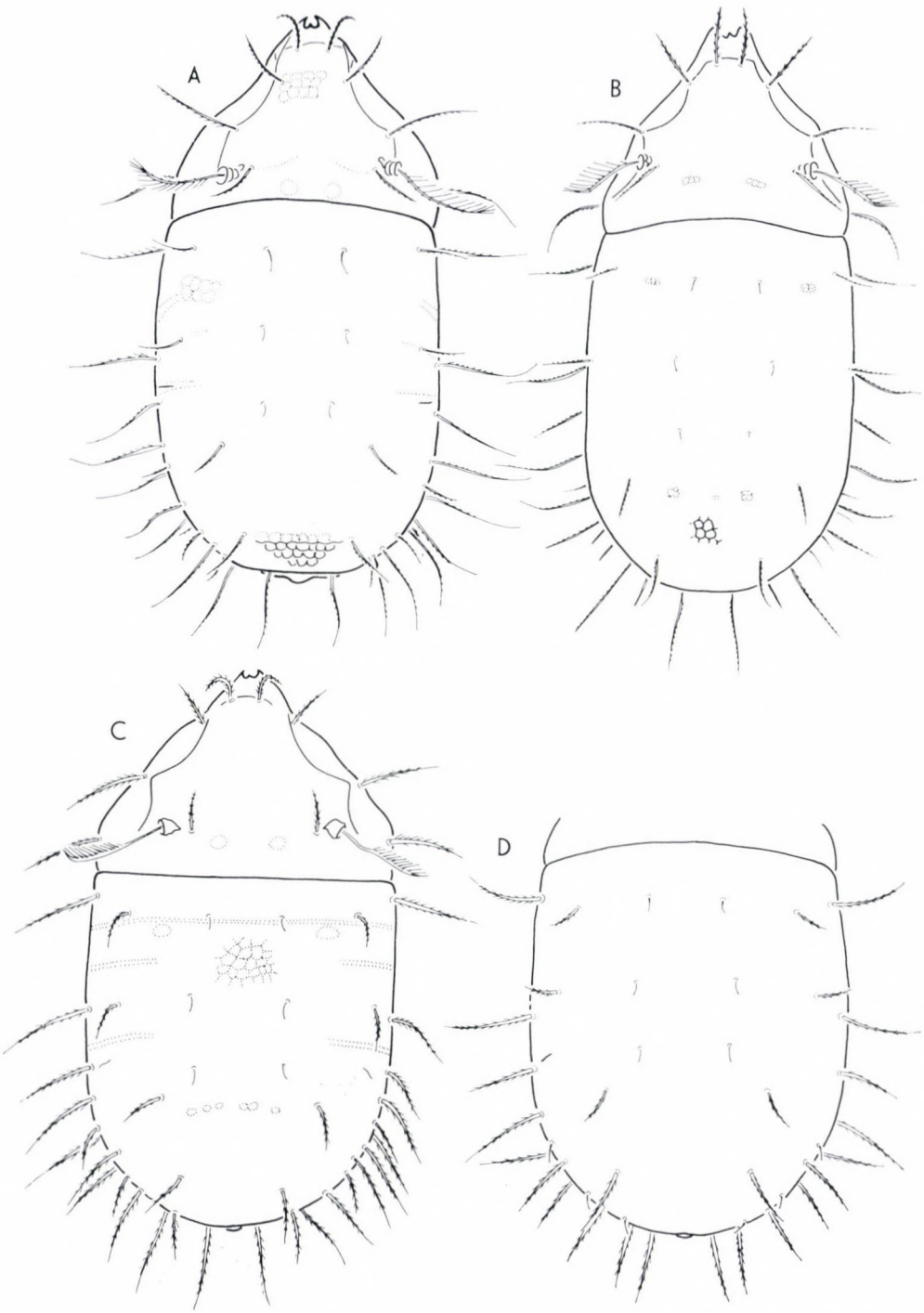

Plate 36. A = *Annectacarus unilateralis* HAMMER, 1973 — B = *A. africanus* BALOGH, 1961 — C = *A. insculptus* WALLWORK, 1962 — D = *A. sejugatus* WALLWORK, 1962

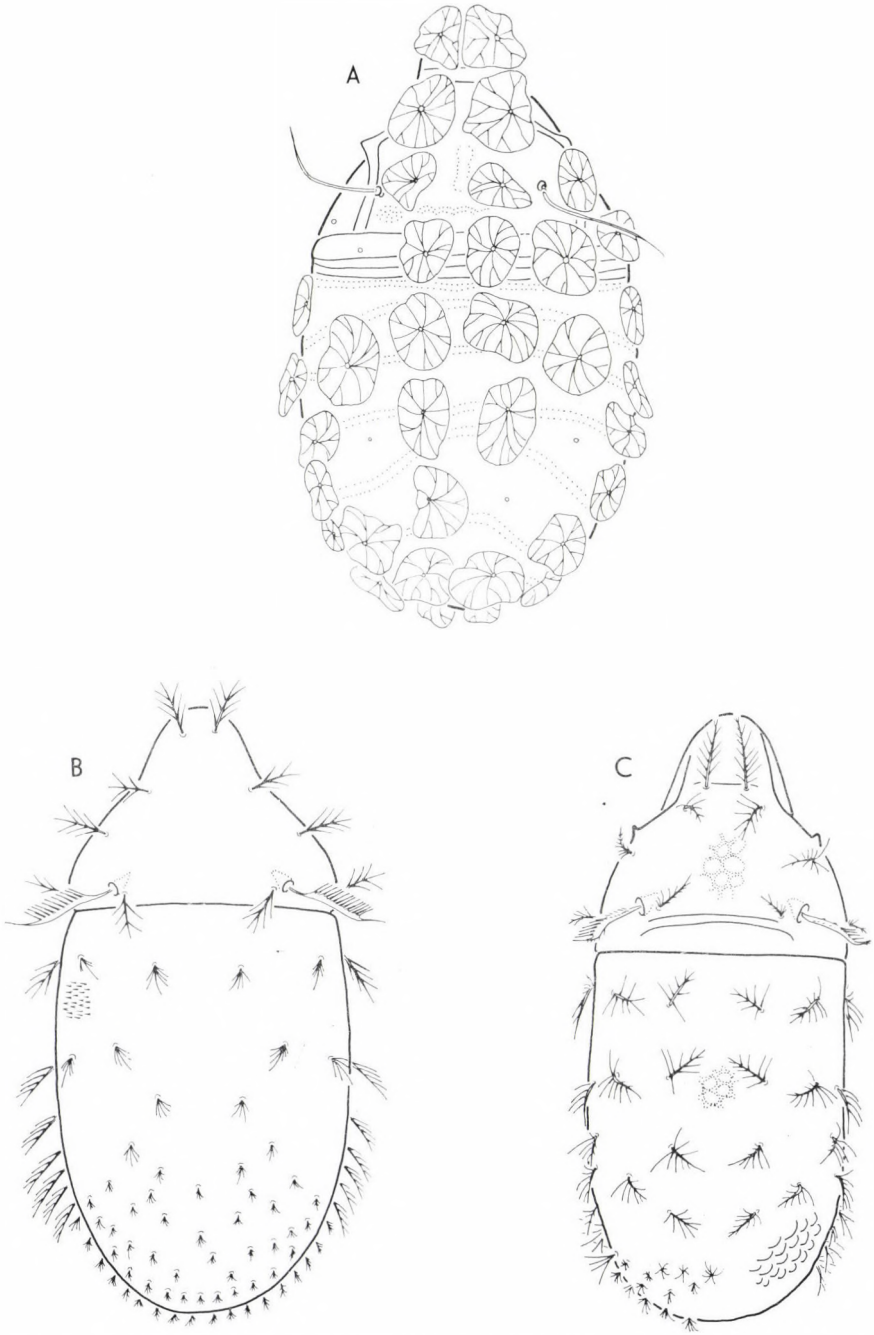

Plate 37. A = *Phyllolohmannia foliifera* (Golosova, 1984) — B = *Vepracarus abchasicus* (Tarba, 1985) — C = *V. cornutus* Sarkar et Subias, 1984

Plate 38. A—B = *Mixacarus zhuzhikovi* BULANOVA-ZACHVATKINA, 1979 — C—D = *Paulianacarus foliatus* SARKAR et SUBIAS, 1984

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

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Different taxa of the family Carabodidae were examined. The revision and redescription of some *Carabodes* and *Austrocarabodes* species are given. The description of some new species of the genera *Carabodes*, *Austrocarabodes* and *Odontocepheus* from North and East Africa, Asia and Europe was made. A new genus *Guineobodes* gen. n. is erected. *Flexa* KULIJEV, 1977 is a junior synonym of *Carabodes* C. L. KOCH, 1836.

In my previous paper of the above title I gave details concerning my principal aims in elaborating the family Carabodidae C. L. KOCH, 1836. In the first part I dealt with the supraspecific taxa of the family. In the subsequent work I plan to study in details the species and the place where they belong. This critical work is especially important since in the larger genera many species are incorrectly placed, thus new combinations are to be expected.

In the present contribution I propose to discuss some taxa of the family Carabodidae, and describe and erect new taxa belonging to other groups, too.

I. THE GENUS FLEXA KULIJEV, 1977

The genus was separated from *Carabodes* C. L. KOCH, 1836 on the basis of two KULIJEV's species, designating *C. dubius* KULIJEV, 1968 as the type of the genus. KULIJEV (1977: 64) emphasized in his differential diagnosis three main characters:

1. Shoulder with a sharp anterior projection emerging before the dorso-sejugal suture.

2. Setae c_2 directed forwards, setiform, over twice longer than the others.

3. Trochanter and femur strongly dilated.

Since I had not examined the type-series I accepted KULIJEV's opinion, but I remarked (MAHUNKA 1986: 92) that the most important character for this taxon is the position of the adanal lyrifissure. Of these four characters in my key for the Carabodid genera I used only the direction of setae c_2 and the position of the lyrifissure as distinguishing features.

Meanwhile I have examined the value and the applicability of these and other characters within the family Carabodidae, and I have found that the

shape of the shoulder and that of the trochanters or the femora III and IV is highly variable also in the other species of the genus *Carabodes* or in other genera, e.g. *Austrocarabodes*, *Gibbicepheus*. The direction of the anterior setae of the notogaster c_2 and *la* is also varying, and the setae directed forwards are known in some other genera, too. On this basis the status of the genus *Flexa* is highly uncertain, therefore, the revision of this genus is necessary.

I have found some specimens of a species collected in the Caucasus (Soviet Union) which well correspond the description with of *Carabodes* (*Flexa*) *dubius* KULIJEV, 1968, I give the redescription of the species hereunder, and propose to outline my points of view concerning the genus *Flexa*. On the basis of above discussion I establish that the genus *Flexa* KULIJEV, 1977 is a junior synonym of the genus *Carabodes* C. L. KOCH, 1836.

Carabodes dubius KULIJEV, 1968

P r o d o r s u m : Rostral setae arising on tubercles, longer than lamellar ones, nearly smooth, the latter well ciliate (Figs 2—3). Lamellar surface and the anterior part of prodorsum foveolate, median part also with some ribs (Fig. 1). Sensillus short, its head clavate, with some spines.

N o t o g a s t e r : Surface with a characteristic polygonal reticulation consisting of irregular tubercles (Fig. 8). Setae c_2 finely roughened, setae 1m and the other setae spinose and spiculate (Fig. 5).

V e n t r a l s i d e (Fig. 4): Epimeral surface alveolate, all setae minute. Genital and anal plates foveolate, ventral plate alveolate. Genital, aggenital and anal setae single, ad_1 and ad_2 resembling notogastral setae, ad_3 thin and setiform. Lyrifissures *iad* originating far anteriorly from anal aperture.

L e g s : Setae *u* on all tarsi dilated basally, with a long and narrowed end. Genu of leg II as shown in Fig. 6.

Measurements: Length: 517 μm, width: 300 μm.

E x a m i n e d m a t e r i a l : Soviet Union, Georgian SSR, Rica-see. Moos from the rock wall of a canyon. 9. VI. 1976, leg. GY. TOPÁL.

R e m a r k s : This species and some similar ones belong to the dubius species-group, which is characterized by the very short clavate sensillus, the very long interlamellar setae originating on the lamellar surface and by one pair (c_2) of notogastral setae directed forward. These species* are the following:

Carabodes intermedius WILLMANN, 1951
dubius KULIJEV, 1968
scopulae KULIJEV, 1968

* The relationship of *C. breviclava* AOKI, 1970 is uncertain. It may also belong to this group.

Key to species

1 (2) Nine pairs of normal notogastral setae phylliform, their entire surface finely ciliate **dubius** KULIJEV, 1968

2 (1) Nine pairs of normal notogastral setae fusiform or asymmetrically clavate, their distal end with some spines.

3 (4) Notogastral setae fusiform and smooth. Peduncle of sensillus long **intermedius** WILLMANN, 1951

4 (3) Notogastral setae dilate distally, with long spines **scopulae** KULIJEV, 1968

II. THE SPECIFIC COMPOSITION OF THE GENERA CARABODES C. L. KOCH, 1836 AND AUSTROCARABODES HAMMER, 1966

I have made extensive use of the highly valuable manuscript of E. PIFFL cataloguing the species of these genera.

The ancient and for a long time the single genus of the family was the type-genus *Carabodes* C. L. KOCH, 1836. Although, by several authors (BERLESE, 1910, 1913; TRÄGÅRDH, 1931; WILLMANN, 1936; BALOGH, 1958) some supra-specific taxa were described until 1965, some of them either proved to be synonymous with or they stood so far from the type-genus that it was rather unlikely that a greater number of the older *Carabodes* species would be ranked into the new genera.

But the situation changed, when erecting the genus *Austrocarabodes* HAMMER (1966: 62) included in it only his new species and a few older ones originally described in the genus *Carabodes*. Many of the earlier combinations with Carabodes were wrong, as were also misconceived some with *Austrocarabodes*, therefore, our present-day knowledge spurs us to compile a catalogue of species for both genera. The lists of the other genera will be published at a later date.

The subsequent list includes all the taxa originally described into this genus, which either still belong here today or not. The literature is restricted only to the most reliable and most important references. I always considered a reference to be useful if it gave a new combination, a new morphological feature, a note to zoogeography or to the ecology of the species.

The italicized names refer to species which do not belong here today. These names are followed with reference to the new combination:

Carabodes C. L. KOCH, 1836

Carabodes C. L. KOCH, 1836:3, 15
Neocepheus WILLMANN, 1936: 433
Flexa KULIJEV, 1977: 64 **syn. n.**
Type-species: *Carabodes coriaceus* C. L. KOCH, 1836

affinis BERLESE, 1913: 94, t: VII, fig. 72
BERNINI 1970: 402, t: II, figs 3—4, III, 2—3
BERNINI 1982: 386
agenjoi PÉREZ-IÑIGÓ, 1969: 412, figs 7—9
albidus BALOGH, 1960: 22, figs 23—24 (→ *Austrocarabodes*)
HAMMER 1966: 62
alveolatus OUDEMANS, 1915: 194 → *Dolicheremaeus* comb. n.
angulatus BALOGH, 1958: 18 (→ *Austrocarabodes*)
HAMMER 1966: 62
apicalis BANKS, 1895: 13 → *Carabodoides* comb. n.
JACOT 1937: 240
NORTON 1978: 611
aphanicus BERNINI, 1979: 325, figs I: a—c, II: a—b, III: a—f
arduinii VALLE, 1955: 12, figs 1, t: I, 2—6
BERNINI 1982: 387
areolatus BERLESE, 1916: 331
SELLNICK und FORSSLUND 1953: 378, fig. 5
SCHWEIZER 1956: 293, figs 219 a—f
RAJSKI 1968: 293
BERNINI 1970: 403, t: III, 1, 4, IV: 1—3
BERNINI 1982: 388
atrichosus MAHUNKA, 1984: 128, figs 39—40
auriculatus sp. n.
australis BALOGH et CSISZÁR, 1963: 474, fig. 29 → *Austrocarabodes* comb. n.
australis boniensis AOKI, 1978: 85, figs 3: a—d → *Austrocarabodes* comb. n.
basilewskyi BALOGH, 1958: 19
bellus AOKI, 1959: 157, figs 1: a—c
BULANOVA-ZACHVATKINA 1975: 187, fig. 389
berninii MAHUNKA, 1983: 382, figs 1—6
bicolor BALOGH, 1958: 18
borhidii BALOGH et MAHUNKA, 1979: 39, figs 4: a—b
bosniae FRANK, 1961: 79, figs 1, 2 → *Tegeocranellus* comb. n.
breviclava AOKI, 1970: 590, figs 16—22
brevis BANKS, 1896: 77
NORTON 1978: 614, fig. 10
canaliculatus C. L. KOCH, 1839: 29, 7 (*Nothrus*)
OUDEMANS 1937: 2580, fig. 1109*
castrii MAHUNKA, 1966: 379, fig. 12 → *minusculus* BERLESE, 1923 comb. n.
BERNINI 1970: 404 (= *minusculus* syn. n.)
celisi BALOGH, 1958: 19 (→ *Trichocarabodes*)
BALOGH 1961: 276, t. 15: 1—2
HAMMER 1966: 62
cellularis BALOGH, 1962: 425, figs 17—18 (→ *Austrocarabodes*)
HAMMER 1966: 62
cephalotes C. L. KOCH, 1836: 3, 16** (species inquirenda)
OUDEMANS 1937: 2632, fig. 1136
chirstlus sp. n.
clavata JACOT, 1938: 13 (*gibbiceps clavata*) stat. n.
coriaceus C. L. KOCH, 1836: 15
MICHAEL 1884: 316, t: XX, 1—8, XXII, 11 (*Tegeocranus*)
OUDEMANS 1937: 2640, fig. 1141
SELLNICK und FORSSLUND, 1953: 381, fig. 7
RAJSKI 1968: 292
BERNINI 1970: t: VIII, 3—4
PÉREZ-IÑIGÓ 1971: 281, fig. 16
MAHUNKA 1986: 117, figs 13—15, 84

* It is almost certain that WILLMANN's note is correct (see OUDEMANS), consequently, the species does not belong to the family Carabodidae.

** It is almost certain that it does not belong to the genus *Carabodes*, nor even to the family Carabodidae.

coronatus MAHUNKA, 1986: 117, figs 127—132
costulatus BALOGH, 1958: 17 (→ *Austrocarabodes*)
BALOGH 1960: 92, figs 6—8
HAMMER 1966: 62
cynocephalus (C. L. KOCH, 1839): 30, 8 (species inquirenda)*
OUDEMANS 1937: 2646, fig. 1142
davisi BALOGH et MAHUNKA, 1969: 46, figs 23—25 → *Austrocarabodes* comb. n.
depilatus BALOGH et MAHUNKA, 1969: 46, fig. 26 → *Austrocarabodes* comb. n.
dissimilis BERNINI, 1976: 30, fig. X: a—b, XI: a—b
dorsalis BANKS, 1896: 77 (→ *Nanhermannia*)
JACOT 1937: 238, fig. 5
NORTON 1978: 611
dubius KULIJEV, 1968: 91, figs 7: a—c
KULIJEV 1977: 66, figs 1: 1—6, 2: 1—3 (Flexa)
ensifer SELLNICK, 1931: 717, figs 20—21 → *Austrocarabodes*
HAMMER 1966: 59 (→ *Austrocarabodes* comb. n.)
excellens BALOGH et MAHUNKA, 1969: 46, figs 27—29
falcatus JACOT, 1937: 365, fig. 15
femoralis (NICOLET, 1855): 466, fig. 9: 2 (*Tegeocranus*)
MICHAEL 1884: 318, t: XX, 9
HULL 1914: 282
SELLNICK und FORSSLUND 1953: 386, fig. 10
BERNINI 1970: 404, t: X, 3—4, XI, 3—4, XX, 1
flagellifer MIHELCIC, 1967: 517, figs 1: a—f
flavus (EWING, 1918)**
forsslundi SELLNICK, 1953: 383, fig. 9 → *ornatus* STORKÁN, 1925
RAJSKI 1968: 297 (syn. with *ornatus*)
fraterculus BALOGH, 1963: 38, figs 6—7 (→ *Gymnobodes*)
BALOGH 1965: 59, t: 9, fig. 7
gibbiceps BERLESE, 1916: 330
globiger BALOGH, 1970: 38, fig. 7
grandjeani BERNINI, 1977: 144, figs 1—3
BERNINI 1982: 389
granosus SELLNICK, 1959: 118, fig. 4a
granulatus BANKS, 1895: 129
NORTON, 1978: 614, fig. 11
haradai AOKI, 1978: 83, figs 2: a—d → *Austrocarabodes* comb. n.
heimi (OUDEMANS, 1903): 312, figs 1—3 (*Cepheus*)
PÉREZ-IÑIGÓ, 1971: 284 (syn. with *labyrinthicus*)
hispanicus PÉREZ-IÑIGÓ, 1966: 351, figs 1: a—b, 2: a—e
PÉREZ-IÑIGÓ 1971: 284
humeratus BERLESE, 1913: 94, t: VII, 73 (→ *Yoshiobodes*)
BALOGH 1970: 299 (*Austrocarabodes*)
hummelincki (WILLMANN, 1936): 433, t: 14, figs 3—5 (*Neocepheus*)
hungaricus BALOGH, 1943: 66, t: XII, 5—6
BERNINI 1981: 27, figs 1—8
imperfectus SELLNICK, 1959: 119, fig. 4b (imperfecta sic!) (→ *Austrocarabodes*)
HAMMER 1966: 62
intermedius WILLMANN, 1951: 169, fig. 11
SCHWEIZER 1956: 295, figs 222: a—c
irmayi BALOGH et MAHUNKA, 1969: 47, figs 32—33 (→ *Yoshiobodes*)
MAHUNKA 1986: 109
jamaicaensis WOOLLEY, 1967: 103, figs 1—2
kusseri J. BALOGH et P. BALOGH, 1983: 307, figs 4: a—g
labyrynthicus (MICHAEL, 1879): 249, t: 11 (*Tegeocranus*)
MICHAEL 1884: 319, figs t: XXI, 1—8, XXII, 3

* The combination of WILLMANN and OUDEMANS is rather uncertain. Considering the shape of the legs, it rather belongs to the groups of Oppoidea.

** *Cepheus flavus* EWING, 1918: WOOLLEY (1957: 113, figs 1—2) erroneously placed it in the genus *Carabodes*. I think that it belongs to the family Cepheidae.

HAMMER 1952: 42, fig. 62
SELLNICK und FORSSLUND 1953: 387, fig. 12
SCHWEIZER 1956: 294, figs 221: a—c
RAJSKI 1968: 294
PÉREZ-IÑIGÓ 1971: 287, figs 19—20
lepidus AOKI, 1978: 81, figs 1: a—d (→ *Austrocarabodes*)
AOKI 1982: 175
longisetosus KULIJEV, 1968: fig. 8 (*tenuis longisetosus*)
BULANOVA-ZACHVATKINA 1975: 185
lounsburyi BERLESE, 1910: 216 [*Carabodes* (*Carabocepheus*) *lounsburyi*]
BALOGH 1965: 59
MAHUNKA 1986: 132, figs 147—151
longulus BALOGH, 1958: 19 (→ *Austrocarabodes*)
HAMMER 1966: 62
longulus WILLMANN, 1944
SELLNICK und FORSSLUND 1953: 373 (as nom. nud.)
lunaris BALOGH, 1962: 423, figs 15—16 (→ *Austrocarabodes*)
HAMMER 1966: 62
luteoauratus HAMMER, 1972: 25, figs 26: a—b (*luteo-auratus*)
HAMMER 1973: 17
magnus KUNST, 1961: 169, figs 9: a—b
manganoi BERNINI, 1976: 25, figs VIII: a—b, IX: a—c
manifera HAMMER, 1977: 30, fig. 19
marginatus (MICHAEL, 1884): 322, t: XXI, 5, XXII, 1—2 (*Tegeocranus*)
SELLNICK und FORSSLUND 1953: 382, fig. 8
RAJSKI 1968: 296
BERNINI 1970: 404, t: VI, 3—4, VII, 1—2, VIII, 2
BERNINI 1974: 51, figs 1—4
marginepunctatus TRÄGÅRDH, 1902: 20 (syn. with *labyrinthicus*)
TRÄGÅRDH 1910: 515, figs 284—289
SELLNICK et FORSSLUND 1953: 388
microtrichus MAHUNKA, 1984: 417, figs 78—81
minusculus BERLESE, 1923: 257
SELLNICK und FORSSLUND 1953: 388, fig. 13
MAHUNKA 1966: 379, fig. 12 (*castrii*)
BERNINI 1970: 404, t: IV, 4—5, V, 1—4
PÉREZ-IÑIGÓ 1971: 282, figs 17—18
BERNINI 1976: 3, figs I: a—h, II: a—j, III: a—j, IV: a—d; 39, 45
montanus BERNINI, 1979: 22, figs VII: 1—4, VIII: 1—4, IX: 1—2, X: 1—4
nepos HULL, 1914: 284, t: C, figs 2, 10 (species inquirenda)
SELLNICK und FORSSLUND 1953: 380, 385
niger BANKS, 1895: 12
NORTON 1978: 613, figs 3—9
nitens JOHNSTON, 1877: 121*
oblonga BANKS, 1895: 13 → *Odontocepheus*
JOHNSTON 1965: 54
NORTON 1978: 613
obsoletus BERLESE, 1916: 329
omo JACOT, 1937: 241, figs 7—8 → *granulatus* BANKS, 1895
NORTON 1978: 615 (proposed synonymy with *granulatus*)
ornatissimus HAMMER, 1966: 58, figs 80—80a
ornatus STORKÁN, 1925: 21, fig. 4
SELLNICK und FORSSLUND 1953: 383, fig. 9 (*forsslundi*)
SCHWEIZER 1956: 294, figs 220: a—c (*forsslundi*)
RAJSKI 1968: 297
BERNINI 1982: 390
palmifer BERLESE, 1904: 27
BERNINI 1970: 404, figs 5: e—f
BERNINI 1982: 390

* On the basis of PIFFL's catalogue. I was unable to check it myself.

papillosus LUCAS, 1846: 319, t: 22, fig. 12 (species inquirenda)
MICHAEL 1898: 39
OUDEMANS, 1937 2647, fig. 1143 (*Oribates*)
paraspinosus KULIJEV, 1968: 88, fig. 5
BULANOVA-ZACHVATKINA 1975: 185
penicillatus BERLESE, 1916: 328
peniculatus AOKI, 1970: 417, figs 47—54
pentatrichus BALOGH, 1962: 98, figs 12—13 (→ *Austrocarabodes*)
perezinigoi SALINAS, 1971: 359, figs 1—3
pirinensis KUNST, 1961: 171, figs 10: a—b
pocsi MAHUNKA, 1983: 409, figs 43—47
poggii BERNINI, 1976: 34, figs XII: a—e
pontiger BERLESE, 1913: 94, t: VI, 67
BERNINI 1970: 407, t: VI, 1—2, VII, 3—4, VIII, 1
pulcher BERNINI, 1976: 21, figs VI: a—b, VII: a
problematicus MAHUNKA, 1985: 317, figs 54—59
quadrangulus BERNINI, 1979: 9, figs I: 1—4, II: 1—5, III: 1—3, IV: 1—4, V: 1—4, VI: 1—4
radiatus BERLESE, 1916: 328
reticulatus BERLESE, 1913: 95, t: VII, 74 (*coriaceus* v. *reticulatus*)
SELLNICK und FORSSLUND 1953: 379, fig. 6
BERNINI 1970: 409, t: IX, 1—5
OUDEMANS 1915: 194 → *Brasiella* comb. n.
OUDEMANS 1917: 55, figs 96—97
SELLNICK und FORSSLUND 1953: 79, fig. 6 (*Chaunoproctus*)
BALOGH 1970: 311, figs 54—55
rimosus AOKI, 1959: 159, figs 2a—d
AOKI 1970: 417, figs 44—46
rugosior BERLESE, 1916: 327 (*femoralis* var. *rugosior*)
SELLNICK und FORSSLUND 1953: 387, fig. 11 (*femoralis rugosior*)
RAJSKI 1968: 294 (*femoralis rugosior*)
BERNINI 1970: 410, t: X, 1, XI, 1—2, XII, 2
BERNINI 1982: 392
schatzi BERNINI, 1976: 16, figs V: a—b
SCHWEIZER 1956: 295, fig. 223 (*minusculus*)
schwartzi BALOGH et MAHUNKA, 1969: 47, figs 32—33 (→ *Austrocarabodes*)
scopulae KULIJEV, 1968: 90, fig. 7
KULIJEV 1977: 66, figs 3: 1—3 (*Flexa*)
scymnus HULL, 1914: 282, t: C, 1, 12 (species inquirenda)
sordidus BALOGH, 1958: 18 (→ *Austrocarabodes*)
HAMMER 1966: 62
strinovichi BALOGH et MAHUNKA, 1978: 40, figs 24—27
spinosus STORKÁN, 1925: 20, fig. 3 (species inquirenda)
subalpinus THOR, 1937: 293
subarcticus TRÄGÅRDH, 1902: 21 (*elongatus* var. *subarcticus*)
RAJSKI 1968: 298
SELLNICK und FORSSLUND 1953: 375, fig. 4
subnudus BALOGH, 1963: 36, figs 4—5 → *Gymnobodes* comb. n.
szentivanyi BALOGH et MAHUNKA, 1967: 43, figs 9—10 → *Austrocarabodes* comb. n.
taprobanae OUDEMANS, 1915: 194 → ? *Fenichelia* comb. n.
OUDEMANS, 1917: 57, figs 98—107
teneriffensis PÉREZ-IÑIGÓ, 1976: 98, figs 15—16
tenuis FORSSLUND, 1953: 373, figs 2—3
FORSSLUND 1943: 190 nom. nud.
WILLMANN 1944:* (*longulus* WILLMANN nom. nud.)
RAJSKI 1968: 299
HAMMER 1977: 30
travei BALOGH et CSISZÁR, 1963: 474, fig. 26 → *Austrocarabodes* comb. n.
tridactylus TRÄGÅRDH, 1907: 29**
trigonosternum PÉREZ-IÑIGÓ, 1976: 96, figs 12—14
tsushimaensis AOKI, 1970: 415, figs 38—43 (*rimosus tsushimaensis*) stat. n.

* I have not seen the publication.
** On the basis of PIFFL's catalogue.

variabilis HAMMER, 1966: 58, fig. 81
vermiculatus BERLESE, 1916: 330
BERNINI 1970: 402
verrucatus TRÄGÅRDH, 1931: 589, figs 66—75 → ? *Austrocarabodes* comb. n.*
willmanni BERNINI, 1975: 455, figs I: a—c, II: a—h, III: a—e
PÉREZ-IÑIGÓ 1971: 282, figs 17—18
BERNINI 1976: 21

Austrocarabodes HAMMER, 1966

Austrocarabodes HAMMER, 1966: 59

Type-species: *Carabodes ensifer* SELLNICK, 1931

agressor BALOGH et MAHUNKA, 1978: 36, figs 12—16
albidus (BALOGH, 1960): 22, figs 23—24 (*Carabodes*)
HAMMER 1966: 62
alveolatus HAMMER, 1973: 18, fig. 9
angulatus (BALOGH, 1958): 18 (*Carabodes*)
HAMMER 1966: 62
arrogans PÉREZ-IÑIGÓ, 1967: 642, figs 6—11
PÉREZ-IÑIGÓ 1971: 289, fig. 23
australis (BALOGH et CSISZÁR, 1963): 474, fig. 29 (*Carabodes*) comb. n.
bacilliger MAHUNKA, 1978: 200, figs 53—56
boniensis (AOKI, 1978): 85, figs 3a—d (*Carabodes australis boniensis*) stat. n.
AOKI 1982: 175
cadeti MAHUNKA, 1978: 202, figs 57—60
cellularis (BALOGH, 1962): 425, figs 17—18 (*Carabodes*)
HAMMER 1966: 62
costulatus (BALOGH, 1958): 17 (*Carabodes*)
BALOGH 1960: 92, figs 6—8 (*Carabodes*)
HAMMER 1966: 62
crenellatus MAHUNKA, 1983: 406, figs 30—33
curvisetiger AOKI, 1982: 173, figs 1a—f
corpulentus (TRÄGÅRDH, 1931): 595, figs 53—85 (*Cepheus*) comb. n.
crinitus (TRÄGÅRDH, 1931): 592, figs 76—82 (*Cepheus*) comb. n.
davisi (BALOGH et MAHUNKA, 1969): 46, figs 23—25 (*Carabodes*) comb. n.
elegans HAMMER, 1966: 61, fig. 83
ensifer (SELLNICK, 1931): 717, figs 20—21 (*Carabodes*)
HAMMER 1966: 286
PÉREZ-IÑIGÓ 1971: 286, figs 21—22
MAHUNKA 1986: 109, figs 9—10, 79—83
erectus MAHUNKA, 1984: 416, figs 76—77
falcatus HAMMER, 1973: 18, figs 10 a—e
flabellifer MAHUNKA, 1986: 111, figs 109—112
foliaceisetus KRIVOLUTSKY, 1971: 940, figs 2: 1a—c
glabrus MAHUNKA, 1982: 313, figs 66—69
gressitti BALOGH et MAHUNKA, 1978: 36, figs 17—21
haradai (AOKI, 1978): 83, figs 2a—d (*Carabodes*)
AOKI 1982: 175
hummeratus papuanus (BALOGH, 1970): 299, fig. 18 → *Yoshiobodes* comb. n.
imperfectus (SELLNICK, 1959): 119, fig. 4b [*Carabodes imperfecta* (sic!)]
AOKI 1966: 770, figs 1—7 (*Carabodes*)
HAMMER 1966: 62 [*imperfecta* (sic!)]
lepidus AOKI, 1978: 81, figs 1a—d (*Carabodes*)
AOKI 1982: 175

* On the basis of the figure, it definitely possesses more than 10 notogastral setae, though, as far as its habitus is concerned, a relationship with *Diplobodes—Kalloia* is more probable. Further research is necessary.

longulus (BALOGH, 1958): 19 (*Carabodes*)
HAMMER 1966: 62
lunaris (BALOGH, 1962): 423, figs 15—16 (*Carabodes*)
HAMMER 1966: 62
maculatus HAMMER, 1966: 59, figs 82 a—b
microlaminatus MAHUNKA, 1983: 408, figs 34—37
nodosus HAMMER, 1966: 61, fig. 84
ocellatus sp. n.
picturatus sp. n.
pentatrichus BALOGH, 1962: 98, figs 12—13
pinnatus MAHUNKA, 1986: 112, figs 113—116
plumosulus BALOGH, 1970: 40, fig. 10 → *Yoshiobodes* comb. n.
plumosus BALOGH, 1970: 40, fig. 9 → *Yoshiobodes* comb. n.
polytrichus BALOGH et MAHUNKA, 1978: 39, figs 22—23
pseudoreticulatus COVARRUBIAS, 1967: 93, figs 4—5
rimosus sp. n.
rugosus MAHUNKA, 1969: 372, fig. 41
shauenbergi MAHUNKA, 1978: 202, figs 61—63
schwartzi (BALOGH et MAHUNKA, 1969): 47, figs 32—33 → *Carabodes* comb. n.
BALOGH et MAHUNKA 1978: 278, figs 6a—c (*Carabodes*)
similis MAHUNKA, 1978: 203, figs 64—67
sinuosociliatus MAHUNKA, 1983: 409, figs 38—42
sordidus (BALOGH, 1958): 18 (*Carabodes*)
HAMMER 1966: 62
spathulatus MAHUNKA, 1978: 204, figs 68—70
sphaeroideus MAHUNKA, 1978: 205, figs 71—74
sphaerula BALOGH, 1970: 38, fig. 8
squamosus HAMMER, 1970: 281, figs 2 a—c (*imperfectus squamosus*) stat. n.
szentivanyi (BALOGH et MAHUNKA, 1967): 43, figs 9—10, *Carabodes* comb. n.
tarandus MAHUNKA, 1986: 114, figs 117—121
travei (BALOGH et CSISZÁR, 1963): 474, fig. 26, *Carabodes* comb. n.
vaucheri MAHUNKA, 1984: 126, figs 36—38
verrucatus (TRÄGÅRDH, 1931): 589, figs 66—75, *Carabodes* comb. n.

III. DESCRIPTION OR REDESCRIPTION OF NEW AND LITTLE KNOWN TAXA

I give in the following some new descriptions and some complementary descriptions of some species from Europe, Asia and Africa, and I establish also a new genus (*Guineobodes* gen. n.).

The new species are:

Austrocarabodes ocellatus sp. n.	— Kenya
picturatus sp. n.	— Kenya
rimosus sp. n.	— Angola
Carabodes auriculatus sp. n.	— Soviet Union
chirstlus sp. n.	— Tunisia
Odontocepheus piramidalis sp. n.	— Tunisia
villosus sp. n.	— Tunisia
Diplobodes africanus sp. n.	— Kenya
Machadocepheus tuberculosus sp. n.	— Kenya

The other species discussed:

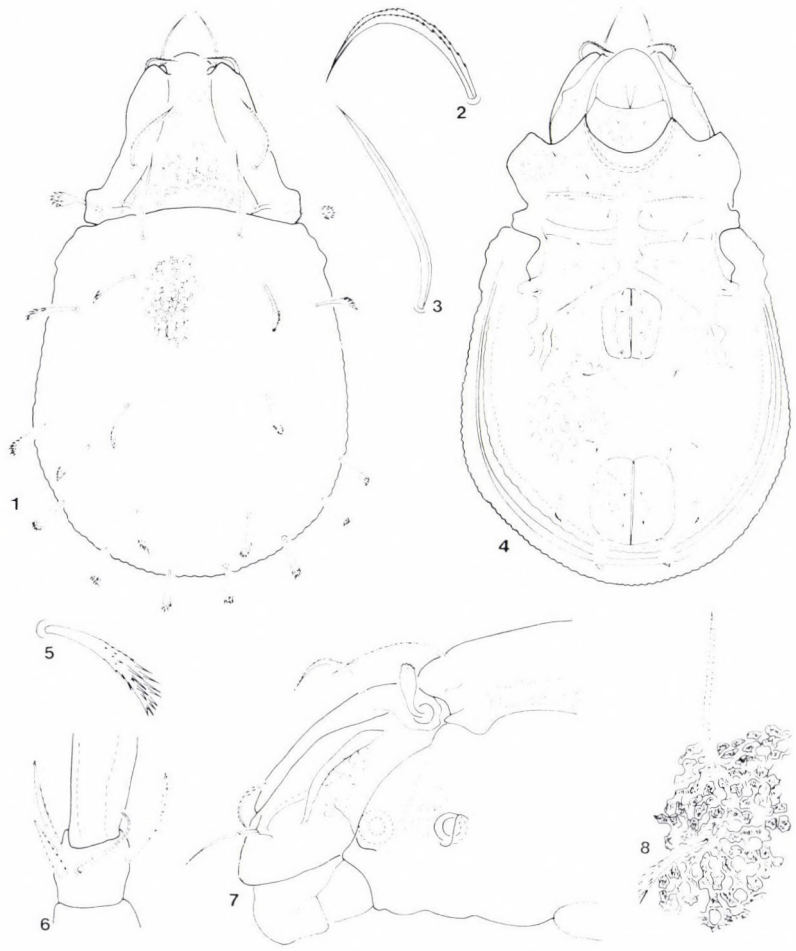
Carabodes areolatus BERLESE, 1913
Carabodes ornatus STORKÁN, 1925
Carabodes subarcticus TRÄGÅRDH, 1902
Carabodes willmanni BERNINI, 1975

Guineobodes gen. n.

D i a g n o s i s : Family Carabodidae, subfamily: Opisthocepheinae. Lamellae fused medially, translamellar apophysis, convex dorsosejugal region and a very highly notogastral elevation present. Fourteen pairs of notogastral setae. Epimeral setal formula: *3—1—3—3*. Anogenital setal formula: *5—1—2—3*.

Type-species: *Machadocepheus papuanus* BALOGH, 1970.

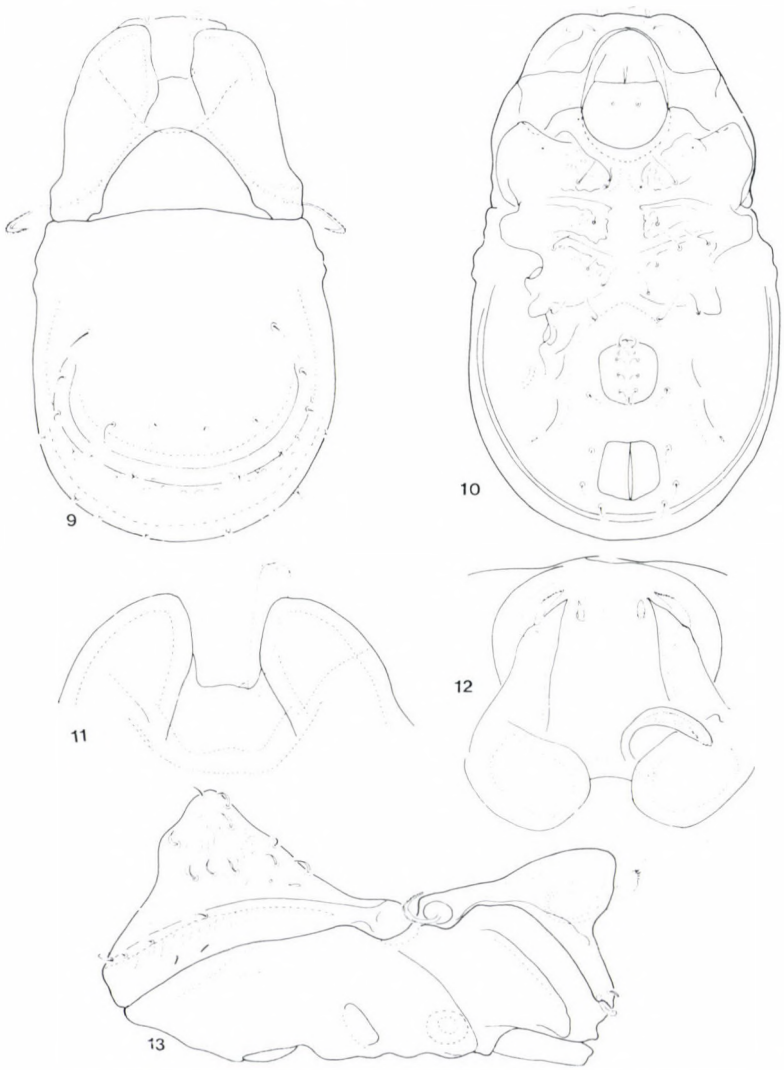
R e m a r k s : The new genus stands very near to *Opisthocepheus* AOKI, 1977, however, the latter has only four pairs of genital setae, one pair of the notogastral setae in humeral position, and its interlamellar setae short and arising on the surface of the translamellar apophysis.



Figs 1—8. *Carabodes dubius* KULIJEV, 1968 — 1 = dorsal side, 2 = seta *in*, 3 = seta *le*, 4 = ventral side, 5 = seta *dm*, 6 = genu of leg II, 7 = prodorsum in lateral view, 8 = sculpture of notogaster

Guineobodes papuanus (BALOGH, 1970) comb. n.

P r o d o r s u m : Lamellae fused medially by a pair of very high translamellar apophyses (Fig. 11). The latter elongated anteriorly and covered by the rostral part of prodorsum. Lamellar setae arising on the outer surface of lamellae, insertion point of the twice curved, gradually thickened interlamellar setae also covered by the interlamellar apophysis (Fig. 12). Basal part of prodorsum convex. Sensillus uncate. Tutorium strong.



Figs 9—13. *Guineobodes papuanus* (BALOGH, 1970) — 9 = dorsal side, 10 = ventral side, 11 = lamellae and the insertion points of the lamellar setae, 12 = rostrum in anterior view, 13 = body in lateral view

Notogaster: A deep hollow present in the dorsosejugal area (Fig. 13), and a very high elevation in the posterior third of the notogaster. Fourteen pairs of notogastral setae, no setae present in humeral position.

Coxisternal region: Epimeral setal formula: *3—1—3—3*. Apodemes short, thin, borders hardly observable (Fig. 10).

Anogenital region: Some strong longitudinal rugae present. Anogenital setal formula: *5—1—2—3*. Setae ad_2 and ad_3 in adanal position. Lyrifissures *iad* opening, very far from anal aperture.

Legs: All joints of legs without ornamentation.

Examined material: Holotype: New Guinea, Wau area, Black Cat Gap. Mt. Mission, Wau; high, sparse Mnium-like moss near peak about 1700 m a.s.l.; 21. April, 1965, leg. J. BALOGH.

Austrocarabodes ocellatus sp. n.

Measurements. — Length: 328—353 μm, width: 172—189 μm.

Prodorsum: Lamellae rounded anteriorly, lamellar setae phylliform, margin smooth. Setae arise on the lateroventral surface of lamellae. Rostral setae similar to the preceding ones, but shorter, arising comparatively near to each other (Fig. 17). Lamellar and interlamellar surface alveolate, medially and anteriorly with round, latero-basally with irregular alveoli, or with rugose sculpture. Interlamellar setae very long, directed forwards, slightly phylliform, with a well-developed vein. Sensillus with a long peduncle, head calyciform.

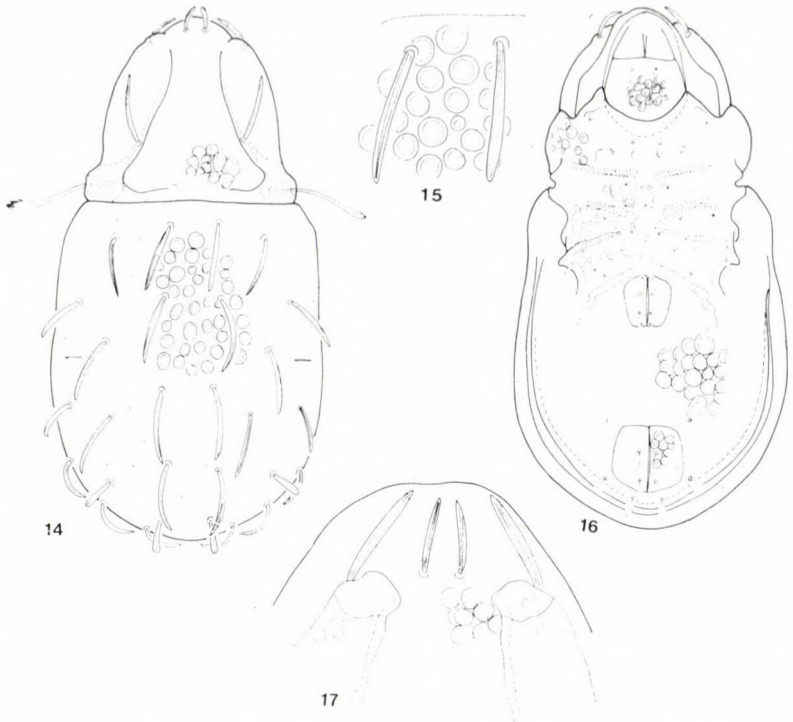
Notogaster: Fourteen pairs of notogastral setae (Fig. 14), resembling interlamellar ones, present. Notogaster ornamented by very characteristic, ocellate sculpture (Fig. 15) in some ♂ specimens much less observable.

Coxisternal region: Mentum also alveolate. Epimeral surface partly with irregular foveolae or spots (mostly medially) and with round alveoli, sculpture similar to that of notogaster (mostly laterally). Epimeral setae short, spiniform.

Borders only partly observable, apodemes well developed, ap. 3 not reaching to sternal one. A. 4 strong composing a transverse band. Discidium well observable (Fig. 16).

Anogenital region: Ventral plate ocellate. Surface of genital plates smooth, sculpture of anal plates similar to that of ventral plate, but the alveoli are much smaller. Genital and aggenital setae short, spinoform, of anoadanal setae ad_1 and an_2 very long, ad_2, ad_3 and an_1 shorter than the preceding ones but all being longer than genital setae. Lyrifissures *iad* not visible.

Type-material: Holotype (1180-HO-87): Kenya: No. 74; Tsavo National Park, Ngulia Lodge, 28. IX. 1985. — Sifted material from litter and dry decaying stumps; leg.



Figs 14—17. *Austrocarabodes ocellatus* sp. n. — 14 = dorsal side, 15 = sculpture of the notogaster, 16 = ventral side, 17 = rostrum in anterior view

S. MAHUNKA and L. MAHUNKA-PAPP. 9 paratypes: from the same sample. Holotype and 7 paratype (1180-HO-87) deposited in the HNHM,* 2 paratypes in MHNG.**

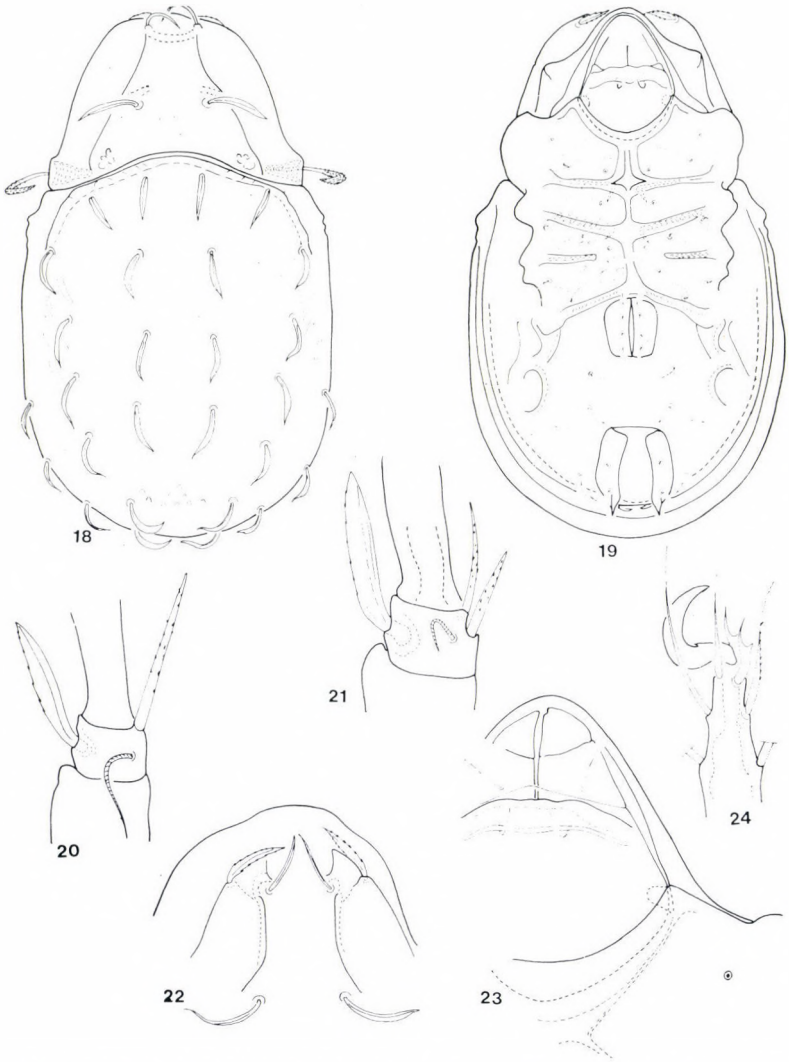
R e m a r k s : The new species is well characterized by the ocellate sculpture on the dorsal and ventral sides. On the basis of this feature it may readily be distinguished from all *Austrocarabodes* HAMMER, 1966, species.

Austrocarabodes picturatus sp. n.

Measurements. — Length: 533—991 μm, width: 311—353 μm.

P r o d o r s u m : Lamellar cuspis well observable, lamellar setae phylliform, originating near to it. Rostral setae much thinner but longer than the preceding ones, originating near to lamellar cuspis (Fig. 22). Interlamellar setae phylliform, directed outwards. Sensillus uncate, well barbed. Prodorsal surface mostly smooth, but four groups of light spots arranged in two pairs observable.

* Hungarian Natural History Museum, Budapest.
** Museum d'Histoire Naturelle, Geneva.



Figs 18—24. *Austrocarabodes picturatus* sp. n. — 18 = dorsal side, 19 = ventral side, 20 = genu of leg I, 21 = genu of leg II, 22 = rostrum in anterior view, 23 = mentum, 24 = tarsus of leg IV

N o t o g a s t e r : Dorsosejugal region enclosed by a chitinous crest (Fig. 18), anterior surface with tubercles and ribs. Notogastral surface mostly smooth but some ribs laterally and some weak foveolae posteriorly also visible. Fourteen pairs of phylliform notogastral setae with a strong median vein present, their surface smooth.

G n a t h o s o m a : Anterior margin of the mentum with a characteristic formation resembling eaves, which cover the insertion points of setae *h* (Fig. 23).

Coxisternal region: Surface ornamented with scattered foveolae. Epimeres well framed by borders, epimeres 1 not meeting medially (Fig. 19). Setae *1a*, *1c*, *2a* and *3a* minute, all others long but thin.

Anogenital region: Two hollows on either side and some chitinous laths laterally present. Surface smooth. Lyrifissures *iad* well visible. Adanal setae phylliform, ad_3 placed in preanal position.

Legs: All setae u of tarsi characteristically dilate and incised distally (Fig. 24). Setae *l"* of genua I and II phylliform, large (Figs 20—21).

Type-material: Holotypus (1181-HO-87): Kenya: No. 11: Ukunda, between the shore and main road, 17. IX. 1985. — Berlese-, Nematoda- and Tardigrada-samples from thin litter and humus of bushes. Stony soil; leg. S. MAHUNKA and L. MAHUNKA-PAPP. 8 paratypes: from the same sample. 6 paratypes: Kenya No. 1: Ukunda, sea shore. 16. IX. 1985. — Berlese-, Nematoda- and Tardigrada-samples from decaying debris and litter, accumulated at base of baobab trees. Sandy soil. Leg. S. MAHUNKA and L. MAHUNKA-PAPP. 2 paratypes: Kenya No. 2: Ukunda, sea shore, 16. IX. 1985. — Berlese-, Nematoda-, and Tardigrada-samples from digging out roots of grassy vegetation, near to sea shore. Leg. S. MAHUNKA and L. MAHUNKA-PAPP. Holotype and 14 paratypes (1181-PO-87) deposited in the HNHM, 2 paratypes in the MHNG and 1 paratype.

Remarks: The new species is distinguished from all heretofore known *Austrocarabodes* HAMMER, 1966 species by its dorsosejugal crest and by the form of setae *u* on tarsi.

Austrocarabodes rimosus sp. n.

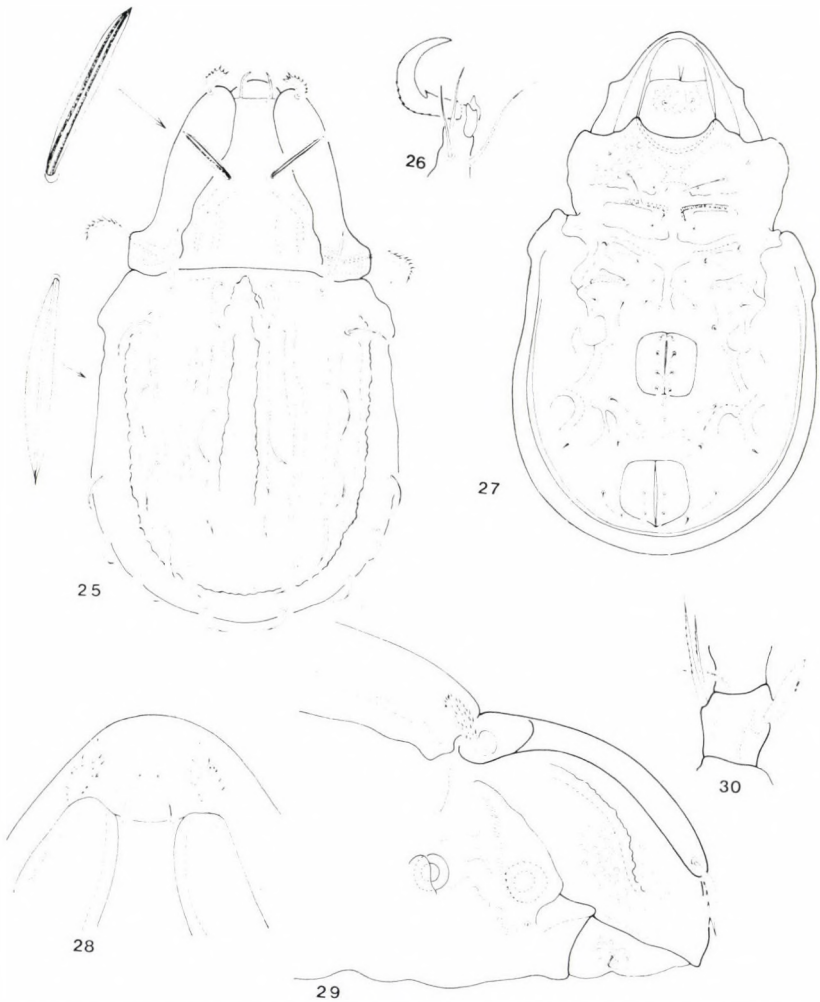
Measurements. — Length: 529 μm, width: 295 μm.

Prodorsum: Rostrum widely rounded, lamellar cuspis also wide, they are connected by a well-observable transverse lamella. Rostral setae thin, short, only slightly phylliform. Lamellar setae very wide, with very long marginal spines (Fig. 28). Interlamellar setae phylliform, originating close to each other in the interlamellar region, directed outwards. They have two lines (Fig. 25). Sensillus comparatively short, bent backwards, its outer surface well spinulose. Interlamellar region with some longitudinal ribs.

Notogaster: Dorsosejugal suture straight medially, in the dorsosejugal region without a hollow. Median part of notogaster framed by a stronger rib, inner part with some longitudinal ribs and foveolae. Fourteen pairs of phylliform notogastral setae present, setae c_2 directed forwards, all others backwards. All setae medially with one vein. Surface and margin of setae without spines or spicules (Fig. 25).

Lateral part of prodorsum: Rostrum smooth, lateral part foveolate. Tutorium weakly developed, without cuspis. Pedotecta I large.

Coxisternal region: Mentum foveolate only anteriorly. Coxisternal region also foveolate laterally. Epimeral setal formula: *3—1—3—3*.



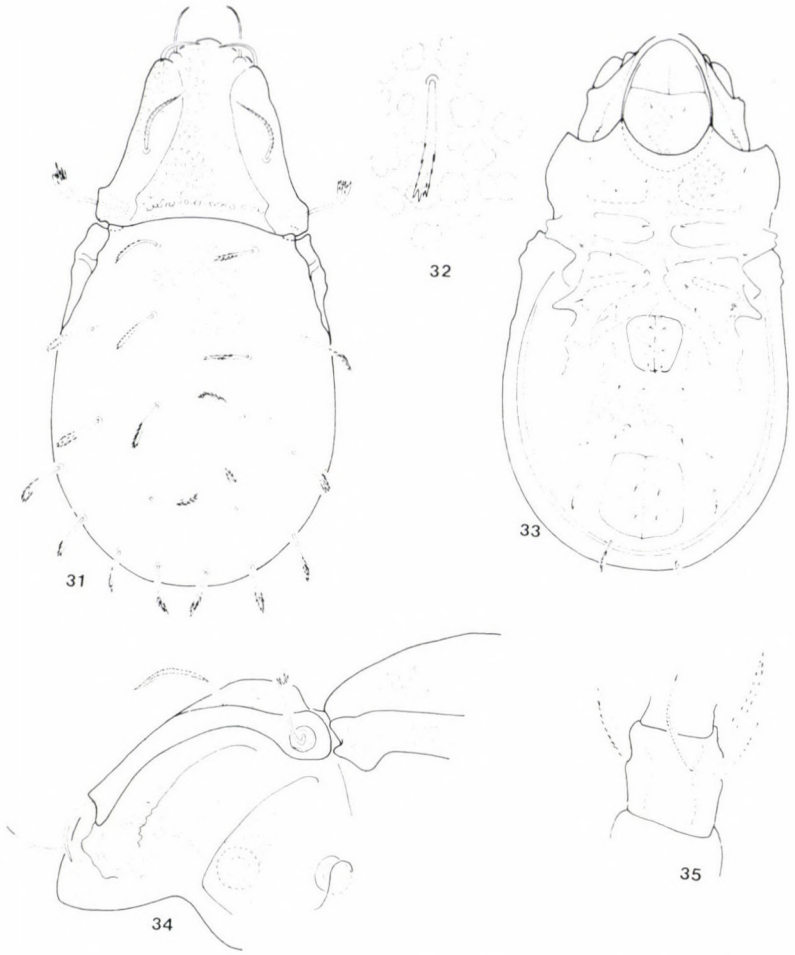
Figs 25—30. *Austrocarabodes rimosus* sp. n. — 25 = dorsal side, 26 = tarsus of leg IV, 27 = ventral side, 28 = rostrum in anterior view, 29 = prodorsum in lateral view, 30 = genu of leg II

Setae *1a*, *1c*, *2a* and *3a* very short, all others long. Apodemes short, borders hardly observable (Fig. 27).

A n o g e n i t a l r e g i o n : Anal plates ornamented by some strong ribs and tectum. All setae of anogenital region thin and simple. Lyrifissures *iad* opening very far from anal aperture.

L e g s : All tarsi have very short and thick setae *u* (Fig. 26). Setae *l''* genu of leg II phylliform (Fig. 30).

T y p e - m a t e r i a l : Holotype (1197-HO-87): Angola, Environ Malange, forest litter and moss, 12. V. 1980, leg. Z. SZABÓ. 5 paratypes from the same sample. Holotype and 4 paratypes (1197-PO-87) in the HNHM, 1 paratype in MHNG.



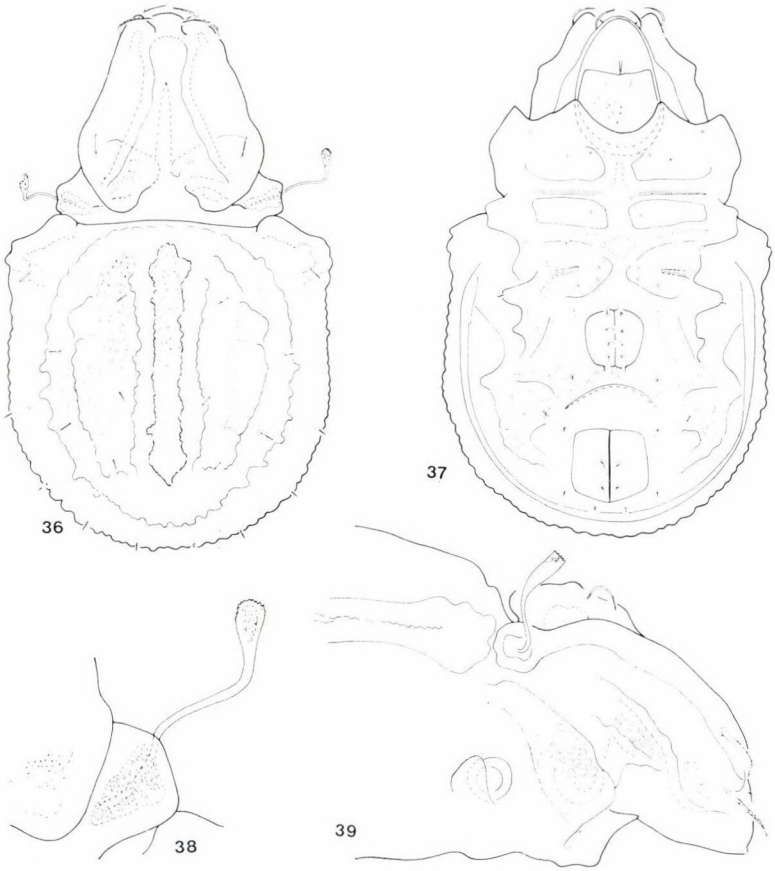
Figs 31—35. *Carabodes areolatus* BERLESE, 1913 — 31 = dorsal side, 32 = sculpture of notogaster, 33 = ventral side, 34 = prodorsum in lateral view, 35 = genu of leg II

R e m a r k s : On the basis of the very wide lamellar setae the new species belongs to the "*tarandus*" species-group by its anteriorly directed setae c_2.

Carabodes areolatus BERLESE, 1913 (Figs 31—35)

The newly examined specimens are not wholly identical with the drawing (Fig. 5) and with the description given by SELLNICK and FORSSLUND (1953: 377). The main differences are the following:

1. Rostral setae much longer and thinner than lamellar ones (nearly equal in length and thick in the figure).



Figs 36—39. *Carabodes auriculatus* sp. n. — 36 = dorsal side, 37 = ventral side, 38 = sensillus, 39 = prodorsum in lateral view

2. On the basal part of prodorsum a comparatively narrow transversal thickening observable. It is never tubercular and is never limited to the outer part of the interbothridial region.

3. Interlamellar setae strongly pilose, arranged in two longitudinal rows.

4. Notogastral sculpture uniform on the whole surface (areolae not larger on the median field of the notogaster than marginally).

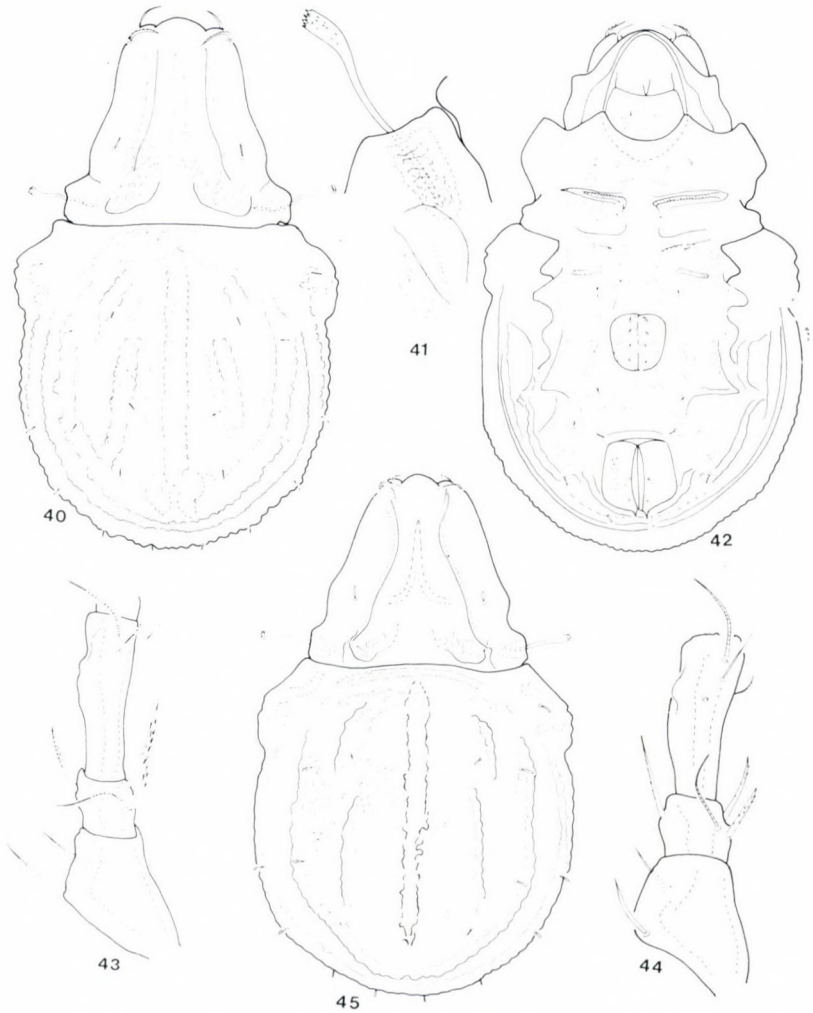
5. Head of sensillus strongly thickened with long spines bent forwards.

Examined material: GDR, Oberhof, Thüringer Wald. Beerberg, 980 m. 1. VIII. 1965; leg. M. Moritz (ZMB).

Carabodes auriculatus sp. n.

Measurements. — Length: 574—689 μm, width: 344—419 μm.

P r o d o r s u m : Rostral and lamellar setae slightly dilate, both spiniform, strongly bent inwards, squamose. Lamellae wide, basally, between them a pair of very large elevations present (Fig. 36), their posterior margin well chitinized, running laterally, over the lamellae. Lamellar setae arising laterally, simple, but also spiniform. Peduncle of sensillus very long, comparatively thin, curved. Its head small, spinose (Fig. 38).



Figs 40—45. *Carabodes femoralis* (NICOLET, 1855) — 40 = dorsal side, 41 = sensillus, 42 = ventral side, 43—44 = genu and tibia of leg II, 45 = dorsal side of an other specimen

N o t o g a s t e r : Ten pairs of spiniform notogastral setae present. Surface ornamented by tubercles and ribs. Median part well framed, an unpaired median, and a pair of lateral longitudinal custulae also observable (Fig. 36).

C o x i s t e r n a l r e g i o n : Epimeral borders and apodemes well observable, epimeral surface sparsely alveolate. All epimeral setae minute (Fig. 37).

A n o g e n i t a l r e g i o n : Ventral plate with strongly chitinized ridges, latter partly composed of tubercles. Anal and genital plates foveolate. All setae in this region minute, adanal setae stronger than the others.

L e g s : Setae *u* on all tarsi spiniform and thick.

T y p e - m a t e r i a l : Holotype (1198-HO-87): As. 290: Soviet Union, Georgian SSR, Ritsa-sea 9. VI. 1976. — Riha-lake. Moss from the rock wall of a canyon. Leg. GY. TOPÁL; Holotype and 3 paratype (1198-PO-87) deposited in the HNHM, 1 paratype in MHNG. 4 paratypes: from the same sample.

R e m a r k s : On the basis of its habitus and the position of setae c_2 the new species belongs to the femoralis-group. It stands closer to *C. femoralis* (NICOLET, 1855) (Figs 40—45) than to *C. rugosior* BERLESE, 1916, since the latter has no tubercles on its notogaster. It may be distinguished from *C. femoralis* by the following characters:

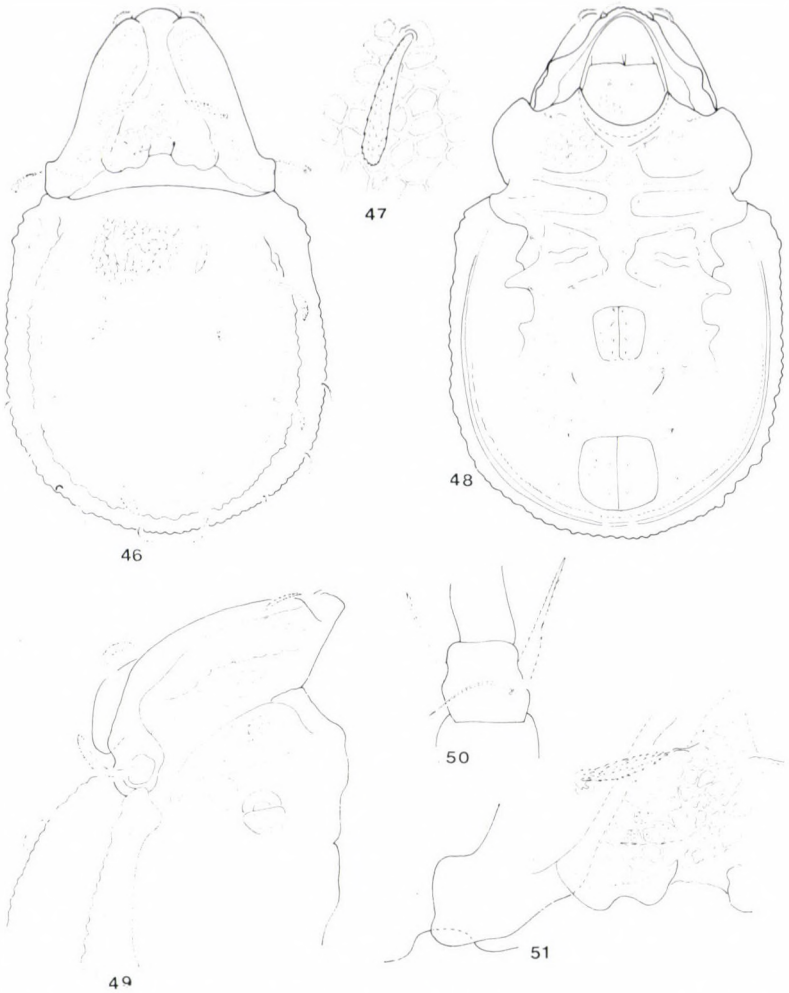
C. femoralis	**C. auriculatus**
1. Peduncle of sensillus short, straight.	1. Peduncle of sensillus long, curved forwards.
2. Prodorsal elevations small, not covering the lamellae.	2. Prodorsal elevations very large, covering the lamellae.
3. One median longitudinal crest present on notogaster.	3. Three longitudinal crests present on notogaster.
4. Setae of notogaster clavate.	4. Setae of notogaster bacilliform.
5. Setae *l''* of genu II longer than *l'*.	5. Setae *l''* of genu II shorter than *l'*.

Carabodes chirstlus sp. n.

Measurements. — Length: 500—566 μm, width: 311—360 μm.

P r o d o r s u m : Lamellae wide, lamellar setae arising laterally, thick and pilose, rostral setae thin but slightly longer than the preceding ones. Two large elevations present in the interlamellar region, their posterior margin divided into two. Basal part of prodorsum excavated (Fig. 51). Surface of elevations and median part of interlamellar region ornamented by polygonal sculpture (Fig. 46). Interlamellar setae phylliform, spiculate. Sensillus slightly fusiform, bent backwards.

N o t o g a s t e r : Surface with a characteristic polygonate sculpture. Fields ornamented also by small tubercles. Ten pairs of phylliform notogastral setae present, four pairs (p_1, p_2, p_3, h_3) shorter than the others (Fig. 46). All setae well spiculate (Fig. 47).

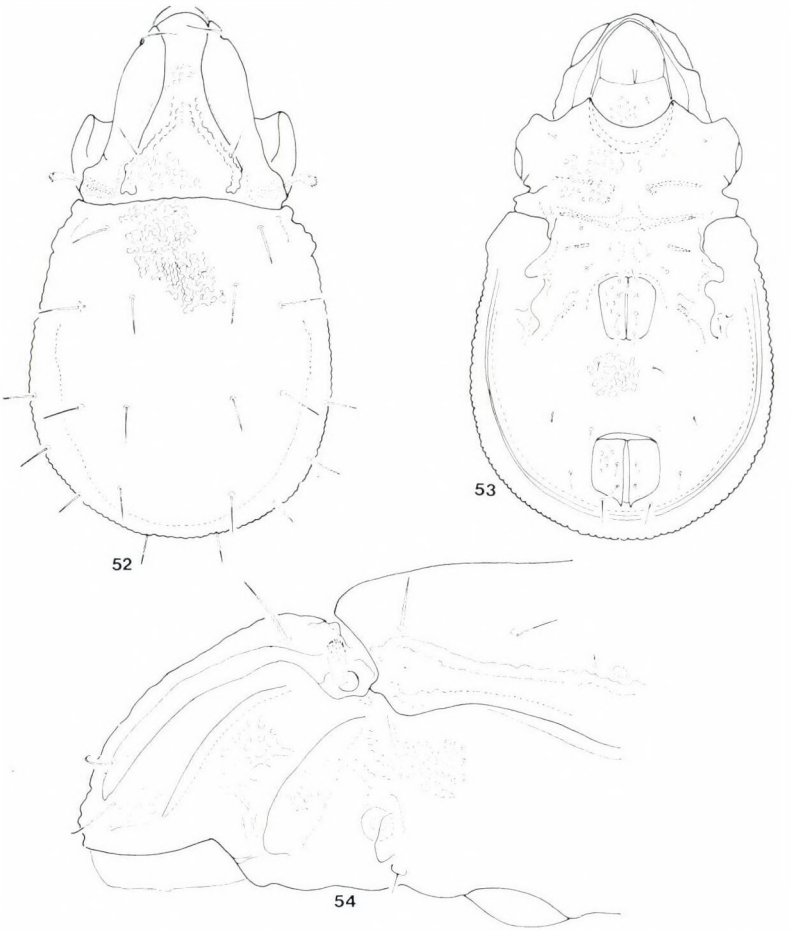


Figs 46—51. *Carabodes chirstlus* sp. n. — 46 = dorsal side, 47 = sculpture of the notogaster, 48 = ventral side, 49 = prodorsum in lateral view, 50 = genu of leg II, 51 = basal part of prodorsum

C o x i s t e r n a l r e g i o n : Epimeral borders well visible, the whole surface alveolate. All epimeral setae — excepting *3c* and *4c* — short, mostly spiniform.

A n o g e n i t a l r e g i o n : Genital and aggenital setae very long, all other setae in this region short or minute. Surface ornamented by alveoli and ribs, some longitudinal ribs well observable along genital aperture. A median field in front of anal aperture smooth. Surface of genital and anal plates foveolate (Fig. 48).

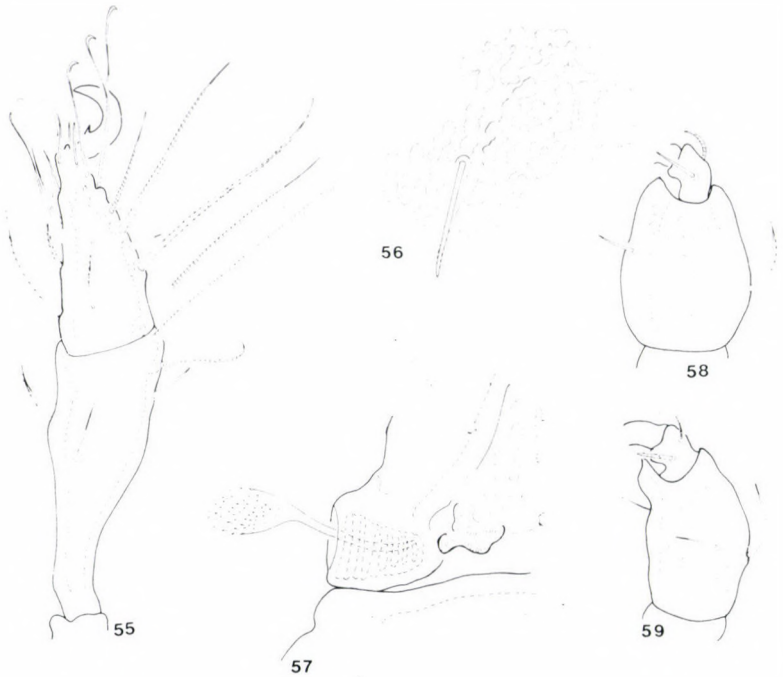
L e g s : Setae *u* on tarsi short, spinoform. Outer setae (*l''*) (Fig. 50) shorter than *l'*.



Figs 52—54. *Carabodes labyrinthicus* (MICHAEL, 1879) — 52 = dorsal side, 53 = ventral side, 54 = prodorsum in lateral view

T y p e - m a t e r i a l : Holotype (1199-HO-87): Tunisia, No. 37-3. Environs of Ain Draham, 31 March, 1977. Berlese- and Tardigrada-samples from Quercus suber and Q. libonotis forests: Moss from perpendicular cliff wall. Leg. S. MAHUNKA; 3 paratypes: from the same sample; 6 paratypes Tunisia, No. 37-2. Environs of Ain Draham, 31 March 1977. Berlese- and Tardigrada-samples from Quercus suber and Q. libanotis forests: moss from the ground with the underlying soil. Leg. S. MAHUNKA. Holotype and 8 paratypes (1199-PO-87) deposited in the HNHM, 1 paratype in MHNG.

R e m a r k s : The new species belongs to the marginatus-group and stands near to *Carabodes marginatus* (MICHAEL, 1884), *C. ornatus* STORKÁN, 1925, *C. quadrangulus* BERNINI, 1979 and *C. montanus* BERNINI, 1979. Prodorsal elevations absent from *C. marginatus* and *C. ornatus* but present in the other species. The latter ones are distinguished from the new species by the following key:

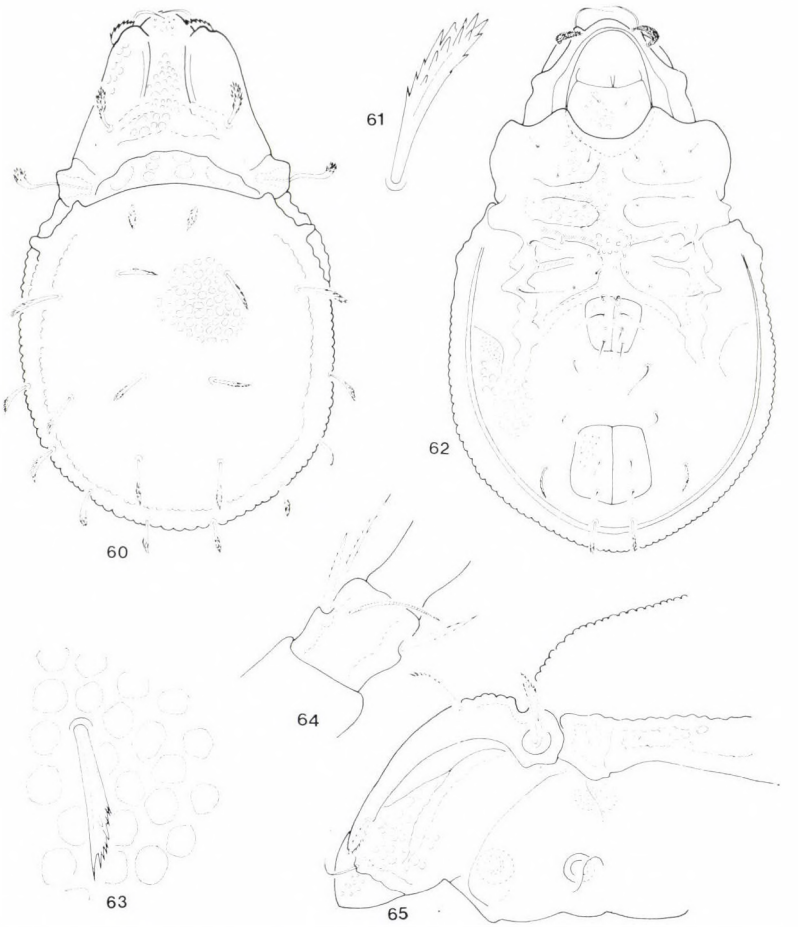


Figs 55—59. *Carabodes labyrinthicus* (MICHAEL, 1879) — 55 = tarsus and tibia of leg I, 56 = sculpture of notogaster, 57 = sensillus and the basal part of prodorsum, 58 = femur of leg IV, 59 = femur of leg III

1 (2) Interlamellar setae short, comparatively thin and erect. No phylliform setae presen on notogaster **montanus** BERNINI, 1979
2 (1) Interlamellar setae phylliform, bent inwards and appressed to prodorsal surface. Notogastral setae partly phylliform.
3 (4) Prodorsal elevations narrowed posteriorly, their posterior margin convex. No essential difference in setae c_2, 1a, 1d. Setae *l'* of genu II much longer than *l''* **quadrangulus** BERNINI, 1979
4 (3) Prodorsal elevations widened posteriorly, their posterior margin concave. Setae c_2 much longer than setae 1a and 1d. Setae *l'* of genu II much shorter than *l''* **chirstlus** sp. n.

Carabodes subarcticus TRÄGÅRDH, 1902

P r o d o r s u m : Rostrum conical, lamellae with free, but well-rounded cuspis. Rostral setae arising on tubercles, before the lamellar cuspis, well observable in lateral view (Fig. 70). Rostrum and the lateral field of prodorsum well ornamented by alveoli, but a field, between tutorium and lamella is smooth. Tutorium with some teeth anteriorly (Fig. 70). Outer surface of lamellae alveolate, inner surface finely pustulate. Interlamellar setae very long, apices curving inwards. A pair of comparatively strong costula converging medially, rest of interlamellar surface well alveolate. A pair of strong tubercles

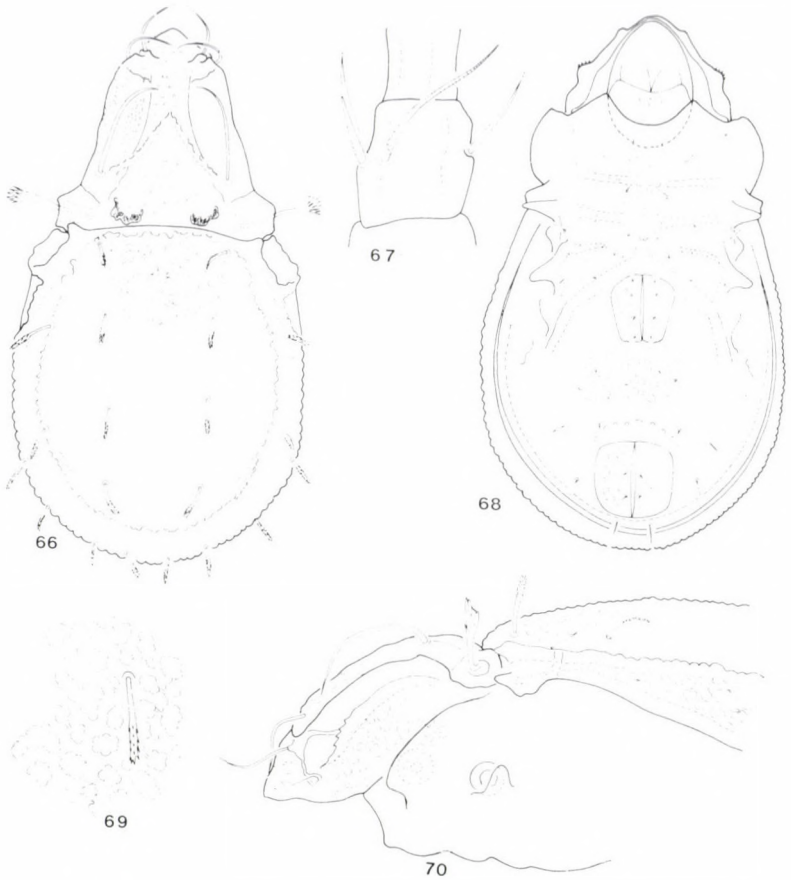


Figs 60—65. *Carabodes ornatus* STROKÁN, 1925 — 60 = dorsal side, 61 = seta *lm*, 62 = ventral side, 63 = sculpture of notogaster, 64 = genu of leg II, 65 = prodorsum in lateral view

observable in the basal part of prodorsum. Sensillus well dilated, its head with long spines.

N o t o g a s t e r : Dorsosejugal region finely pustulate, one pair of very strong condyles also present, directed toward sensillus (Fig. 66). Median pair of notogaster well framed, its sculpture consisting of regular alveoli (Fig. 69), but the lateral part of the notogaster with pustules or tubercles. Ten pairs of slightly dilated notogastral setae present, their distal end squamose or spinose.

C o x i s t e r n a l r e g i o n : Whole surface, also the surface of the mentum and pedotecta I ornamented by alveoli, epimeral borders not visible. Apodemes well observable. Two rounded median fields framed by foveoli visible. All epimeral setae short and spiniform.



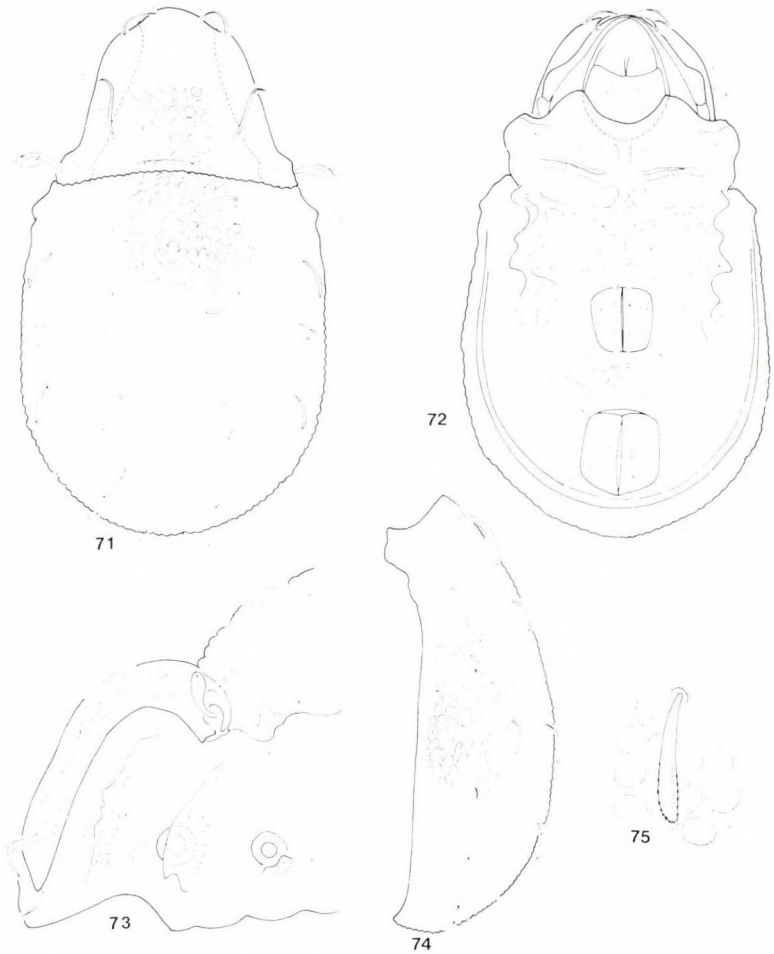
Figs 66—70. *Carabodes subarcticus* TRÄGÅRDH, 1902 — 66 = dorsal side, 67 = genu of leg II, 68 = ventral side, 69 = sculpture of notogaster, 70 = prodorsum in lateral view

A n o g e n i t a l r e g i o n (Fig. 68): Sculpture similar to that of the median part of notogaster, surface of genital and anal plate ornamented by smaller foveolae. Genital, aggenital, anal and adanal setae thin, setiform. Adanal setae roughened, all others smooth. Lyrifissures *iad* originating far from anal aperture.

L e g s : Setae *u* on all tarsi slightly widened basally, narrowed distally. Setae *l*'' of genu II (Fig. 67) short and thin, much thinner than setae *l*' or *lv*'.

E x a m i n e d m a t e r i a l : Hungary, Egyek: Ohati-erdő, Püspökladány: Ágotapuszta; Újszentmargita: Margitai-erdő. IV—IX. — Extracted from samples taken both in planted and original forest. A sporadic species in the forest of Europe. Leg. S. MAHUNKA.

R e m a r k s : The species is well characterized by the denticulate tutorium, its wide sensillus and by the sculpture of the notogaster.



Figs 71—75. *Carabodes willmanni* BERNINI, 1975 — 71 = dorsal side, 72 = ventral side, 73 = prodorsum in lateral view, 74 = notogaster in lateral view, 75 = sculpture of notogaster

Carabodes willmanni BERNINI, 1975

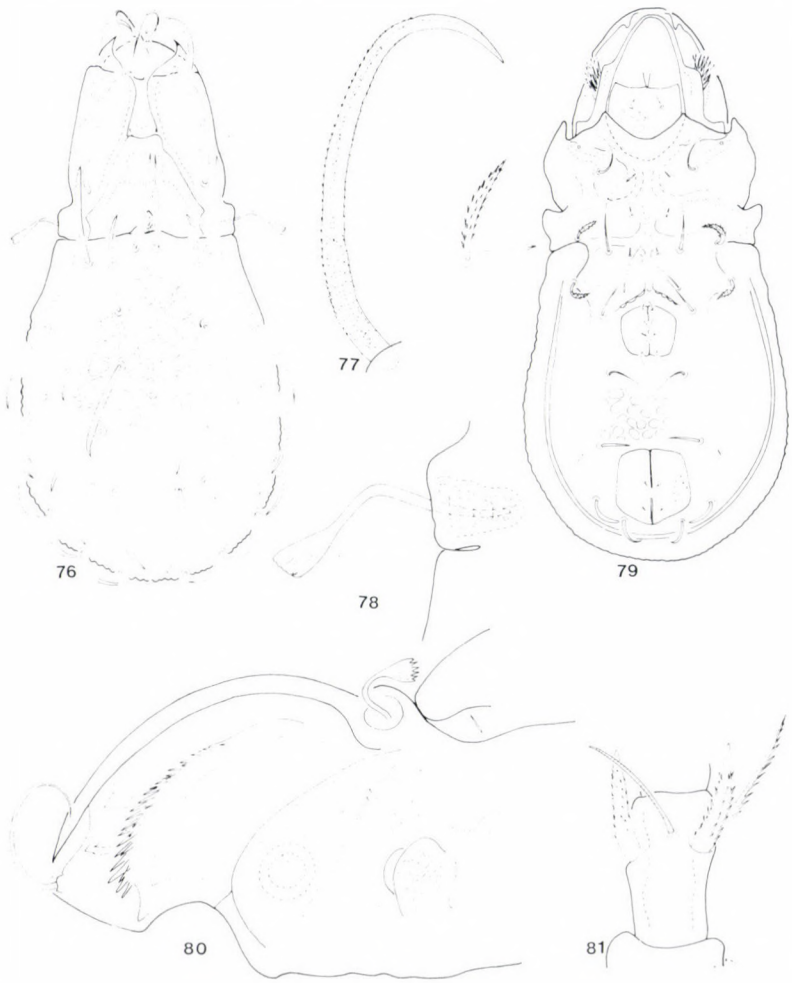
This highly variable and widely distributed species has been known only from Tangier in North Africa. The newly collected Tunisian specimens (Figs 71—75) are similar to the latter one (see BERNINI, 1975: 466, fig. III. b) and stands comparatively far from the type-series. They may be distinguished from the specimens from Tangier by the shape of the interlamellar setae (long and curved at their distal end) and by the notogastral sculpture (pustules stand very near to each other, without large smooth fields among them).

Examined material: Tunisia, No. 37-2: Environs of Ain Draham, 31. March, 1977. Berlese- and Tardigrada-samples from Quercus suber and Q. libanotis forests: moss from the ground with the underlying soil. Leg. S. MAHUNKA.

Odontocepheus piramidalis sp. n.

Measurements. — Length: 591—632 μm, width: 275—330 μm.

P r o d o r s u m : Rostral setae arising on tubercles, directed backwards. Lamellae gradually widened anteriorly, with a concave cuspis, their surface foveolate. All setae thick and squamose (Fig. 77). In the interlamellar region a characteristic chitinous formation (Fig. 76) present, like that of the genus *Berlesezetes* MAHUNKA, 1980. Sensillus (Fig. 78) directed outwards and backwards, its peduncle geniculate. Tutorium (Fig. 80) well developed, with long and strong spines, arranged in a longitudinal row.



Figs 76—81. *Odontocepheus piramidalis* sp. n. — 76 = dorsal side, 77 = seta *le*, 78 = sensillus, 79 = ventral side, 80 = prodorsum in lateral view, 81 = genu of leg II

N o t o g a s t e r : Median, unpaired notogastral condyles present, it is well chitinized, much darker than the rest of the surface. All notogastral setae very long and strong, setae *p* are longer than the distance between them. Surface of these setae squamose or finely roughened. Surface of notogaster alveolate.

C o x i s t e r n a l r e g i o n : Epimeral setal formula: *3—1—3—3*. Setae *1b*, *3b*, *4a* and *4b* very long and strong, directed forwards, or inwards, all strong, similar to notogastral setae. Setae *1a*, *1c*, *2a* minute, setae *3c* and *4c* slightly dilate, their surface also squamose. Surface of epimeral region with tubercles or with pustules (Fig. 79).

A n o g e n i t a l r e g i o n : Surface of genital and anal plates irregularly foveolate, genital and aggenital setae setiform, adanal setae phylliform or similar to notogastral setae.

L e g s : Setae *p* and *u* on tarsi of all legs long, with dilate end. Setae of genu II as shown in Fig. 81.

T y p e - m a t e r i a l : Holotype (1200-HO-87): Tunisia, No. 49. About 2 km NW from Maktar, 3 April, 1977. Berlese- and Tardigrada-samples from barren sites on border of town: litter from base of Pinus pinsapo and a pulvinate Composite plant. Leg. S. MAHUNKA. 2 paratypes: from the same sample. Holotype and 1 paratype (1200-PO-87) deposited in the HNHM, 1 paratype in MHNG.

R e m a r k s : See in the remarks of the following new species.

Odontocepheus villosus sp. n.

Measurements. — Length: 687—825 μm, width: 316—412 μm.

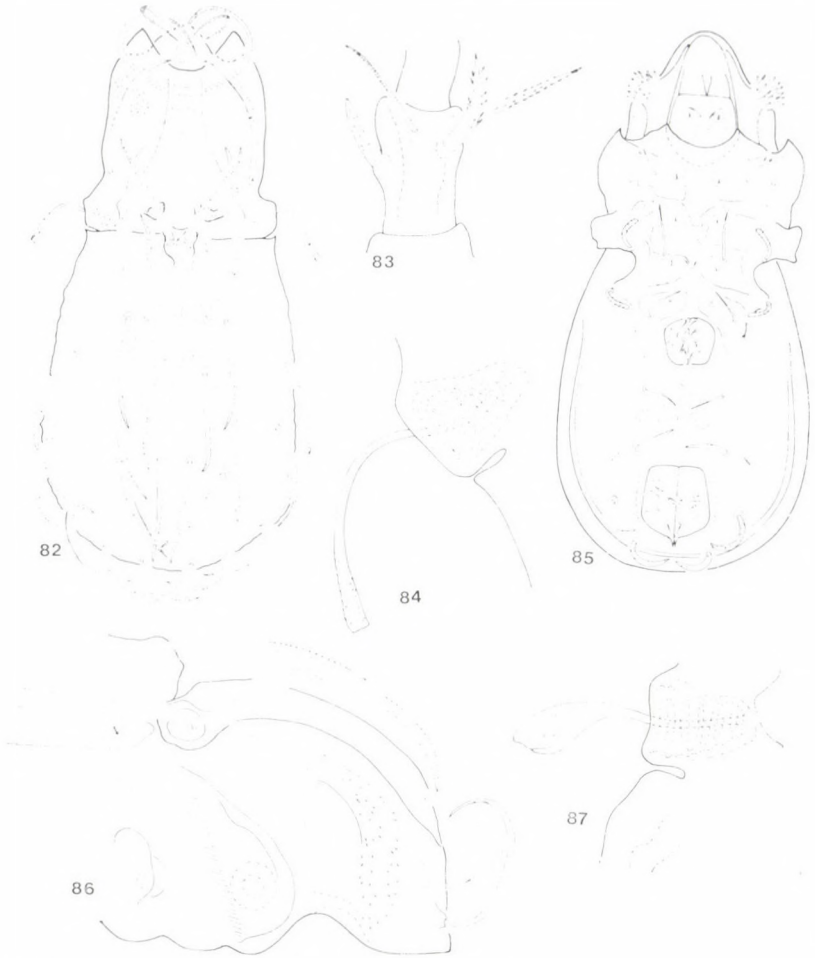
P r o d o r s u m : Lamellae wide, lamellar surface pustulate, arranged nearly in parallel rows. Their cuspis wide, a well-observable translamella present. Interlamellar region wide, its surface irregularly foveolate. One pair of very strong prodorsal condyles present (Fig. 82). Sensillus (Fig. 84) long, gradually thickened, proximally bent backwards. Tutorium with long and strong spines, forming (Fig. 86) a bunch.

N o t o g a s t e r : A pair of very strong, anteriorly concave, median condyles present on the anterior margin of notogaster. Notogastral setae very long, thick and squamose.

C o x i s t e r n a l r e g i o n : Apodemes and borders well developed, slightly stronger than in the preceding species. Epimeral setae very characteristic, setae *1a*, *1c*, *2a* minute, setae *1b*, *3b*, *4a* and *4b* thick, directed forwards, setae *3c* and *4c* also thick but blunt (Fig. 85).

A n o g e n i t a l r e g i o n : Genital setae pilose, all other setae aquamose. Surface of genital and anal plates irregularly foveolate.

L e g s : Genu of leg II as shown in Fig. 83.



Figs 82—86. *Odontocepheus villosus* sp. n. — 82 = dorsal side, 83 = genu of leg II, 84 = sensillus, 85 = ventral side, 86 = prodorsum in lateral view. — Fig. 87 = *Odontocepheus elongatus* (MICHAEL, 1879): sensillus

T y p e - s p e c i e s : Holotype (1201-HO-87): Tunisia: No. 37-1: Environs of Ain Draham, 31. March, 1977. Berlese- and Tardigrada-samples from Quercus suber and Q. libanotis forest: litter samples from various places in closed forest; leg. S. MAHUNKA. 5: from the same sample. Holotype and 4 paratypes (1201-PO-87) deposited in the HNHM, 1 paratype in MHNG.

R e m a r k s : The *Odontocepheus* species heretofore known from the Palaearctic Region may be distinguished by the following key:

1 (4) One strong, unpaired median condyles present on the anterior margin of the notogaster. Peduncle of sensillus long, nearly twice longer than head.
2 (3) One pair of condyles present on the basal part of prodorsum. Median notogastral condyles concave medially, nearly quadrangular **villosus** sp. n.

3 (2) No basal condyles on prodorsum. Median notogastral concyles triangular **piramidalis** sp. n.

4 (1) One pair of notogastral condyles and one pair of prodorsal condyles present. Peduncle of sensillus short, its head large and clavate (Fig. 87) **elongatus** (MICHAEL, 1879)

Diplobodes africanus sp. n.

Measurements. — Length: 777—822 μm, width: 510—563 μm.

P r o d o r s u m : Rostrum very wide, its outline undulate. Rostral setae small, weakly dilated, arising far from each other. Lamellae gradually narrowed basally, wide and angular anteriorly (Fig. 91) with sharp cuspis. Lamellar setae phylliform, serrate; completely covered by lamellae in dorsal view. Interlamellar setae simple, setiform. Surface of interlamellar region smooth. Sensillus (Fig. 93) uncate. Sack of bothridium very long, arched, like a cornu (Fig. 93).

N o t o g a s t e r : Dorsosejugal suture undulate. Seven pairs of rounded elevations on the median part of notogaster (Fig. 88) present, this part also is completely elevated from the marginal part. Posterior part concave. Lateral margin of notogaster with transverse rugae, rest of surface, excepting 7 pairs of elevations, foveolate. Fourteen pairs of very thin, fine notogastral setae present, five pairs of them in postero-marginal and no seta in humeral position. Lyrifissures *im* opening marginally, near to the first pairs of lateral elevations.

G n a t h o s o m a : Mentum very large, nearly twice longer than rutellum, its surface smooth.

L a t e r a l p a r t o f p r o d o r s u m : Tutorium well developed, its cuspis observable.

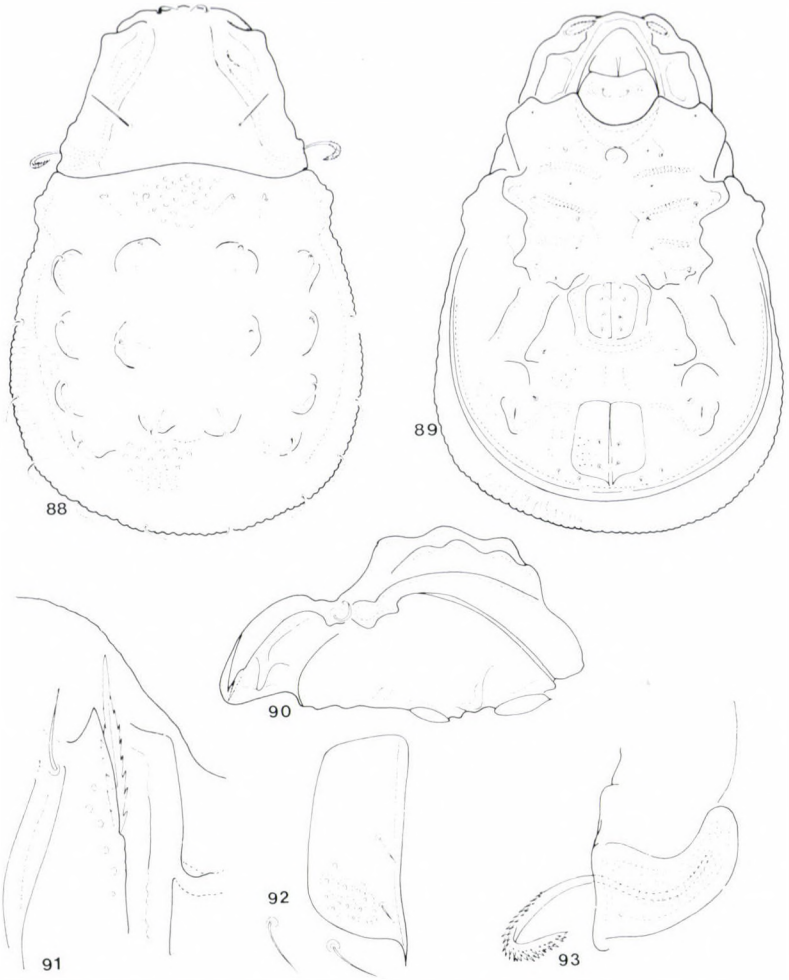
C o x i s t e r n a l r e g i o n : Epimeral setal formula: *3—1—3—3*. Apodemes 2, ap. sej., ap. 3 and 4 nearly equal in length. No sternal apodeme or border present, a wide median, unpaired field present. Epimeral surface ornamented by some weak alveoli. Setae *1a*, *1c*, *2a* reduced, all represented only by their alveoli, rest of setae fine and thin (Fig. 89).

A n o g e n i t a l r e g i o n : The surface divided by strong chitinous laths, some weak foveolae also visible. Anogenital setal formula: *4—1—2—3*.*

All setae thin and simple. Setae ad_1 and ad_2 in postanal, ad_3 in para-anal position. Surface of genital plates smooth, that of anal plates foveolate. Inner margin of anal plates ending in sharply pointed spines (Fig. 92). Lyrifissures *iad* well visible.

L e g s : Setae *u* of all tarsi simple, setiform. All femora foveolate, other joints of legs smooth.

* In one case three pairs of genital setae were observable.



Figs 88—93. *Diplobodes africanus* sp. n. — 88 = dorsal side, 89 = ventral side, 90 = body in lateral view, 91 = end of lamella, 92 = anal plate, 93 = sensillus

T y p e - m a t e r i a l : Holotype (1182-HO-87): Kenya No. 74: Tsavo National Park, Ngulia Lodge, 28. IX. 1985. — Sifted material from litter and dry decaying stumps; leg. S. MAHUNKA and L. MAHUNKA-PAPP. 10 paratypes: from the same sample; 1 paratype: Kenya No. 1. Ukunda, sea shore. 16. IX. 1985. — Berlese-, Nematoda- and Tardigrada-samples from decaying debris and litter, accumulated at base of baobab trees. Sandy soil. Leg. S. MAHUNKA and L. MAHUNKA-PAPP; 1 paratype: Kenya: No. 11. Ukunda, between the shore and main road. 17. IX. 1985. — Berlese-, Nematoda- and Tardigrada-samples from thin litter and humus of bushes. Stony soil. Leg. S. MAHUNKA and L. MAHUNKA-PAPP. Holotype and 10 paratypes (1182-PO-87) deposited in the HNHM, 1 paratype in MHNG and 1 paratype in NHMN.

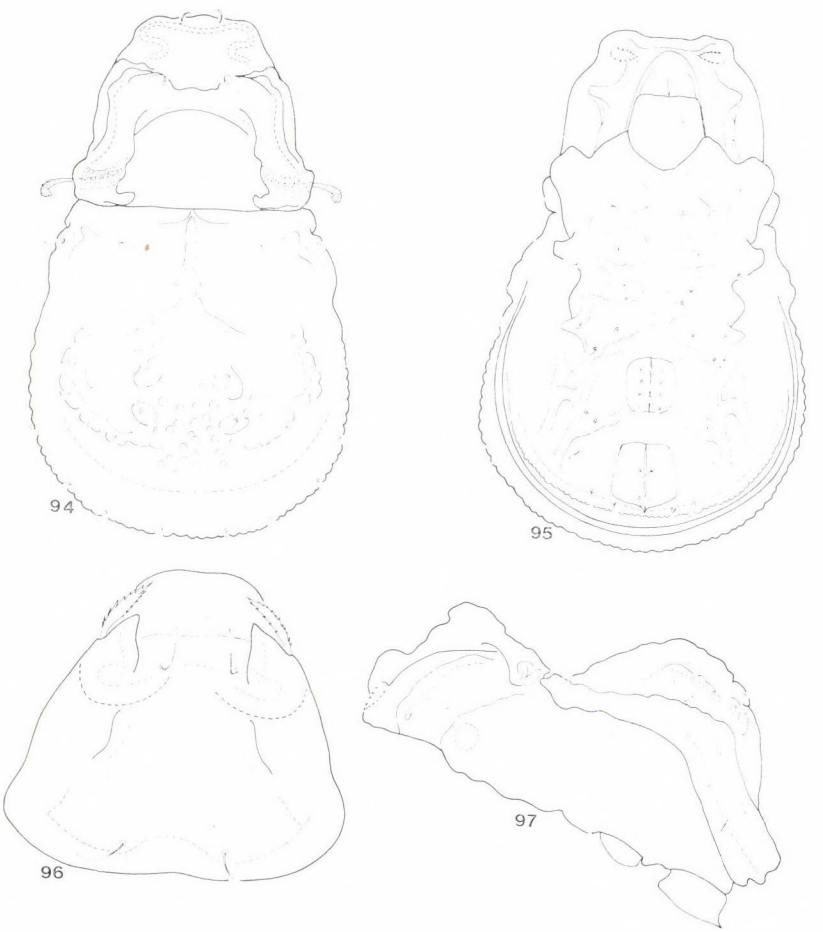
R e m a r k s : The new species is well comparable with the type of the genus *Diplobodes* AOKI, 1958. The new species is a good example to prove the distinction of the genus from the other genera of the family Carabodidae

MAHUNKA, 1986). The new taxon is near to the type of the genus (*D. kanekoi* AOKI, 1958), however, its lamellae are without ornamentation and no anterior median elevations are present which well characterizes the type species.

Machadocepheus tuberculosus sp. n.

Measurements. — Length: 465—511 μm, width: 279—316 μm.

P r o d o r s u m : Rostrum very wide, laterally a characteristic structure observable (Fig. 97). Lamellae bearing sharp cuspis, lamellar setae phylliform (Fig. 96), rostral and interlamellar setae thin and simple. Median part of notogaster highly elevated, a transversal formation resembling spectacles well



Figs 94—97. *Machadocepheus tuberculosus* sp. n. — 94 = dorsal side, 95 = ventral side, 96 = prodorsum in anterior view, 97 = body in lateral view

visible, interlamellar setae arising on it. Basal part of prodorsum slightly excavate. Sensillus short, but its head reclinate (Fig. 94), well spinulose. Sack of bothridium very long, comparatively narrow, curved. Tutorium well developed.

N o t o g a s t e r : Dorsosejugal suture straight, well visible. Median part of notogaster also very high, this elevation bearing some paired tubercles and an unpaired one medially, anteriorly a narrowed and divided costula observable. Fifteen pairs of short, simple notogastral setae present. Surface partly alveolate, postero-marginal region smooth.

C o x i s t e r n a l r e g i o n : All epimeres well framed by the borders, a wide median, longitudinal field present. Epimeral setae thin, simple and long, excepting setae *1a* and *1c*.

A n o g e n i t a l r e g i o n : Much shorter longitudinally than coxisternal region. Ventral plate with strong laths (Fig. 95). All setae short and thin. Setae *ag* and ad_3 originating very near to each others. Lyrifissures *iad* well observable, originating far from anal aperture. Setae ad_1 and ad_2 stand near to each other, in postanal position.

T y p e - m a t e r i a l : Holotype (1183—HO—87): Kenya: No. 74: Tsavo National Park, Ngulia Lodge. 28. IX. 1985. — Sifted material from litter and dry decaying stumps. Leg. S. MAHUNKA and L. MAHUNKA-PAPP, 2 paratypes: from the same sample. Holotype deposited in the HNHM, 1 paratype in MHNG, 1 paratype in NHMH.

R e m a r k s : The new species stands nearest to *M. sagitta* BALOGH et MAHUNKA, 1966, however, the latter has a much longer and thinner sensillus and the structure of its prodorsum is also different.

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BRACONIDAE (HYMENOPTERA) FROM KOREA, IX*

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Fourty-seven species of Braconidae are reported from Korea belonging to the subfamilies Dirrhopinae Ichneutinae, Miracinae, Neoneurinae, Microgastrinae and Opiinae. Six new species are described: *Ichneutes senator* sp. n. ♀, *Mirax irruptor* sp. n. ♀, *M. mogrus* sp. n. ♀, *Microgaster dornator* sp. n. ♀, *M. eminius* sp. n. ♀ and *M. taptor* sp. n. ♀. One new synonymy was established: *Microgaster spinolae* (Nees, 1834 (sen. syn.) = *Microplitis sapporoensis* Ashmea[4], 1906 (jun. syn.). 32 species are new to the fauna of Korea. With 46 original figures.

1. List of the species

Fourty-seven Braconid species are reported from Korea (i.e. from the Democratic People's Republic of Korea) representing the following subfamilies: 1 species of Dirrhopinae, 4 species of Ichneutinae, 2 species of Miracinae, 1 species of Neoneurinae, 37 species of Microgastrinae and 2 species of Opiinae. Detailed collecting data are given for every species and, where necessary, completed with taxonomical and zoogeographical notes. The Braconid material is deposited in the Hungarian Natural History Museum, Budapest.

DIRRHOPINAE

Dirrhope rufa Foerster, 1851, ♀ new — The female is similar to the male sex. Body somewhat stronger, head and mesonotum with rougher sculpture. Antenna with 24 joints, flagellar joints 7-8—24 cubic. Ovipositor sheath very short. — Reported from Germany, Hungary and the USSR (European part). New to the fauna of Korea.

Locality — 1 ♀: Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 5 August 1975, No. 319.

ICHNEUTINAE

Ichneutes senator sp. n.: see p. 444.

Oligoneurus inopinatus Tobias et Belokobylskij, 1981 — Recently described from the Far East Maritime Territory of the USSR. New to the fauna of Korea.

My three specimens (2 ♀♀ + 1 ♂) from Korea match the original description excepting the following features (which are infraspecific variations):

* Zoological Collectings by the Hungarian Natural History Museum in Korea, No. 82.

Korean specimens	Original description
1. First tergite distinctly broadening at spiracles (1 ♀ + 1 ♂).	1. First tergite hardly broadening at spiracles.
2. Diameter of tentorial dimple about equal with its distance from eye.	2. Diameter of tentorial dimple somewhat greater than its distance from eye.
3. Ground colour of body blackish brown.	3. Ground colour of body black.
4. Antenna with 20 (1 ♀) and 22 joints (1 ♀).	4. Antenna broken.

Localities — 1 ♀: Prov. South Pyongan: Lyong-ak san, 25 km W from Pyongyan, 31 August 1971, No. 224. — 1 ♀: Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 5 August 1975, No. 318. — 1 ♂: Kum-gang san: Lake Sam Il, 10 July 1977, No. 357.

Paroligoneurus ectoedemiae BELOKOBYLSKIJ, 1986 — The species was recently described from the Far East Maritime Territory of the USSR. New to the fauna of Korea.

Locality — 1 ♀: Kum-gang san: Lake Sam Il, 10 July 1977, No. 357.

Proterops nigripennis WESMAEL, 1835 — Frequent in the Palaearctic Region.

Locality — 1 ♀: Prov. Ryang-gang: Chann-Pay plateau, 15 km SSW from Sam-zi-yan on the road between Hyesan and Sam-zi-yan, 1600 m, 23 July 1975, No. 277.

MIRACINAE

Mirax irruptor sp. n.: see p. 446.

Mirax mogrus sp. n.: see p. 448.

NEONEURINAE

Neoneurus viennensis (GIRAUD, 1871) — Distributed in Europe, the USSR and Mongolia. New to the fauna of Korea.

Locality — 1 ♂: Prov. Chagang: Mt. Myohyang san, Chongchon-gang valley, 12 Sept. 1980, No. 639.

MICROGASTRINAE

Apanteles argiope NIXON, 1965 — My material was compared with 1 ♀ paratype from Malaya: Kuala Lumpur and with 1 ♀ paratype from the Philippines: Luzon (see NIXON, 1965: 85); the 2 paratypes were kindly lent to me by Mr T. HUDDLESTON (London). My specimens represent *A. argiope* though few deviations were observed as follows:

Korean ♀♂	2 ♀ *paratypes*
1. Legs reddish yellow; all coxae and distal half to third of hind femur black; hind tibia black to blackish, its base straw yellow to reddish yellow; middle tarsus brown, hind tarsus blackish.	1. Legs black to blackish brown; fore femur + tibia reddish yellow, middle femur reddish brown, base of hind tibia yellowish to yellowish brown.
2. Sternites 1—3 yellow to vivid yellow; tergite 3 reddish yellow to testaceous.	2. Sternites 1—3 yellow to brownish yellow; tergite blackish to rusty brown.
3. Flagellar joints 1-6—7 black with more or less reddish suffusion.	3. Flagellar joints black.
4. Hind two ocelli minutely farther from each other than their own diameter; POL : greatest diameter of an ocellus as 11 : 5.	4. Hind two ocelli minutely closer to each other than their own diameter; POL : greatest diameter of an ocellus as 10 : 5.
5. Metacarp somewhat longer than pterostigma.	5. Metacarp as long as pterostigma.
6. Ovipositor sheath somewhat shorter than hind tibia.	6. Ovipositor sheath as long as hind tibia.

Widely distributed in the Old World (NIXON l.c.). New to the fauna of Korea. The Korean occurrence indicates its northernmost distribution.

Localities — 7 ♀♀ + 2 ♂♂: Prov. South Pyongan: Pyongyan, city park between river Te-dong and Pyongyan Hotel, 4 August 1971, No. 137. — 3 ♀♀ + 4 ♂♂: Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 5 August 1971 (1 ♂): No. 144, 12 August 1971 (1 ♀): No. 166, 15 August 1971 (1 ♀): No. 177, 31 August 1971 (1 ♀ + 2 ♂♂): No. 225, 3 Sept. 1971 (1 ♂): No. 235. — 2 ♀♀ + 2 ♂♂: Prov. South Pyongan: De Sang san, 10—12 km NE from Pyongyan, 7 August 1971 (2 ♂): No. 145, 8 August 1971 (1 ♀): No. 153, 25 July 1977 (1 ♀): No. 386. — 1 ♂: Prov. South Pyongan: Lyong-ak san, 14 km W from Pyongyan, 11 August 1971, No. 160. — 1 ♂: Prov. South Pyongan: Chang-lyong san, 50 km N of Pyongyan and 15 km E from Sa-gam, 13 August 1971, No. 169. — 1 ♂: Prov. South Pyongan: Pyongyan, Nung-ra do, 14 August 1971, No. 175. — 1 ♀: Prov. South Pyongan: Bongwa-ri, on the river-side Te-dong, about 45 km E from Pyongyan, 16 August 1971, No. 179.

Apanteles brevicornis (WESMAEL, 1837) — Sporadic to frequent in Europe, its most eastward distribution was reported from Azerbaidzhan in the USSR. New to the fauna of Korea.

Locality — 1 ♀: Mt. Pektusan: wooden environs of the Sam-zi-yan hotel, 19 July 1977, No. 376.

Apanteles carbonarius (WESMAEL, 1837) — Widely distributed in the Palaearctic Region (in Europe frequent to common, listed from Mongolia and Korea).

Localities — 1 ♀: Kum-gang san: Ruekhaam, about 7 km W from Hotel Kum-gang, 11 July 1977, No. 358. — 2 ♂♂: Mt. Pektusan: wooden environs of the Sam-zi-yan hotel, 19 July 1977, No. 374.

Apanteles conopiae WATANABE, 1934 — Described from Japan, reported from Malaya. New to the fauna of Korea.

Locality — 1 ♀: South Hwangae Prov.: Songhwa, 50 m above sea level, 17 Sept. 1979, No. 542.

Apanteles falcatus (NEES, 1834) — Frequent to common in the Palaearctic Region.

Locality — 10 ♀♀ + 3 ♂♂: Mt. Pektusan: wooden environs of the hotel Sam-zi-yan hotel, 19 July 1979, No. 376.

Apanteles forensis TOBIAS, 1976, ♂ new — Fore half of first tergite converging basally, its hind half subparallel, i.e. indistinctly narrowing posteriorly. Antenna longer than body, its penultimate joint thrice longer than broad. Hind femur apically and below blackish. Distal two-thirds of hind tibia blackish. Otherwise the male similar to the female. According to MASON (1981) the species represents the genus *Nyereria* MASON, 1981. — Described from Chabarovsk (Far East Maritime Territory of the USSR) on the basis of the female holotype. New to the fauna of Korea.

Locality — 1 ♂: Prov. Kyonggi (= "Prov. Kengi"): Pagyon san (= "Bagyon san"), Pagyon popo, about 27 km SW from Kaesong, 7 June 1970, No. 100.

Apanteles formosus (WESMAEL, 1837) — Widely distributed in the Palaearctic Region. Nearest to Korea reported from Japan. New to the fauna of Korea.

Locality — 4 ♀♀: Prov. Kanwon: Kum-gang san, environs of Hotel, 20 August 1982, leg. BERON et POPOV.

Apanteles inclusus (RATZEBURG, 1844) (= *curvulus* THOMSON, 1895; = *rectinervis* TELENGA, 1955) — Reported from Korea under the name *A. curvulus* THOMSON (PAPP, 1974).

Locality — 2 ♀♀ + 1 ♂: "Korea, Gimhae, Gyeong-sangnam-Do", ex *Apatele increata* HAMPSON 12 June 1980 (new host datum), leg. et educ.?

Apanteles kariyai WATANABE, 1937 (= *purgatus* TELENGA, 1955: synonymized by PAPP, 1986). — My synonymization was based on the examination and comparison of authenticated specimens of *A. kariyai* (sen. syn.) and *A. purgatus* (jun. syn.). *A. kariyai* is distributed in the eastern Palaearctic Region penetrating into the northern Oriental Region (China: Mandzhuria; USSR: Far East Maritime Territory: Japan; Taiwan). New to the fauna of Korea. It seems to be a frequent to common species in Korea.

Nearest to *A. rufocoxalis* (RILEY, 1881) (Nearctic Region), the two species are difficult to differentiate (and supposedly they are vicariant in their distribution):

A. kariyai WAT.	*A. rufocoxalis* (RILEY)
1. Metacarp distinctly longer than pterostigma.	1. Metacarp usually somewhat shorter than, or at most as long as, pterostigma.
2. First section of n. bas. shorter than parapterostigma.	2. First section of n. bas. as long as parapterostigma.
3. Sculpture of mesonotum of usual size, together with head not pruinose, latter shiny.	3. Sculpture of mesonotum rather weak, together with head pruinose.

Also closely related to *A. ruficrus* (HALIDAY, 1834) (Cosmopolitan) and *A. analis* (NEES, 1834) (Europe, USSR):

A. kariyai WAT.	*A. ruficrus* (HAL.)
1. First tergite at most as long as wide at hind, usually slightly shorter, and somewhat less broadening distally; second tergite slightly shorter than, and exceptionally as long as, third tergite (Fig. 6 in PAPP, 1986).	1. First tergite usually slightly longer than wide at hind, somewhat more broadening distally; second tergite one-fourth to one-fifth shorter than third tergite (Figs 54—55 l.c.).
2. Temple in dorsal view somewhat less rounded (Fig. 5 l.c.).	2. Temple in dorsal view somewhat more rounded (Fig. 56 l.c.).
3. Tergites (1—)2—3(—4) reddish yellow; hind coxa always reddish yellow.	3. Tergite 3 usually more or less, tergite 4 less usually with yellow to reddish yellow pattern; hind coxa black apically reddish yellow.

A. kariyai WAT.	*A. analis* (NEES)
1. First tergite usually as long as wide behind (Fig. 6 in PAPP, 1986).	1. First tergite one-third to one-fourth longer than wide behind (Fig. 4 l.c.).
2. Scutellum distinctly to roughly punctate.	2. Scutellum smooth to finely punctate, subpunctate.
3. Second tergite reddish.	3. Second tergite black.

Localities — 4 ♀♀ + 1 ♂: Prov. South Pyongan: Pyongyan Hotel garden, 14—15 August 1971: Nos 176—177, 2 and 4 Sept. 1971: Nos 234 and 237 (previously named as *A. ruficrus* HALIDAY: PAPP, 1974). — 4 ♂♂ + 1 ♀: Prov. Ryang-gang: Hyesan, garden and room of Hotel Hyesan, 23 August 1971 (4 ♂♂): No. 193 and 26 July 1975 (1 ♀): No. 294. (4 ♂♂ from loc. No. 193 previously named as *A. ruficrus* HAL.) — 12 ♀♀ + 1 ♂: Prov. South Pyongan: Pyongyan, garden of the Embassy of the Hungarian People's Republic, 16—20 July 1975, Nos 266 and 274. — 2 ♀♀: Prov. South Pyongan: Pyongyan, De-sang san, 10—12 km NE from Pyongyan, 18 July 1975: No. 267 and 1 July 1977: No. 333. — 2 ♀♀ + 2 ♂♂: Sa Gam, water basin and inundation area of a river, 5 July 1977 (2 ♀♀): No. 347 and 24 July 1977 (2 ♂♂): No. 384. — 1 ♀: Mt. Pektusan, wooden environs of the Sam-zi-yan hotel, 19 July 1977, No. 377. — 2 ♀♀: South Pyongan Prov., Lake Taesong-ho, 13 Sept. 1979, No. 528. — 1 ♀: Kaeson City: Kaesong, Hotel Janamsan, 29 July 1982, No. 873.

Apanteles nixoni PAPP, 1971 — Described from Mongolia. This is the second report of its distribution. The species resembles *A. carbonarius* WESMAEL. New to the fauna of Korea.

Locality — 1 ♀: Prov. South Pyongan: Sa-gam, 45 km N from Pyongyan, 12 August 1971, No. 164.

Apanteles pallipes REINHARD, 1880 — Reported from several localities in Korea (PAPP, 1974a).

Localities — 3 ♀♀: Pyongyang City: Daesong san, 10 km NE of Pyongyan, 23 Sept. 1978 (1 ♀): No. 390 and 20 Sept. 1979 (2 ♀♀): No. 554. — 1 ♀: North Hwanghae Prov.: Sariwon, 20 km SSE from town by Lake Sohung-ho, 29 Sept. 1978, No. 425. — 3 ♀♀: Kangwon Prov.: Kumgang-san, 12 Oct. 1978, No. 488. — 1 ♀: Pyongyang City: Pyongyang, 9 Sept. 1980, No. 624.

Apanteles pompelon NIXON, 1965 — My two female specimens agree well with the original description (NIXON, 1965). Described from Japan (Sapporo) and recorded from Czechoslovakia. New to the fauna of Korea.

Localities — 1 ♀: Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 4 August 1975, No. 315. — 1 ♀: Prov. Gang-von: district On-dzong, Kum-gang san, along Ok-rudong, 250—300 m, 7 August 1975, No. 324.

Apanteles vindicius NIXON, 1965 — Described from Italy ("Laguna Veneta"), reported from Hungary and Daghestan (USSR). A rare species though it seems widely distributed in the Palaearctic Region. New to the fauna of Korea. My Korean specimen is quite similar to the Hungarian female.

Locality — 1 ♀: Pyongyang City: Lyong-ak san, 15 km W of Pyongyang, 270 m, 20 Sept. 1979, No. 557.

Cardiochiles japonicus WATANABE, 1937 — The only deviation between the original description and my female specimen refers to the colour of pterostigma: that of the Japanese

forms "dark brown" and that of the Korean female yellow. — Up to now it has been known from Japan. New to the fauna of Korea.

Locality — 1 ♀: Prov. Gang-von: district On-dzong, Kum-gang san, Sam-il po, 4 August 1975, No. 314.

Dioltogaster connexa (NEES, 1834) — First tergite twice as long as wide at hind, with parallel sides. Second tergite 2.3—2.5 times wider behind than long medially. The European representatives with longer first tergite and with more transverse second tergite. Body 3—3.2 mm long. — Listed sporadically from several localities in the Palaearctic Region; nearest to Korea from the Tuvinsk Autonome Territory (USSR). New to the fauna of Korea.

Localities — 2 ♂♂: Prov. South Pyongan: Pyongyan, Nung-ra do, 17 August 1971, No. 182. — 1 ♂: De Sang-san, 10 km NE from Pyongyan, 1 July 1977, No. 332. — 4 ♀♀: "Korea, Suweon", ex *Porthesia similis* FUESSLY (food-plant Malus domestica), 13 June 1980, leg. et educ.?

Dioltogaster eclectes ssp. **extentus** (PAPP, 1974) — The subspecies was described from Korea, the nominate form known from the Philippines, Malaya, Borneo and New Guinea. New to the fauna of New Guinea (1 ♀, nominate form: New Guinea, Wau, caught with Malaise trap, 18 Sept. 1972, leg. L. MÓCZÁR).

Locality — 1 ♀: Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 6—8 August 1975, No. 326.

Hygroplitis abdominalis (NEES, 1834) — A Palaearctic species, rather frequent. New to the funa of Korea.

Localities — 1 ♂: De Sang-san, 10 km NE from Pyongyan, 1 July 1977, No. 332. — 3 ♂♂: Mt. Pektusan: wooded environs of the Sam-zi-yan hotel, 18 July 1977, No. 372.

Hypomicrogaster psarae (WILKINSON, 1927) — Coxae and trochanters 1—2 together with first tergite whitish. Flagellum yellow, its dorsal side sightly fumous. Mesonotum evenly punctate, interspaces shiny. Body 4 mm long. — Reported from Malaya, Viet-Nam (Siam) and India. New to the fauna of Korea and Taiwan, too (2 ♀♀ + 2 ♂♂: Formosa: Taihorinsho, IX—X 1909, leg. SAUTER).

Locality — 1 ♀: Prov. South Pyongan: Mang-yong-dae, 25 km W from Pyongyan, 5 August 1971, No. 139.

Lissogaster asramenes (NIXON, 1968) — My Korean male specimen is similar to that of the European (Hungarian) representatives excepting its hind tibia with somewhat extended black to blackish colour. — Reported from Italy, Hungary, Romania and Turkey. New to the fauna of Korea.

Locality — 1 ♂: Prov. Gang-von: district On-dzong, Kum-gang san, along Ok-ru-dong, 250—300 m, 7 August 1975, No. 324.

Lissogaster ductilis (NIXON, 1968) — Penultimate joint of antenna 1.6 times longer than broad. Femora 2—3 blackish to black. — A rare species. Reported from Finland, Hungary, Mongolia one locality each. New to the fauna of Korea.

Locality — 1 ♀: Mt. Pektusan: wooded environs of the Sam-zi-yan hotel, 18 July 1977, No. 371.

Lissogaster globata (LINNÉ, 1758) — Locality: 1 ♀: Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 6—7 Sept. 1971, No. 243.

Lissogaster parvistriga (THOMSON, 1895) — Localities: 1 ♂: Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 3 August 1971, No. 136. — 1 ♀: Prov. South Pyongan: De-sang san, 12 km NE from Pyongyan, 7 August 1971, No. 145. — 2 ♀♀: + 1 ♂: Prov. Ryang-gang: Chann-Pay plateau, 24 km NW from Sam-zi-yan along the road to Mt. Pektusan, 2000 m, 24 July 1975, No. 281. — 2 ♀♀: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m, 24 July 1975, No. 282. — 1 ♂: Prov. South Pyongan: Lyong-ak san, 14 km W from Pyongyan, 30 July 1975, No. 301.

Lissogaster polita (MARSHALL, 1885) — Femora 1—3 of the single female black with reddish yellow (femora 1—2) to reddish pattern (femur 3), those of the European females black. Femora of the two males with usual colour pattern. — Reported from a few European countries and from the USSR (European part, Armenia). New to the fauna of Korea.

Localities — 1 ♀: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m, 23 July 1975, No. 278. — 2 ♂♂: Kum-gang san: Ruekbaam, about 7 km W from Hotel Kum-gang, 11 July 1977, No. 358.

Lissogaster szelenyii (PAPP, 1974) — The species was described from Korea, hitherto known only from this country. In my original description (PAPP, 1974b) I have compared my new species with *L. leechi* (WALLEY, 1935) (Nearctic Region). My revision of the European

Lissogaster BENGTSSON, 1926 (= *Microgaster* auct. nec LATREILLE, 1804) species was published two years later (PAPP, 1976), and *L. szelenyii* was not included in the key given in this revision. With the help of this key my species runs to *L. auriculata* (FABRICIUS, 1804) and *L. postica* (NEES, 1834). The distinction of the three species is disclosed below in a tabular form:

L. szelenyii PAPP	*L. auriculata* (F.)
1. Hind tarsus as long as hind tibia; hind basitarsus long, as long as hind tarsal joints 2—4; in lateral view tarsal claws less long and more broadening basally (Fig. 37).	1. Hind tarsus somewhat shorter than hind tibia; hind basitarsus short, as long as hind tarsal joints 2—3; in lateral view tarsal claws long and less broadening basally (Fig. 42).
2. Temple in dorsal view rounded (Fig. 38).	2. Temple in dorsal view constricted (Fig. 43).
3. Fourth joint of maxillary palp distinctly shorter, i.e. fifth joint about 1.5 times as long as 4th joint.	3. Fourth joint of maxillary palp indistinctly shorter, i.e. about as long as fifth joint (Fig. 44).
4. Metacarp attenuating distally (Fig. 40).	4. Metacarp evenly wide up to its distal end (Fig. 45).
5. Hypopygium with lateral creases, i.e. less strongly sclerotized.	5. Hypopygium without lateral creases, i.e. strongly sclerotized.

L. szelenyii PAPP	*L. postica* (NEES)
1. First tergite less distinctly broadening posteriorly, about 1.5 times wider behind than basally (Fig. 41).	1. First tergite distinctly broadening posteriorly, almost twice wider behind than basally (Fig. 46).
2. Mesonotal disc antero-posteriorly with diminishing and weakening punctation, its posterior third smooth, shiny.	2. Anterior two-thirds of mesonotal disc with distinct and rather confluent punctation, its posterior third with weakening punctation, shiny.
3. Inner margin of eyes distinctly converging to oral part.	3. Inner margin of eyes subparallel, i.e. indistinctly converging to oral part.
4. Fourth joint of maxillary palp distinctly shorter, i.e. about half as long as fifth joint (Fig. 39).	4. Fourth joint of maxillary palp only somewhat shorter than fifth joint (cf. Fig. 44).
5. Tegula black or brownish black.	5. Tegula bright yellow.
6. Body 4—4.2 mm long.	6. Body 3.2—3.5 mm long.

Microgaster atamiensis (ASHMEAD, 1906) — Scape sometimes with reddish pattern (1 ♂: loc. No. 182, 1 ♂: loc. No. 318). *M. atamiensis* (ASHMEAD) and *M. leoniae* (NIEZABITOWSKI, 1910) are very similar to each other, their specific differences are restricted to three features as tabulated below:

M. atamiensis (ASHM.)	*M. leoniae* (NIEZ.)
1. First tergite slightly, though distinctly broadening posteriorly.	1. First tergite parallel-sided.
2. Wings fumous to strongly fumous.	2. Wings hyaline to subhyaline.
3. Body relatively stronger, 3.5—3.8 mm long.	3. Body relatively less strong, 3—3.3 mm long.

Up to now known only from Japan. New to the fauna of Korea.

Localities — 1 ♀: Prov. South Pyongan: Chang-lyong san, 50 km N of Pyongyan and 15 km E from Sa-gam, 13 August 1971, No. 169. — 1 ♂: Prov. South Pyongan: Pyongyan, Nung-ra do, 17 August 1971, No. 182. — 2 ♀: Kaesong: Mts. Pakyon, 20—21 km NE from Kaesong, 11 Sept. 1971, Nos 260—261. — 1 ♂: Prov. Ryang-gang: Hyesan, Mt. Ze-dong, 1150 m, 26 July 1975, No. 293. — 1 ♂: Prov. Pyong-Sung: Bek-sung-li, Za-mo san, 60 km NE from Pyongan, 1 August 1975, No. 305. — 4 ♂♂: Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 5 August 1975 (2 ♂♂): No. 318 and 10 July 1977 (2 ♂♂): No. 354. — 1 ♀: Prov. North Pyongan, Mt. Myohyang-san, Hotel, 14 August 1982, leg. BERON et POPOV.

Microgaster decens (TOBIAS, 1964) — Reported from Kazakhstan (USSR), Hungary and Mongolia. I possess specimens from Germany and Finland. New to the fauna of Korea.

Localities — 1 ♂: Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 7—8 August 1971, No. 150. — 3 ♀♀ + 2 ♂♂: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m, 27—28 August (3 ♀♀): Nos 209 and 218, 24 July 1975 (2 ♂♂): No. 282. — 3 ♂♂: Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 5 August 1975 (1 ♂): No. 318, 6—8 August 1975 (1 ♂): No. 326, 11 July 1977 (1 ♂): No. 358.

Microgaster deprimator (FABRICIUS, 1798) (= *sordipes* NEES, 1834) — Second tergite weakly to very weakly rugose-rugulose. Scape reddish yellow, dorso-apically blackish. Tegula of female (loc. No. 112) with blackish suffusion. Otherwise similar to the European forms. — Distributed in the Palaearctic Region, in Europe frequent. New to the fauna of Korea.

Localities — 1 ♀: Prov. Kyonggi (= "Prov. Kengi"): Pagyon san (= "Bagyon san"), San-chon tong, about 20 km SE from Kaesong, 8 June 1970, No. 112. — 1 ♂: Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 7 August 1975, No. 326.

Microgaster dornator sp. n.: see p. 450.

Microgaster eminius sp. n.: see p. 452.

Microgaster eremita (REINHARD, 1880) — Second tergite rugulose-uneven (that of European forms polished). Ocelli relatively large, distance between two ocelli somewhat shorter than diameter of an ocellus (that of European forms longer or equal in length). — Distributed in the Palaearctic Region, frequent in Europe. New to the fauna of Korea.

Locality — 1 ♀: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m, 27 August 1971, No. 209.

Microgaster flavipalpis (BRULLÉ, 1832) (= *Microplitis ruricola* LYLE, 1918) — The specimens from Korea are quite similar to the Mongolian and European representatives of this species. Reported from a few European countries and from Mongolia. New to the fauna of Korea.

Localities — 1 ♀: Prov. South Pyongan: Pyongyan, city park between river Te-dong and Pyongyan Hotel, 4 August 1971, No. 137. — 6 ♀♀: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1500 m, 24 August 1971, No. 196. — 1 ♀: Prov. Ryang-gang: Hyesan, Mt. Ze-dong, 1150 m, 22 July 1975, No. 275. — 1 ♀: Prov. Ryang-gang: Chann-Pay plateau, 15 km SSW from Sam-zi-yan on the road between Hyesan and Sam-zi-yan, 1600 m, 23 July 1975, No. 277. — 11 ♀♀: Prov. Ryang-gang: Chann-Pay plateau, 24 km NW from Sam-zi-yan along the road to Mt. Pektusan, 2000 m, 24 July 1975, No. 281. — 1 ♂: Prov. Ryang-gang: Chann-Pay plateau, Mt. Pektusan, Mu-do-bong, 2100—2200 m, 25 July 1975, No. 288. — 1 ♀: De Sang-san, 10 km NE from Pyongyan, 1 July 1977, No. 332. — 5 ♀♀: Mt. Pektusan: wooded environs of the Sam-zi-yan hotel, 18—19 July 1977, Nos 372 and 374.

Microgaster kaszabi (PAPP, 1980) — I have described this species from Mongolia on the basis of a single female specimen. The Korean female at hand is its second known representative. The only deviation between the two specimens is the size of ocelli: Mongolian female: ocelli relatively large, distance between fore and a hind ocelli shorter than greatest diameter of hind ocellus, — Korean female: ocelli relatively small, distance between fore and a hind ocelli longer than greatest diameter of hind ocellus. Otherwise the latter specimen agrees with the holotype. New to the fauna of Korea.

Locality — 1 ♀: Prov. Ryang-gang: river Karim, 10 km NEE from Bochonbo, 1100 m, 27 July 1975, No. 297.

Microgaster manilae (ASHMEAD, 1904) — With the help of WILKINSON's key (1930) my specimens runs unambiguously to this name. First tergite distinctly twice as long as broad at its base, with subparallel to parallel sides. Ring of hind tibia bright white, otherwise brownish black at base and at distal half. — Described from the Philippines (Manila). I have specimens from Taiwan (= Formosa) and New Guinea, too (localities see below). New to the fauna of Korea, Taiwan and New Guinea. Supposedly widely distributed in the Oriental Region.

Localities — 1 ♂: K o r e a, Prov. Gang-von: district On-dzong, Kum-gang san, near Hotel Go-song, 250 m, 4 August 1975, No. 315. — 4 ♂♂: T a i w a n, Taihorinsho, Jan. 1908: 1 ♂ and Oct. 1909: 3 ♂♂, leg. SAUTER. — 2 ♀♀: N e w G u i n e a, Wau, 10—17 Sept. 1972, leg. L. MÓCZÁR.

Microgaster mediator HALIDAY, 1834 — Frequent to common in the Palaearctic Region.

Localities — 1 ♂: Prov. South Pyongan: Ponghwa-ri, on the river Te-dong, about 45 km E of Pyongyang, 23 May 1970, No. 19. — 2 ♂♂: Prov. South Pyongan: Pyongyan, city park between river Te-dong and Pyong-yan Hotel, 4 August 1971, No. 137. — 1 ♀: Prov. South Pyongan: Mang-yong-dae, 25 km W from Pyongyan, 5 August 1971, No. 139. — 38 ♀♀ + 19 ♂♂: Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 7 August—7 Sept. 1971, caught in Malaise trap, Nos 150, 166, 176, 177, 188, 225, 229, 234, 237, 342. — 1 ♀ + 1 ♂: Prov. South Pyongan: Lyong-ak san, 14 km W from Pyongyan, 11 August 1971, No. 159. —

4 ♀♀ + 2 ♂♂: Prov. South Pyongan: Chang-lyongsan, 50 km N of Pyongyan and 15 km E from Sa-gam, 13 August 1971, Nos 168 and 169. — 1 ♀: Prov. South Pyongan: Pyongyan, Nung-ra do, 17 August 1971, No. 182. — 1 ♂: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m, 28 August 1971, No. 218. — 12 ♀♀: Prov. South Pyongan: Pyongyan, garden of the Embassy of Hungarian People's Republic, 16—20 July 1975, caught in Malaise-trap, Nos 266 and 274. — 1 ♂: Prov. South Pyongan: Nam-po, 19 July 1975, No. 273. — 1 ♀: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m, 24 July 1975, No. 285. — 2 ♂♂: Nampo, Vando, about 60 km SW from Pyongyan, 3 July 1977, No. 339. — 1 ♂: Kum-gang san: Hotel Kum-gang at village Ontsong, 9 July 1977, No. 354. — 1 ♂: Kum-gang san: Ruekhaam, about 7 km W from Hotel Kum-gang, 11 July 1977, No. 358.

Microgaster pallidipes (SZÉPLIGETI, 1902) — Similar to *M. fulvicornis* WESMAEL, 1837 (western Palaearctic Region), the distinction between them is given in a tabular form:

M. fulvicornis WESM.	*M. pallidipes* (SZÉPL.)
1. Body strong, 3.5—4 mm long.	1. Body gracile, 2—3 mm long.
2. Penultimate joint of antenna 1.7—1.8 times, exceptionally twice, as long as broad.	2. Penultimate joint of antenna 2.3—2.6 times as long as broad.
3. Vertex laterally from ocellar field with similar rugo-rugulosity to neighbouring surface, not shiny.	3. Vertex laterally from ocellar field with distinctly weaker, i.e. punctate-coriaceous sculpture and here more or less shiny.
4. Hypopygium relatively more pointed, surpassing end of metasoma.	4. Hypopygium relatively less pointed, not surpassing end of metasoma.

Additional features: 1. First tergite twice longer than broad at base, with parallel sides, narrowing at its distal third to fourth. 2. Antenna as long as (♀♀) or longer than (♂♂) body. 3. Radial vein of fore wing emitted slightly distally from middle of pterostigma. 4. Colour of body variable, there are a light and a dark form; a) Light form: flagellum brownish to yellowish, metasoma reddish yellow; its last 2—3 segments more or less darkening, b) Dark form: flagellum blackish, metasoma reddish yellow, first tergite brownish, dark brown to blackish, last 3(—4) segments black.

Described from Singapore, hitherto reported only from Taiwan (CHOU, 1981). I have two specimens from Taiwan, their locality data: 1 ♀ + 1 ♂: "Formosa, Tainan, Febr. 1909, leg. SAUTER". New to the fauna of Korea. Supposedly widely distributed in the Oriental Region.

The species was described on the basis of a single male specimen which I designate here as the holotype, its data: "Singapore, BIRÓ, 1898" (first label, printed) — "*pallidipes*" (SZÉPLIGETI's handwriting) "SZÉPLIGETI" (printed) (second label) — "*Microplitis pallidipes* SZÉPLIG." (SZÉPLIGETI's handwriting) (third label) — "Holotypus" (printed red) "*Microplitis pallidipes* SZÉPL. 1902 ♂ det. PAPP, 1967" (my handwriting) (fourth label with red frame) — "Hym. Typ. No." (printed red) "665" (my handwriting) "Mus. Budapest" (printed red) (fifth label). Holotype deposited in the Hungarian Natural History Museum, Budapest.

Localities — 1 ♀: Prov. South Pyongan: Ponghwa-ri (= "Prov. South Phenan: Bongha ri"), on the river Te-dong, about 45 km E of Pyongyan, 23 May 1970, No. 19. — 1 ♀ + 7 ♂♂: Prov. South Pyongan: Pyongyan, city park between river Te-dong and Pyongyan Hotel, 4 August 1971 (2 ♂♂): No. 137 and 1 Sept. 1971 (1 ♀ + 5 ♂♂): No. 227. — 28 ♀♀ + 38 ♂♂: Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 4 August—7 Sept. 1971, caught in Malaise-trap, Nos 144, 162, 166, 176, 177, 188, 189, 225, 235, 237, 243. — 1 ♀ + 5 ♂♂: Prov. South Pyongan: Mang-yong-dae, 25 km W from Pyongyan, 5 August 1971, No. 140. — 2 ♀♀: Prov. South Pyongan: De-Sang san, 10—12 km NE from Pyongyan, 7 August 1971 (1 ♀): No. 145 and 25 July 1977 (1 ♀): No. 386. — 2 ♂: Prov. South Pyongan: Lyong-ak san, 14 km W from Pyongyan, 11 August 1971, No. 160. — 3 ♀♀ + 1 ♂: Prov. South Pyongan: Chang-lyong san, 50 km N of Pyongyan and 15 km E from Sa-gam, 13 August 1971, No. 169. — 2 ♀♀ + 1 ♂: Prov. South Pyongan: Pyongyan, Nung-ra do, 17 August 1971, No. 182. — 11 ♀♀ + 2 ♂♂: Prov. South Pyongan: Pyongyan, garden of the Embassy of Hungarian People's Republic, 16—20 July 1975, Nos 266 and 274. — 2 ♂: Prov. Pyong-Sung: Bek-sung-li, Za-mo san, 60 km NE from Pyongyan, 1—10 August 1975, No. 331. — 1 ♀: Kum-gang san: 3—4 km S from Hotel Kum-gang, 12 July 1977, No. 363. — 1 ♂: Prov. South Pyongan: Myongsin, 30 km NE of Pyongyang, 19 Sept. 1979, No. 546.

Microgaster pellucida (TELENGA, 1955) — My Korean specimens (1 ♀ + 3 ♂♂) quite agree with the original description (TELENGA, 1955), and in Telenga's key it runs to this name; furthermore, they are similar to the representatives of this species from Hungary. —

Described from Soviet Middle Asia ("Barnaul"), I have several specimens from the USSR (Georgia), Hungary, Denmark, Bulgaria. New to the fauna of Korea.

Locality — 1 ♀ + 3 ♂♂: Prov. Pyong-Sung: Bek-sung-li, Za-mo san, 60 km NE from Pyongyan, 10 August 1975, No. 331.

Microgaster spinolae NEES, 1834 (= *Microplitis sapporoensis* ASHMEAD, 1906, syn. n.)* — Frequent to common in the Palaearctic Region.

Locality — 1 ♀: Kum-gang san, Ruekhaam, about 7 km W from Hotel Kum-gang, 11 July 1977, No. 358.

Microgaster taptor sp. n.: see p. 453.

Microgaster tuberculifer WESMAEL, 1837 — Common in the Palaearctic Region.

Localities — 1 ♀: Prov. South Pyongan: Pyongyan, city park between river Te-dong and Pyongyan Hotel, 4 August 1971, No. 137. — 2 ♀♀: Prov. South Pyongan: Pyongyan, Pyongyan Hotel garden, 7—8 August 1971 (1 ♀): No. 150 and 6—7 Sept. 1971 (1 ♀): No. 243, caught in Malaise-trap. — 1 ♀: Prov. South Pyongan: Chang-lyong san, 50 km N of Pyongyan and 15 km E from Sa-gam, 13 August 1971, No. 169. — 7 ♀♀ + 12 ♂♂: Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1600—1700 m, 25—28 August 1971 (6 ♀♀ + 12 ♂♂): Nos 198, 209, 218, 24 July 1975 (1 ♀): No. 282.

OPIINAE

Eurytenes abnormis (WESMAEL, 1835) — Frequent in the western Palaearctic Region and in the Nearctic Region. New to the fauna of Korea. The Korean occurrence of this species indicates its Holarctic distribution.

Locality — 1 ♀: Prov. Kangwon, Kumgang-san, near Kuryong Falls, 18 Sept. 1980, No. 698.

Opius (Psyttalia) romani FAHRINGER, 1934 — Antenna with 31 joints; hind femur less thick, 4.5 times as long as broad (that of the holotype thrice as long as broad). Ground colour of body rusty with blackish pattern, dorsal side of mesosoma almost entirely and tergites 3—7 black. — Up to now it has been known only on the basis of the holotype female specimen from China (South Kanshu). New to the fauna of Korea.

Locality — 1 ♀: Korea, Onpho ad Chongjin, 14 August 1959, leg. PISARSKI et PRÓSZYŃSKI.

2. Description of the new species

Six new species are described from Korea (i.e. from the Democratic People's Republic of Korea) belonging to the genera *Ichneutes* NEES, 1816 (1 species), *Mirax* HALIDAY, 1833 (2 species) and *Microgaster* LATREILLE, 1804 (3 species). The new species are related to their nearest allies. The holotype- and paratype-specimens are deposited in the Hungarian Natural History Museum, Budapest.

* *Microgaster spinolae* NEES, 1834

Microgaster spinolae NEES, 1834: Hym. Ichn. affin. Mon. 1: 166 ♀♂, type locality: "prope Sickerhausen" (Federal Republic of Germany), syntypes destroyed.

Microplitis sapporoensis ASHMEAD, 1906: Proc. U. S. natn. Mus. 30: 194 ♀, type locality: "Sapporo" (Japan), holotype in Washington (Natn. Mus. Nat. Hist.); **syn. n.**

The above synonymization is based on my examination and comparison of authentically identified specimens of *M. spinolae* and the holotype of *M. sapporoensis*. The holotype was kindly lent to me by Dr P. M. MARSH (Washington), for which I express my sincere thank to him.

Designation of the female holotype of *Microplitis sapporoensis* ASHMEAD, its data are quoted according to the sequence of the labels: "Type No." (printed) "7285" (handwriting) "U.S.N.M." (printed) (red first label) — "39" (handwriting) (second label) — "Japan Sapporo leg. MATSUMURA" (my handwriting above), "teste PAPP J. 1983" (my handwriting below) (fourth label).

Ichneutes senator sp. n. ♀
(Figs 1—5)

♀. Body 3.8 mm long. Head in dorsal view transverse, 1.8 times broader than long, eye distinctly longer than temple, latter moderately rounded (Fig. 1). Ocelli small, distance between two ocelli equal with greatest diameter of a hind ocellus, OOL almost thrice as long as POL. In lateral view eye 1.85 times higher than wide, temple slightly wider than eye (Fig. 2). Face about twice as wide as high, inner margin of eyes slightly converging. Clypeus twice wider below than high medially. Malar space and base of mandible equal in length. Maxillar palp as long as height of head. Face rugose, otherwise head smooth and shiny with rather disperse and fine punctation. Antenna somewhat longer than body, with 28 joints. First flagellar joint 1.6 times longer than second joint, further joints gradually shortening and attenuating so that penultimate joint 1.5 times as long as broad.

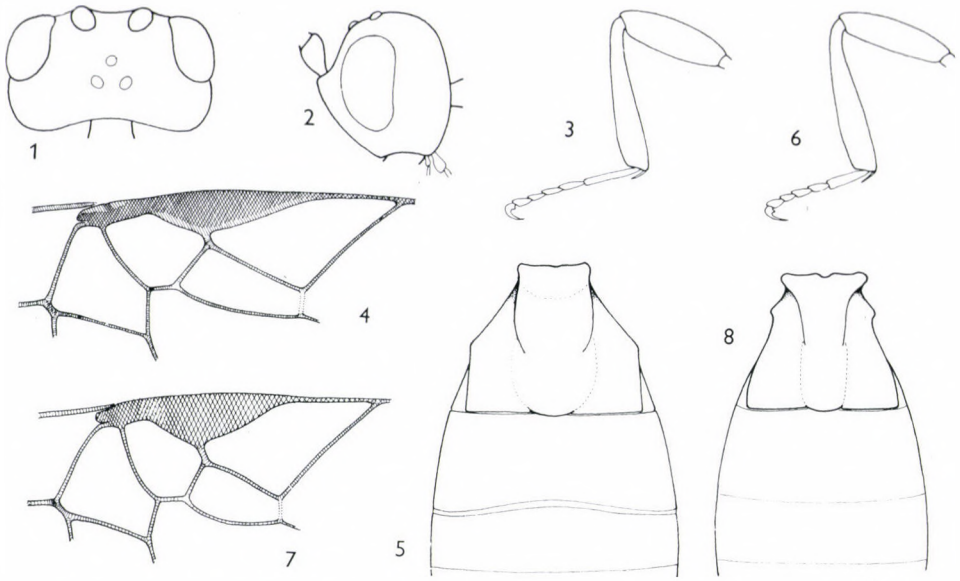
Mesosoma in lateral view 1.35 times as long as high, in dorsal view head about one-fifth broader than mesonotum between tegulae. Notaulix evenly deep, crenulated. Prescutellar furrow deep, with five crenulae. Praecoxal suture crenulated. Mesonotum, scutellum and mesopleuron smooth and shiny, mesopleuron above crenulo-rugose. Propodeum scrobiculate-rugose. Hind femur thick, thrice as long as broad. Hind tibia indistinctly longer than tarsus, hind tarsal joints 2—3 almost as long as basitarsus (Fig. 3).

Fore wing somewhat shorter than body. Pterostigma (Fig. 4) wedge-shaped, almost four times longer than wide, issuing radial vein from its basal third; *r1* very short, *r2* distinctly twice longer than *cuqu1*, *r3* ending far before tip of wing and 1.3 times longer than *r2*. Nervulus hardly postfurcal. First discoidal cell (*D1*) relatively wide, *d* one-fifth longer than *n. bas.*

Metasoma somewhat longer than mesosoma but shorter than head and mesosoma together. First tergite (Fig. 5) rugose, strongly broadening from base to spiracles, hardly broadening beyond spiracles, 1.2 times wider behind than long medially, pair of basal keels merging into rugosity about middle of tergite. Second tergite transverse, distinctly 1.5 times longer than third tergite, suture between tergites 2—3 slightly bisinuate. Second tergite rugo-rugulose, further tergites polished. Hypopygium in lateral view pointed, ovipositor sheath as long as hind basitarsus.

Head and mesosoma brownish black, tergites brown, first tergite dark brown, sternites yellow, sternites 1—3 basally brownish. Mandible brownish yellow, palpi pale yellow. Antenna greyish brown, flagellar joints 1—2 below with yellowish pattern. Tegulae brownish yellow. Legs yellow, hind tarsus brownish fumous. Wings brownish fumous, pterostigma and vein brown.

♂ and host unknown.



Figs 1—5. *Ichneutes senator* sp. n.: 1 = head in dorsal view, 2 = head in lateral view, 3 = hind leg without coxa and trochanters, 4 = middle part of right fore wing, 5 = tergites 1—3. — Figs 6—8. *I. lapponicus* THOMSON: 6 = hind leg without coxa and trochanters, 7 = middls part of right fore wing, 8 = tergites 1—3

Locality — Holotype ♀: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Go-song, 250 m" (first label) — "No. 326, 6—8 August 1975, leg. J. PAPP et A. VOJNITS". — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7081.

The new species, *Ichneutes senator* sp. n., is superficially like *I. lapponicus* THOMSON, 1895* (Sweden, Denmark), however, they are distinguished by a few, though specific features:

I. senator sp. n.	*I. lapponicus* THOMS.
1. First tergite more broadening posteriorly, 1.2 times wider behind than long medially (Fig. 5).	1. First tergite less broadening posteriorly, indistinctly wider behind than long medially (Fig. 8).
2. First discoidal cell wider than high, i.e. *d* one-fifth longer than *n. bas.*; nervulus hardly postfurcal; *Cu2* relatively long, *r3* only 1.3 times longer than *r2* (Fig. 4).	2. First discoidal cell less wide than high, i.e. *d* indistinctly longer than *n. bas.*; nervulus distinctly postfurcal; *Cu2* relatively short, *r3* 1.7 times longer than *r2* (Fig. 7).
3. Third femur thick, thrice as long as broad; hind tarsus almost as long as hind tibia (Fig. 3).	3. Third femur less thick, four times as long as broad; hind tarsus short, 0.7 times as long as hind tibia (Fig. 6).
4. Legs yellow.	4. Legs brownish yellow, coxae and first trochanters rather brown.

* My single female specimen of *I. lapponicus* THOMSON was identified by Dr. E. HAESELBARTH (München) in 1983 who is preparing a revision of the European *Ichneutes* species.

Mirax irruptor sp. n. ♀
(Figs 9—12)

♀. Body 1.5—1.6 mm long. Head in dorsal view (Fig. 9) transverse, 1.8 times broader than long, eye 1.7 times longer than temple, latter rounded. Head behind (i.e. temple and occiput) not margined. Ocelli round, small and rather near to each other, distance between two ocelli somewhat longer than diameter of an ocellus. OOL twice as long as POL. Eye in lateral view 1.7—1.8 times higher than wide, temple less wide than eye. Face nearly twice wider than high; inner margin of eye somewhat converging below. Clypeus almost twice wider below than high medially. Malar space about 1.5 times longer than basal width of mandible. Head smooth and shiny, occiput and temple behind uneven and somewhat less shiny. Antenna as long as body, with 14 joints. First flagellar joint 1.3—1.4 times as long as second joint. Further joints gradually shortening so that penultimate joint distinctly twice as long as broad; last joint pointed.

Mesosoma in lateral view 1.4 times as long as high. Mesonotum between tegulae somewhat less broad than head. Notaulix absent. Prescutellar furrow distinct as a narrow and shallow groove. Propodeum with a medio-longitudinal carina on its anterior two-thirds and a transverse, slightly bisinuate carina crossing each other posteriorly in a characteristic form (Fig. 11). Declivous anterior part of mesonotum rugulose, disc of mesonotum antero-posteriorly subrugulose-uneven to almost smooth and subshiny. Scutellum smooth and shiny. Propodeum also smooth and shiny, posteriorly from transverse carina rather uneven. Mesopleuron polished, sternaulix absent. Legs usual in form. Hind femur thrice as long as broad. Hind tibia and tarsus equal in length. Hind basitarsus long, almost as long as hind tarsal joints 2—4 (Fg. 12).

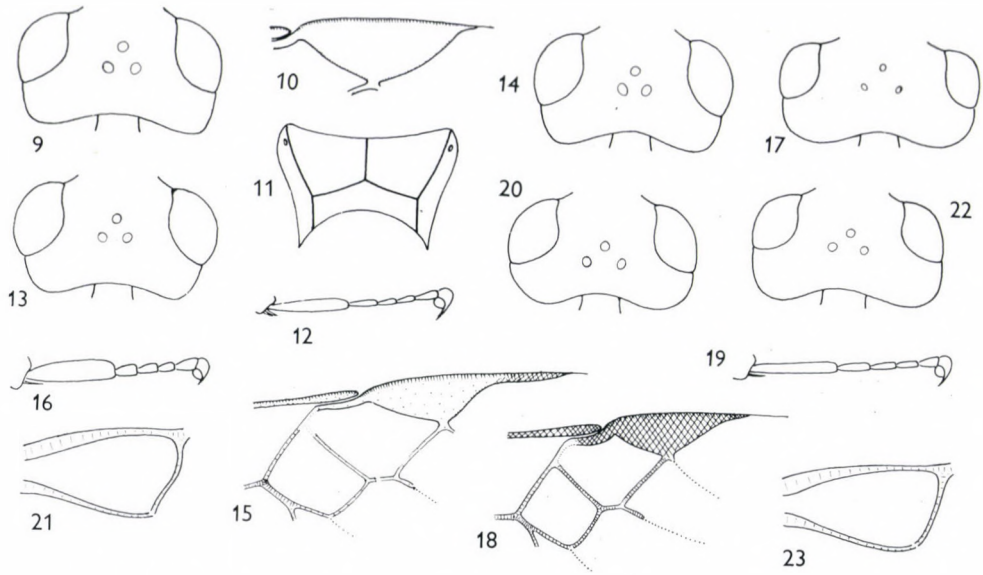
Fore wing one-fifth longer than body. Pterostigma 2.2—2.3 times longer than wide, issuing *r1* (+*cuqu1*) proximal from its middle. Metacarp stub-like (Fig. 10). *N. bas.* and *d* equal in length, i.e. *D1* not wide; *d1* distinctly shorter than *d2*.

Metasoma somewhat shorter than mesosoma. Hypopygium in lateral view moderately pointed. Ovipositor sheath in lateral view as long as hind basitarsus.

Head yellow or dark yellow, mesosoma dark to blackish brown, metasoma basally (i.e. segments 1—2 or 1—3) whitish yellow, hind tergites blackish brown, hind sternites yellow with brownish tint. Wings hyaline, pterostigma and veins opaque yellow.

♂ and host unknown.

Localities — Holotype ♀: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, near Hotel Go-song, 250 m" (first label) — "No. 318, 5 August 1975, leg. J. PAPP et A. VOJNITS" (second label). — Paratypes, 1 ♀: "Korea, Prov. Ryang-gang: Hyesan, Mt. Ze-dong, 1150 m"



Figs 9—12. *Mirax irruptor* sp. n.: 9 = head in dorsal view, 10 = pterostigma with short metacarp, 11 = propodeum with carination, 12 = hind tarsus. — Fig. 13. *M. insularis* MUESEBECK: head in dorsal view. — Figs 14—16. *M. mogrus* sp. n.: 14 = head in dorsal view, 15 = middle part of right fore wing, 16 = hind tarsus. — Figs 17—19. *M. rufilabris* HALIDAY: 17 = head in dorsal view, 18 = middle part of right fore wing, 19 = hind tarsus. — Figs 20—21. *Microgaster dornator* sp. n.: 20 = head in dorsal view, 21 = nervellus of right hind wing. — Figs 22—23. *M. malimba* PAPP: 22 = head in dorsal view, 23 = nervellus of right hind wing

(first label) — "No. 293, 26 July 1975, leg. J. PAPP et A. VOJNITS" (second label). — 1 ♀: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, Sam-il po" (first label) — "No. 314, 4 August 1975, leg. J. PAPP et A. VOJNITS" (second label). — Holotype and 2 paratypes are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7082 (holotype) and 7083—7084 (paratypes).

The new species, *Mirax irruptor* sp. n., stands nearest to *M. rufilabris* HALIDAY, 1833 (Europe) and *M. insularis* MUESEBECK, 1937 (Central America), they are distinguished from each other by the following features:

M. irruptor sp. n.	*M. rufilabris* HAL.
1. Propodeum with a medio-longitudinal and a transverse carinae crossing each other posteriorly (Fig. 11).	1. Propodeum without carination.
2. Prescutella furrow distinct as a narrow and shallow groove.	2. Prescutellar furrow absent.
3. Head yellow or dark yellow.	3. Head brownish to dark brown.

M. irruptor sp. n.	*M. insularis* MUES.
1. Propodeum with a medio-longitudinal carina on its anterior two-thirds and a transverse carina crossing each other posteriorly (Fig. 11).	1. Propodeum with a complete medio-longitudinal carina.

2. First flagellar joint 1.3—1.4 times as long as second joint.	2. First flagellar joint 1.1—1.2 times as long as second joint.
3. In dorsal view eye not protruding, temple rounded (Fig. 9).	3. In dorsal view eye somewhat protruding, temple somewhat more rounded (Fig. 13).
4. *d1* distinctly shorter than *d2*.	4. *d1* at most hardly shorter than *d2*, usually equal in length.
5. Mesosoma blackish brown, pronotum + prosternum yellow to dark yellow.	5. Mesosoma entirely yellow to dark yellow with brownish suffusion.

Mirax mogrus sp. n. ♀
(Figs 14—16)

♀. Body 2 mm long. Head in dorsal view (Fig. 14) transverse, 1.8 times broader than long, eye twice as long as temple, latter somewhat constricted. Head behind (i.e. temple and occiput) not margined. Ocelli round, relatively large and near to each other, distance between two ocelli shorter than greatest diameter of an ocellus. OOL four times as long as POL. Eye in lateral view 1.5 times higher than wide, temple less wide than eye. Face 1.5 times wider than high; inner margin of eyes subparallel, i.e. weakly converging below. Clypeus twice wider below than high medially. Malar space as long as basal width of mandible. Head uneven to almost smooth with faint silky shine. Antenna somewhat longer than body, with 14 joints. First flagellar joint indistinctly longer than second joint. Further joints gradually shortening and slightly attenuating so that penultimate joint 2.5 times as long as broad; last joint pointed.

Mesosoma somewhat elongated, in lateral view 1.5 times as long as high. Mesonotum between tegulae distinctly less broad than head. Notaulix absent. Prescutellar furrow distinct as a narrow and shallow groove. Propodeum strongly carinated, with a medio-longitudinal carina on its anterior two-thirds and a transverse, bisinuate carina crossing each other posteriorly in a characteristic form (cf. Fig. 11). Declivous part of mesonotum rugulose to uneven, disc of mesonotum antero-posteriorly uneven to almost smooth and with faint silky shine. Scutellum with disperse punctation, with faint silky shine. Propodeum subrugulose-uneven, dull. Mesopleuron weakly shiny to dull, its upper third polished, sternaulix absent. Legs usual in form. Hind femur 3.3 times as long as broad. Hind tibia and tarsus equal in length. Hind basitarsus unusually thick, in lateral view twice wider than further tarsal joints (Fig. 16).

Fore wing somewhat longer than body. Pterostigma just thrice as long as wide, issuing *r1* (+*cuqu1*) somewhat distal from its middle. Metacarp unusually long, distinctly longer than half pterostigma (Fig. 15). *N. bas.* somewhat shorter than *d*, i.e. *D1* relatively wide; *d1* indistinctly shorter than *d2*, i.e. nervulus issuing almost from middle of *d* (Fig. 15).

Metasoma indistinctly shorter than mesosoma. Hypopygium in lateral view pointed. Ovipositor sheath in lateral view as long as hind basitarsus.

Head and mesosoma yellow to brownish yellow, mesosoma dorsally with faint brownish tint. Metasoma pale yellow, tergites 3—7 blackish brown. Palpi pale yellow. Flagellum brownish. Legs light yellow. Wings hyaline, pterostigma and vein opaque yellowish.

♂ and host unknown.

Locality — Holotype ♀: "Korea, Prov. South Pyongan, Pyongyan, garden of Hungarian Embassy" (first label) — "No. 274, 18—20 July 1975, leg. J. PAPP et A. VOJNITS". — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7085.

The new species, *Mirax mogrus* sp. n., is remarkable for its propodeum with a characteristic and unusually strong carination, and differs from its nearest allies, *M. rufilabris* HALIDAY, 1833 (Europe) and *M. insularis* MUESEBECK, 1937 (Central America), by the following features:

M. mogrus sp. n.	*M. rufilabris* HAL.
1. Propodeum with a medio-longitudinal and a transverse carinae crossing each other posteriorly (cf. Fig. 11); rugose and dull.	1. Propodeum without carination, smooth and shiny.
2. In dorsal view temple somewhat constricted; ocelli near to each other, distance between two ocelli shorter than greatest diameter of a hind ocellus (Fig. 14).	2. In dorsal view temple rounded; ocelli far from each other, distance between two ocelli about twice as long as greatest diameter of a hind ocellus (Fig. 17).
3. Hind basitarsus thick, in lateral view twice wider than further tarsal joints (Fig. 16).	3. Hind basitarsus not thick, in lateral view only slightly wider than further tarsal joints (Fig. 19).
4. *d1* indistinctly shorter than *d2*, i.e. nervulus issuing almost from middle of *d* (Fig. 15).	4. *d1* distinctly shorter than *d2*, i.e. nervulus issuing from proximal half of *d* (Fig. 18).
5. In lateral view ovipositor sheath long, as long as hind basitarsus.	5. In lateral view ovipositor sheath less long, half as long as hind basitarsus.
6. Body reddish yellow, hind tergites blackish brown.	6. Body dark brown to blackish, metasoma basally yellow to whitish yellow.

M. mogrus sp. n.	*M. insularis* MUES.
1. Propodeum with a medio-longitudinal carina on its anterior two-thirds and a transverse carina crossing each other posteriorly (cf. Fig. 11).	1. Propodeum with a complete medio-longitudinal carina.
2. First flagellar joint indistinctly longer than second flagellar joint.	2. First flagellar joint 1.1—1.2 times as long second flagellar joint.
3. Hind basitarsus thick, in lateral view twice wider than further tarsal joints (Fig. 16).	3. In lateral view hind basitarsus only somewhat thicker than further tarsal joints (cf. Fig. 19).
4. Body 2 mm long.	4. Body 1.5 mm long.

The two new *Mirax* species from Korea are characterized by their propodeal carination, however, clearly differing from each other by the following specific features:

M. mogrus sp. n.	*M. irruptor* sp. n.
1. Propodeum rugose, carination relatively stronger.	1. Propodeum smooth and shiny, carination relatively less strong (Fig. 11).
2. First flagellar joint indistinctly longer than second flagellar joint.	2. First flagellar joint 1.4 times as long as second joint.

3. Metacarp long, distinctly longer than half pterostigma (Fig. 15).
4. In lateral view hind basitarsus twice wider than further tarsal joints (Fig. 16).
5. Body 2 mm long.

3. Metacarp short and stub-like, distinctly much shorter than half pterostigma (Fig. 10).
4. In lateral view hind basitarsus only somewhat thicker than further tarsal joints (Fig. 12).
5. Body 1.5—1.6 mm long.

Microgaster dornator sp. n. ♀
(Figs 20—21, 24)

♀. Body 3.2 mm long. Head in dorsal view (Fig. 20) 1.7 times broader than long, eye 1.4 times as long as temple, latter distinctly rounded. Ocelli small and round, distance between fore and a hind ocelli equal with diameter of an ocellus. OOL indistinctly longer than POL. Eye in lateral view 1.85 times higher than wide and slightly wider than temple. Face almost quadrate, i.e. somewhat wider than high, inner margin of eyes parallel. Malar space as long as basal width of mandible. Head densely rugose. Antenna as long as body; first flagellar joint 3.3 times as long as broad, further joints gradually shortening so that penultimate joint distinctly twice as long as broad.

Mesosoma in lateral view 1.5 times as long as high. Mesonotum with similar rugosity to that of head; notaulix indicated by somewhat rougher rugosity. Scutellum rugose. Propodeum areolate-rugose with one medio- and a pair of latero-longitudinal keels. Mesopleuron anteriorly rugose-rugulose, precoxal suture crenulated, posteriorly from suture mesopleuron polished. Hind femur 3.8 times as long as broad; hind tibia and tarsus equal in length, hind basitarsus almost as long as hind tarsal joints 2—4.

Fore wing as long as body. Pterostigma (Fig. 24) 2.5 times as long as wide, issuing radial vein from its middle. Metacarp as long as pterostigma, *r1* somewhat shorter than *cuqu1*. *D1* 1.2 times wider than high, *d2* 2.5 times as long as *d1*. Nervellus weakly though distinctly sigmoid (Fig. 21); *Cu* narrowing distally, *cu* 1.47 times longer than *n. bas.*

First tergite twice as long as broad, with parallel sides, its surface rugose. Second tergite medio-laterally rugulose to uneven. Further tergites polished. Hypopygium in lateral view somewhat pointed, ending distinctly before hind tip of metasoma; ovipositor sheath short, somewhat shorter than second joint of hind tarsus.

Head, mesosome, first tergite and median field of second tergite black; second tergite laterally and third tergite yellow, further tergites blackish brown, sternites 1—3 pale yellow to yellow, further sternites together with hypopygium also blackish brown. Palpi light yellow. Scape blackish, flagellum reddish yellow, distally darkening. Tegula reddish yellow. Legs reddish yellow, hind coxa blackish and only apically reddish yellow, hind femur and tibia

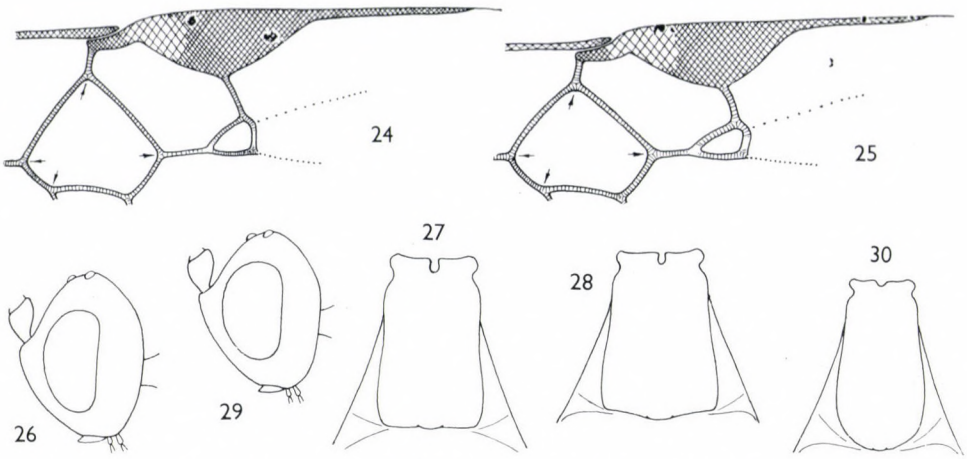


Fig. 24. *Microgaster dornator* sp. n.: middle part of right fore wing. — Fig. 25. *M. malimba* PAPP: middle part of right fore wing. — Figs 26—27. *M. eminius* sp. n.: 26 = head in lateral view, 27 = first tergite. — Figs 28—29. *M. kaszabi* PAPP: 28 = first tergite, 29 = head in lateral view. — Fig. 30. *M. mongolica* PAPP: first tergite

apically darkening to blackish, hind tarsus with blackish suffusion. Wings hyaline. Pterostigma brown, basally with yellow spot.

♂ and host unknown.

Locality — Holotype ♀: "Korea, Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m" (first label) — "No. 289, 24—25 July 1975, leg. J. PAPP et A. VOJNITS" (second label). — Holotype is deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7086.

The new species, *Microgaster dornator* sp. n., runs to *M. malimba* PAPP, 1984 (Nederland) with the help of my key (PAPP, 1984), and the two species may be distinguished by the following features:

M. dornator sp. n.	*M. malimba* PAPP
1. Eye in dorsal view 1.4 times longer than temple, head 1.7 times broader than long, temple more rounded (Fig. 20).	1. Eye in dorsal view as long as or slightly longer than temple, head 1.7—1.8 times broader than long, temple less rounded (Fig. 22).
2. Penultimate joint of antenna distinctly twice as long as broad.	2. Penultimate joint of antenna 1.4—1.5 (—1.6) times as long as broad.
3. *D1* somewhat, i.e. 1.2 times wider, than high; pterostigma issuing radial vein from its middle, metacarp as long as pterostigma (Fig. 24).	3. *D1* distinctly, i.e. 1.4 times, wider than high; pterostigma issuing radial vein distal from its middle, metacarp somewhat though distinctly shorter than pterostigma (Fig. 25).
4. Nervellus weakly though distinctly sigmoid (Fig. 21).	4. Nervellus straight (Fig. 23) to almost straight.
5. Second tergite rugulose to uneven.	5. Second tergite polished.

The new species resembles *M. mandibularis* THOMSON, 1895 (Europe, Mongolia), however, they are clearly separated by the following specific characters:

M. dornator sp. n.	*M. mandibularis* THOMS.
1. First tergite rugose, second tergite rugulose to uneven.	1. First tergite coriaceous to rugulose, more or less shiny; second tergite polished.
2. Metacarp as long as pterostigma (Fig. 24).	2. Metacarp somewhatthough distinctly shorter than pterostigma (cf. Fig. 25).
3. Scutellum rugose and dull, i.e. its sculpture less distinctly weaker than that of mesonotum.	3. Scutellum uneven to rugulose, subshiny and never dull, i.e. its sculpture always distinctly weaker than that of mesonotum.

Microgaster eminius sp. n. ♀
(Figs 26—27)

♀. Body 3.1 mm long. Head in dorsal view transverse, 1.8 times broader than long, eye 1.2 times as long as temple, latter rounded. Ocelli small and round, fore ocellus somewhat smaller than hind pair of ocelli, distance between fore and a hind ocelli equal with diameter of hind ocellus. OOL somewhat longer than POL. Eye in lateral view twice higher than wide, and indistinctly wider than temple (Fig. 26). Face almost quadrate, i.e. just wider than high, inner margin of eyes parallel. Malar space as long as basal width of mandible. Face and clypeus densely rugulose, frons and vertex as well as temple anteriorly uneven to almost smooth and shiny, temple posteriorly and occiput subrugulose-rugulose. Antenna somewhat longer than body. First flagellar joint 4.4 times as long as broad, further joints gradually shortening so that penultimate joint twice as long as broad.

Mesosoma in lateral view about 1.5 times as long as high. Mesonotum with somewhat weaker rugulosity than that of face, subshiny. Notaulix indicated by rough rugosity. Scutellum rugulose-uneven, subshiny. Propodeum areolate-rugose with one medio- and a pair of latero-longitudinal keels. Mesopleuron anteriorly rugose-rugulose, precoxal suture crenulated, posteriorly from suture mesopleuron polished. Hind femur 3.5—3.7 times as long as broad; hind tibia and tarsus equal in length.

Fore wing as long as body. Pterostigma 2.6 times as long as wide, issuing radial vein somewhat distally from its middle. Metacarp somewhat shorter than pterostigma, *r1* and *cuqu1* equal in length. *D1* 1.28—1.3 times wider than high, *d2* twice as long as *d1*. Nervellus weakly arched; *Cu* distally distinctly narrowing, *cu* slightly longer than *n. bas.*

First tergite (Fig. 27) 1.5 times longer than its greatest width behind, with parallel sides, its surface rugose. Further tergites polished. Hypopygium in lateral view truncate, ending distinctly before hind tip of metasoma; ovipositor sheath short, as long as fourth joint of hind tarsus.

Head and mesosoma black, metasoma blackish brown, sternites 1—4 pale yellow, hind margin of tergite 3 yellowish. Scape and pedicel yellow(ish), flagellum yellowish brown or dark. Clypeus, labium, mandible and oral parts

yellow, palpi pale yellow. Tegula blackish. Legs yellow, hind tibia whitish, apically darkening (loc. No. 182: holotype + 1 paratype); legs also yellow, hind coxa and femur (almost) entirely brownish black, hind tibia apically and hind tarsus blackish brown. Wings subhyaline, below pterostigma brownish. Pterostigma dark brown, basally yellowish.

♂ and host unknown.

Localities — Holotype ♀ + 1 ♀ paratype: "Korea, Prov. South Pyongan, Pyongyan, Nung-ra do (island), 17. Aug. 1971." (first label), "No. 182, leg. S. HORVATOVICH et J. PAPP" (second label). — 1 ♀ paratype: "Korea, Prov. South Pyongan, Nung-ra do (island), 14. Aug. 1971." (first label), No. 175, leg. S. HORVATOVICH et J. PAPP" (second label). — 1 ♀ paratype: "Korea, Prov. Gang-von, district On-dzong, Kum-gang san, along Ok-ru dong, 250—300 m" (first label), "No. 324, 7 August 1975, leg. J. PAPP et A. VOJNITS" (second label). — Holotype (♀) and 3 ♀ paratypes are deposited in the Hungarian Natural History Museum, Budapest: Hym. Typ. No. 7087 (holotype) and 7088—7090 (paratypes).

The new species, *M. eminius* sp. n., runs to *M. kaszabi* (PAPP, 1980) (Korea, Mongolia) with the help of my key (PAPP, 1984b), however, they are easy to distinguish with the following features:

M. eminius sp. n.	*M. kaszabi* (PAPP)
1. First tergite 1.5 times as long as greatest width, with parallel sides (Fig. 27).	1. First tergite 1.4 times as long as its greatest width, with slightly, though distinctly broadening sides (Fig. 28).
2. Head above and temple anteriorly almost smooth to uneven, shiny.	2. Head above and temple rugose-rugulose, dull.
3. Eye in lateral view indistinctly wider than temple (Fig. 26).	3. Eye in lateral view 1.5(—1.7) times wider than temple (Fig. 29).
4. Legs lemon yellow, hind coxa above with brownish tint. Tergites 2—3 dark brown.	4. Legs reddish yellow. Tergites 2—3 also reddish yellow.

The new species is related to *M. mongolica* (PAPP, 1967) (Mongolia, Israel, Jordan) too, their distinctive features are expounded in a tabular form:

M. eminius sp. n.	*M. mongolica* (PAPP)
1. First tergite 1.5 times longer than broad, with parallel sides (Fig. 27); its surface rugose.	1. First tergite usually 1.8—2 times (exceptionally 1.5—1.6 times) longer than broad, with subparallel sides (Fig. 30); its surface uneven.
2. Metacarp only somewhat shorter than pterostigma.	2. Metacarp about half as long as pterostigma, and at most somewhat longer.
3. Tegula blackish.	3. Tegula yellow or reddish yellow.

Microgaster taptor sp. n.
(Figs 31—33)

♀. Body 3.2—3.4 mm long. Head in dorsal view transverse, 1.8 times broader than long, eye somewhat longer than temple, latter rounded. Ocelli small, distance between fore and a hind ocelli as long as or slightly shorter

than diameter of an ocellus. OOL distinctly one-third longer than POL. Eye in lateral view almost twice higher than wide, and as wide as temple. Face one-fourth wider than high, inner margin of eyes parallel. Malar space as long as basal width of mandible. Rugosity of face somewhat stronger than other part of head. Antenna somewhat longer than body. First flagellar joint thrice as long as broad, further joints gradually shortening and attenuating so that penultimate joint also thrice as long as broad (Fig. 33).

Mesosoma in lateral view about 1.5 times as long as high. Mesonotum with similar rugosity to that of face, notaulix indicated by somewhat stronger rugosity. Scutellum rugulose, weakly shiny. Propodeum areolate-rugose with one medio- and a pair of latero-longitudinal keels. Mesopleuron anteriorly densely rugulose, precoxal suture with crenulation, posteriorly from precoxal suture mesopleuron polished. Hind femur distinctly 4.5 times as long as broad. Hind tibia just shorter than hind tarsus.

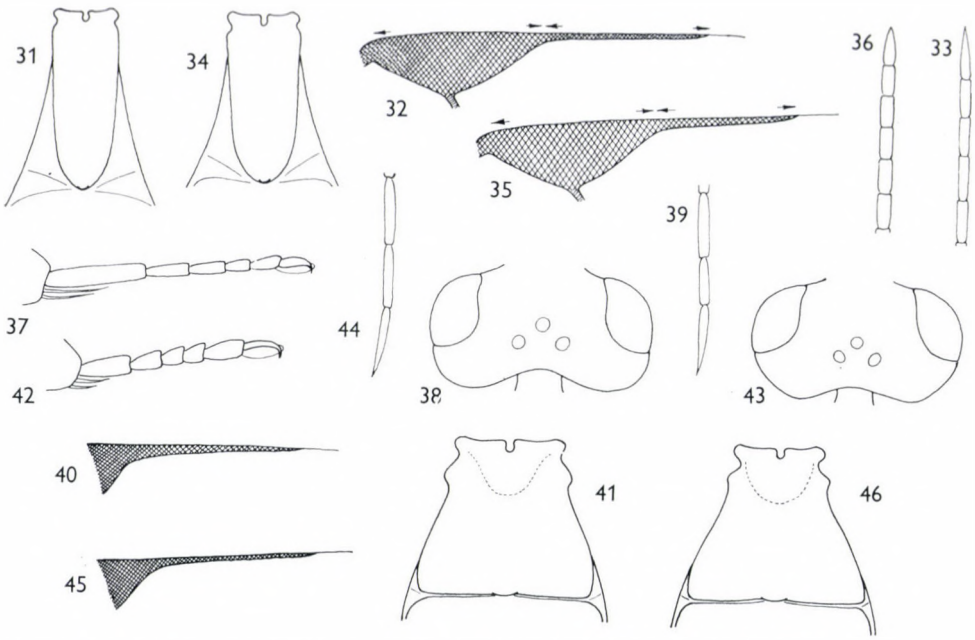
Fore wing somewhat longer than body. Pterostigma (Fig. 32) 2.7—2.9(—3) times as long as wide, issuing radial vein somewhat proximally from its middle. Metacarp as long as pterostigma, *cuqu1* somewhat longer than *r1*. *D1* 1.25 times wider than high, *d2* four times as long as *d1*. Nervellus faintly arched; *Cu* distally narrowing, *cu* almost twice to twice as long as *n. bas.*

First tergite (Fig. 31) 2.6—2.7 times as long as broad at hind, parallel sided and moderately narrowing at its hind third, its surface rugulose-uneven, subshiny. Further tergites polished. Hypopygium in lateral view small, truncate, ending before hind tip of metasoma; ovipositor sheath short, about as long as third joint of hind tarsus.

Body black. Antenna black. Palpi yellow or reddish yellow, first joint brownish. Tegula reddish yellow, basally with blackish tint or spot. Ground colour of legs black. Fore femur and tibia reddish yellow, former with blackish base. Distal half to third of middle femur and entire tibia reddish yellow, proximal half to two-thirds of femur black to blackish. Hind tibia distally darkening yellowish, apically blackish. Fore and middle tarsi dark fumous, hind tarsus blackish. Wings subhyaline, pterostigma and veins brownish, blackish brown pigmented. Pterostigma basally with a rather faint yellow(ish) spot.

♂ and host unknown.

Localities — Holotype ♀: "Korea, Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m" (first label), "No. 289, 24—25 July 1975, leg. J. PAPP et A. VOJNITS" (second label). — 2 ♀ paratypes: "Korea, Prov. Ryang-gang: Chann-Pay plateau, Sam-zi-yan, 1700 m" (first label), "No. 282, 24 July 1975, leg. J. PAPP et A. VOJNITS" (second label). — 1 ♀ paratype: "Korea, De-Sang san, 10 km NE Pyongyan, 1. VII. 1977" (first label), "No. 332, netting in grasses, DELY & DRASKOVITS" (second label). — 1 ♀ paratype: "Korea, Mt. Pektusan, 2—6 km N Sam-zi-yan hotel, wood, 18. VII. 1977" (first label), "No. 372, netting in grasses, DELY & DRASKOVITS" (second label). — Holotype (♀) and 4 ♀ paratypes are deposited in the Hungarian Natural History Museum, Budapest; Hym. Typ. No. 7091 (holotype) and 7092—7095 (paratypes).



Figs 31—33. *Microgaster taptor* sp. n.: 31 = first tergite, 32 = pterostigma + metacarp, 33 = flagellar joints 12—16. — Figs 34—36. *M. decens* TOBIAS: 34 = first tergite, 35 = pterostigma + metacarp, 36 = flagellar joints 11—16. — Figs 37—41. *Lissogaster szelenyii* PAPP: 37 = third tarsus, 38 = head in dorsal view, 39 = last three joints of maxillary palp, 40 = metacarp, 41 = first tergite. — Figs 42—45. *L. auriculata* (FABRICIUS): 42 = third tarsus, 43 = head in dorsal view, 44 = last three joints of maxillary palp, 45 = metacarp. — Fig. 46. *L. postica* (NEES): first tergite

The new species, *Microgaster taptor* sp. n., is allied with *M. decens* (TOBIAS, 1964) (Europe, USSR, Mongolia, Korea), the specific differences between them are rather difficult to recognize:

M. taptor sp. n.

1. Penultimate joint of antenna thrice as long as broad (Fig. 33).
2. First tergite 2.6—2.7 times longer than broad at base (Fig. 31).
3. Metacarp as long as pterostigma (Fig. 32).
4. Hind femur entirely and middle femur basally black.

M. decens (TOBIAS)

1. Penultimate joint of antenna twice as long as broad (Fig. 36).
2. First tergite 2.3—2.4 times longer than broad at base (Fig. 34).
3. Metacarp one-third to one-fourth shorter than pterostigma (Fig. 35).
4. Hind and middle femora reddish yellow, at most hind femur with dark suffusion.

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Acta Zoologica Hungarica 33 (3—4), pp. 457—461 (1987)

THE LECTOTYPE OF GYMNOMETOPINA CLUNICRUS (DUDA, 1923) (DIPTERA: SPHAEROCERIDAE)

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Lectotype is designated for *Borborus* (*Gymnometopa*) *clunicrus* DUDA, 1923, the type-species of *Gymnometopina* HEDICKE, 1923. The type-series includes specimens of two species [the other one is *G. garambaensis* (VANSCHUYTBROECK, 1959)]. With 10 figures.

Gymnometopa was erected as a new subgenus in the genus *Borborus* (*Cypsela*) in DUDA's (1923) famous paper with a single species *clunicrus*. In the same year one of the nomen-novum hyenas of his age, HEDICKE (1923), published a replacement name, *Gymnometopina*, for the subgenus, since *Gymnometopa* DUDA, 1923 is a junior homonym of *Gymnometopa* COQUILLETT, 1905.

The type-series (14 syntypes) of *clunicrus* were deposited in the Diptera collection of the Hungarian National Museum and they had remained there almost without any harm till the middle of the 1960s, when the late dr. MÁTYÁS PÁL ARADI borrowed the whole collection of Sphaeroceridae preserved in the Zoological Department, HNHM. The material was returned to the Zoological Department in November, 1969. These type-specimens (together with other types, e.g. those of *Achaetothorax abyssinica* (DUDA, 1923)) were mixed into the unnamed specimens and they were found in the course of the identification of those materials (ca. in 1974), i.e. all of the type-series are preserved.

The genus *Gymnometopina* HEDICKE, 1923 as a monophyletic group includes Afrotropical species. In the catalogue of the region, RICHARDS (1980) listed 14 species in the subgenus *Gymnometopina* of the genus *Copromyza* FALLÉN. NORRBOM and KIM (1985) and NORRBOM (1987) have clearly delimited the genus; NORRBOM (1987) revealed that 9 of the 14 species of RICHARDS (1980) belong to other genera (*Dudaia* HEDICKE, *Metaborborus* VANSCHUYTBROECK) and described other 8 new species of *Gymnometopina*.

Contrarily to the fact, that the types of clunicrus have not been studied since its description — owing to the good original description — some authors (e.g. HACKMAN, 1961, 1965; NORRBOM, 1987) applied this name properly for their specimens (for the misidentifications published, see NORRBOM, 1987). Since our studies proved that the specimens in the type-series of this type-

species belong to two species, it became a necessary and urgent task to designate the lectotype for this species. In accordance of the opinion of Dr. ALLEN L. NORRBOM that specimen was selected as lectotype by which the stability of the nomenclature is better served (see below).

Borborus (*Gymnometopa*) *clunicrus* DUDA, 1923

DUDA, 1923: Arch. Naturgesch., 89A(4): 105—107. Type-series: "4 ♂♂ 3 ♀♀, bezettelt mit "Madagascar SIKORA", sowie 3 ♂♂ 2 ♀♀, bezettelt mit "Africa orient. KATONA 904 Kilima-Ndjaro", und 2 ♀♀, bezettelt mit "Abyssinia KOVACS Marako 1912 III".

Lectotype male.

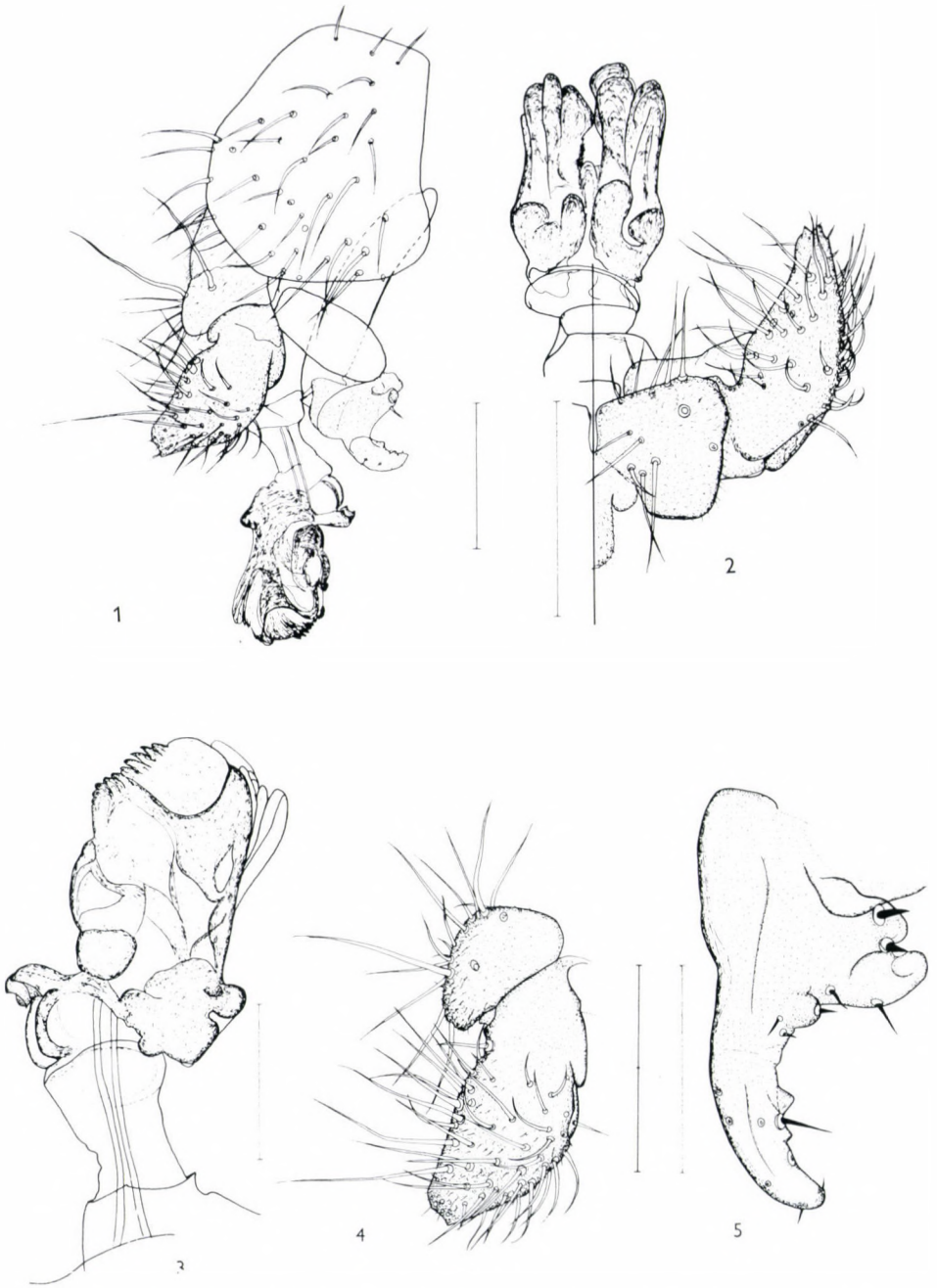
Length of head: 0.45 mm, length of thorax: 1.04 mm, i.e. body length ca. 2.5 mm (but not precisely measurable, since its abdomen has been removed). Body length of conspecific paralectotype males: 2.67—3.19 mm, of paralectotype females: 2.03—2.89 mm. Length of wing: 2.83 mm, width 1.06 mm; arista 0.80 mm long; length of hind femur 1.33 mm, width at its thickest part 0.26 mm; length of hind tibia 1.12 mm, width at its thickest part 0.21 mm (with a ventral spur of 0.20 mm).

Originally dark brown, shining (as seen on freshly collected specimens) but colour became faint in the 82 years of preservation.

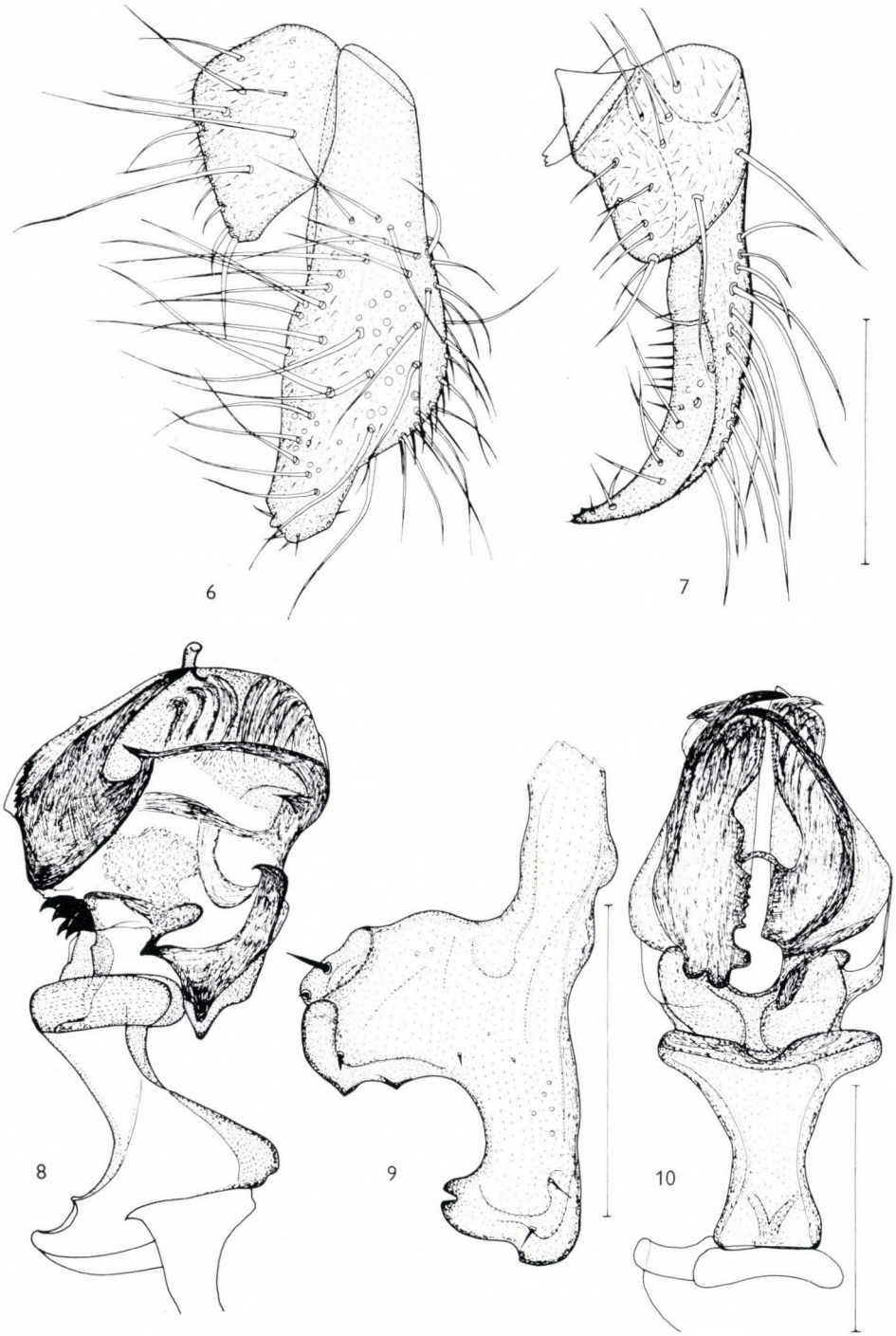
Head bare but occiput and postgenae microtomentose (of grey microtrichia). Genae at narrowest as wide as width of 2nd antennal joint. Arista with short, sparse but evenly placed cilia. Third antennal flagellomere nearly reniform, globular, upper corner rounded. 6 pairs of *if*; a whole row each of thin but long, incurving inner orbital setae; 2 *ors*, *oc*, *vte*, *vti* and *vi* rather long but thin.

Mesonotum and pleura shining black. Thoracic chaetotaxy: 1 *h*, 1 longer anterior and 1 shorter posterior *np*, 1 long *prsut*, 1 + 2 *dc* and 3 other longer setae in front of the presutural one, 1 long *prsc*, 2 *sc*, 1 short sternopleural (cf. DUDA, 1923). One intraalar row each of ca. 4 long thin setae. Wings pale yellowish with ochreous veins. Legs covered with long hairs. Basal third of femora yellow, apical 2/3 bright dark brown, hind femur without any microtomentose area, tibiae dark brown but basal dorsal parts ("knees") light. Middle tibia with a strong ventral bristle at apical 4/5, apicoventral bristle medium long. Tarsi yellowish white (basal half of metatarsi darker). Fore metatarsus apically with a strong ventrally curved posterior tooth.

Male abdominal sternites wide, female (paralectotype ♀) sterna 1—5 ca. twice wider than hind femur at base. Syntergite with broad medial transverse bare area. Surstylus (Figs 6, 7) rather long, its small posteroapical lobe with 3 apices; medial surface with straight bristles. Paramere (Fig. 9) very



Figs 1—5. *Gymnometopina garambaensis* (VANSCHUYTBROECK, 1959), a paralectotype male of the type-series of *G. clunicrus* (DUDA, 1923); 1 = genitalia, lateral view, 2 = cercus, surstylus and aedeagus, posterior view, 3 = aedeagus, lateral view, 4 = right cercus and surstylus, broadest view, 5 = paramere, lateral view. Scales: Figs 1, 2, 4: 0.2 mm, Figs 3, 5: 0.1 mm



Figs 6—10. *Gymnometopina clunicrus* (DUDA, 1923), lectotype male, genitalia. 6 = right cercus and surstylus, broadest view, 7 = same, posterior view, 8 = aedeagus, lateral view, 9 = left paramere, lateral view 10 = aedeagus, ventral view. Scales: 0.2 mm

characteristic, distiphallus (Figs 8, 10) large, ventrobasally with 2 pairs of black teeth, dorsally with a pair of long, incurving lateral processes.

Female cerci (paralectotype ♀♀) with several short stiff hairs and with 1 pair of long apical hairs (longer than 2nd hind tarsomere).

Lectotype male (Figs 6—10). 1. Africa or., KATONA 904 [East Africa, collected by K. KITTENBERGER in 1904]; 2. Kilima-Ndjaro (on the other side of the label) "X."; 3. "cluni-crus ♂" det. O. DUDA; 4. (red lectotype label of the HNHM) "*Borborus clunicrus* DUDA, 1923"; 5. "*Gymnometopina clunicrus* DUDA" det. A. L. NORRBOM VIII., 1986. The lectotype is pinned on a minutia pin into a kerria bricklet, abdomen removed and preserved — with the genitalia — in glycerine in a plastic microvial; its left hind leg is missing.

Paralectotypes, conspecific with the lectotype: 1 ♂, 2 ♀: same as 1.—4. of the lectotype; 1 ♂: 1. Africa or., KATONA, 2. Shirati, 1909. II., 3. "cluni-crus ♂" det. O. DUDA, 4. and 5. same as above, 4 ♂, 3 ♀: 1. Madagascar, SIKORA; 2. "cluni-crus ♂" det. O. DUDA; 3. same as 4. of the lectotype (one of the females is without head and abdomen). I regarded the male from Shirati as syntype, though DUDA wrote 3 males from the Kilima-Ndjaro.

Paralectotypes, specimens of *Gymnometopina garambaensis* (VANSCHUYTBROECK, 1959) (Figs 1—5): 2 ♂: 1. Abyssinia KOVÁCS; 2. Marako 1912. III.; 3. "cluni-crus ♂" det. O. DUDA; 4. (red paralectotype label of the HNHM) "*Borborus clunicrus* DUDA, 1923"; 5. "*Gymnometopina garambaensis* (VANS.)" det. A. L. NORRBOM, VIII. 1986. The details of the genitalia are essentially the same as published by NORRBOM (1987) for *G. garambaensis*. DUDA published these specimens as "2 ♀♀".

Other specimens of *G. clunicrus* (DUDA, 1923) in the collection of the HNHM: 1 ♂: Madagascar, SIKORA [obviously from the same collectings as the types; this fact refers to the practice of the late K. KERTÉSZ by not sending the whole series of specimens to abroad for identification]. 1 ♂, 1 ♀: Abyssinia, KOVÁCS — Jerrer-völgy [valley], 1911. VII. 10; 1 ♂: Nigeria, Yankari Reserve, Wikki — Aug. 13, 1978, leg. A. DEMETER, No. 13 (new for Nigeria).

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Acta Zoologica Hungarica 33 (3—4), pp. 463—484 (1987)

TAXONOMIC STUDIES ON THE PALAEARCTIC CUCULLIAE. PART II (LEPIDOPTERA: NOCTUIDAE)

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Description of one new subgenus *Calocucullia* subgen. n. for *celsiae* HERRICH-SCHÄFFER, five new species, *platinea* sp. n. (Mongolia), *retectina* sp. n. (Central Asia), *turkestana* sp. n. (Aksu, Issyk-Kul), *implicata* sp. n. (Mongolia) and *falcata* sp. n. (Afghanistan), a new subspecies of *virgaureae* BOISDUVAL, ssp. *cinnamona* ssp. n. (Mongolia) and two new subspecies of *mixta* FREYER, *lucida* ssp. n. (Semiretshye) and *lorica* ssp. n. (Hungary). *C. cyanorea* BOURSIN is synonymized with *scoparioides* BOURSIN, the lectotype of *C. amota* ALPHÉRAKY is designated and the male genitalia are illustrated.

The first part of the series on the taxonomical problems of the genus *Cucullia* SCHRANK, 1802 sensu lato contains the descriptions of four new species. Present paper deals with the taxonomic relegation of some *Cucullia* species and species groups with the descriptions of some new taxa. As the result of the studies it was unambiguously pointed out that the species *C. celsiae* HERRICH-SCHÄFFER, [1850] belongs to a distinct subgenus representing a transitional form between the genera *Cucullia* and *Calophasia* STEPHENS, 1829 by their characteristics of genitalia of both sexes. Besides the taxonomic discussion of *C. celsiae* this paper deals with the species of four species groups, namely the *scopariae-splendida*, the *dracunculi-virgaureae*, the *mixta-vicina-cemenelensis* and the *sinopsis-mediogrisea* groups with the descriptions of some new taxa belonging to these groups. Finally, the photographs of the new taxa described in the previous article of the series are also published here.

Calocucullia subgen. n.

Subgenerotype: *Cucullia celsiae* HERRICH-SCHÄFFER, [1850]

Antennae finely ciliate, frons with two double tufts, palpi short and arcuate, second joint wide and strongly hairy, apical joint very short, cylindrical. Lamina of frons smooth and slightly prominent, without protuberance. Basis of antenna with a fine tuft, eyes large, rounded, fore tibiae with a large flattened spine, second and third tibiae without spines. Fore wing broad and

Figs. 1—7. 1—2 = *Cucullia* (*Calocucullia*) *celsiae* HERRICH-SCHÄFFER, Yugoslavia. 3—4 = *Calophasia platyptera* (ESPER), Sardinia. 5 = *C. almoravida nigrella* TURATI, Sardinia. 6 = *C. platyptera* (ESPER), Gallia. 7 = *Cucullia* (*Calocucullia*) *celsiae* HERRICH-SCHÄFFER, Bulgaria

relatively short, apex pointed, hind wing small and rounded. Colouration of fore wing unusual in genus, inner half of wing dark blackish- or chocolate-brown, outer part light ochreous-brown.

Male genitalia (Figs 1—2): uncus short and wide, pointed, tegumen narrow and high, fultura inferior subtriangular with long upper part having parallel margins. Vinculum strong, V-shaped. Valvae elongate, wide at base,

apical part narrow, slightly pointed, cucullus reduced. Clavus a small, rounded lobe, harpe absent, sacculus strong with a long and strong, pointed and slightly curved apical processus. Aedoeagus relatively long and thick, vesica consists of three diverticles, two of them with short but thick, bulbed cornuti.

Female genitalia (Fig. 7): ovipositor short and wide, gonapophyses relatively long. Ostium bursae with large, sclerotized sterigmae, ductus bursae long and wide, strongly sclerotized and more or less flattened. Apex bursae small, rounded, corpus bursae elongate, sac-like.

Taxonomic position: This monotypic subgenus represents an intermediate stage between the "true" Cucullinae and the species of the genus *Calophasia* STEPHENS, 1829. The type-species, *celsiae* has a unique colouration in the whole genus, the male copulatory apparatus shows a specially modified configuration which is highly similar to that of some *Calophasia* species, principally to *platyptera* (ESPER, 1788) — see Figs 3—6 — while the structure of the vesica maintains the typical configuration of *Cucullia*. The absence of the harpe is an extreme character, the reduced cucullus and the characteristic saccular processus — which very clearly show the relationship between *Calocucullia* and *Calophasia* — are the main features of the male genitalia. A somewhat similar processus can be found in *C. generosa* STAUDINGER, 1889, and in some tropical species it is originated from the costal part of valva and not from the sacculus. In the case of the female genitalia the characteristic ostium bursae and the long and wide, heavily sclerotized ductus bursae are the distinctive features, which also show similarity to those of the *Calophasia* species.

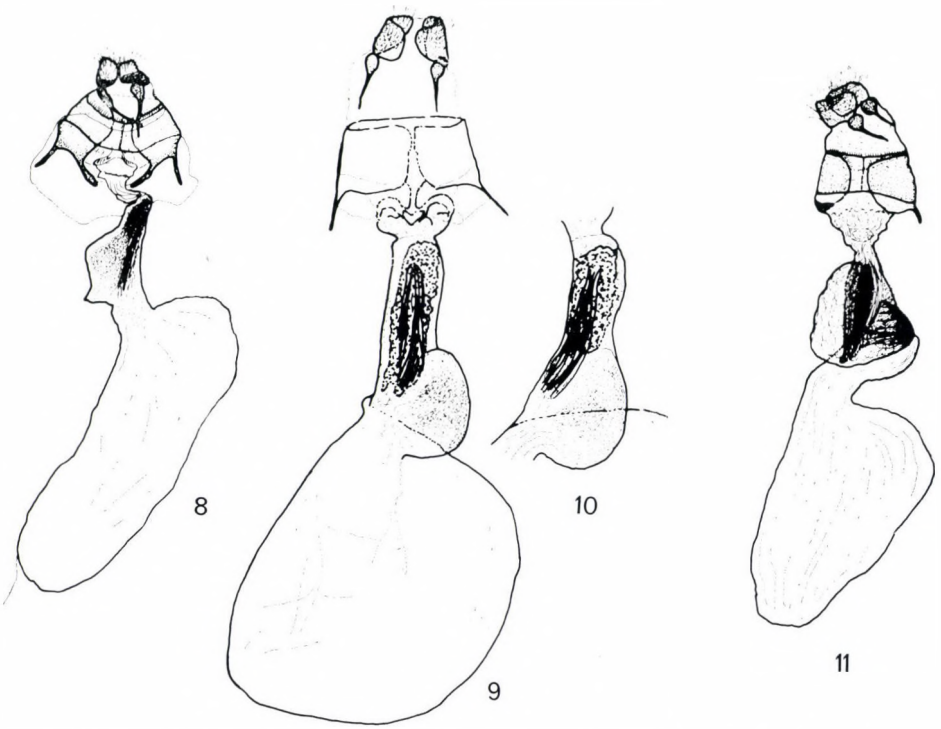
These characteristics evidently show a close relationship between the subgenera *Calocucullia* and *Calophasia* and, on the other hand, the possible paths of development from a probably common ancestor.

Two new species of the scopariae-splendida group

Cucullia platinea sp. n. (Plate I: 1)

Holotype: female, Mongolia, 106°56′ E, 47°56′ N, Ulaanbaatar, Tolgoyt, 1300 m, 4. VIII. 1986, leg. FÁBIÁN, HREBLAY, PEREGOVITS and RONKAY, deposited in coll. HNHM, Budapest. Slide No. 2010 L. RONKAY.

Alar expanse 31.5 mm, length of fore wing 15 mm. Head brownish, palpi brownish with white tip, collar white with two khaki-brown stripes. Thorax whitish with some brownish hairs at the middle. Fore wing elongate, pointed, ground colour of fore wing pure silvery with two narrow, khaki-brown stripes at costal and inner margins. Wing pattern almost totally absent, only with a small, double black spot in place of orbicular, a second in the cell and a third one at upper angle of cell. Cilia white with a row of strong, black spots at base. Hind wing whitish with dark greyish brown marginal



Figs 8—11. 8 = *Cucullia platinea* sp. n., Holotype, Mongolia. 9—10 = *C. splendida* (CRAMER), Mongolia, slides Nos 2037, 2009. 11 = *C. retectina* sp. n., Holotype, Asia c.

field and some greyish irroration in cell, cellular lunule absent, cilia white. Underside of wings white, fore wing very strongly covered with dark brownish grey, only costal and apical parts remaining white, base of cilia with some blackish spots. Hind wing with somewhat lighter but extensive greyish suffusion in cell and in marginal field.

Female genitalia (Fig. 8): papillae anales wide and short, gonapophyses short, proximal pair of papillae with long, sclerotized appendices running from apophyses to ostial margin. Ostial appendage reduced, initial part of ductus bursae membranous, central part with short but strongly sclerotized crests and a small lamina, proximal part dilated to a wide lobe. Bursa copulatrix elongate, sac-like.

Specific differences and taxonomic position: The new species differs with its unique colouration from all the known Palaearctic *Cucullia* species, the nearest relative is the well-known species: *splendida* (CRAMER, 1777), but these two species can be very easily separated. The main distinctive characters are: the ground colour of *platinea* is pure silvery, the costal and inner margins are with narrow khaki-brown stripes, the base of cilia, the middle and the upper

angle of the cell with black spots. The hind wing has more extensive dark irroration on both sides, the cellular lunule is absent. The related *splendida* has bluish-turquoise, very shiny and patternless fore wing, the margins without dark stripes, the row of dark spots at the base of the cilia is absent. The hind wing has cellular lunule and its underside has no strong darker irroration. The configuration of the female genitalia of the two related species displays also well-discernible differential characters, namely the proximal pair of papillae anales has long appendices in *platinea*, which are absent in *splendida* (Figs 9—10), the ductus bursae of *platinea* is sclerotized very slightly, the smooth lamina is reduced strongly, while the same of *splendida* has well-developed, smooth lamina and much stronger and longer crests.

The new species was found at the suburb of Ulaanbaatar as a unique specimen with a long series of splendida, consequently, they occur sympatrically in the northern part of C Mongolia.

Cucullia retectina sp. n. (Plate I: 2)

Holotype: female, "Simb., 26 Maia" "coll. ERSCHOV" (in Russian), in coll. Zoological Institute, Leningrad. Slide No. 1647 L. RONKAY.

Alar expanse 39 mm, length of fore wing 18.5 mm. Head and thorax ashy grey, base of collar brownish with black line, metathoracic tufts blackish. Fore wing ashy grey with slight brownish shade. Subbasal line absent, submedian fold with furcate, fine and short black streak. Antemedial line double, wide and diffuse, blackish brown, outer part of it much stronger, filling of line grey; oblique to submedian fold and only slightly sinuous, lower part with two strong angles. Orbicular spot oblique, with whitish annulus, incompletely defined by black and with two brownish spots inside. Claviform spot absent, upper part of medial line represented by a dark brown spot between orbicular and reniform, lower part of it a diffuse brownish stripe with darker shadow on outer edge. Reniform spot grey with some darker brown spots in it, rather indistinctly defined by brown. Postmedial line pale and obsolete at costal margin, much stronger below reniform; blackish brown, sinuous, terminally with whitish shadow. Subterminal line wide and very diffuse, whitish grey, terminal area with two strong, blackish streaks at tornus and at lower angle of cell. Termen with darker brownish grey irroration, apical part of costa with pale grey spots. Terminal line ochreous white with black lunules on inner side, cilia grey with fine whitish line. Hind wing greyish white with darker suffusion at terminal area, cilia whitish. Underside of fore wing brownish grey, unicolorous, with only some whitish scales at costa and outer margin, ghost of orbicular slightly discernible. Hind wing whitish with wide darker terminal area, cellular lunule absent.

Female genitalia (Fig. 11): ovipositor and gonapophyses short, ostial appendage absent. Ostial part of ductus bursae membranous, medial part wide with a smooth lamina on dorsal and with some strongly sclerotized crests on ventral surface, proximal part with a subtriangular, sclerotized lobe. Apex bursae a large and curved, rugulose sac, corpus bursae large, elliptical.

Specific differences and taxonomic position: This species by its appearance seems to be a "mixture" of some related species as *retecta* PÜNGELER, 1901, *nigrifascia* HAMPSON, 1894, *scoparioides* BOURSIN, 1941,* *formosa* ROGENHOFER, 1860, *absinthii* (LINNAEUS, 1761) and *fuchsiana* EVERSMANN, 1842. But the new species is smaller than *retecta* and *nigrifascia*, its ground colour is more unicolorous, without dark and strong medial fascia. *Retectina* is somewhat larger than *scoparioides* with much wider wings, its orbicular spot is whitish, the reniform is not encircled strongly, the black streaks of subterminal area are longer and stronger, the inner area of hind wing is darker. The next related species, *formosa* has white hind wing, *absinthii* and *fuchsiana* have different wing pattern.

The female genitalia differ from *retecta* with the different ductus bursae since *retecta* has a strongly sclerotized, double lobe on medial part of ductus bursae. The other similar species, *scoparioides* (Figs 38—39) has much slightly sclerotized medial part of ductus bursae, without the smooth lamina on dorsal surface. By its external and genitalic characters this species — provisorically — can be placed between *retecta* and *scoparioides*.

New taxa of the dracunculi-virgaureae group

The *dracunculi-virgaureae* group (sensu stricto) contains the following species and subspecies:

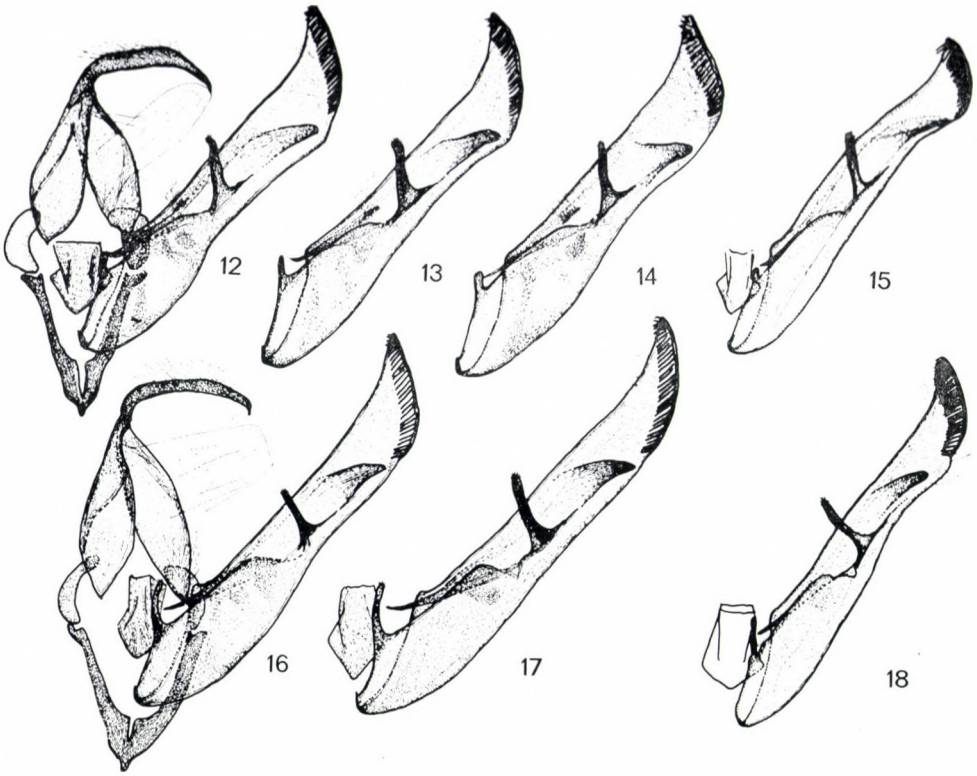
— **dracunculi dracunculi** (HUBNER, 1813) (= *incana* EVERSMANN, 1842, *dracunculi lynosiridis* FUCHS, 1913 syn. n.)
— **dracunculi anthemidis** GUENÉE, 1852
— **turkestana** sp. n. (= *dracunculi* var. *amota* sensu WARREN in SEITZ, nec ALPHÉRAKY)
— **implicata** sp. n.
— **virgaureae virgaureae** BOISDUVAL, 1840 (= *dracunculi* sensu EVERSMANN, nec HÜBNER)
— **virgaureae cinnamona** ssp. n.
— **virgaureae** ssp. (in Tien-Shan)

The descriptions of the new taxa with the discussion of their taxonomic relationships are given below

Cucullia turkestana sp. n. (Plate I: 4—6)

Holotype: male, "Ost-Turkestan (Aksu), RÜCKBEIL jr. 1910" "Zool. Mus. Berlin", deposited in coll. PÜNGELER, Berlin. Slide No. 1890 L. RONKAY. Paratypes: 1 ♂, 2 ♀♀, from same locality, leg. RÜCKBEIL (1 ♂, 1910, 1 ♀, 1903, 1 ♀, 5—17. VII. 1910), in coll. PÜNGELER,

* The studies of the types of *scoparioides* and *cyanorea* BOURSIN, 1941 (syn. n.) — on the basis of their high similarity of their female genitalia and external features — reveal the identity of these taxa.



Figs 12—18. 12—13 = *Cucullia turkestana* sp. n., 12 = Holotype, Aksu, 13 = Paratype, Issyk-Kul. 14 = *C. dracunculi* HÜBNER, Ural. 15 = *C. implicata* sp. n., Paratype, Mongolia. 16 = *C. virgaureae* (BOISDUVAL), Rossia mer. 17 = *C. virgaureae* ssp., Tien-Shan. 18 = *C. virgaureae cinnamona* ssp. n., Paratype, Mongolia

Berlin; 1 ♂ from same locality, coll. Naturhistorisches Museum, Vienna; 1 ♂, Issyk-Kul, Asia centr., coll. WAGNER, in coll. HNHM Budapest. NO Afghanistan, Badakshan, 3000 m, 15 km NO Baharak, 29.6.1971, leg EBERT et NAUMANN, coll. NAUMANN, Bielefeld. Slides Nos 1490, 1655, 1891, 2402 (males), 1892 (female), L. RONKAY.

Alar expanse 39—40 mm, length of fore wing 18—19 mm. Head ochreous grey with lighter stripe on frons, palpi with brownish hairs. Collar and thoracic tufts ochreous grey with black stripes and two brownish stripes on collar. Ground colour of fore wing characteristic light ochreous grey with fine ochreous shine, females somewhat darker and more greyish. Costal margin with more or less strong ash-grey irroration, inner margin with a pale greyish stripe. Subbasal line reduced to two costal spots, antemedial line very strongly sinuous, double, filled with light ochreous and defined with grey by both sides; inner area, mostly in the females, with stronger ochreous irroration. Dark streak of submedian fold very fine and long, orbicular and reniform spots ochreous with some brownish spots in centre, their outlines pale, sometimes reduced. Medial area with some darker irroration, place of claviform light, whitish

ochreous. Postmedial line sinuous, diffuse at middle, its filling, mostly at inner margin, light ochreous. Marginal area with a dark, strong line at tornus running from postmedial line to cilia and with some short, lighter and darker lines between veins; veins partly covered with grey, subterminal line very pale or obsolescent. Terminal line double, a row of black spots and a white line, cilia ochreous grey, finely spotted. Hind wing whitish, marginal area and veins covered with pale brownish (males) or with wide and relatively dark marginal field (females). Cilia white with brownish inner line. Underside of wings shiny whitish, inner parts of fore wing strongly irrorated with brownish but ghosts of orbicular and reniform spots slightly visible. Hind wing of males nearly pure whitish with only some dark scales on veins, in the females with darker marginal field.

Male genitalia (Figs 12—13, 22—26): uncus strong, irregularly curved, its apex pointed. Tegumen moderately high, strong and wide, fultura inferior subtriangular, vinculum strong, V-shaped. Valvae elongate, wide, cucullus well developed, apically elongate and pointed, slightly arcuate. Sacculus strong, clavus short, finger-like. Harpe finely twisted, long and relatively thick, wide-based, its apex more or less rounded. Costal lobe smooth, conical and more or less pointed. Aedoeagus moderately long and slightly curved, with a characteristic distal dorsal appendage consisting of a very short pedicle and a rounded semiglobular plate covered with teeth. Vesica consists of three diverticles, two of them shorter with two long and strong cornuti, third upturned, elongate, sac-like.

Female genitalia (Figs 32—33): ovipositor short and wide, apophyses relatively long. Ostium bursae with small, V-shaped ostial appendage, ductus bursae wide and heavily sclerotized with long, sinuous crests and a strong but small, pocket-like emergence at middle. Apex bursae with a sclerotized, triangular lobe and a membranous, small sac, corpus bursae large, elliptical, finely rugulose.

Specific differences and taxonomic position: The new species is a sympatric sibling of *dracunculi* (as *turkestana* occurs in Soviet and Chinese Turkestan since the true *dracunculi* is also known from Issyk-Kul, Aksu, Kuldja) and it was mentioned for a long time as "*dracunculi* var. *amota* STAUDINGER" (nec ALPHÉRAKY !). After the study of the types of *amota* ALPHÉRAKY, 1887, it was pointed out (BOURSIN, 1941) that the true *amota* is not a member of the *dracunculi* group (s. str.) but belongs to the *asteris* group (s. str.).* (These two groups are very closely related to each other, see RONKAY and RONKAY, 1986.) Surprisingly enough without reason, this taxon was downgraded to *dracunculi* and has not been studied in detail so far. The investigations on the

* Since no lectotype of *amota* has been designated, we rectify this ommission in the final part of this section.

Central Asian "*dracunculi*" material clearly indicate that there are two distinct species with very interesting differential characters in the configuration of the genitalia of both sexes, besides the differences between the coloration of *dracunculi* (with shiny bluish or ashy grey ground colour of fore wing) and *turkestana* (light ochreous grey with some darker grey irroration). The distal dorsal appendage of *turkestana* has very short pedicel and rounded, semiglobular plate with teeth along the median line of the entire plate while in case of *dracunculi* (Figs 14, 27—29) this appendage has much longer pedicel and elongate, elliptical plate with teeth only on distal half. Accordingly to these structures — in this case the "key-hole model" seems to be correct — the ductus bursae of *turkestana* has the pocket-like emergence placed at the middle of its length and smaller, less elongate, since in the case of *dracunculi* (Figs 30—31) this pocket can be found in the proximal third of ductus bursae, larger and more elongate. (The total length of ductus bursae is similar in these two species.)

But the taxonomic relationships of the species of the *dracunculi* group seem to be more difficult as, surprisingly, in the Mongolian material of the two Hungarian expeditions in 1986 a third, new species was found which is very near to *turkestana* but differs from the latter by its external and genitalic features, too.

Cucullia implicata sp. n. (Plate I: 7)

Holotype: female, Mongolia, Chovd aimak, Bulgan Sum, 31. VII. 1986, leg. Z. VARGA, deposited in coll. HNHM. Slide No. 2053 L. RONKAY. Paratypes: 1 ♂, Mongolia, 104°03′ E, 43°26′ N, Mts. Gurvan Sayhan, valley Yulin-am, 2350 m, 24. VII. 1986, leg. FÁBIÁN, HREBLAY, PEREGOVITS and G. RONKAY, in coll. G. RONKAY. 6 ♂♂, 1 ♀, Mongolia, Bajanhongor aimak, Mts. Ih Bogd uul, 1850 m, valley of Pitut river, 100°13′ N, 24—26. VII. 1987, leg. HREBLAY, Peregovits, Stéger, coll. HNHM, HREBLAY, G. RONKAY and P. GYULAI. Slides Nos 2000, 2472 L. RONKAY.

Alar expanse 38—41 mm, length of fore wing 18—19 mm. Head and thorax dark ochreous grey, palpi with dark hairs, collar with blackish basal and apical lines and a pale brownish medial stripe. Medial part of thorax dark grey-brown, abdomen light ochreous grey with dark dorsal crest. Ground colour of fore wing light ashy grey with some ochreous tinge and dark grey-brown irroration, mostly at costal area and in the cell, coloration of female specimen much darker than that of male. Antemedial line strongly sinuous, double, dark grey, submedian fold with fine, long blackish line. Postmedial line obsolescent, sinuous, becoming stronger at inner margin, filled with light grey. Orbicular and reniform spots small, narrow, ochreous with dark spots inside and a dark brownish grey, quadrangular spot between them in cell. Medial area somewhat lighter than other parts of wing, principally at place of claviform spot, which is whitish grey. Subterminal line deleted, terminal area with whitish and dark grey, short lines between and on veins, a pale dark streak at lower extremity of reniform and a strong, dark line in tornus from

Figs 19—29. 19 = *Cucullia virgaureae cinnamona* ssp. n., Paratype, Mongolia. 20 = *C. virgaureae* ssp., Tien-Shan. 21 = *C. implicata* sp. n., Paratype, Mongolia. 22—26 = *C. turkestana* sp. n., 22—24 = Holotype, Aksu, 25 = Paratype, Aksu, 26 = Paratype, Issyk-Kul. 27—29 = *C. dracunculi* HÜBNER, 27—28 = Ural, 29 = Hungary

postmedial line to base of cilia. Terminal line whitish with some dark spots on inner side, cilia greyish with short whitish lines at ends of veins. Hind wing pale whitish grey, marginal field and veins strongly covered with dark brown, cellular lunule very pale. Cilia whitish with some scattered brownish spots on inner side. Underside of wings light whitish grey covered nearly totally with

darker grey except inner area of hind wing, lines and spots absent, terminal line of fore wing whitish, cilia as on upper side.

Male genitalia (Figs 15, 21): uncus moderately long and irregularly arcuate, apex pointed. Tegumen wide and less high, fultura inferior subtriangular, vinculum strong, V-shaped. Valvae elongate, narrow, distally slightly curved, cucullus relatively short, apex of it pointed. Harpe finely twisted, with rounded tip, sacculus strong, clavus short, finger-like. Aedoeagus moderately long and thick, distal dorsal lamina with characteristic appendage covered by teeth. Vesica consists of three diverticles, two of the short with strong cornuti, third elongate, sac-like, upturned.

Female genitalia (Figs 34—35): ovipositor short and wide, gonapophyses relatively long. Ostium bursae with strong, V-shaped appendage, ductus bursae heavily sclerotized, long and wide, with a large, lateral, pocket-like emergence at medial part. Apex bursae with a sclerotized triangular and a small, membranous sac, corpus bursae large, elliptical.

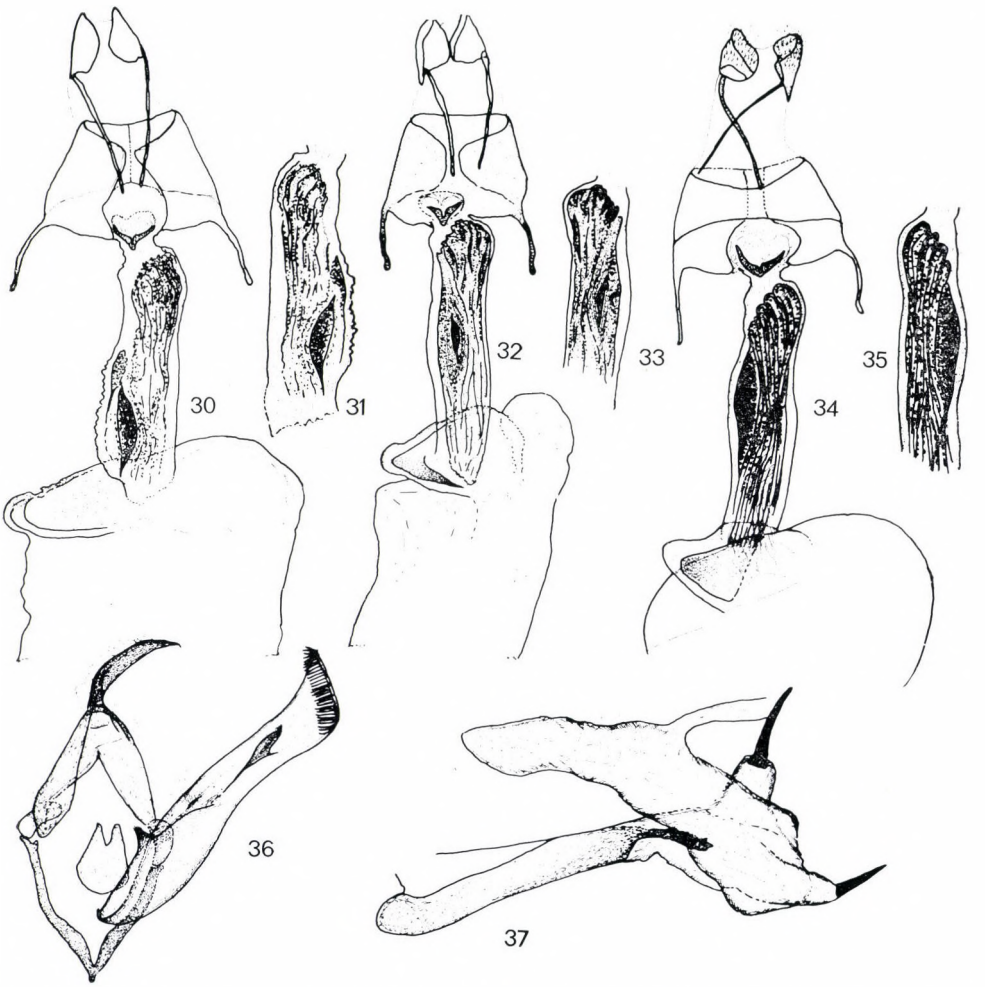
Specific differences and taxonomic position: The new species is closely related to *turkestana*, but differs from it with its essentially darker coloration (mostly in the cell and on hind wing) and by the configuration of genitalia of both sexes. The male genitalia of *implicata* have much slender and smaller valvae with shorter cucullus and curved distal end; the female genitalia of *implicata* have much strongly developed pocket-like emergence of ductus bursae and this emergence is located more laterally.

It is probable that *implicata* represents only a well-isolated Mongolian subspecies of *turkestana*, but the differences between the two taxa are so conspicuous that they should be separated at specific level.

Cucullia virgaureae cinnamona sp. n. (Plate II: 11)

Holotype: female, Mongolia, 106°52′ E, 47°50′ N, Ulaanbaatar, Mts. Bogdo uul, 1700 m, 6. VII. 1986, leg. FÁBIÁN, HREBLAY, PEREGOVITS and G. RONKAY, deposited in coll. HNHM, Budapest. Paratypes: 1 ♂, 1 ♀ from same locality, 9. VII. and 11. VII. 1986, 2 ♂♂, 4 ♀♀, Mongolia, 106°43′ E, 47°52′ N, Ulaanbaatar, airport, 1300 m, 6. VII., 10. VII. and 11. VII. 1986, leg. by the mentioned collectors; 1 ♀, Mongolia, 106°58′ E, 48°06′ N, Tsagandavaa, at the vicinity of the wolfram mine, 1400 m, 2. VIII. 1986, leg. GY. FÁBIÁN, 2 ♂♂ from same locality, 4. VIII. 1987, leg. HREBLAY, PEREGOVITS and STÉGER, the specimens are deposited in coll. HNHM, Budapest and in the collections of the collectors. Slides Nos 2002, 2036 (males) L. RONKAY.

Alar expanse 39—43 mm, length of fore wing 17—19 mm. Head brown with dark lines, palpi dark brown, collar light ochreous grey with rosy shade and two brown transversal stripes, basal line blackish. Thorax ochreous grey with some greyish and blackish hairs, middle of thorax dark chocolate-brown. Abdomen greyish brown with blackish dorsal tufts. Ground colour of fore wing light yellowish brown, very strongly covered with cinnamon-brown scales, costa widely dark brown. Wing pattern strongly reduced, orbicular and



Figs 30—37. 30—31 = *Cucullia dracunculi* HÜBNER, Kuldja. 32—33 = *C. turkestana* sp. n., Paratype, Aksu. 34—35 = *C. implicata* sp. n., Holotype, Mongolia. 36—37 = *C. amota* ALPHÉRAKY, Lectotype, Tura

reniform spots absent or obsolescent with deleted outlines (sometimes with some blackish spots remnants of the outlines). Transversal lines only very slightly darker than ground colour, strongly sinuous, sometimes defined by some yellowish and violaceous scales. Submedian fold with long yellow line, dark stripe of tornus short and pale, terminal area with some whitish-greyish lines and blackish scales. Cilia brown with darker inner side, terminal line a row of short black arches and a fine whitish line. Hind wing ochreous with darker brown irroration, a pale cellular lunule, some dark covering on veins and dark, wide marginal area. Cilia whitish with light rosy-brown shine. Underside of wings whitish, fore wing nearly totally covered with dark brown,

hind wing with light inner area, pale cellular lunule and dark brown marginal field, cilia rosy-white. Females somewhat darker, marginal field of hind wing wider and underside of both wings darker.

The new subspecies differs from the nominate race with its very characteristic, intensive cinnamon-brown coloration, the absence of strong yellowish irroration in cell and medial area and with the reduction of orbicular and reniform spots. In the configuration of the male genitalia the new subspecies shows also distinctive features, since the valvae (Fig. 18) are much narrower with more elongate cucullus and longer harpe than those of the nominate subspecies (Fig. 16).

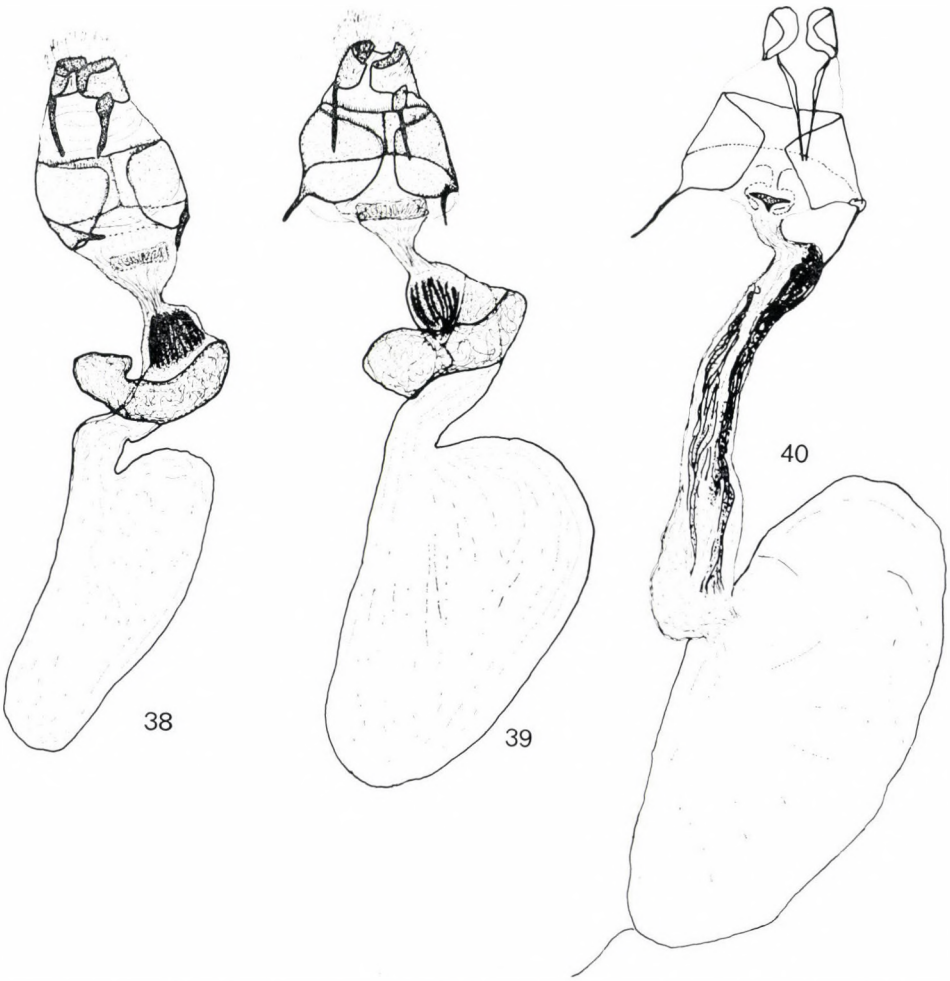
In the collection of the Zoological Institute, Leningrad a very interesting specimen of *virgaureae* was found, which was collected in the Tien-Shan Mts. It is very large (alar expanse 47 mm), the thorax, the collar and the ground colour of fore wing are light, shiny bluish grey with darker brown costal and inner margins, the cell is covered with yellowish scales, the reniform and orbicular spots are relatively strong, their outlines consisting of dark spots and short lines, nearly fully developed; the yellowish streak of the submedian fold is absent. It is very probable that the Tien-Shan race represents a different subspecies, but, as it is known as a unique specimen (male) and the configuration of the male genitalia of these three races — *virgaureae*, *cinnamona* and the Tien-Shan race (Figs 17, 20) — does not show strong differences qualifying to be specific, we desist to describe the latter as a new subspecies.

Designation of the lectotype of Cucullia amota Alphéraky, 1887

The type material of *Cucullia amota* preserved in the collection of the Zoological Institue, Leningrad consists of two specimens of which the male is designated here as lectotype. The data of the lectotype are as follows: "Osch., Tura ♂", "Amota Alph. Origin.", "45", "26. IV. 84", "Кол. Вел. кн. Ник. Минайл."" ["Kol. Vel. Kn. Nik(olaia) Mikhail(ovitsa)]", slide No. 1748 L. Ronkay. Paralectotype: female, from the same locality, 18. IV. 84.

Two new subspecies of Cucullia mixta Freyer, 1841

The mixta group is a small but well-defined group of species consisting of only three species: *cemenelensis* Boursin, 1924, *mixta* Freyer, 1841 and *vicina* Bang-Haas, 1912. These taxa have very similar male genitalia but relatively strongly different coloration and wing pattern. The western species, *cemenelensis* occurs in Spain and in France, the sporadically distributed *mixta* (and its different subspecies) occurs in N Italy, Hungary, Eastern Turkey, in



Figs 38—40. 38 = *Cucullia scoparioides* BOURSIN, Paratype, China. 39 = ibid., Holotype of *C. cyanorea* BOURSIN, China. 40 = *C. opacographa* G. RONKAY et L. RONKAY, Paratype, Afghanistan

the Ural Region and, sympatrically with *vicina* which has a strongly restricted area in Chinese and Soviet Turkestan — in Central Asia.

The differences between the external characteristics are very conspicuous in the case of the species of this group, the main differences are as follows: *cemenelensis* has light grey fore wing without strong yellowish stripe in submedian fold, the transversal lines and outlines of orbicular and reniform spots are more or less obsolescent. The second species, *mixta*, has very striking yellowish stripe in submedian fold, the wing pattern is more distinct than that of *cemenelensis*. The third species, *vicina*, has a reduced but visible light basal stripe and very strong and distinct wing pattern of fore wing. The specific

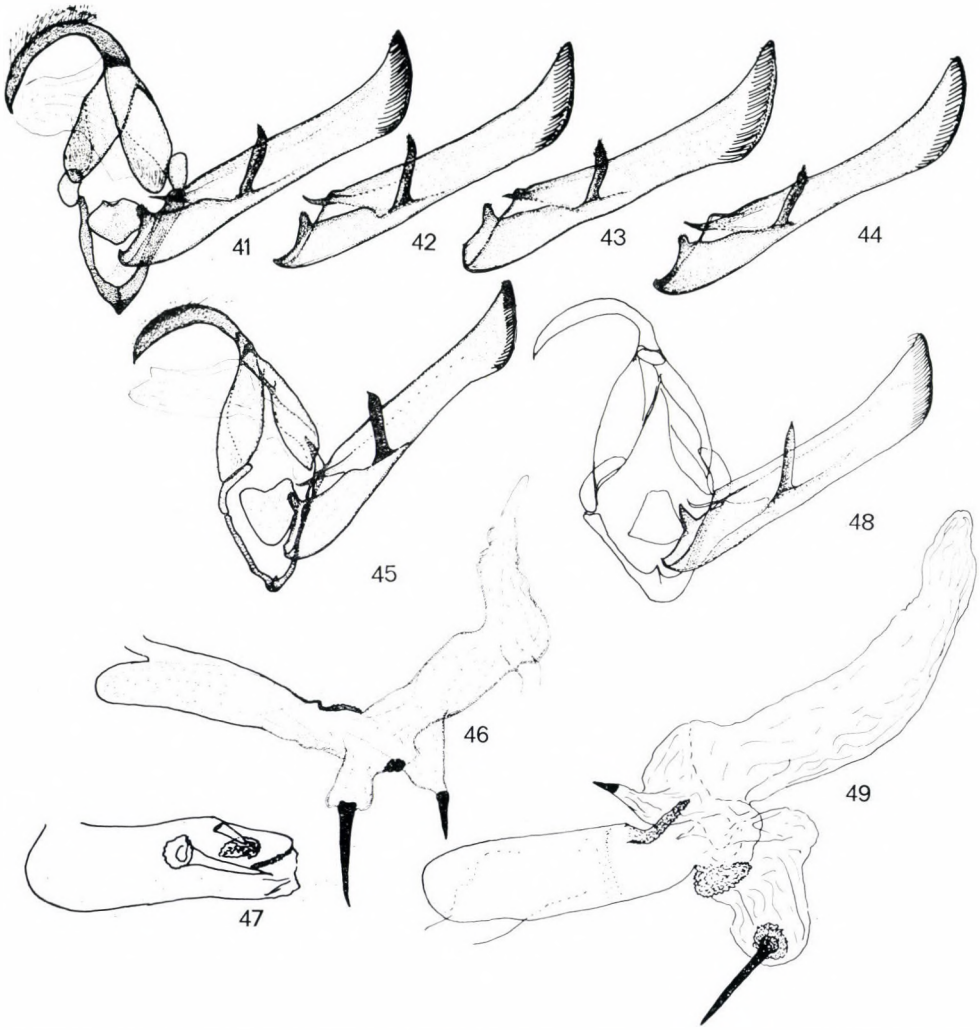
differences of the male genitalia of these species are relatively slight but well discernible: in the case of *mixta* the uncus is long, the cucullus is elongate and pointed, in *vicina* the uncus is much shorter and thick, the cucullus is much more shorter and the vesica has very small dentated lamina. The third species, *cemenelensis* has wide but shorter valvae and short cucullus, long and straight harpe and a large dentate lamina in the vesica (Figs 41—49).

The nominate race of *mixta* occurs in the Southern Ural, the Hungarian and the Central Asian population represent two new, undescribed subspecies, while in Eastern Turkey occurs a very unusual race of mixta with white hind wing (HACKER, pers. comm.; HACKER and PINKER, in press). The descriptions of the two new subspecies are given below.

Cucullia mixta lorica ssp. n.

Holotype: male, "Csákvár, Öreghegy, 1981. V. 27, SZEŐKE" (C Hungary, Vértes Mts), deposited in coll. SZEŐKE. Paratypes: 3 ♂♂, 1 ♀ from same locality and data; 2 ♂♂, 2 ♀♀ from same locality, 3. VI. 1981; 3 ♂♂ from same locality, 11. VI. 1981; 6 ♂♂, 1 ♀, from same locality, 25. VI. 1982; 1 ♂, from same locality, 2. VI. 1983; 1 ♂ from same locality, 3. VI. 1984, the specimens were collected by K. SZEŐKE, in coll SZEŐKE, VARGA, HERCZIG, GYULAI, RONKAY, FEDOR, SZABÓKY and HNHM, Budapest; 1 ♂, Vértes Mts., Csákberény, Buckahegy, 24. VI. 1986, leg. et coll. SZABÓKY, 12 ♂♂, 1♀ from same locality, 11—13. VI. 1987, kg. FÁBIÁN, KŐSZEGI, RONKAY, and SZABÓKY, in coll. the collectors and HNHM; 1 ♂, Budaörs, C Hungary, 4. VI. 1950, leg. et coll. BALOGH; 1♀, Hungary, Budapest, Rózsadomb, 8. VI. 1912, CSERNY, in coll. HNHM, Budapest. Slides Nos 1480 L. RONKAY, 2864 Z. VARGA (males).

Alar expanse 35—43 mm, length of fore wing 15—19 mm. Head dark grey, frons with blackish brown stripes, collar light yellowish or rosy-grey, with a basal blackish line, reddish brown stripes and darker brown tip. Thorax ochreous or ashy grey, with blackish hairs and dark brown medial part, thoracic crest dark brown. Abdomen more or less greyish, dorsal tufts small, dark. Fore wing of males dark plumb-grey with some ochreous-brown and brownish grey irroration and fine brilliant sheen. Costal part of basal area brownish, subbasal line absent, antemedial line strongly waved, double, inner part brownish grey, outer dark grey, its filling lighter grey. Basal streak of submedian fold a fine blackish line in a very conspicuous, light ochreous, elongate patch. Medial line absent, postmedial line less strong, very sinuous, double with fine lighter filling. Orbicular and reniform spots ochreous with brownish spots in their centres, more or less continuously encircled with blackish spots. Costal area above cell darker grey, darkest area of wing. Subterminal line an obsolescent, sinuous, whitish grey line, marginal field with reddish or ochreous brown spots and short lines between veins, apical part with some whitish lines; veins on outer part of wing with fine grey irroration. Terminal line a fine whitish line with small black spots, cilia grey with whitish lines at ends of veins. Hind wing whitish with darker veins and cellular lunule, marginal suffusion dark brownish grey, strong and wide, cilia whitish with a



Figs 41—49. 41—42 = *Cucullia mixta lorica* ssp. n., Paratypes, Hungary. 43 = *C. mixta* FREYER, Ural. 44 = *C. mixta lucida* ssp. n., Holotype, Semiretshye. 45—46 = *C. vicina* BANG-HAAS, Dsharkent. 47 = *C. mixta lorica* ssp. n., Paratype, Hungary. 48—49 = *C. cemenelensis* BOURSIN, Gallia

fine brown basal line. Underside of fore wing dark brownish grey with some ash-grey at marginal fields, hind wing whitish with dark veins, cellular lunule and marginal area. Ground colour of fore wing of females darker with more intensive reddish brown irroration, hind wing nearly totally dark brown, cellular lunule more obsolete, basal field of wing light brownish. Underside of both wings nearly unicolorous, dark brown, only basal fields somewhat lighter.

The new subspecies differs from the nominate race with its darker ground colour of fore wing, less intensive brownish pattern and much lighter and

conspicuous patch of the basal area. The hind wing is more contrasty and the marginal area is much darker, especially in the case of females, the underside is more unicolorous and darker in shade. The configuration of the male genitalia of *lorica* differs from the nominate subspecies with its longer harpe, more parallel margins of the valvae, the large cornutus of vesica has wider basis (Figs 41—43, 47).

Cucullia mixta lucida ssp. n.

Holotype: male, "Semiretshj. obl., Dzharkent, 9. V. 1915" (in Russian: "Семиреч. обл., Джаркент, 9. 5. 1915"), coll. DIAKONOFF, deposited in coll. of the Zoological Institute, Leningrad. Slide No. 1642 L. RONKAY. Paratypes: 4 ♂♂ from same locality and data, in coll. Zool. Inst., Leningrad.

Alar expanse 36—38 mm, length of fore wing 16.5—17.5 mm. Wing shape and pattern similar to other races of mixta but ground colour of fore wing light bluish grey with strong ashy-grey irroration and silvery-grey sheen. Transversal lines very pale and obsolescent, yellowish patch of submedian fold also pale, with fine and short basal blackish streak. Orbicular and reniform spots distinct, nearly fully encircled with yellow, with some brownish spots inside of them. Claviform spot a silvery-white, small spot. Postmedial line sinuous, lower part of it deleted, subterminal line serrate, pale, reddish brown, defined with yellowish on inner and with greyish brown on outer side. Terminal line a row of short black streaks and a grey line, cilia grey with fine white basal line. Hind wing whitish with greasy shine, marginal field wide, brownish, terminal line brown, cilia white. Underside of wings very shiny, light greyish white with more or less intensive light brown irroration, mostly at inner area of fore wing and on veins of hind wing. Transversal lines obsolete, cellular lunules small, pale; cilia of both wings white or whitish.

The eastern race of *mixta* differs from the other subspecies with its much lighter coloration of fore wing and less distinct wing pattern; in the male genitalia the valvae are more slender and the cucullus is more elongate than in the nominate race (Figs 43, 44).

The discussion of the sinopsis-mediogrisea group with the description of a new species

Cucullia falcata sp.n. (Plate II: 13)

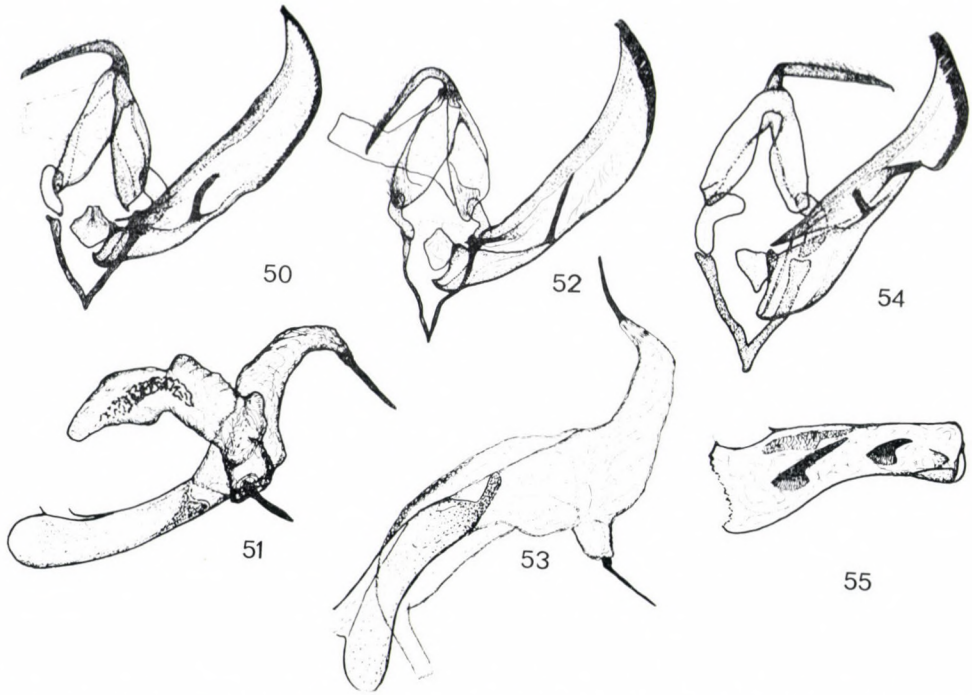
Holotype: male, "SO Afghanistan, Safed Koh, Südseite, Kotkai, 2350 m, 21. VI.—1. VII. 1969, leg. VARTIAN, deposited in coll. VARTIAN. Slide No. 1951 L. RONKAY. Paratype: 1 ♂, from same locality and data, in coll. VARTIAN.

Alar expanse 40 mm, length of fore wing 17 mm. Head and thorax pale ash-grey, frons and thoracic crest with darker brownish grey hairs, collar with brown basal stripe bordered with a fine black line, medial part striolate, tip

of it brownish. Ground colour of fore wing light ashy grey with some bluish grey shade and fine darker brownish grey irroration in basal area; costal margin finely covered with dark grey. Subbasal line only a small darker spot, antemedial line very strongly waved, dark grey, darkest at inner margin, finely defined with whitish grey on inner side. Streak of submedian fold very fine and long, dark grey. Upper part of medial line an oblique, wide, dark stripe, lower part deleted, postmedial line arcuate, strongly sinuous, becoming stronger and double at tornus, its filling whitish grey. Orbicular and reniform spots less defined, their outlines consist of darker brownish spots and a pale brownish grey shadow at inner side of reniform. Filling of orbicular spot light brownish, this brownish shade extended in cell towards to postmedial line but less intensive than in orbicular. Subterminal line absent, outer part of wing with elongate, darker brownish triangular spots in apical field and darker covering on veins. One of the two strong, dark streaks of marginal field running from lower extremity of reniform to outer margin, second from postmedial line to outer margin at tornus. Terminal line fine, whitish, cilia greyish with darker inner side and whitish spots at ends of veins. Hind wing whitish grey with darker veins, cellular lunule pale but visible, marginal area with wide, darker grey suffusion. Terminal line and cilia whitish, latter slightly spotted with brown. Underside of wings whitish, fore wing and marginal field of hind wing more or less strongly covered with grey, shadows of orbicular, reniform and cellular lunule of hind wing slightly visible, transversal line pale, diffuse.

Male genitalia (Figs 50—51): uncus long and very narrow, strongly curved at proximal third, tegumen high, fultura inferior more or less rounded. Vinculum short and gracile, V-shaped. Valvae elongate, strongly arcuate, cucullus and corona very long, apex pointed and arcuate. Clavus small and wide, harpe short, finely arcuate, finger-like. Aedoeagus relatively short and thick with sclerotized distal lamina. Vesica consists of three diverticles, two of them short with fine, pointed terminal cornuti, third of them long and reclinate with a characteristic, sclerotized ribbon on dorsal surface.

Specific differences and taxonomic position: The new species is closely related to *sinopsis* BOURSIN, 1941 and *mediogrisea* WARREN, 1913 (the third species of this group, *eugrapha* BOURSIN, 1941 is much more distinct) but the differences between them are well discernible. The ground colour of *falcata* is more greyish than that of *sinopsis*, the medial and terminal fields have stronger and more distinct pattern, the postmedial line is stronger and serrate, the costal part and the cell have no yellowish shade, the reniform is more distinctly encircled. The hind wing of *falcata* is more uniformly suffused with pale greyish than in case of *sinopsis*, the underside of fore wing is much lighter and slightly transparent, the transversal line is visible. The two other related species, *mediogrisea* and *eugrapha* have much darker coloration than the two species discussed above. The male genitalia display also good distinctive fea-



Figs 50—55. 50—51 = *Cucullia falcata* sp. n., Holotype, Afganistan. 52—53 = *C. sinopsis* BOURSIN, Holotype, China. 54—55 = *C. eugrapha* BOURSIN, China ("Neoallotype")

tures: the harpe of *falcata* is much shorter than those of *sinopsis* (Figs 52—53) and *mediogrisea*, the apical part is slightly curved. The cucullus of *falcata* is more strongly curved at apex and the clavus is less wide than that of *sinopsis*. The cornuti of the vesica of the two similar species have different shape and size (see the Figs 51, 53). The related species, *eugrapha* has a very special shape of valvae (Figs 54—55) with much shorter cucullus and a short, costal lobe which is absent in this group, but the presence of the very characteristic sclerotized ribbon of the large diverticle of the vesica are evidently show the close relationship with the other species of the group.

It is an interesting fact that this sclerotized ribbon, besides the *sinopsis-mediogrisea* group, can be found only in the *prenanthis-armena* group (and, probably in *stigmatophora* HAMPSON, 1906, of which we could study only female specimens) and these groups are very far from each other both from morphological and zoogeographical points of view. But, on the other hand, these two groups strongly differ from the other groups of the genus. We have not enough information whether it is only a question of simple convergence, that this character appears in these groups, or not? But it is quite likely that these groups derive from a common ancestor and as a result of their different

ways of development in highly different habitats and zoogeographical region they represent two differently — and very specially — modified groups of species preserved only this common character showing their close relationship.

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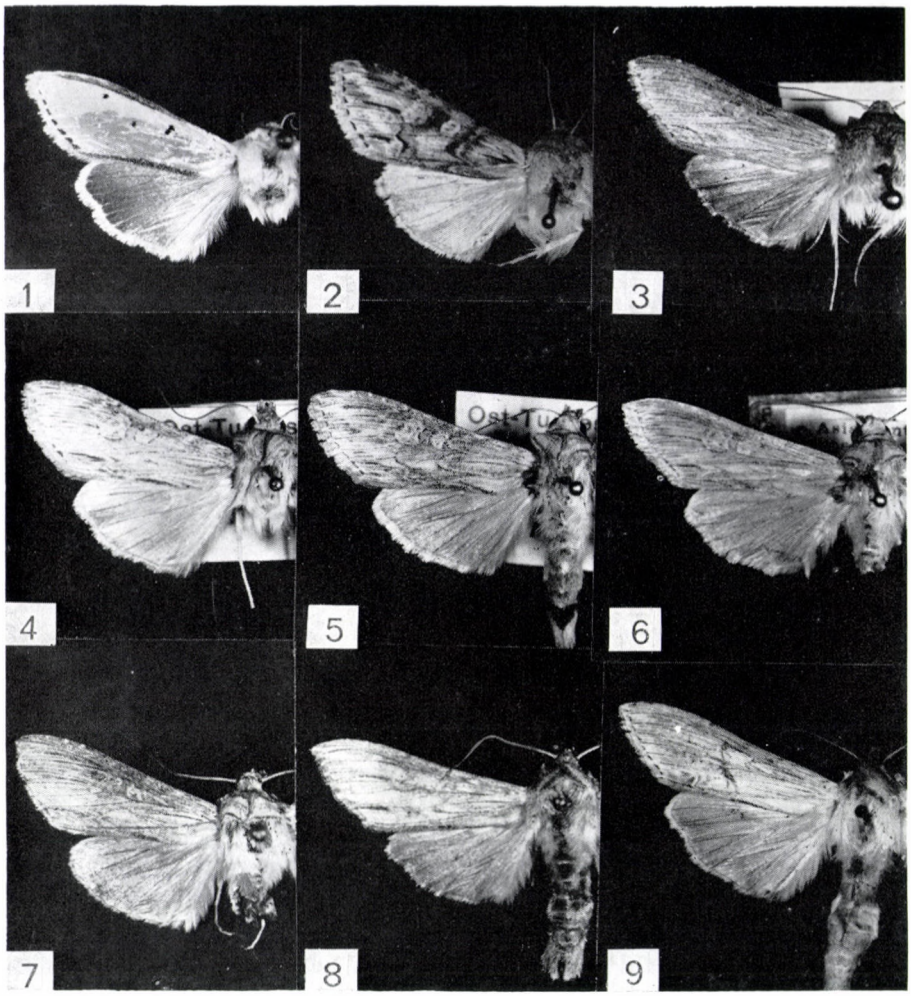
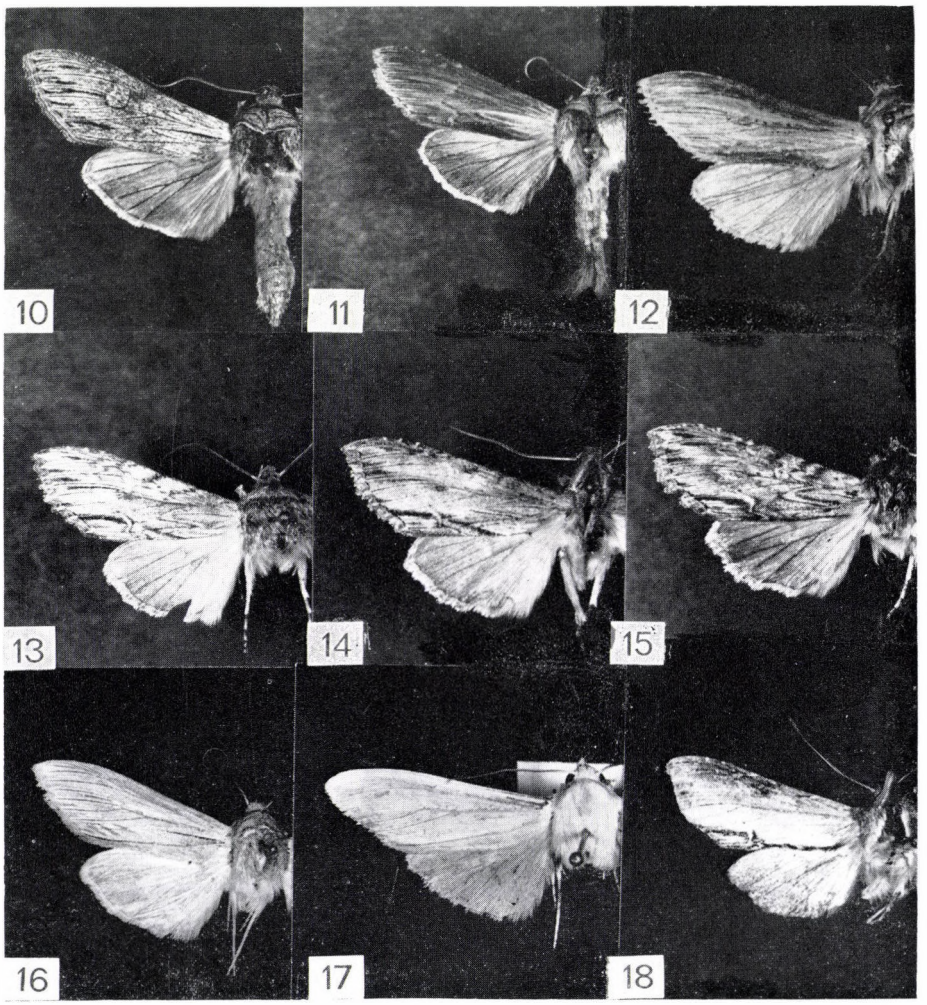
Plate I



1 = *Cucullia platinea* sp. n., Holotype, Mongolia. — 2 = *C. retectina* sp. n., Holotype, Asia c. — 3 = *C. dracunculi* HÜBNER, Ural. — 4 = *C. turkestana* sp. n., Holotype, Aksu; 5 = Paratype, Aksu; 6 = Paratype, Issyk-Kul. — 7 = *C. implicata* sp. n., Paratype, Mongolia. — 8 = *C. opacographa* G. RONKAY et L. RONKAY, Holotype, Afghanistan. — 9 = *C. amota* ALPHÉRAKY, Lectotype, Tura

Plate II



10 = *Cucullia papoka* G. RONKAY et L. RONKAY, Holotype, Mongolia. — 11 = *C. virgaureae sinnamona* ssp. n., Paratype, Mongolia. — 12 = *C. virgaureae* ssp., Tien-Shan. — 13 = *C. falcata* sp. n., Holotype, Afghanistan. — 14 = *C. sinopsis* BOURSIN, Holotype, China. — 15 = *C. eugrapha* BOURSIN, Holotype, China. — 16 = *C. subgrisea* G. RONKAY et L. RONKAY, Holotype, USSR, Kazakhstan. — 17 = *C. sabulosa* STAUDINGER, Emba. — 18 = *C. armena* G. RONKAY et L. RONKAY, Holotype, Armenia

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