

Supplement to the classification of *Phthiracaroida*, with redescriptions
and descriptions of some species
(*Acari, Oribatida, Euptyctima*)

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ABSTRACT. Two new genera *Arphthnicarus* and *Phrathnicarus*, and a new species *Phrathnicarus inflatus* (New Zealand) are described. Following new synonyms are proposed: *Phthiracarus bryobius* JACOT, 1930 (= *P. pilosus* SERGENKO, 1987), *P. incertus* NIEDBALA, 1983 (= *P. conformis* SERGENKO, 1987), *P. pygmaeus* BALOGH, 1958 (= *P. serrula* BALOGH et MAHUNKA, 1977), *Steganacarus (Steganacarus) coniunctus* NIEDBALA, 1983 (= *Steganacarus danae* MAHUNKA and MIKO, 1989), *Steganacarus (Steganacarus) patruelis* NIEDBALA, 1983 (= *Steganacarus lazitanicus* MAHUNKA et MIKO, 1989), *Steganacarus (Steganacarus) spinosus* (SELLNICK, 1920) (= *Steganacarus barborae* MAHUNKA et MIKO, 1989), *S. (Tropacarus) desmeti* NIEDBALA, 1986 (= *S. (T.) altitudinis* BERNINI, BERNINI et AVANZATI, 1989), *Austrophthiracarus radiatus* BALOGH et MAHUNKA, 1978 (= *A. similis* BALOGH et BALOGH, 1983), *Atropacarus (Hoplophorella) lanceosetus* (BALOGH et MAHUNKA, 1981) (= *Hoplophorella neglecta* NIEDBALA, 1984), *A. (H.) singularis* (SELLNICK, 1959) (= *Hoplophthiracarus regalis* MAHUNKA, 1978), *Atropacarus (Atropacarus) wandae* (NIEDBALA, 1981) (= *Steganacarus navarrensis* MORAZA, 1984). A new name *Phthiracarus mahunkai* is proposed for *Phthiracarus flagellatus* (MAHUNKA, 1980) not *P. flagellatus* WALLWORK, 1977. NIEDBALA'S (1986) classification of *Phthiracaroida* is modified. Generic diagnoses and a determination key for genera and subgenera are provided. Comments on some papers published after the classification (NIEDBALA 1986a) was proposed are made.

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INTRODUCTION

The *Phthiracaroida* form a group of mites of comparatively few noticeable and taxonomically useful characters, and consequently species of this group are rather difficult to identify. However, starting from the fifties, the group has become a popular object of scientific studies, and during the last decade many new species were described, mainly by MAHUNKA and NIEDBALA. The monograph of the *Phthiracaroida* (NIEDBALA 1992) did not include papers published after my new classification, and the catalogue of the *Phthiracaroida* (NIEDBALA 1986a, 1986b). In my opinion it is necessary to discuss certain statements and suggestions contained in these works. Such a discussion does not imply any fundamental changes in my system of the *Phthiracaroida* (NIEDBALA 1986a, 1988, 1992). It supports the basic thesis of the system, at the same time revealing a need for its modification.

The second part of this paper contains redescrptions or supplementary descriptions of species, even those recently described, whose original descriptions disregarded many important morphological characters and erroneously interpreted other features. The redescrptions were mostly based on type material.

MODIFICATION OF THE CLASSIFICATION OF THE *PHTHIRACAROIDEA*.

There are three main reasons to modify the classification, and to shorten diagnoses of several genera:

1. Descriptions of new species of various genera increased their variability range, thus narrowing the gap between them, as was suggested earlier (NIEDBALA 1987). For this reason, diagnoses of some genera had to be shortened.

2. Detailed redescrptions of type species of some genera caused nomenclature changes, and new generic synonymies were established.

3. A newly described genus and a redescrbed subgenus had to be placed in the system.

Detailed redescrptions of species described by BALOGH and MAHUNKA, especially type species of *Austrophthiracarus* BALOGH and MAHUNKA, 1978, *Antarctoplophora* MAHUNKA, 1980, *Fuegoplophora* MAHUNKA, 1980, *Phthirarica* MAHUNKA, 1982, *Hauserophtiracarus* MAHUNKA, 1982 and *Sturmacarus* BALOGH, 1984 induce some nomenclature changes.

It appears that *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978, the type species of the genus *Austrophthiracarus* BALOGH and MAHUNKA, 1978, has morphological characters similar to those of *Calyptophthiracarus mitratus* AOKI, 1980, the type species of *Calyptophthiracarus* AOKI, 1980. The similarities involve mainly the arrangement of genital setae i.e. the setae are arranged in two rows, or at least setae g_6 and g_7 are remote from the paraxial margin of plate. Thus *Austrophthiracarus* BALOGH and MAHUNKA becomes a senior, and *Calyptophthiracarus* Aoki a junior synonym.

Moreover, an analysis of morphological characters of five type species, namely *Antarctoplophora darwini* MAHUNKA, 1980; *Fuegoplophora foveoreticulata* MAHUNKA, 1980; *Phthirarica ridicula* MAHUNKA, 1982; *Hauserophthiracarus oenipontanus* MAHUNKA, 1982 and *Sturmacarus espeletiae* BALOGH, 1984 indicates that all these species are congeneric with *Austrophthiracarus radiatus*, being similar mainly in the arrangement of genital setae. Therefore *Austrophthiracarus* BALOGH and MAHUNKA, 1978 is a correct name for *Calyptophthiracarus* AOKI, 1980, also sensu NIEDBALA (1986a, 1986b, 1988, 1992), and its synonymy is the following:

- Austrophthiracarus* BALOGH and MAHUNKA, 1978
Calyptophthiracarus AOKI, 1980 **syn. nov.**
Antarctoplophora MAHUNKA, 1980
Fuegoplophora MAHUNKA, 1980
Phthirarica MAHUNKA, 1982
Hauserophthiracarus MAHUNKA, 1982 **syn. nov.**
Sturmacarus BALOGH, 1984

For species that fit into the generic definition of *Austrophthiracarus* BALOGH and MAHUNKA, 1978 sensu NIEDBALA (1986a, 1986b, 1988, 1992) I propose a new genus *Arphthiracarus* **gen. nov.**, with the type species *Hoplophthiracarus latebrosus* NIEDBALA, 1982.

To sum up, *Calyptophthiracarus* AOKI sensu NIEDBALA (1986a, 1986b, 1988, 1992) is now *Austrophthiracarus* BALOGH and MAHUNKA, 1978, yet *Austrophthiracarus* BALOGH and MAHUNKA, 1978 sensu NIEDBALA (1986a, 1986b, 1988, 1992) is now *Arphthiracarus* NIEDBALA **gen. nov.** An analysis of morphological characters of other species described by me reveals similarities to *Austrophthiracarus radiatus* (especially in the arrangement of genital setae). As a result they are now included in *Austrophthiracarus* in its new sense. These are: *Austrophthiracarus incrassatus* (NIEDBALA, 1984), *Austrophthiracarus baloghi* NIEDBALA, 1987, and *Austrophthiracarus willmanni* NIEDBALA, 1987. A list of species known so far in the genera *Austrophthiracarus* and *Arphthiracarus* is given below for the sake of clarity.

***Austrophthiracarus* BALOGH and MAHUNKA, 1978**

(type species – *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978): *radiatus*

BALOGH and MAHUNKA, 1978; *admirabilis* (NIEDBALA, 1982); *andinus* BALOGH, 1984; *baloghi* (NIEDBALA, 1987); *candidulus* (NIEDBALA, 1983); *costai* (MACFARLANE and SHEALS, 1965); *cucundus* (NIEDBALA, 1988); *darwini* (MAHUNKA, 1980); *dilucidus* (NIEDBALA, 1988); *elizabethensis* (NIEDBALA, 1988); *espeletiae* BALOGH, 1984; *excellens* (NIEDBALA, 1982); *foveoreticulatus* (MAHUNKA, 1982); *globiger* (HAMMER, 1962); *heterotrichus* (MAHUNKA, 1979); *hirtus* BALOGH, 1984; *incrassatus* (NIEDBALA, 1984); *inuitatus* (NIEDBALA, 1983); *kochi* (NIEDBALA, 1987); *laticus* (NIEDBALA, 1982); *michaeli* (NIEDBALA, 1987); *mirandus* (NIEDBALA, 1988); *mitratus* (AOKI, 1980); *nicoleti* (NIEDBALA, 1987); *nitidus* PEREZ-ÍNIGO, 1988; *oenipontanus* (MAHUNKA, 1982); *olivaceus* (JACOT, 1928); *pavidus* (BERLESE, 1913); *perti* (NIEDBALA, 1987); *phaleratus* (NIEDBALA, 1982); *portentosus* (NIEDBALA, 1988); *pullus* (NIEDBALA, 1989); *ridiculus* (MAHUNKA, 1982); *scopoli* (NIEDBALA, 1987); *sellnicki* (NIEDBALA, 1987); *similis* BALOGH and BALOGH, 1983; *strigosus* (NIEDBALA, 1984); *tragardhi* (NIEDBALA, 1987); *tricarinatus* (NIEDBALA, 1988); *vicinus* (NIEDBALA, 1984); *villosus* (NIEDBALA, 1982); *wallworki* BALOGH and BALOGH, 1983; *willmanni* (NIEDBALA, 1987).

Arphthiacarus gen. nov.

(type species - *Hoplophthiracarus latebrosus* (NIEDBALA, 1982)): *latebrosus* (NIEDBALA, 1982); *aokii* (NIEDBALA, 1987); *brasiliensis* (NIEDBALA, 1988); *contrarius* (NIEDBALA, 1985); *dubius* (NIEDBALA, 1982); *inaequus* (NIEDBALA, 1985); *indicus* (BAYOUMI and MAHUNKA, 1979); *indiligens* (NIEDBALA, 1985); *inelegans* (NIEDBALA, 1985); *inenarrabilis* (NIEDBALA, 1982); *ineptus* (NIEDBALA, 1984); *mirandus* (NIEDBALA, 1988); *pervicax* (NIEDBALA, 1984); *remotus* (NIEDBALA, 1989); *saucius* (NIEDBALA, 1988); *sculptilis* (NIEDBALA, 1988); *sentus* (NIEDBALA, 1989); *sororius* (NIEDBALA, 1982); *veteratorius* (NIEDBALA, 1988).

In my comments on the synonymized genera (NIEDBALA 1986a, 1992) I synonymized *Tropacarus* EWING, 1917 with *Steganacarus* EWING, 1917. The decision was based on the fact that the only difference between those two genera was the presence of a median notogastral ridge. The character is variable, and in some populations the ridge is present in the posterior part of notogaster only (e.g. *Phthiracarus (Trachyhoplophora) brevipilus* BERLESE, 1923). However, BERNINI and AVANZATI (1989a) demonstrated the real existence of this taxon (subgenus), with the use of gene sequencing and enzyme analysis. The genetic distance between *Steganacarus (Tropacarus)* BERNINI and AVANZATI, 1989, and *Steganacarus (Steganacarus)* NIEDBALA, 1983 is close to that between *Steganacarus (Steganacarus)*, and *Steganacarus (Rhacaplacarus)* NIEDBALA, 1986 (based on the following species: *S. (T.) brevipilus* (BERLESE, 1923); *S. (T.) carinatus* (C.L.KOCH, 1841); *S. (S.) magnus* (NICOLET, 1855); *S. (R.) ortizi* (PEREZ-ÍNIGO, 1969). The diagnosis of the subgenus *Tropacarus* (BERNINI and AVANZATI, 1989a, p. 14) is less convincing. The presence of the median notogastral ridge seems to be a good character (even in *S. (T.) brevipilus* it may be present along the whole notogaster), but the remaining 11 features are not so (p. 15). In some way they enable a distinction between species within *Tropacarus* and *Steganacarus*, but

are not reliable enough to distinguish between the two subgenera. For example, the presence of the lateral aspal keel on prodorsum does not enable a distinction between *Tropacarus* and *Steganacarus* (cf. NIEDBALA 1992). Setae ad_1 and ad_2 on the ano-adanal plate (x_1, x_2) are supposed to be displaced in *Tropacarus*, and arranged in a row in *Steganacarus*. However, they are displaced in *S. (S.) vernaculus* NIEDBALA, 1982, but not in *S. (T.) balcanicus* BERNINI and AVANZATI, 1989 (fig. 54: right) and *S. (T.) pseudocarinatus* BERNINI and AVANZATI, 1989 (fig. 55: left) (BERNINI and AVANZATI 1989b). Likewise, the length of ano-adanal setae is not always a distinctive character; e.g. *S. (T.) boulfekhari* NIEDBALA 1986, and *S. (T.) desmeti* NIEDBALA, 1988 lack short ano-adanal setae, like other species of *Tropacarus*. Moreover, *S. (S.) flagellatissimus* MAHUNKA, 1979, and *S. (S.) herculeanus* WILLMANN, 1953 have long ano-adanal setae, and a high and angled median aspal ridge, but *S. (S.) inaestimabilis* NIEDBALA, 1984 has short ano-adanal setae and a low aspal ridge.

Despite all the above reservations and exceptions I consider the observations of the Italian authors to be very valuable, and I think that after some verification, certain regularities could be established.

Finally, a newly described genus *Phrathicarus* gen. nov. is on one hand related to *Arphthicarus* gen. nov., and on the other to *Atropacarus* (*Atropacarus*) NIEDBALA, 1986 (see comments on *Phrathicarus inflatus* sp. nov.). Therefore it should be placed in an adequate position in the system, which now is proposed as follows.

CLASSIFICATION OF THE PHTHIRACAROIDEA

Superfamily - *Phthiracaroidea* PERTY, 1841

Family - *Phthiracaridae* PERTY, 1841

Tribe - *Phthiracarini* PERTY, 1841

Genus - *Phthiracarus* PERTY, 1839

Family - *Steganacaridae* NIEDBALA, 1986

Subfamily - *Steganacarinae* NIEDBALA, 1986

Tribe - *Plonaphacarini* NIEDBALA, 1986

Genus - *Plonaphacarus* NIEDBALA, 1986

Tribe - *Steganacarini* NIEDBALA, 1986

Genus - *Hoplophthiracarus* JACOT, 1933

Genus - *Steganacarus* EWING, 1917

Subgenus - *Steganacarus* EWING, 1917

Tropacarus EWING, 1917

Rhacaplacarus NIEDBALA, 1986

Subfamily - *Atropacarinae* NIEDBALA, 1986

Tribe - *Austrophthiracarini* nov. nom.

Genus - *Austrophthiracarus* BALOGH & MAHUNKA, 1978

Tribe - *Atropacarini* NIEDBALA, 1986

Genus - *Arphthicarus* gen. nov.

Protophthiracarus BALOGH, 1972

Phrathiracarus gen. nov.

Notophthiracarus RAMSAY, 1966

Atropacarus EWING, 1917

Subgenus - *Atropacarus* EWING, 1917

Hoplophorella BERLESE, 1923

DIAGNOSES OF GENERA

***Phthiracarus* PERTY, 1839**

type species - *Phthiracarus contractilis* PERTY, 1841 (= *Hoplophora laevigata* C.L.KOCH, 1841).

Body surface smooth, punctate (except *P. papillosus* PARRY, 1979). Dorsal and lateral regions of prodorsum not fused. Lateral carina of prodorsum may be long, extending beyond or reaching the sinus, but in many cases it is shorter. No furrows in the back of prodorsum (with some exceptions). Sensillus most often smooth, short, fusiform or rounded distally, or else long and filiform, without a distinct head. Rostral setae remote from the end of rostrum. Interlamellar setae always parallel to the surface of prodorsum. Setae of prodorsum and notogaster smooth, fine and long, tapering to a sharp point. No carina on notogaster. There are 15 pairs of gastronotal setae, rarely more. Genital setae arranged in two rows, setae g_8 - g_9 remote from the paraxial margin, seta g_6 usually near or above g_5 . Adanal setae always remote from the paraxial margin of plate, setae ad_1 and ad_2 may be normal, minute or vestigial. Neotrichy involving adanal setae may occur. Seta d of tibia IV short, coupled with solenidion. When present, seta v' on femur I long. Seta ft" of tarsus I normal.

***Plonaphacarus* NIEDBALA, 1986**

type species - *Hoplophthiracarus eximius* NIEDBALA, 1982.

Dorsal and lateral regions of prodorsum not fused. Rostral setae inserted far from the end of rostrum. Genital setae arranged in two rows, setae g_7 - g_9 always remote from the paraxial margin. Adanal setae at a distance from the paraxial margin of ano-adanal plate. Seta v' of femur I present.

***Hoplophthiracarus* JACOT, 1933**

type species - *Hoploderma histricinum* BERLESE, 1908.

Body surface usually covered with concavities. Dorsal region of prodorsum not fused with the lateral regions. Furrows usually present on the back of prodorsum. Interlamellar setae more or less erect. Lamellar setae usually very short. The form of sensillus is usually of "histricinus" type. Seta c₁ on notogaster shorter than the distance

between setae c_1 and d_1 . There are always 9 pairs of genital setae. Adanal setae remote from the paraxial margin of ano-adanal plate; seta ad_1 longer than the anal setae. All setae on ano-adanal plate normal. Neotrichy of adanal setae has been observed. Seta d on femur I usually at the distal end of segment.

***Steganacarus* EWING, 1917**

type species - *Hoplophora magna* NICOLET, 1855 = *Hoploderma anomala* BERLESE, 1883.

Body surface covered with concavities. Lateral carina of prodorsum does not extend beyond the sinus. Furrows present on the back of prodorsum. There are 15 pairs of gastronotal setae. Seta ad_1 near the paraxial margin, in a row with anal setae. Seta ad_2 near anal setae, or displaced towards the paraxial margin, where it forms a row with anal setae and seta ad_1 . There are always 5 normal setae on the ano-adanal plate. Seta v' on femur I and seta l' on genu IV present.

***Steganacarus (Rhacaplacarus)* NIEDBALA, 1986**

type species - *Hoplophorella amoena* NIEDBALA, 1983.

Lamellar and exobothridial setae short. Length ratio of lamellar seta/prodorsum < 0.18 ; length ratio of exobothridial seta/prodorsum < 0.07 . Setae h on infracapitulum usually shorter than the distance between them. Seta ad_2 displaced towards the paraxial margin. Distance between seta ad_2 and anal setae equal to that between the anal setae and paraxial margin. Seta v' on femur short; length ratio $v''/v' < 2.25$.

***Steganacarus (Steganacarus)* EWING, 1917**

type species - *Hoplophora magna* NICOLET, 1855 = *Hoploderma anomala* BERLESE, 1883.

Seta ad_2 displaced towards the paraxial margin, in a row with anal setae and seta ad_1 . Seta d on femur I displaced towards the distal end of segment.

***Steganacarus (Tropacarus)* EWING, 1917**

type species - *Hoplophora carinata* C.L.KOCH, 1841 (neotype designated by BERNINI and AVANZATI 1989 is deposited in the Berlese collection).

Median notogaster ridge present (at least partially).

***Austrophthiracarus* BALOGH and MAHUNKA, 1978**

type species - *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978.

Body surface punctate. Dorsal and lateral regions of prodorsum not fused. Rostral setae inserted at a distance from the end of rostrum. Neotrichy of gastronotal and adanal

setae is sometimes observed. There are always 9 pairs of genital setae. Genital setae arranged in two rows; seta g_6 close to, or even above g_4 . At least setae g_6 and g_7 remote from the paraxial region. Adanal setae remote from the paraxial margin of plate; all of these normal.

***Arphthiarius* gen. nov.**

type species - *Hoplophthiarius latebrosus* NIEDBALA, 1982.

Dorsal and lateral regions of prodorsum not fused. Lamellar setae short; length ratio of lamellar setae/prodorsum < 0.18 . Seta c_1 on notogaster shorter than the distance between setae c_1 and d_1 . There is a neotrichy of gastronotal and adanal setae. Setae g_7 - g_9 displaced towards the paraxial margin of ano-adanal plate; almost in a row with setae g_1 - g_5 ; seta g_6 remote from the margin and located above g_5 . When it is placed below this seta, the distance between g_6 and g_5 is shorter than that between g_5 and g_4 . Seta ad_1 at a distance from the paraxial margin and longer than anal setae. Seta ad_2 far from the margin; adanal setae normal. Seta ft'' on tarsus I normal.

***Protophthiarius* BALOGH, 1972**

type species - *Neophthiarius chilensis* BALOGH and MAHUNKA, 1967.

Body surface covered with concavities. There are furrows on the back of prodorsum. Dorsal and lateral regions of prodorsum not fused. Exobothridial seta short or vestigial. There is a neotrichy involving setae of notogaster and ano-adanal plate. Setae c_1 shorter than the distance between setae c_1 and d_1 . Setae g_7 - g_9 displaced towards the paraxial margin, form a row with setae g_1 - g_5 (sometimes one of these setae not displaced). Seta g_6 remote from the margin and situated on the side, or above g_5 . There are always 9 pairs of genital setae. Setae of ano-adanal plate normal. Seta ad_1 displaced towards the paraxial margin, in a row with anal setae; seta ad_2 at a distance from the margin. Seta v' on femur I short (length ratio $v''/v' > 2.25$). Seta ft'' on tarsus I normal. Seta l' of genu IV present.

***Phrathicarius* gen. nov.**

type species - *Phrathicarius inflatus* sp. nov.

Body surface punctate. Dorsal and lateral regions of prodorsum not fused. Lateral carina and furrows in the back of prodorsum absent. Interlamellar setae erect. Neotrichy of the gastronotal setae present. There are 9 pairs of genital setae. Setae g_7 - g_9 (or only g_7 and g_9) displaced towards the paraxial margin, in a row with g_1 - g_5 . Seta g_6 (or also g_8) remote from the margin. Four setae (ad_1 , an_1 , an_2 and ad_2) form a row near the paraxial margin of ano-adanal plate. Seta d on femur I located at the distal end of segment. Seta v' on femur I and seta l' on genu IV present. Seta l' on tibia IV short, coupled with solenidion. Seta ft'' on tarsus I normal.

***Notophthiracarus* RAMSAY, 1966**

type species - *Phthiracarus maculatus* TRÄGÅRDH, 1931.

There are 9 pairs of genital setae arranged in a single line. Distance between setae g_6 and g_5 longer than that between g_5 and g_4 or g_3 and g_4 . There are 5 pairs of setae on ano-adanal plate. Setae ad_1 and ad_2 remote from the paraxial margin, normal, minute or vestigial. Seta v' on femur I (if present) minute (length ratio $v''/v' < 2.25$). Seta l' on genu IV always present. Seta ft'' on tarsus I normal.

***Atropacarus* EWING, 1917**

type species - *Hoplophora stricula* C.L.KOCH, 1836.

Body surface covered with concavities. There are furrows on the back of prodorsum. Lamellar setae minute (length ratio of lamellar setae/prodorsum < 0.18). Genital setae in a single row or nearly so; distance between setae g_6 and g_5 longer than that between g_5 and g_4 . Seta ad_1 always close to the paraxial margin, in a row with anal setae. Seta ad_2 remote from the paraxial margin or close to it. Seta v' on femur I minute (length ratio $v''/v' < 2.25$).

***Atropacarus (Hoplophorella)* NIEDBALA, 1986**

type species - *Hoplophorella cucullatum* EWING, 1909.

There are 15 pairs of gastronotal setae. As a rule only 2 lyrifissures, ia and im . There are 9 pairs of genital setae and 5 pairs on ano-adanal plate. Seta ad_2 remote from the paraxial margin. Seta ft'' on tarsus I normal.

***Atropacarus (Atropacarus)* EWING, 1917**

type species - *Hoplophora stricula* C.L.KOCH, 1836.

Cerotegument usually present. Lateral carina of prodorsum usually absent. Sensillus long. Rostral setae usually placed at the end of rostrum. There are 16 or more pairs of setae on notogaster (only *A. (A.) pergratus* NIEDBALA, 1993 has 15 pairs). Vestigial seta f_1 always below h_1 . Lyrifissure im below the line $cp-h_3$. Four setae (ad_1 , an_1 , an_2 , ad_2) on the paraxial margin of ano-adanal plate. All setae on ano-adanal plate normal. There may be a neotrichy involving adanal setae. Seta d on femur I located at the distal end of segment. Seta a'' on tarsus I and seta a'' on tarsus II not recurved distally. Seta ft'' on tarsus I minute.

DETERMINATION KEY FOR GENERA AND SUBGENERA

1. Four setae (ad_1 , an_1 , an_2 , ad_2) in a row near the paraxial margin of ano-adanal plate 2.
- . Fewer setae near the paraxial margin 5.

2. Seta d on tibia IV long, independent of the solenidion. Genital setae g_7 - g_9 displaced towards the paraxial margin of genito-aggenital plate and arranged in a row, or nearly, with setae g_1 - g_5 ; seta g_6 not displaced and located near g_5 or above it; when it is located below seta g_5 , the distance between g_6 and g_5 is shorter than that between g_5 and g_4 3.
- Seta d on tibia IV short, coupled with solenidion. All genital setae located in a row or nearly; seta g_6 remote from the paraxial margin, beyond the row of the remaining setae 4.
3. Median notogaster ridge present (at least partially) *Steganacarus (Tropacarus)*.
- Median notogaster ridge absent *Steganacarus (Steganacarus)*.
4. Seta g_6 and rarely g_8 remote from the paraxial margin of genito-aggenital plate, the remaining setae arranged in a row near the paraxial margin of genito-aggenital plate *Phrathicarus* gen. nov.
- All genital setae located in a row or nearly, near the paraxial margin of plate; distance between setae g_6 and g_5 longer than that between g_5 and g_4 *Atropacarus (Atropacarus)*.
5. Three setae (ad_1 , an_1 , an_2) in a row, evenly spaced, near the paraxial margin of ano-adanal plate; seta ad_1 not longer than anal setae 6.
- Two setae (an_1 and an_2) near the paraxial margin of ano-adanal plate; when seta ad_1 close to the paraxial margin below the anal setae, then it is longer than anal setae 8.
6. Seta d on tibia IV long and independent of the solenidion. Genital setae g_7 - g_9 displaced towards the paraxial margin and arranged almost in a row with setae g_1 - g_5 ; seta g_6 remote from the margin and located near or above g_5 *Steganacarus (Rhacaplacarus)*.
- Seta d on tibia IV short, coupled with solenidion. Genital setae g_6 - g_9 displaced towards the paraxial margin and arranged in a row, or nearly, with setae g_1 - g_5 , or setae g_7 - g_9 displaced towards the margin, seta g_6 remote from the margin 7.
7. Genital setae g_7 - g_9 displaced towards the paraxial margin and arranged in a row, or nearly, with setae g_1 - g_5 , seta g_6 remote from the paraxial margin and located near or above g_5 *Protolphthiracarus*.
- Genital setae in a row, or nearly, near the paraxial margin, distance between g_6 and g_5 longer than that between g_5 and g_4 *Atropacarus (Hoplophorella)*.
8. Seta d on tibia IV long, independent of the solenidion 9.
- Seta d on tibia IV short, coupled with solenidion 10.
9. Genital setae arranged in two rows; g_6 - g_9 always some distance from the paraxial margin *Plonaphacarus*.
- Genital setae g_6 - g_9 or only g_7 - g_9 displaced from the paraxial margin and arranged in a row, or nearly, with setae g_1 - g_5 ; seta g_6 remote from the paraxial margin and close to or below g_5 ; when it is located above seta g_5 , distance between g_5 and g_6 shorter than that between g_5 and g_4 *Hoplophthiracarus*.
10. Genital setae arranged in two rows; setae g_6 - g_9 remote from the paraxial margin or at least setae g_6 and g_7 remote distinctly, seta g_6 above or near g_5 , no furrows on the back of prodorsum 11.

- Genital setae displaced towards the paraxial margin and arranged in a row or nearly, or seta g_7 - g_9 displaced towards the margin, seta g_6 remote from the margin; furrows on the back of prodorsum present or absent 12.
- 11. Setae on notogaster smooth and thin, tapering to a point at the distal end *Phthiracarus*.
- Setae on notogaster covered with spines, smooth but short and spiniform, or long but flagellate *Austrophthiracarus*.
- 12. Genital setae g_7 - g_9 displaced towards the paraxial margin and forming a row with setae g_1 - g_5 ; seta g_6 above g_5 ; when it is below seta g_5 , distance between g_6 and g_5 shorter than that between g_5 and g_4 ; neotrichy of ano-adanal and gastronotal setae present or absent *Arphthiracarus*.
- Genital setae arranged in a row, or nearly, near the paraxial margin; distance between g_6 and g_5 longer than that between g_5 and g_4 or g_4 and g_3 ; no neotrichy of ano-adanal and gastronotal setae (exception: *N. kamilli* NIEDBALA, 1987) *Notophthiracarus*.

DESCRIPTION OF A NEW SPECIES

***Phrathiracarus inflatus* sp. nov.**

(Figs 192 -199)

Measurements: prodorsum: length 419, width 278, height 141, sensillus 141, in 454, le 95.9, ro 156, ex 30.3; notogaster 782, width 262, height 515, c_1 424, h1 454, ps1 379; genito-aggenital plate 197x182; ano-adanal plate 278x182.

Colour light brown. Body surface punctate and covered with strong cerotegument.

Prodorsum. Dorsal and lateral regions short. Lateral carina absent. Sensillus long, narrow, bent, rough. Interlamellar setae erect, long, strong, rough with flagellate distal ends. Rostral setae strong, bent, rough with flagellate distal ends. Lamellar setae strong, rough, in>ro>le>ex.

Notogaster with 19 pairs of normal setae of varied length and shape. Additional setae in rows c and ps. Setae d_1 , d_2 , h_3 , ps_2 , ps_3 , ps_4 , fairly short, rough, the remaining setae long ($c1/c1-d1=2,27$), strong, rough, with flagellate distal ends. Vestigial setae absent. One pair of lyrifissures im only.

Ventral region. Infracapitular mentum with h setae longer than the distance between them. Arrangement of genital setae 4+2:3. Setae g_6 and g_8 remote from the inner margin of plate (in the holotype their position is distinct). Ano-adanal plate with five rough setae, four long setae flagelliform, inserted at the inner margin, ad, spiniform.

Leg chaetotaxy complete. Tibia IV with short seta d coupled with solenidion. Seta d on femur I located at the distal end of article and forked. Setae a" on tarsus I and a" on tarsus II hooked distally, seta ft" straight.

The species differs from other species in the following characters: shape of sensillus, shape and length of interlamellar and rostral setae, heterotrichous gastronotal setae, arrangement of genital, anal and adanal setae.

Holotype and 18 paratypes: New Zealand, Forster col., Waipona Forest, 06.01.1967, RRF (holotype and 9 paratypes in J. BALOGH's collection, 8 paratypes in the Department of Animal Taxonomy and Ecology, University of Poznań).

Distribution: New Zealand.

In the tribe *Atropacarini* NIEDBAŁA, 1986 the genus occupies an intermediate position between *Arphthycarus* gen. nov. (arrangement of genital setae, long "ft" seta on tarsus I) and *Atropacarus* (*Atropacarus*) (neotrichy of gastronotal setae, four setae at the inner margin of ano-adanal plate). For a detailed description of the genus see page 8.

REDESCRIPTIONS OF SPECIES

All abbreviations and explanations as in NIEDBAŁA 1992. Measurements are given for one specimen for a species.

Phthiracarus atlanticus (PÉREZ-IÑIGO, 1987)

(Figs 1-6)

Archiphthiracarus atlanticus PÉREZ-IÑIGO, 1987

Archiphthiracarus atlanticus: NIEDBAŁA 1992

Material examined: a microscopic slide labelled "*Archiphthiracarus atlanticus* n.sp. Zool. SUELO SMA-23, Isla Santa Maria (Azores)", with 3 specimens (holotype and 2 paratypes?), (courtesy Dr. C. PÉREZ-IÑIGO, Instituto Espanol de Entomologia, Madrid).

Measurements of one of the specimens: prodorsum: length 425, height 139, sensillus 95.1, le 152, ro 108, ex 82.4; notogaster: length 865, height 688, c_1 285, h_1 158; genito-aggenital plate 214x186; ano-adanal plate 279x158. According to PÉREZ-IÑIGO (1987): length of prodorsum 336-420, length of notogaster 708-804.

Colour dark brown, body integument generally smooth punctate and porose.

Prodorsum with distinct dorsal and lateral regions. Lateral carina long, extending far beyond the sinus. Sensillus long, lanceolate. Setae long, smooth, fairly wide, gradually tapering, $in > le > ro > ex$.

Notogaster with 15 pairs of normal setae; setae moderately long, similar in structure to prodorsal setae, $c_1/c_1-d_1=1.45$, c_1 , c_2 and h_2 slightly longer than the remaining setae. Setae c remote from the anterior margin, c_2 much more so than c_1 and c_3 . Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im (in one specimen right lyrifissure ips absent).

Ventral region. Arrangement of genital setae 4+3:2. All the five setae on ano-adanal plate well developed.

Leg chaetotaxy complete. Setae a" on tarsus I, a" and ft" on tarsus II hooked distally.

Distribution: Azores.

The species is very similar to *Phthiracarus lentulus* (C.L. KOCH, 1841) but differs in wider setae and well developed adanal setae.

***Phthiracarus bryobius* JACOT, 1930**

(Figs 7-9)

Phthiracarus bryobius: NIEDBALA 1986b, 1992

Phthiracarus pilosus SERGENKO, 1987 **syn. nov.**

Phthiracarus pilosus: NIEDBALA 1992

Material examined: a microscopic slide labelled "N1062h Zakarpatskaja oblast Malyj Gorunskij pereval mokh 12.11.1984. *Phthiracarus pilosus* holotyp" (courtesy Dr. G. D. SERGENKO, Institut Zoologii AN UR, Kiev).

Measurements: prodorsum: length 255, width 187, sensillus 32.9, in 109, le 114, ro 68.3. According to SERGENKO (1987): prodorsum 253, width 179, in 116, le 128, ro 67, sensillus 38; notogaster 380, height 306, c₁ 98, c₂ 182, cp 190, h₁ 172, c₁-d₁ 93, an₁ 48.

Phthiracarus bryobius JACOT, 1930 was redescribed on the basis of a "cotype" (NIEDBALA 1992). *Phthiracarus pilosus* SERGENKO, 1987 is undoubtedly a synonym of this species. Tarsus IV has 12 setae, not 11 as mentioned by SERGENKO.

Distribution: Holarctic.

***Phthiracarus imbecilis* (MAHUNKA, 1989)**

(Figs 10-14)

Archiphthiracarus imbecilis MAHUNKA, 1989

Archiphthiracarus imbecilis: NIEDBALA 1992

Material examined: alcohol-preserved paratype labelled "*Archiphthiracarus imbecilis* sp. n. South Africa" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 233, height 75.9, sensillus 25.3, in 88.5, le 58.2, ro 43, ex 30.4; notogaster: length 409, height 318, c₁, h₁ and ps₁ 95.9, c₃ 40.4; genito-aggenital plate 139x50.6; ano-adanal plate 106x75.9. According to MAHUNKA (1989): length of prodorsum 254-337; notogaster: length 451-648, height 360-517.

Colour brown, body surface smooth and punctate.

Prodorsum. Dorsal and lateral regions and lateral carina weakly marked. Lateral carina reaching the sinus. Sensillus short with round head, covered with minute spines. Setae fairly strong, smooth, thin, in>le>ro>ex.

Notogaster with 15 pairs of normal setae; setae fairly strong but slightly flagellate, c₁=c₁-d₁. Seta c₃ short, adjacent to anterior margin, setae c₁ and c₂ at a distance from it, c₂ more so than c₁. Vestigial setae f₁ and f₂ absent. Only one pair of lyrifissures (ip?).

Ventral region. Arrangement of genital setae 4:5. Setae g₁-g₅ minute, but g₆-g₈ long, in an unusual position, situated far from the paraxial margin of plate, seta g₆ near

the abaxial margin. Ano-adanal plate with five well developed setae, $ad_3 > ad_2 > ad_1 > an$.

Leg chaetotaxy complete. Setae d and l_m on femur I closer to the proximal end of article, seta d strong and large. Setae a" on tarsus I and a" and ft" on tarsus II straight distally.

Distribution: South Africa.

The unusual arrangement of genital setae makes the species easily distinguishable from other members of *Phthiracarus*.

***Phthiracarus incertus* NIEDBALA, 1983**

(Fig. 15-20)

Phthiracarus incertus: NIEDBALA 1986b, 1992

Phthiracarus conformis SERGENKO, 1987 **syn.nov.**

Phthiracarus conformis: NIEDBALA 1992

Material examined: microscopic slides labelled "N 424 w* okr. g. Lvova listvennyj les trukha 11.05.83 g. *Phthiracarus conformis*", holotype and two paratypes. (courtesy G.D. SERGENKO, Institut Zoologii AN UR, Kiev).

Measurements: prodorsum: length 278, width 231, sensillus 80.8, in 121, le 111, ro 65.6; genito-agenital plate 126x106; ano-adanal plate 192x90.9. According to SERGENKO (1987): prodorsum: length 230-314, width 180-250, sensillus 67-94, in 100-154, le 83-140, ro 38-67; notogaster: length 414-570, height 330-470, c_1 134-214, c_1-d_1 122-150, h_1 112-224, ps_1 112-211.

Phthiracarus incertus NIEDBALA, 1983 was described in my papers (1983, 1992) and *Phthiracarus conformis* SERGENKO, 1987 is undoubtedly a synonym of this species. It is interesting that the holotype and one paratype of *P. conformis* have all the four pairs of lyrifissures ia, im, ip, ips, but the other paratype has only ia and im.

Distribution: Holartic.

***Phthiracarus mahunkai** nom. nov.**

(Figs 21-27)

Neoprotophthiracarus flagellatus MAHUNKA, 1980

Neoprotophthiracarus flagellatus: NIEDBALA 1986b, 1992

Material examined: two alcohol-preserved paratypes labelled "Neoprotophthiracarus flagellatus sp. n. Argentina, Ushuaia 26 III 1975 Am-75/3 leg. E.HORAK" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest)

Measurements: prodorsum: length 288, width 202, height 101, sensillus 32.9, in

* *Phthiracarus flagellatus* (MAHUNKA, 1980) is a junior subjective homonym of *Phthiracarus flagellatus* WALLWORK, 1977. I change this name in honour of Dr. S. MAHUNKA (Természettudományi Múzeum Allatára, Budapest) who described this species.

88.5, le 45.5, ro 63.2, ex 53.1; notogaster: length 515, width 348, height 321, c_1 91.1, h_1 and ps, 88.5; genito-aggenital plate 119x78.4; ano-adanal plate 263x86. According to MAHUNKA (1980): length of prodorsum 248-280, notogaster: length 456-528, height 316-336.

Colour yellow, body surface smooth and punctate.

Prodorsum. Dorsal and lateral regions distinct. Lateral carina absent. Sensillus with short pedicel and rounded, rough head. Setae thin, smooth, but fairly strong, $in > ro > ex > le$.

Notogaster with 20 pairs of normal setae, smooth, thin, moderately long ($c_1/c_1-d_1=0.78$). Setae c_1 and c_3 near the anterior margin, seta c_2 remote. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with h setae long, $h > h-h$. Arrangement of genital setae 4+5:0. Two pairs of anal setae and four pairs of adanal setae. Anal setae longer than adanal. Adanal setae become gradually smaller towards the anterior end of ano-adanal plate.

Leg chaetotaxy reduced. Setae v' on femur I and a'' on tarsus I absent. Setae a'' on tarsus I and a'' and ft'' on tarsus II straight distally.

Distribution: Argentina.

It is a typical Neotropical species of *Phthiracarus* with neotrichy of gastronotal and adanal setae.

Phthiracarus parmatus (NAKATAMARI, 1985)

(Figs 28-31)

Paraphthiracarus parmatus NAKATAMARI, 1985

Paraphthiracarus parmatus: NIEDBALA 1992

Material examined: a microscopic slide with paratype labelled "*Paraphthiracarus parmatus* sp. nov. NSMT-Ac 9645" (courtesy Dr. S. I. UENO, National Science Museum, Tokyo).

Measurements: sensillus 37.9, in 81, le 63.2, ex 40.5; genito-aggenital plate 136x116; ano-adanal plate 207x90.9. According to NAKATAMARI (1985): length of prodorsum 290-370, in 90; notogaster: length 560-710, height 460-520.

The paratype examined is partly damaged and only its visible characters are given below.

Colour yellow. Body surface punctate.

Prodorsum. Sensillus short, with thick, clavate head. Setae smooth, relatively long, $in > le > ex$. Notogaster with 15 pairs of normal, relatively long, smooth setae. Vestigial setae f_1 slightly dorsal to h_1 setae.

Ventral region. Arrangement of genital setae 4+2:3. Ano-adanal plate with five short, well developed setae.

Legs. All setae on femur I situated at the distal end of segment.

Distribution: Japan.

The species is similar to *Phthiracarus japonicus* AOKI, 1958 and *Phthiracarus clavatus* PARRY, 1979, but *P. japonicus* differs in the shape of sensillus, vestigial setae situated below h_1 , and adanal setae ad_1 and ad_2 vestigial. *P. clavatus* has a slightly different shape of sensillus, longer gastronotal setae, arrangement of genital setae: 4+3:2 and arrangement of setae on femur I somewhat different.

***Phthiracarus prior* JACOT, 1933**

(Figs 32-36)

Phthiracarus prior: NIEDBALA 1986b, 1992

Material examined: two microscopic slides in bad condition, one labelled "Pinkoson Springs Fla. Dry leaves B.F. 3/14/38 Grossman Col. *Phthiracarus prior* sp. nov. Cotype figured G33P9"; the other "Palatka Fla. live oak leaves F.B. 4/15/38 Grossman Col. *Phthiracarus prior* sp. nov. G69P4". (courtesy Dr. H. A. DENMARK, Florida State Collection of Arthropods, Gainesville).

Measurements: prodorsum: length 192, height 75.9, sensillus 27.8; length of notogaster 318; length of genito-aggenital plate 88.5; length of ano-adanal plate 101. According to JACOT (1933): prodorsum: length 217, width 127, height 80; notogaster: length 344, width 226, height 242.

Colour light yellow, body surface punctate.

Prodorsum. Dorsal and lateral regions and lateral carina invisible. Sensillus lanceolate. Only rostral setae of moderate length visible.

Notogaster with 15 pairs of normal, fairly long, thin, smooth setae. Vestigial setae and lyrifissures invisible.

Ventral region. Arrangement of genital setae 4+3:2. Ano-adanal plate with five setae, ad_1 and ad_2 vestigial.

Legs. Only seta d on femur I situated in the middle of article visible.

Distribution: USA: Florida.

Some characters are poorly visible because of the bad condition of the specimens. In spite of that, the species is easy to distinguish based on the following combination of characters: sensillus lanceolate, ad_1 and ad_2 vestigial, seta d on femur I inserted in the middle of segment.

***Phthiracarus pygmaeus* BALOGH, 1958**

(Figs 37-39)

Phthiracarus serrula BALOGH and MAHUNKA, 1977 **syn. nov.**

Phthiracarus serrula: NIEDBALA 1986b, 1992

Material examined: alcohol-preserved holotype labelled "*Phthiracarus serrula* sp. n. det. J. BALOGH, S. MAHUNKA, Hung. Soil Zool. Exp. II S. Am. No. B-B No 447-2" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: length of prodorsum 121, sensillus 70.8, in 35.4, le 25.3, ro 37.9; notogaster: length 263, width 167, height 177, c_1 37.9, h_1 27.8, ps_1 25.3, $c_1/c_2-d_1=0.53$; genito-aggenital plate 70.8x58.2; ano-adanal plate 75.9x51.8. According to BALOGH, MAHUNKA (1977): length of prodorsum 163; notogaster: length 302, height 194.

Phthiracarus pygmaeus BALOGH, 1958 was redescribed based on paratype in my monograph (NIEDBALA 1992).

Distribution: Angola, Cuba, Bolivia.

All the morphological characters: ornamentation of notogaster surface, arrangement of prodorsal setae, shape of sensillus, arrangement and shape of gastronotal setae, arrangement of genital, anal and adanal setae, and leg chaetotaxy indicate that *Phthiracarus serrula* BALOGH and MAHUNKA, 1977 is a synonym of *Phthiracarus pygmaeus* BALOGH, 1958.

Phthiracarus sanvicensis SUBIAS and GIL, 1990

(Figs 40-43)

Material examined: alcohol-preserved paratype labelled "Cobo de Jan Vincent (Portugal) U.T.N. - 29SNA01 3/3/1983 L.S. SUBIAS leg." (courtesy Prof. L. S. SUBIAS, Catedra de Entomologia, Universidad Complutense, Madrid).

Measurements: prodorsum: length 277, height 90.9, sensillus 32.9, in 70.8, le 75.9, ro 43; notogaster: length 530, height 394, c_1 50, h_1 131, ps_1 137, length of genito-aggenital plate 136; length of ano-adanal plate 151. According to SUBIAS and GIL (1990): length of prodorsum 213-268; length of notogaster 406-542.

Colour light brown. Body surface punctate.

Prodorsum with dorsal and lateral regions indistinct. Lateral carina long, exceeding the sinus. Sensillus small with rounded head. Interlamellar and lamellar setae of almost equal length, rostral setae shorter, exobothridial setae vestigial.

Notogaster with 15 pairs of normal, moderately long ($c_1/c_2-d_1=0.86$), smooth, thin setae; setae c_1 and c_3 remote from the anterior margin, seta c_2 remote. Seta ps_3 shorter than ps_2 , seta ps_4 the shortest. Three pairs of lyrifissures ia, im, ip present.

Ventral region. Infracapitular mentum with h setae shorter than the distance between them. Arrangement of genital setae 4+3:2. Ano-adanal plate with five well developed setae, $ad_1 > ad_2 > an > ad_3$.

Leg chaetotaxy complete. Seta d on femur I short, thin, situated at the distal end.

Distribution: Portugal.

The species is similar to *Phthiracarus bryobius* JACOT, 1930, but has its gastronotal setae shorter and of different shape. It also differs in the insertion of d seta on femur I.

Plonaphacarus eximius (NIEDBALA, 1982)

(Figs 44-51)

Hoplophthiracarus eximius NIEDBALA, 1982

Steganacarus politus MAHUNKA, 1983

Steganacarus politus: NIEDBALA 1992

Plonaphacarus eximius: NIEDBALA 1986b, 1992

I synonymised *Steganacarus politus* MAHUNKA, 1983 with *Plonaphacarus eximius* (NIEDBALA, 1982) in my catalogue in 1986b. Now I supplement the description of this species with illustrations and measurements of MAHUNKA's specimens.

Material examined: alcohol-preserved paratype labelled "*Steganacarus politus* sp. n. Mexique, AC/9 leg. de Chambrier det. S. MAHUNKA" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 273, width 197, height 106, sensillus 96.1, in 177, le 131, ro 55.7; notogaster: length 507, width 342, height 330, c_1 134, $c_1/c_2-d_1=1.1$, d_1 106, d_2 60.7, h_1 137, ps_1 142; genito-aggenital plate 126x80.8; ano-adanal plate 182x80.8.

Distribution: Mexico.

Plonaphacarus loebli (MAHUNKA, 1985)

(Figs 52-61)

Hoplophthiracarus loebli MAHUNKA 1985

Hoplophthiracarus loebli: NIEDBALA 1992

Material examined: alcohol-preserved paratype labelled "*Hoplophthiracarus loebli* sp. n. det. S. MAHUNKA Ind. 72/18 Ind 72/58 leg. C. BESUCHET and L. LOBL" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 348, width 263, height 116, sensillus 75.9, in 182, le and ro 43.0, ex 10.1; notogaster: length 708, width 469, height 423, c_1 162, h_1 172, ps_1 156; genito-aggenital plate 167x116; ano-adanal plate 237x121. According to MAHUNKA (1985): length of prodorsum 307-342; notogaster; length 574-634, height 396-416.

Colour brown. Body surface strongly foveolate. Some foveolae joined with double line.

Prodorsum. Dorsal and lateral regions narrow, dorsal with an incision anterior to rostral setae. Lateral carina weak, reaching the sinus. No furrows on the back. Sensillus long, with lanceolate head, covered with minute spines. Interlamellar setae long, resemble gastronotal setae, erect. Lamellar and rostral setae spiniform and rough, exobothridial setae minute.

Notogaster with 15 pairs of normal setae; setae strong, long, $c_1/c_2-d_1=0.8$, covered with minute spines, setae c_1 and c_3 near the anterior margin, seta c_2 remote. Setae c_2 , d_2 and e_2 slightly shorter than the other setae. Vestigial setae f_1 and f_2 invisible because of the strong sclerotisation of body. Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with vestigial h setae. Formula of genital setae is 4+2:3. Ano-adanal plate with five rough setae, $ad_2>ad_1>an>ad_3$.

Leg chaetotaxy reduced, seta a' on tarsus I absent. Setae a" on tarsus I and a" on tarsus II hooked, seta ft" on tarsus II straight distally.

Distribution: India.

Plonaphacarus loebli (MAHUNKA, 1985) differs from its congeners in the strongly foveolate body surface, narrow dorsal region of prodorsum and length of anal and adanal setae.

***Hoplophthiracarus* (?) *grossmani* JACOT, 1933**

Material examined: a microscopic slide labelled "Vero Beach Fla Shore Beach debris Grossman col. 1 *Hoplophthiracarus grossmani* sp. nov. cotype G67P2" (courtesy Dr. A. B. JOHNSTON, Museum of Comparative Zoology, Harvard University, Cambridge, MA).

The slide contains small fragments of notogaster and chelicerae only. I am afraid that the identity of this species is doubtful.

Distribution: USA.

***Hoplophthiracarus paludis* JACOT, 1938**

(Figs 62-68)

Hoplophthiracarus paludis: NIEDBALA 1986b, 1992.

Material examined: two microscopic slides labelled "A. P. Jacot Coll. *Hoplophthiracarus paludis* sp. nov. cotypes, Sphagnum bog. Mc Clean, N.Y. Oct. 24/32 Coll. by Norman DAVIS", one (3294h) with 6, and the other (3291h) with 17 specimens (courtesy Dr. A. B. JOHNSTON, Museum of Comparative Zoology, Harvard University, Cambridge, MA).

Measurements: prodorsum: length 205, height 162, sensillus 40.5, in 98.7, le 7.6, ro 27.8; notogaster: length 404, height 257, c_1 and h_1 101, ps_1 93.6; length of genito-aggenital plate 116, length of ano-adanal plate 172. According to JACOT (1938): length of prodorsum 200; notogaster: length 420, height 280.

Colour dark, rusty, body surface punctate.

Prodorsum. Dorsal and lateral regions invisible. Lateral carina reaches the sinus. Sensillus long, with long stalk and enlarged, fusiform head, covered with minute spines. Interlamellar setae erect, strong, barbed in the distal half, rostral setae spiniform, lamellar setae minute, exobothridial setae vestigial.

Notogaster with 15 pairs of normal setae; setae fairly thin and long ($c_1/c_1-d_1=1$), sparsely covered with minute spines. Seta c_3 near the anterior margin, seta c_1 remote from the margin, seta c_2 remote. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im.

Ventral region. Arrangement of genital setae 7:2. Ano-adanal plate with five well developed setae, $ad_1 > ad_2 > an > ad_3$.

Leg chaetotaxy complete. Seta d on femur I situated at the distal end. Setae a" on tarsus I and a" and ft" on tarsus II straight at the distal end.

Distribution: USA.

The species is related to *Hoplophthiracarus histricinus* (BERLESE, 1908) but differs in the longer and thinner gastronotal setae.

***Hoplophthiracarus robustior* JACOT, 1933**

(Figs 69-73)

Hoplophthiracarus robustior: NIEDBALA 1986b, 1992.

Material examined: three microscopic slides, cotypes, labelled "Pensacola Fla Pine Needles B.F. 3/39/38 Grossman Col. *Hoplophthiracarus robustior* sp. nov." ; G61P6 - 1 specimen; G6P11- 1 specimen; G61P12 - 2 specimens (courtesy Dr. A. B. JOHNSTON, Museum of Comparative Zoology Harvard University, Cambridge, MA).

Measurements: prodorsum: length 220, height 75.9, sensillus 78.4, in 68.3; notogaster: length 465, height 257, c_1 58.2; length of genito-aggenital plate 121; length of ano-adanal plate 151. According to JACOT (1933): prodorsum: length 225-263, width 143-168, height 107-115; notogaster: length 435-496, width 287-313, height 262-332.

Distribution: USA: Florida.

All the three slides are in bad condition, but all the visible characters indicate that it is *Hoplophthiracarus histricinus* (BERLESE, 1908).

***Steganacarus (Steganacarus) coniunctus* NIEDBALA, 1983**

Steganacarus danae MAHUNKA and MIKO, 1989 syn. nov.

Material examined: two alcohol-preserved paratypes labelled "*Steganacarus danae*, Turkey, Kackar Daglari, Kovrun, 1880 m, *Picea orientalis*, forest litter, mosses (courtesy Dr. L. MIKO, Institute of Experimental Biology and Ecology, Košice).

Paratype I: length of notogaster 604, seta c_1 70.8, maximum length of setae on ano-adanal plate 53.1. Paratype II: length of notogaster 494, seta c_1 55.7, maximum length of setae on ano-adanal plate 43.0. Both paratypes in fact have setae on ano-adanal plate shorter than seta c_1 , but all the remaining characters agree with those of *S. (S.) coniunctus*.

Distribution: Caucasus, Turkey.

***Steganacarus (Steganacarus) patruelis* NIEDBALA, 1983**

Steganacarus lazitanicus MAHUNKA and MIKO, 1989 syn. nov.

Material examined: three alcohol-preserved paratypes labelled "*Steganacarus lazitanicus*, Turkey, Kackar Daglari Ayder, 1200 m, *Pic. orient.* litter, 1 VII 1987" (courtesy Dr. L. MIKO, Institute of Experimental Biology and Ecology, Košice).

In my description of *S. (S.) patruelis* I did not point out the presence of polygonal reticulation on the body surface, and this misled the cited authors. But in the paratypes

of *S. lazitanicus* the lateral carina of prodorsum is long, and the location of seta I on femur I is characteristic, being shifted towards proximal end.

Distribution: Caucasus, Turkey.

***Steganacarus (Steganacarus) spinosus* (SELLNICK, 1920)**

Phthiracarus spinosus SELLNICK, 1920

Steganacarus barborae MAHUNKA and MIKO, 1989 **syn. nov.**

Material examined: two alcohol-preserved paratypes labelled "*Steganacarus barborae*, Turkey, Kackar Daglari, 1200 m, Ayder, *Picea orientalis* litter" (courtesy Dr. L. MIKO, Institute of Experimental Biology and Ecology, Košice).

Slightly longer setae h_1 , ps_1 and ps_2 in specimens from Turkey are within the range of infraspecific variability of *S. (S.) spinosus*.

Recently BERNINI and AVANZATI (1989c) presented a redescription of this species, and designated the neotype.

Distribution: Central and Oriental Europe, Occidental Asia.

***Steganacarus (Tropacarus) desmeti* NIEDBALA, 1986**

Steganacarus (Tropacarus) altitudinis BERNINI, BERNINI and AVANZATI, 1989 **syn. nov.**

I have not seen the type specimen. However, a detailed description and excellent illustrations of *S. (T.) altitudinis* clearly demonstrate that it is a junior synonym of *S. (T.) desmeti*.

Distribution: Algeria.

***Steganacarus (Rhacaplacarus) granulatus* (BANKS, 1902)**

(Figs 74-81)

Hoploclerisma granulata BANKS, 1902

Hoploclerisma granulata: NIEDBALA 1986b, 1992

Steganacarus granulatus: JACOT 1930

Material examined: alcohol-preserved type labelled "Aspis + attached chelicera, single chelicera, infracapitulum + legs I-IV, single leg IV, damaged notogaster, ventral shield, prelarvae *Hoploclerisma granulata* Bk Ottawa Can. Mus. Comp. Zool. Harvard Univers. Type" (courtesy Dr. A. B. JOHNSTON, Museum of Comparative Zoology, Harvard University, Cambridge, MA).

Measurements: prodorsum: length 298, width 252, height 121, sensillus 81, le 60.7, ro 45.5; seta c_1 on notogaster 185, $c_1/c_1-d_1=1.0$; genito-aggenital plate 182x106; ano-adanal plate 202x114.

The specimen is damaged. Colour light grey, body surface covered with strong concavities.

Prodorsum. Dorsal and lateral regions narrow and long. Dorsal carina strong, lateral carina reaching the sinus. Sensillus long, spindle shaped, probably deformed. Interlamellar setae broken, but larger than lamellar setae. Lamellar setae serrated, rostral setae rough, $in > le > ro > ex$.

Notogaster. Setae strong, large, covered with spines on their whole length. Spines longer at the distal end of setae. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im .

Ventral region. Formula of genital setae 4+3:2. Ano-adanal plate with five setae, seta ad_2 the longest and covered with small spines in the distal half, all the remaining setae smooth, ad_3 the shortest.

Leg chaetotaxy complete, setae a'' on tarsus I, a'' and ft'' on tarsus II hooked at the distal end.

Distribution: Canada.

The species is similar to *Steganacarus (R.) thoreau* JACOT, 1930 but the setae of notogaster are different, as well as the arrangement of genital setae and the position of seta l'' on femur I.

Austrophthiracarus andinus (BALOGH, 1984)

(Figs 82-91)

Phthirarica andina BALOGH, 1984

Phthirarica andina: NIEDBALA 1992

Material examined: 8 alcohol-preserved specimens (paratypes?), labelled "*Phthirarica andina* n. sp. Kolumbia 41 det. P. BALOGH, types" (courtesy Prof. J. BALOGH, Eötvös Loránd Tudományegyetem, Budapest).

Measurements: prodorsum: length 318, width 232, height 151, in 141, le 90.9, ro 136, ex 20.2, sensillus 70.7; notogaster length 647, width 462, height 456, c_1 136, h_1 126, ps_1 146; genito-aggenital plate 162x121; ano-adanal plate 278x136. According to BALOGH (1984); length of prodorsum 315-349; notogaster: length 582-754, height 467-480.

Colour light brown. Body surface smooth and punctate.

Prodorsum. Dorsal and lateral regions distinct but short. Lateral carina absent. Sensillus long, bent, narrow, distal end slightly fusiform, covered with small spines. Lamellar setae similar to interlamellar but smaller; both barbed in the distal half. Rostral setae rough, directed inside, $in > ro > le > ex$. Among the paratypes I found two specimens with short and rough interlamellar setae.

Notogaster with 20-21 pairs of normal, relatively long ($c_1/c_1-d_1=0,87$), strong setae, covered in the distal half with small spines. Additional setae in h and ps rows. Setae c_1 and c_3 inserted near the anterior border, seta c_2 remote. Vestigial setae f_1 below h_1 . All typical notogastral lyrifissures: ia , im , ip , ips .

Ventral region. Infracapitular mentum with h setae moderately long, but shorter than the distance between them. Arrangement of genital setae 4+5:0. Ano-adanal plate

with two anal and four adanal relatively long setae, covered with small spines in the distal half, $ad_1 > ad_2 > ad_3 > an > ad_4$.

Leg chaetotaxy complete. Seta a" on tarsus I hooked, setae a" and fi" on tarsus II straight distally.

Table

	length of in	number of gastronotal setae	
		right side	left side
paratype 1	long	21	21
paratype 2	short	20	20
paratype 3	short	20	20
paratype 4	long	21	21
paratype 5	long	21	21
paratype 6	long	21	21
paratype 7	long	20	21
paratype 8	long	20	20

Distribution: Colombia.

The most distinctive character separating this species from its congeners is the shape of rostral setae, long and directed inwards.

***Austrophthiracarus caudatus* (BALOGH and MAHUNKA, 1977)**

(Figs 92-95)

Phthiracarus caudatus BALOGH and MAHUNKA, 1977

Phthiracarus caudatus: NIEDBALA 1986b, 1992

Material examined: alcohol-preserved holotype labelled "*Phthiracarus caudatus* sp. n. Hung. Sol. Zool. Exp. II A. Am. No. B-B No 421-2 Det J. BALOGH, S. MAHUNKA, Holotypus" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allattára, Budapest).

Measurements: prodorsum: length 139, height 60.7, sensillus 63.2, in 43, le 17.7, ro 35.4; notogaster: length 260, width 190, height 142, c_1 27.8, h_1 35.4, ps_1 25.3; genito-aggenital plate 60.7x55.7; ano-adanal plate 134x53.1. According to BALOGH and MAHUNKA (1977): length of prodorsum 178, notogaster: length 306, height 214.

Colour light, yellow. Surface of notogaster, back of prodorsum genito-aggenital and ano-adanal plates strongly pitted.

Prodorsum without dorsal and lateral regions. Lateral carina fairly long. Sensillus long, with narrow stalk and lanceolate head. Interlamellar setae long, almost erect, rough, lamellar and rostral setae thin, smooth, exobothridial setae invisible.

Notogaster with 15 pairs of normal setae; setae short ($c_1/c_1-d_1=0.46$), rough, c_1 and c_2 setae remote from the anterior margin, seta c_3 near the margin. Vestigial setae and lyrifissures invisible because of the strongly sculptured integument.

Ventral region. Arrangement of genital setae 4+4:1. Five setae on ano-adanal plate, anal setae shorter than adanal.

The leg chaetotaxy is not presented because I examined the holotype with legs hidden below the prodorsum. In spite of this I am sure that seta d on tibia IV is short and coupled with solenidion.

Distribution: Bolivia.

A. caudatus is similar to *P. pygmaeus* BALOGH, 1958 but the shape of gastronotal setae and arrangement of prodorsal and genital setae make it easily distinguishable.

***Austrophthiracarus darwini* (MAHUNKA, 1980)**

(Figs 96)

Antarctoplophora darwini MAHUNKA, 1980

Antarctoplophora darwini: NIEDBALA 1986b, 1992

Austrophthiracarus darwini: NIEDBALA 1986b, 1992

Material examined: two alcohol-preserved paratypes labelled "*Antarctoplophora darwini* sp. n. det. MAHUNKA 26 III 1975. leg. E. HORAK Argentinien (Patagonien): Monte Susana, ca 460 m" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

I redescribed this species in my monograph in 1992. I present here a detailed illustration of genito-aggenital plate. Arrangement of genital setae 4+4:1. Setae g_6 and g_7 remote from the inner margin of plate, setae g_8 and g_9 near the margin. Both paratypes have 22 pairs of gastronotal setae and arrangement of anal and adanal setae 2:5 and 2:6 (Paratype I) and 2:7 and 2:7 (paratype II).

Distribution: Argentina.

All the remaining characters are in accordance with my redescription (NIEDBALA 1992).

***Austrophthiracarus equisetosus* (MAHUNKA, 1980)**

(Figs 97-105)

Neoprotophthiracarus equisetosus MAHUNKA, 1980

Neoprotophthiracarus equisetosus: NIEDBALA 1986b, 1992

Material examined: alcohol-preserved paratype labelled "*Neoprotophthiracarus equisetosus* sp. n. Argentina Ushuaia 26 III 1975 Am-75/3 leg. E. HORAK" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 273, width 197, height 106, sensillus 27.8, in and le 37.9, ro 40.5, ex 27.8; notogaster: length 530, width 353, height 318, c_1 73.4, h_1 65.8, ps_1 58.2; genito-aggenital plate 137x106; ano-adanal plate 257x167. According to MAHUNKA (1980): length of prodorsum 248-264; notogaster: length 448-520, height 300-344.

Colour yellow. Body surface smooth, punctate.

Prodorsum with dorsal and lateral regions distinct, narrow, dorsal longer than lateral. Lateral carina absent. Sensillus short, with narrow pedicel and rounded, rough head. Setae short, setiform and rough.

Notogaster with 19 pairs (18 pairs according to MAHUNKA), of short ($c_1/c_1-d_1=0,63$) and rough setae. Setae c_1 and c_3 remote from the anterior margin, seta c_2 remote. Additional setae in rows h and ps. Vestigial setae f_1 below h_1 setae. Only one pair of lyrifissures: ia.

Ventral region. Infracapitular mentum with h setae slightly shorter than the distance between them. Arrangement of genital setae 4+5:0. Ano-adanal plates each with two anal and four adanal setae, approximately equal in length.

Leg chaetotaxy reduced, seta v' on femur I absent. Setae a" on tarsus I and a" and ft" on tarsus II straight at the distal end.

Distribution: Argentina.

The species differs from other similar species with neotrichy of gastronotal and adanal setae in a lower number of gastronotal and adanal setae and in rough, rounded head of sensillus.

Austrophthiracarus espeletius (BALOGH, 1984)

(Figs 106-115)

Sturmacarus espeletiae BALOGH, 1984

Sturmacarus espeletiae: NIEDBALA 1992

Material examined: alcohol-preserved specimen labelled: "*Sturmacarus espeletiae* P. BALOGH, 1984 Kolumbia 41 18 ex. Types" (courtesy Prof. J. BALOGH, Eötvös Loránd Tudományegyetem, Budapest).

Measurements: prodorsum: length 252, width 177, height 101, sensillus, in and le 35.4, ro 37.9, ex 15.2; notogaster 490, width 333, height 303, c_1 , h_1 and ps_1 73.4; genito-aggenital plate 136x90.9; ano-adanal plate 182x106. According to BALOGH (1984): length of prodorsum 217-291; notogaster: length 390-533, height 295-385.

Colour light brown. Body surface punctate.

Prodorsum. Dorsal and lateral regions distinct, long and narrow. Lateral carina absent. Sensillus short, fusiform, barbed, with a sharp distal point. Setae short, rough.

Notogaster with 19 pairs of setae (only one specimen has 20 pairs of setae), short ($c_1/c_1-d_1=0.64$), rough. Additional setae in h and ps rows. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im.

Ventral region. $h=h-h$ at the infracapitular mentum. Formula of genital setae 4+5:0 (seta g, inserted anteriorly to g_s). Ano-adanal plate with two anal and four adanal setae, $ad_1 > an_1 > an_2 > ad_2 > ad'_2 > ad_3$.

Leg chaetotaxy complete. Setae a" on tarsus I, a" and ft" on tarsus II straight distally.

Distribution: Colombia.

The species is very similar to *Austrophthiracarus cucundus* (NIEDBALA, 1988) from Equador, but differs in the shape of sensillus, length of interlamellar setae equal

to that of lamellar setae, presence of five gastronotal setae in ps row and insertion of genital setae g_7 below g_5 .

***Austrophthiracarus foveoreticulatus* (MAHUNKA, 1980)**

(Figs 116-124)

Fuegoplophora foveoreticulata MAHUNKA, 1980

Fuegoplophora foveoreticulata: NIEDBALA 1986b, 1992

Material examined: three alcohol-preserved paratypes labelled "*Fuegoplophora foveoreticulata* sp. n. Argentina Ushuaia 26 III 1975 leg. E. HORAK" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 459, width 318, height 177, sensillus 43, in 63.2, le 45.5, ro 50.6, ex 27.8; notogaster: length 865, height 593, c_1 75.9, h_1 and ps_1 63.2; genito-aggenital plate 177x171; ano-adanal plate 399x177. According to MAHUNKA (1980): length of prodorsum 368-480; notogaster: length 656-1080, height 464-728.

Colour light brown. Body surface covered with strong concavities.

Prodorsum slightly angulate in lateral view. Dorsal and lateral regions distinct, dorsal longer than lateral. Lateral carina reaching the sinus. Furrows in the back distinct. Sensillus short, with small stalk and widened head. Setae short, spiniform, in $ro > le > ex$.

Notogaster with 28 (according to MAHUNKA 25-26) pairs of normal setae, short ($c_1/c_1-d_1=0.39$), spiniform, rough. Seta c_3 remote from anterior margin, c_1 slightly more, c_2 remote. Additional setae in rows h and ps. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular setae h very long, $h > h-h$. Arrangement of genital setae 4+4:1 or 4+3:2. Ano-adanal plates each with two anal and 5-7 adanal setae.

Leg chaetotaxy reduced, seta v' on femur I absent. Setae a'' on tarsus I, a'' and ft'' on tarsus II hooked at the distal end.

Table

	arrangement of genital setae	setae of ano-adanal plate right	setae of ano-adanal plate left
paratype I	4+4: 1	2: 7	2: 7
paratype II	4+3: 2	2: 6	2: 6
paratype III	4+3: 2	2: 5	2: 6

Distribution: Argentina.

Austrophthiracarus foveolatus (MAHUNKA, 1980) differs from its congeners in the foveolate body surface, angulate prodorsum and absence of seta v' on femur I.

***Austrophthiracarus hirtus* (BALOGH, 1984)**

(Figs 125-129)

Sturmacarus hirtus BALOGH, 1984*Sturmacarus hirtus*: NIEDBALA 1992

Material examined: alcohol-preserved holotype labelled "*Sturmacarus hirtus* Kolumbia 31 det. P. BALOGH 1 ex" (courtesy Prof. J. BALOGH, Eötvös Loránd Tudományegyetem, Budapest).

Measurements: prodorsum: length 343, width 237, height 116, sensillus 25.2, in 85.8, le 65.6, ro 75.7, ex 50.5; notogaster: length 596, height 399, c_1 and h_1 162, ps_1 167. According to BALOGH (1984): length of prodorsum 349; notogaster: length 590, height 431.

Colour brown, body surface distinctly punctate.

Prodorsum. Dorsal and lateral regions narrow and long. Lateral carina absent. Sensillus short, with narrow stalk and rounded, smooth head. Setae smooth, fairly long, $in > ro > le > ex$.

Notogaster with 18 pairs of normal setae; setae long ($c_1/c_1-d_1=1.07$), fairly rough and slightly flagellate at the distal end. Additional setae in h and ps rows. Setae c_1 and c_3 slightly remote from the anterior margin, seta c_2 remote. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im .

Ventral region. Arrangement of genital setae 4+5:0. Ano-adanal plate with two anal and four adanal, moderately long setae, $an=ad_1 > ad_2 > ad_3$.

Leg chaetotaxy complete. Setae a'' on tarsus I and a'' on tarsus II hooked at the distal end, seta ft'' on tarsus II straight.

Distribution: Colombia.

The most distinctive character separating this species from its congeners is the length and shape of notogastral setae.

***Austrophthiracarus multisetosus* BALOGH and BALOGH, 1983**

(Figs 130-131)

Austrophthiracarus multisetosus: NIEDBALA 1986b, 1992.

Material examined: three alcohol-preserved paratypes labelled "*Austrophthiracarus multisetosus* BAL. BAL. 83 Type mater. Australia Plowman 2" (courtesy Prof. J. BALOGH, Eötvös Loránd Tudományegyetem, Budapest).

Measurements: according to BALOGH and BALOGH (1983): notogaster: length 562, height 332.

Number of gastronotal setae 30-32. Two pairs of lyrifissures ia and im . Only one specimen has lyrifissure ip on the right side. Number of anal and adanal setae: paratype I - 10 pairs, paratype II - 10 on the right and 9 on the left side, paratype III - 9 pairs.

Distribution: Australia.

The species is very similar to *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978. The main differences concern the shape of sensillus, length of gastronotal setae and number and arrangement of adanal setae (Figs. 131).

***Austrophthiracarus nitidus* (PÉREZ-ÍÑIGO and BAGGIO, 1988)**

(Figs 132-138)

Calyptophthiracarus nitidus PÉREZ-ÍÑIGO and BAGGIO, 1988

Calyptophthiracarus nitidus: NIEDBALA 1992

Material examined: two microscopic slides with two specimens (paratypes ?) labelled "*Calyptophthiracarus nitidus* P. I., B. SP-1-76, Sao Paulo" the first and "...SP-1-72..." the second. (courtesy Dr. C. PÉREZ-ÍÑIGO Instituto Español de Entomología, Madrid).

Measurements: according to PÉREZ-ÍÑIGO and BAGGIO (1988): length of prodorsum 280, length of notogaster 520.

The species was described in detail and I repeat only the main characters, adding some details.

Colour light yellow. Body surface covered with weak concavities.

Prodorsum. Dorsal region narrow. Rostral setae smooth, inserted near each other, lamellar setae spiniform, smooth, interlamellar setae the longest with pectination in the distal half, exobothridial setae vestigial. Sensillus long, with narrow pedicel and rounded head.

Notogaster with 15 pairs (PÉREZ-ÍÑIGO and BAGGIO (1988) illustrated e_1 , h_1 , ps_1 setae on both body sides) of normal setae; setae strong, moderately long ($c_1 < c_1 - d_1$), heavily barbed in the distal half, except c_3 which is spiniform and smooth. Setae $c_1 - c_3$ remote from anterior margin. I failed to observe lyrifissures and vestigial setae.

Ventral region. Infracapitular mentum with setae h very long. Genito-aggenital plates bear 9 genital setae each (one paratype without g_5 seta on the left plate), with formula 4+2:3. Ano-adanal plate each with five strong setae, $ad_2 > ad_1 > an > ad_3$. Only seta ad_3 finely barbed, the remaining setae smooth.

Leg chaetotaxy complete. Seta d on tibia IV short and coupled with solenidion, setae a'' on tarsus I a'' and ft'' on tarsus II straight distally.

Distribution: Brazil.

The shape of sensillus and notogastral setae, different prodorsal setae and shape of setae c_3 and ad_3 make the species easily distinguishable from its congeners.

***Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978**

(Figs 139-157)

Austrophthiracarus radiatus: NIEDBALA 1986b, 1992

Austrophthiracarus similis BALOGH and BALOGH, 1983 **syn. nov.**

Steganacarus similis: NIEDBALA 1986b

Austrophthiracarus similis: NIEDBALA 1992

Material examined: six alcohol-preserved paratypes labelled "*Austrophthiracarus radiatus* sp. n. Australia, Queensland det. J. BALOGH, S. MAHUNKA leg. C. PLOWMANN Mt. Glorius 48 km NW Brisbane" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest), four specimens in alcohol labeled "*Austrophthiracarus similis* BAL. BAL. Type-mater. Australia Plowman, 46" (courtesy Prof. J. BALOGH, Eötvös Loránd Tudományegyetem, Budapest).

New locality: Australia, ANIC - No 297, VIC Kimberlond, Val. Reserve, Wet Sclerophyll, 920 m, 37°34'S, 145°52'E, 4.11.1970, leg. R. W. TAYLOR, R. J. BARTELL, 11 specimens.

Measurements: prodorsum: length 317, width 232, height 111, sensillus 35.3, in and le 25.2, ro 40.4, ex 10.1; notogaster: length 596, width 399, height 368, c_1 55.5, h_1 and ps_1 45.4; genito-aggenital plate 141x95.9; ano-adanal plate 242x116. According to BALOGH and MAHUNKA (1978): length of prodorsum 267-293; notogaster: length 462-571, height 292-340. According to BALOGH and BALOGH (1983): notogaster: length 710-775, height 429-551; specimen from a new locality: prodorsum: length: 348, width 263, height 108, sensillus and in 42.8, le 49.0, ro 45.9, ex 6.1; notogaster: length 672, width 410, height 433, c_1 and h_1 91.8, ps_1 85.7; genito-aggenital plate 159 x 131; ano-adanal plate 248 x 159.

Colour light brown. Body surface punctate but the margin of body covered with concavities.

Prodorsum with dorsal and lateral regions distinct and long. Lateral carina absent. Sensillus short, with narrow, short stalk and fusiform head (sensillus in paratype broken). Setae short, spiniform, rough, $ro > in = le > ex$.

Notogaster with 27-31 pairs of normal setae, ($c_1/c_1-d_1=0.46$); setae short, spiniform, rough, setae c_1 and c_3 remote from the anterior margin, seta c_2 remote. Additional setae inserted in h and ps rows. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with h setae variable in length. Genito-aggenital plate each with nine genital setae, their formula 4+5:0. Ano-adanal plate with two anal and 4-7 adanal setae.

Leg chaetotaxy complete. Setae a" on tarsus I, a" and ft" on tarsus II straight distally.

Paratypes and specimens from new locality	number of setae			
	notogaster		ano-adanal plate	
	right side	left side	right plate	left plate
paratype I	29	29	6	5
paratype II	28	29	6	6
paratype III	28	28	6	5
paratype V	29	30	6	7
paratype VI	29	31	6	6

specimen I	27	27	6	6
specimen II	28	29	6	7
specimen III	27	28	6	6
specimen IV	27	27	7	7
"paratypes" of <i>A. similis</i>				
paratype I			5	4
paratype II			5	5
paratype III			5	5

Distribution: Australia.

The species is similar to *Austrophthiracarus excellens* (NIEDBALA, 1982) but differs in the presence of only two pairs of lyrifissures ia and im and in the arrangement of adanal setae.

***Austrophthiracarus wallworki* BALOGH and BALOGH, 1983**

(Figs 157-166)

Austrophthiracarus wallworki: NIEDBALA 1986b, 1992

Material examined: one alcohol-preserved paratype labelled "*Austrophthiracarus wallworki* BAL. BAL. 1983, Type-mat. Australia, Plowman 2" (courtesy Prof. J. BALOGH, Eötvös Loránd Tudományegyetem, Budapest).

Measurements: prodorsum: length 273, width 217, height 101, in 85.8, le 70.7, ro 55.5, ex 12.6; notogaster: length 535, width 364, height 318, c_1 and h_1 106, ps_1 101; genito-aggenital plate 126x106; ano-adanal plate 242x136. According to BALOGH and BALOGH (1983): prodorsum: length 254, width 217; notogaster: length 410, height 340.

Colour light brown. Body surface smooth, punctate.

Prodorsum. Dorsal and lateral regions distinct, narrow. Lateral carina absent. Sensillus broken off in paratype, described by BALOGH and BALOGH (1983) as short, with small stalk and rounded head. Setae relatively long, barbed in the distal half. Setae le inserted in an unusual position, between interlamellar and rostral setae, in>le>ro>ex.

Notogaster with 22 pairs of normal, moderately long setae ($c_1 < c_1 - d_1$), barbed in the distal half. Additional setae in h and ps rows, c_1 and c_3 setae near anterior margin, seta c_2 remote. Vestigial seta f_1 below h_1 on the right side. On the left side the seta is absent. Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with h setae very short. Arrangement of genital setae 4+5:0. Ano-adanal plate each with two anal and five adanal setae.

Leg chaetotaxy. Right femur without v' seta but on the left femur this seta present. Setae a'' on tarsus I and a'' on tarsus II hooked at the distal end, seta ft'' on tarsus II straight.

Distribution: Australia.

The unusual position of lamellar setae, inserted between interlamellar and rostral setae, make the species easily distinguishable from its congeners.

***Protophthiracarus chilensis* (BALOGH and MAHUNKA, 1967)**

(Figs 167-175)

Notophthiracarus chilensis BALOGH and MAHUNKA, 1967*Protophthiracarus chilensis*: BALOGH 1972*Notophthiracarus chilensis*: NIEDBALA 1986b, 1992

Material examined: alcohol-preserved holotype labelled "*Notophthiracarus chilensis* sp. n. Holotypus det. J. BALOGH, S. MAHUNKA 0-184-68/D-Am)" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 252, width 222, height 95.9, sensillus 68.3, in 210, le 58.2, ro 68.3, ex 22.8; notogaster: length 590, width 387, height 380, c_1 222, h_1 192, ps_1 197; genito-aggenital plate 111x121; ano-adanal plate 263x146. According to BALOGH and MAHUNKA (1967): length of prodorsum 269-293; length of notogaster 525-575.

Colour light brown or yellow, body surface strongly punctate.

Prodorsum with dorsal and lateral regions distinct. Lateral carina short, not reaching the sinus. Sensillus club-like, covered with minute spines. Interlamellar and lamellar setae barbed, erect, rostral setae spiniform, rough, $in > ro > le > ex$.

Notogaster with 21 pairs of normal setae, like interlamellar setae covered with small spines. Additional setae in h and ps rows. c_1 and c_3 setae remote from the anterior margin, c_2 remote. Vestigial setae f_1 above h_1 . Two pairs of lyrifissures: ia and im .

Ventral region. Arrangement of genital setae 4+3:2. Ano-adanal plate with 7 pairs of setae. Three rough setae situated at the inner margin, four adanal setae longer and similar to gastronotal setae.

The legs are hidden below the prodorsum and I did not examine them, but seta d on femur I is short and forked at the distal end, and seta d on tibia IV is short and coupled with solenidion.

Distribution: Chile.

The species differs from its congeners in the length and shape of gastronotal setae.

***Protophthiracarus echiappiger* (BALOGH and MAHUNKA, 1978)**

(Figs 176-180)

Steganacarus echiappiger BALOGH and MAHUNKA, 1978*Steganacarus echiappiger*: NIEDBALA 1986b, 1992

Material examined: alcohol-preserved holotype labelled "*Steganacarus echiappiger* sp. n. Brasilia Manaus INPA forest litter det. J. BALOGH, S. MAHUNKA BRB. 138-142 1967 21 leg. J. BALOGH holotypus" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 303, height 167, sensillus 144, in 37.9, le 20.2, ro 30.4, ex 7.6; notogaster: length 716, height 393, c_1 40.5, h_1 and ps_1 50.6; genito-aggenital plate 187x101; ano-adanal plate 111x80.8. According to BALOGH and

MAHUNKA (1978): length of prodorsum 131-152; notogaster: length 271-369, height 164-213. The measurements given by BALOGH and MAHUNKA (1978) differ greatly from those of the holotype.

Colour light yellow.

Prodorsum with foveolae on the margin. Notogaster ornamented with foveolae, punctate. Genito-aggenital plate with concavities in the anterior and paraxial part, ano-adanal plate with concavities in the antiaxial part.

Prodorsum. Dorsal region long and somewhat expanded. Lateral region very short. Three dorsal carinae present, the central being the largest. Lateral carina of medium length. Furrows on the back present. Sensillus long, setiform. Behind the bothridium a distinct roll is present. Setae simple, smooth, short, in>ro>le>ex.

Notogaster with anterior part elongated and terminated with hump. Two dorsal carinae present. On the sides 5 pairs of protuberances, each with one seta. Setae short ($c_1/c_1-d_1=0.18$), simple, smooth, flagelliform, c_1 and c_2 setae at the anterior process, c_3 seta near anterior margin. Vestigial setae f_1 not visible. Two pairs of lyrifissures: ia and im.

Ventral region. Setae h on the infracapitular mentum shorter than the distance between them. Formula of genital setae 4+2:3. Ano-adanal plate with five short setae, seta ad_3 longer than the remaining setae.

Leg chaetotaxy complete. Setae a" on tarsus I, a" and ft" on tarsus II straight distally.

Distribution: Brazil.

The species is similar to *Austrophthiracarus tricarinatus* (NIEDBAŁA, 1988) but differs in the arrangement of genital and adanal setae.

Protrophthiracarus varians (JACOT, 1933)

(Figs 181-191)

Hoplophorella varians JACOT, 1933

Hoplophorella varians: NIEDBAŁA 1986b, 1992

Material examined: two microscopic slides, one labelled "Gainesville, Fla. Dry leaves F.B. 4/21/18 Grossman Col.2 *Hoplophorella varians* sp. nov. G75P8", the other "St. Augustine Fla North Beach Dry Leaves B. F. 4/1/38 Grossman Col. 1 *Hoplophorella varians* sp. nov. Cotype G63P2" (courtesy Dr. A. B. JOHNSTON, Museum of Comparative Zoology, Harvard University, Cambridge, MA).

Measurements: prodorsum: length 409, height 162, sensillus 91.1, in 43, le 27.8, ro 43; length of notogaster 902, c_1 60.7, h_1 96.1, ps_1 101; length of genito-aggenital plate 234; length of ano-adanal plate 209; according to JACOT (1933); length of notogaster 540-870.

Colour dark brown. Body surface covered with concavities.

Prodorsum. Dorsal carina distinct. Dorsal and lateral regions, as well as lateral carina invisible. Sensillus long, narrow, slightly inflated in the middle, covered with

thin spines. Rostral, lamellar and interlamellar setae spiniform. Interlamellar and lamellar setae larger than rostral, exobothridial setae vestigial.

Notogaster. Setae of varied shape (all visible setae are drawn in Figs 186, 187). Dorsal setae inflated distally and covered with thin spines, seta c_1 shorter than d_1 , setae c_3 and d_2 spiniform. Setae c_1 - c_3 remote from the anterior margin. Vestigial setae and lyrifissures invisible.

Ventral region. Genito-aggenital plate with nine genital setae, formula 4+2:3. Ano-adanal plate with five setae, seta ad_2 dilated in the middle.

Leg chaetotaxy complete. Setae a'' on tarsus I, a'' and ft'' on tarsus II hooked distally.

Distribution: USA.

The varied shape of gastronotal setae distinguishes the species from other, similar species.

Notophtiracarus cavernosus (MAHUNKA, 1987)

(Figs 200-207)

Notophtiracarus cavernosus; MAHUNKA 1990

Hoplophorella cavernosa MAHUNKA, 1987

Hoplophorella cavernosa: NIEDBALA 1992

Material examined: alcohol-preserved paratype labelled "*Hoplophorella cavernosa* sp. n. Africa no 119 Tanzania, Kilimanjaro, Kibo 3890 m 1 VII 1972 leg. T. POCs det. S. MAHUNKA paratypus" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatúra, Budapest).

Measurements: prodorsum: length 394, width 273, height 247, sensillus 37.9, in 43.0, le 37.9, ro 35.4, ex 37.4; notogaster: length 681, width 442, height 437, c_1 32.9, h_1 and ps_1 30.4; genito-aggenital plate 177x151; ano-adanal plate 263x151. According to MAHUNKA (1987): length of prodorsum 377-435, notogaster: length 607-730, height 393-467.

Colour light brown. Body surface covered by tubercules and short ribs.

Prodorsum. Dorsal carina very high, lateral carina absent. Furrows on the back strong. Dorsal and lateral regions narrow and joined. Sensillus short and clavate, slightly serrate. Setae thin, short, smooth, $in > le = ex > ro$.

Notogaster with 15 pairs of normal, minute ($c_1/c_1-d_1=0.22$) setae, seta c_3 near the anterior margin, setae c_1 and c_2 remote. Vestigial setae f_1 below h_1 setae. All lyrifissures: ia , im , ip , ips present.

Ventral region. Infracapitular mentum with h setae very long. Genital plate with nine genital setae arranged as 4+1:4. Ano-adanal plates each with five short setae, adanal setae near paraxial margin of plate.

Leg chaetotaxy complete. Seta d on femur I remote from the distal end, seta v'' on femur I remote from v' . Setae a'' on tarsus I and a'' on tarsus II have hooked tips, seta ft'' on tarsus II straight.

Distribution: Tanzania.

The shape of prodorsum, sensillus and prodorsal regions, as well as the arrangement of setae on femur I enable an easy distinction between this species and its congeners.

***Notophthiracarus dactyloscopicus* (MAHUNKA, 1978)**

(Figs 208-214)

Hoplophthiracarus dactyloscopicus MAHUNKA, 1978

Notophthiracarus dactyloscopicus: MAHUNKA 1990

Hoplophthiracarus dactyloscopicus: NIEDBALA 1986b, 1992

Material examined: one alcohol-preserved paratype labelled "*Hoplophthiracarus dactyloscopicus* sp.n. Mauritius Mau 75/2 leg. SCHAUENBERG det. MAHUNKA paratypus" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 195, width 147, height 63.2, sensillus 30.4, in 60.7, le 40.5, ro 27.8, ex 10.1; notogaster: length 399, width 254, height 204, c₁ 37.9, h₁ 40.5, ps₁ 35.4; genito-aggenital plate 126x68.3; ano-adanal plate 142x78.4. According to MAHUNKA (1978): length of prodorsum 174-198; notogaster: length 323-396, height 188-212.

Colour light brown, body surface ornamented with longitudinal parallel ribs which, particularly on the notogaster, "resembling the dermatoglyph of a finger" as described by MAHUNKA (1978).

Prodorsum. Dorsal and lateral regions and lateral carina invisible. Sensillus short, with rounded head. Setae thin, smooth, interlamellar setae erect, in>le>ro>ex.

Notogaster with 15 pairs of normal setae; setae short, thin, slightly flagellate, generally similar in shape to those of prodorsum. Seta c₃ on the anterior margin, c₁ remote from the margin, c₂ more remote. Vestigial setae f₁ below h₁. Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with h setae very long. Formula of genital setae 4+2:3. All five setae on the ano-adanal plate of similar length.

Leg chaetotaxy reduced. Seta v' on femur I absent. Seta d on femur I situated in the middle of article. Setae a" on tarsus I, a" and ft" on tarsus II straight distally.

Distribution: Mauritius.

The species differs from all its congeners in the ornamentation of body surface.

***Notophthiracarus maculatus* (TRÄGÄRDH, 1931)**

(figs 215-221)

Phthiracarus maculatus TRÄGÄRDH, 1931

Phthiracarus maculatus: NIEDBALA 1986b, 1992

Material examined: alcohol-preserved "co-type" labelled "1933 H H.34 *Phthiracarus maculatus* TRÄGÄRDH among mosses and leaves. 1917 Maratiera, Juan Fernandez TRÄGÄRDH det. Nat. Hist. Juan Fernandez and Easter I 1931 3 p. 553" (courtesy Dr. A. S. BAKER, Department of Zoology, British Museum (Natural History)).

Measurements: prodorsum: length 409, width 303, height 151, sensillus 35.4, in 177, le and ro 68.3, ex 63.2; notogaster: length 744, width 567, height 614, c_1 177, c_3 75.9, h_1 and ps_1 197; length of genito-aggenital plate 212; length of ano-adanal plate 252. According to TRÄGÄRDH (1931): length of prodorsum 700; notogaster: length 875, height 650.

Colour brown, grey, body surface punctate.

Prodorsum. Dorsal region longer than lateral. Lateral carina absent. Sensillus small, its head rounded with undulating border. Interlamellar and lamellar setae erect and covered with spines. Interlamellar broader than lamellar, rostral setae rough, $in > le = ro > ex$.

Notogastral setae strong, covered with spines. Dorsal setae c_1 , d_1 , e_1 , h_1 and ps_1 longer and broader than the remaining setae, $c_1 < c_1 - d_1$, c_3 the shortest; c_2 seta remote from the anterior margin, c_1 and c_3 closer to it. Vestigial setae f_1 absent. Two pairs of lyrifissures: ia and im.

Ventral region. Formula of genital setae 4:5. Ano-adanal plate with five setae, ad1 and ad₂ setae vestigial, located near anal setae.

Leg chaetotaxy probably complete. The absence of seta l" on femur I may be abnormal. Setae a" on tarsus I, a" and ft" on tarsus II hooked distally.

Distribution: Island of Juan Fernandez.

Three species of *Notophthiracarus* are similar to *N. maculatus*. These are: *N. australis* RAMSAY, 1966, *N. sicilicomus* (HAMMER, 1962) and *N. caliginosus* NIEDBALA, 1989. *N. maculatus* differs from other species in the following combination of characters: length and shape of notogastral setae, absence of vestigial seta fl, arrangement of genital setae, arrangement of anal and adanal setae, setae ad1 and ad2 vestigial.

Atropacarus (Hoplophorella) cornutus (MAHUNKA, 1978)

(Figs 222-228)

Steganacarus cornutus MAHUNKA, 1987

Hoplophorella cornuta: MAHUNKA 1990

Steganacarus cornutus: NIEDBALA 1986b, 1992

Material examined: two alcohol-preserved paratypes labelled "*Steganacarus cornutus* sp.n. Mauritius, Mau 75/41 paratypus leg. SCHAUBENBERG det. MAHUNKA" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 293, width 187, height 126, sensillus 50.6, in 22.8, le and ro 20.2; notogaster: length 634, width 311, height 355, c_1 20.2, h_1 and ps_1 17.7; genito-aggenital plate 146x95.9; ano-adanal plate 141x106. According to MAHUNKA (1987): length of prodorsum 283-326; notogaster: length 656-761, height 356-408.

Colour light brown, body surface covered with regular concavities.

Prodorsum with dorsal region longer than lateral regions. Dorsal region enlarged at the distal end. Lateral carina absent. Furrows on the back distinct. Sensillus lanceolate, rough. Setae short, smooth, but exobothridial setae vestigial.

Notogaster. "Frontal part produced into a long process reaching above prodorsum, this part being sharply pointed, in dorsal view triangular in outline, in front somewhat rounded" wrote MAHUNKA in his description. 15 pairs of normal setae, similar in structure to prodorsal setae, minute, smooth. Setae c_1 and c_2 inserted on the anterior process, seta c_3 on the anterior margin. I did not see vestigial setae f_1 . Two pairs of lyrifissures: ia and im.

Ventral region. Arrangement of genital setae 5(4+1):4. All the five setae on ano-adanal plate minute.

Leg chaetotaxy complete, setae a" on tarsus I and a" on tarsus II hooked distally, seta ft" on tarsus II straight.

Distribution: Mauritius.

The triangular process at the anterior part of notogaster makes the species easily distinguishable.

Atropacarus (Hoplophorella) cuneisetus (MAHUNKA, 1988)

(Figs 229-236)

Hoplophorella cuneiseta MAHUNKA, 1988

Hoplophorella cuneiseta: NIEDBALA 1992

Material examined: alcohol-preserved holotype labelled "*Hoplophorella cuneiseta* sp. n. det. S. MAHUNKA, Holotypus, Viet Nam No. 34, Vinh Phu, Tam Dao 21 I 1986, leg. MAHUNKA et OLAH" (courtesy Dr S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 170, width 124, height 60.7, sensillus 50.6, in 32.9, le 15.2, ro 27.8; notogaster: length 328, width 232, height 202, c_1 48.1, h_1 35.4, ps_1 40.5; genito-aggenital plate 93.6x58.2; ano-adanal plate 101x55.7. According to MAHUNKA (1988): length of prodorsum 154-172; notogaster: length 292-340, height 192-204.

Colour light yellow, body surface covered with weak concavities mainly at the margin.

Prodorsum. Dorsal and lateral regions distinct. Dorsal region enlarged towards rostral setae. Lateral carina reaching the sinus. Furrows on the back present. Sensillus spindle-shaped, enlarged in the distal half and covered with minute spines (in Figs. 229, 230 its external layer destroyed). Interlamellar setae inflated in the distal half, rostral and lamellar setae spiniform, exobothridial setae vestigial.

Notogaster with 15 pairs of normal setae ($c_1/c_1-d_1=0.63$); setae inflated at the distal end and covered with minute spines, c_1 seta near the anterior margin, c_2 and c_3 remote from the margin. Vestigial setae f_1 below h_1 . Only one pair of lyrifissures: ia.

Ventral region. Infracapitular mentum with h setae shorter than their mutual distance. Arrangement of genital setae 6(4+2):3. Ano-adanal plate with five setae, ad_2 seta the longest, lanceolate, covered with small spines, seta ad_3 the shortest, spiniform.

Leg chaetotaxy reduced. Seta v' on femur I, a' on tarsus I, l' on genu IV absent. Setae a" on tarsus I, a" and ft" on tarsus II straight distally.

Distribution: Vietnam.

The species differs from other members of the genus, which have large gastronotal setae, in the shape of dorsal region of prodorsum, lanceolate shape of interlamellar setae, lack of collar in the anterior part of notogaster and reduced leg chaetotaxy.

***Atropacarus (Hoplophorella) floridus* (JACOT, 1933)**

(Figs 237-242)

Hoplophorella cucullata floridae JACOT, 1933

Hoplophorella floridae: AOKI 1980

Atropacarus (Hoplophorella) floridae: NIEDBALA 1986b, 1992

Material examined: three microscopic slides labelled 1. "Gainesville, Fla Azalea Leaves B.F. 1/26/38 Grossman Col. 1. *Hoplophorella cucullata floridae* subsp. nov. G6P16", 2. "Bradenton, Fla Dry Leaves F.B. 5/1/38 Weber Grossman Col. 3. *Hoplophorella cucullata* subsp. nov. G87P5", 3. "Gainesville, Fla Damp Leaves B.F. 2/29/28 Grossman Col. 1 *Hoplophorella cucullata floridae* subsp. nov. G29P5" (courtesy Dr. A. B. JOHNSTON, Museum of Comparative Zoology, Harvard University, Cambridge, MA).

Measurements: prodorsum: length 205, height 88.5, sensillus 75.9, in 35.4, le 30.4, ro 20.2; notogaster: length 424, height 252, c, 55.7, $c_1/c_1-d_1=0.55$, h_1 and ps_1 50.6; length of genito-aggenital plate 121; length of ano-adanal plate 134.

A detailed description of that species is presented in my monograph (NIEDBALA 1992). Slight differences concern femur I: seta v' is present in the type and setae l' , v' and v'' are situated closer to the distal end of article (Fig. 242).

Distribution: Amphipacific (?).

***Atropacarus (Hoplophorella) galeatus* (BALOGH and MAHUNKA, 1978)**

(Figs 243-249)

Steganacarus galeatus BALOGH and MAHUNKA, 1978

Steganacarus galeatus: NIEDBALA 1986b, 1992

not *Protophthiracarus subsellatus* (BALOGH and MAHUNKA, 1977)*

Material examined: alcohol-preserved holotype labelled "*Steganacarus galeatus* sp. n. Brasilia, Manaus INPA forest litter 1967 IX 21 leg. J. BALOGH BRB 138-142 Holotypus" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 364, width 272, height 177, sensillus 142, in and le 35.4, ro 63.2; notogaster: length 837, width 377, height 432, c_1 96.1, h_1 and ps_1 101; genito-aggenital plate 192x90.9; ano-adanal plate 167 x 80.8. According to

* *Steganacarus galeatus* BALOGH and MAHUNKA, 1978 was erroneously synonymized by NIEDBALA (1992) with *Protophthiracarus subsellatus* (BALOGH and MAHUNKA, 1977).

BALOGH and MAHUNKA (1978): length of prodorsum 189; notogaster: length 426, height 250. Measurements given by BALOGH and MAHUNKA (1978) differ considerably from those of the holotype.

Colour brown.

Prodorsum with indistinct foveolae or mosaic on the borders, notogaster covered with concavities, punctate, more distinctly so on the margins. Prodorsum with robust dorsal carina, with three teeth at the anterior end. Lateral carina reaches the sinus. Dorsal region long and very large at the anterior end. Lateral region very short. Furrows on the back distinct. Sensillus long, thin, setiform. Interlamellar and lamellar setae spiniform, rostral setae strong, large and smooth, directed inside, exobothridial setae invisible.

Notogaster with dorsal carina and a robust projection in its anterior part. 15 pairs of normal, short ($c_1/c_1-d_1=0.27$), widened and phylliform setae. Setae c_1 and c_3 inserted on the projection, seta c_3 near the anterior margin. Vestigial setae invisible. Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with h setae longer than the distance between them. Arrangement of genital setae 6(4+2):3. Ano-adanal plate with five setae. Three setae on the inner margin, spiniform, ad_2 and ad_3 setae large, lanceolate.

Leg chaetotaxy reduced. Seta a' on tarsus I and sometimes seta v' on femur I (right in the holotype) absent. Setae a'' on tarsus I, a'' and ft'' on tarsus II straight distally.

Distribution: Brazil.

The distinctive characters of the species are the shape of prodorsum, notogaster, rostral setae, ad_3 setae and arrangement of genital setae.

***Atropacarus (Hoplophorella) lanceosetus* (BALOGH and MAHUNKA, 1981)**

(Figs 250-256)

Steganacarus lanceoseta BALOGH and MAHUNKA, 1981

Steganacarus lanceoseta: NIEDBALA 1986b, 1992

Hoplophorella lanceoseta: MAHUNKA 1985

Hoplophorella neglecta NIEDBALA, 1984 **syn. nov.**

Atropacarus (Hoplophorella) neglectus (NIEDBALA, 1984)

Material examined: alcohol-preserved holotype labelled "*Steganacarus lanceoseta* sp. n. Hung. XXI Soil Zoo. Exp. S. Am. No. P.34 Villa Hayes Holotypus det. J. BALOGH, S. MAHUNKA" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 202, width 149, height 91.1, sensillus 78.4, in and ro 35.4, le 15.2; notogaster: length 394, width 268, height 257, c_1 156, ps_1 73.4; genito-agenital plate 98.7x77.2; ano-adanal plate 137x73.4. According to BALOGH and MAHUNKA (1981): length of prodorsum 197-205; notogaster: length 388-410, height 250-259.

Colour light brown, integument of body regularly punctate and covered with concavities on the margins only.

Prodorsum. Dorsal and lateral regions distinct. Dorsal region narrow at the base and widening at the distal end, trapezial. Lateral carina short. Furrows on the back clearly visible. Sensillus long with narrow stalk and swollen distal end, covered with spines. Setae short, spiniform, rough, $in=ro>le$, ex vestigial.

Notogaster with 15 pairs of normal, moderately long ($c_1/c_1-d_1=0.86$), lanceolate setae. Seta c_1 near the anterior margin, setae c_2 and c_3 remote from the margin. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with setae h very small, $h<h-h$. Arrangement of genital setae 6(4+2):3. Ano-adanal plate with five setae, seta ad_2 lanceolate and the longest.

Leg chaetotaxy reduced, setae v' on femur I and l'' on genu IV absent, setae a'' on tarsus I, a'' and ft'' on tarsus II straight distally. In the specimen from Peru (sub *Hoplophorella neglecta* NIEDBALA, 1984) seta v' on femur I is present.

Distribution: South America.

The species is distinct in having the trapezial shape of dorsal region of prodorsum, lanceolate shape of gastronotal setae and reduced leg chaetotaxy.

***Atropacarus (Hoplophorella) lanceosetoides* (MAHUNKA, 1985)**

(Figs 257-264)

Hoplophorella lanceosetoides MAHUNKA, 1985

Hoplophorella lanceosetoides: NIEDBALA 1992

Material examined: one alcohol-preserved paratype labelled "*Hoplophorella lanceosetoides* sp. n. 9 VII 1980 leg. S. et L. MAHUNKA St. Lucia No 11-2 Castries, Vigie Point det S. MAHUNKA Paratypus" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest)

Measurements: prodorsum: length 180, width 129, height 70.8, sensillus 81.0, in 27.8, le 20.2, ro 75.9, ex 7.6; notogaster: length 358, width 227, height 192, c_1 65.8, h_1 73.4, ps_1 70.8; genito-aggenital plate 86.0x65.8; ano-adanale plate 121x60.7. According to MAHUNKA (1985): length of prodorsum 173-180; notogaster: length 333-364, height 207-216.

Colour light brown, integument generally punctate, body covered with weak cerotegument.

Prodorsum. Dorsal region longer than lateral, enlarged towards rostral setae. Lateral carina reaching the sinus. Furrows on the back distinct. Sensillus long, narrow, spindle-shaped, serrated in the distal half. Rostral seta long, large, rough, obtuse distally. Lamellar and interlamellar setae spiniform, $ro>in>le>ex$.

Notogaster with 15 pairs of normal setae; setae lanceolate, of moderate length ($c_1/c_1-d_1=1.0$), rough. Seta c_1 inserted on the anterior margin, seta c_2 near the margin, seta c_3 slightly remote from the margin. Vestigial setae f_1 below h_1 . Two pairs of lyrifissures: ia and im.

Ventral region. Infracapitular mentum with h setae short, $h<h-h$. Arrangement of genital setae 6(4+2):3. Ano-adanal plate with five setae, three on the inner margin, setae ad_2 the longest, ad_3 the shortest.

Leg chaetotaxy reduced. Setae a' on tarsus I and l'' on genu IV absent. Setae a'' on tarsus I, a'' and ft'' on tarsus II straight distally.

Distribution: Antilles.

The species is similar to *A. (H.) lanceolatus* (BALOGH and MAHUNKA, 1981) but differs in the length and shape of rostral setae.

***Atropacarus (Hoplophorella) singularis* (SELLNICK, 1959)**

(Figs 265-272)

Hoplophorella singularis SELLNICK, 1959

Atropacarus (Hoplophorella) singularis: NIEDBALA 1986b, 1992

Hoplophthiracarus regalis MAHUNKA, 1978 **syn. nov.**

Hoplophorella regalis: MAHUNKA 1990

I redescribed this species in my monograph in 1992. Here I add the measurements and illustration of synonymised species only.

Material examined: one alcohol-preserved paratype labelled "*Hoplophthiracarus regalis* sp. n. Maurica Mau-75/48 leg. SCHAUEBERG det. MAHUNKA paratypus" (courtesy Dr. S. MAHUNKA, Természettudományi Múzeum Allatára, Budapest).

Measurements: prodorsum: length 252, width 162, height 93.4, sensillus 48.1, in 101, le 22.8, ro 83.5, ex 20.2; length of notogaster 530, c₁ 95.9; genito-aggenital plate 157x93.6; ano-adanal plate 182x91. According to MAHUNKA (1978): length of prodorsum 215-240; notogaster: length 405-483, width 325-368.

The only slight differences concern the rostral setae which are rough, and the arrangement of genital setae: on the right genito-aggenital plate 6(4+1):4, on the left 6(4+2):3.

Distribution: Gondwanan.

A. (H.) singularis (SELLNICK, 1959) differs in the shape of ad₁ seta.

***Atropacarus (Atropacarus) punctulatus* MORAZA, 1984**

(Figs 273-276)

Atropacarus punctulatus MORAZA, 1984

Atropacarus punctulatus: NIEDBALA 1992

Material examined: holotype on microscopic slide labelled "*Atropacarus punctulatus* M. L. MORAZA Holotipo no 3 Al 0003 lej Embalse de Leurza mantillo del Hayedo" (courtesy Dr. M. L. MORAZA, Departamento de Zoología, Universidad de Navarra, Pamplona).

Measurements: prodorsum: length 202, height 109, sensillus 88.5, in 55.7, le 27.8, ex 15.2; notogaster: length 369, height 222, c₁ 43.0, h₁ 48.1, ps₁ 45.5; genito-aggenital plate 88.5x83.5; ano-adanal plate 190x121. According to MORAZA (1984): length 213; length of notogaster 397.

Colour yellow, body surface covered with concavities, but middle of notogaster punctate.

Prodorsum. Regions and lateral carina invisible. Furrows on the back distinct. Sensillus long, flagellate at the distal end, covered with distinct spines in the distal half. Interlamellar setae strong, covered with spines in the distal half. Lamellar setae spiniform, rough. Rostral setae long, rough with flagellate distal end, $in > ro > le > ex$.

Notogaster with 16 pairs of normal, short ($c_1/c_1-d_1=0.59$) spiniform, rough setae. Setae c_1 near the anterior margin, setae c_2 and c_3 remote from the margin. Vestigial setae f_1 above h_1 . Lyrifissures absent.

Ventral region. Genito-agenital plate with 9 pairs of genital setae. Ano-adanal plate with five setae, setae at the inner margin sparsely barbed and with flagellate ends.

Legs not examined.

Distribution: Spain.

The species is distinct due to the shape of sensillus, rostral setae and setae at the inner margin of ano-adanal plate.

Atropacarus (Atropacarus) wandae (NIEDBALA, 1981)

(Figs 277-280)

Steganacarus wandae NIEDBALA, 1981

Steganacarus navarrensis MORAZA, 1984 *syn. nov.*

Steganacarus navarrensis: NIEDBALA 1992

Material examined: three specimens on microscopic slide labelled: "*Steganacarus navarrensis* M. L. MORAZA Holotipo y 2 paratipos no 2 AE 0006 Hayedode Urbasa mantillo" (courtesy Dr. M. L. MORAZA, Departamento de Zoología, Universidad de Navarra, Pamplona).

Measurements: length of prodorsum 177, sensillus 78.4, in 37.9, le 10.1, ro 25.3, ex 5.1; notogaster: length 318, height 281, c_1 30.4, h_1 27.8, ps_1 22.8, length of the longest an 60.7, ad_3 32.9. According to MORAZA (1984): length of prodorsum 176-209; length of notogaster 286-407.

Colour yellow, body surface covered with concavities.

Prodorsum. Regions and lateral carina invisible. Furrows on the back distinct. Sensillus sickle-shaped, with minute spines in the distal half. Interlamellar setae strong, barbed in the distal half. Lamellar setae short, smooth, conical. Rostral setae spiniform, rough, $in > ro > le > ex$.

Notogaster with 16 pairs of normal setae; setae short ($c_1/c_1-d_1=0.52$), conical, covered with small, weak spines. Seta c_1 near the anterior margin, setae c_2 and c_3 remote from the margin. Vestigial setae f_1 above h_1 . Two pairs of lyrifissures: ia and im .

Ventral region. Arrangement of genital setae 6:3. Ano-adanal plate with five setae, $an/not = 0.19$.

Leg chaetotaxy reduced; seta a' on tarsus I and seta l' on genu IV absent. Setae a'' on tarsus I, a'' and ft'' on tarsus II straight distally.

Distribution: European.

The species differs from its congeners in the shape and length of gastronotal setae, shape of lamellar setae and reduced leg chaetotaxy.

REMARKS

Below I give some comments on the chapter "Complementary data to the knowledge of *Phthiracaridae*" in MAHUNKA (1990).

In the abstract of his paper MAHUNKA states that he erected a new subgenus in the genus *Notophthiracarus* RAMSAY, 1966. However, his paper contains neither description, nor any comments on this subgenus, except placing "(N.)" in two species (p. 204).

The system of the *Phthiracaroidea* I proposed in 1986 (NIEDBAŁA 1986a) was not published in 1988 as "a new variety, partly modifying his category" but presented in extenso.

On p. 191 MAHUNKA states that the system contains "still numerous contradictions or debatable ranging". His reservations deserve some comments. Page 191, Ad. 1. It is not true that "basing on the theory of WOAS (1981) NIEDBAŁA considers the structure of gastronotal setae primarily important". The character is the first that separates the families of the *Phthiracaroidea*, and its presence in that particular place is due to the procedure and rules of cladistic methodology. If Dr. MAHUNKA had studied the rules of cladogram construction carefully (NIEDBAŁA 1986a, pp. 61-71), he would have noticed that, applying the principle of parsimony, 8 variants of 720 were left, 3 of them (A,B,C) having the structure of gastronotal setae as a separating character. Variant A was selected because of the priority of characters 2 and 5 over character 9, and due to the most similar geographic distribution of the closest taxa.

Likewise, it is not true that *Phthiracarus spadix* NIEDBAŁA, 1983 has spiculate setae. There are only two pairs of spiculate setae in this species, namely e_1 and h_1 . Another species with similar setae is *Phthiracarus incredibilis* NIEDBAŁA, 1983. However, these two are exceptions. Therefore the character "spiculate setae" appears in *Phthiracaridae* extremely rarely, and this confirms the existing rule that in *Phthiracaridae* the setae are smooth, narrowing towards distal end.

However, in two species of *Notophthiracarus*: *N. conspicuus* NIEDBAŁA, 1989, and *N. distinctus* NIEDBAŁA, 1989 (in MAHUNKA (1990) cited as "disjunctus" (sic!)) the setae are flagelliform, quite different from those in the *Phthiracaridae*. It requires further studies to determine precisely the structure of these two types of setae. Besides, none of the following characters marks a distinct hiatus: setae simple, fine, completely smooth, tapering towards distal end (symplesiomorphic), or setae not smooth, or smooth but spiniform, or flagellate (synapomorphic). In fact, in the *Phthiracaridae* it appears as an apomorphy in one species only, *P. papillosus* PARRY, 1979, and may represent a case of convergence. As a plesiomorphic condition it appears more often in the phylogenetically younger family, the *Steganacaridae*, and this fact confirms the evolutionary significance of this character. Classification expresses various categories of discontinuities in nature. Does a hiatus between higher taxa have to be distinct? The evolution is a continuous process. If large enough fossil materials were available, the hiatus would be completely absent. In the course of neontological studies the hiatus narrows, which is also obvious from this work.

Page 192, Ad 2. In my system I did not consider "surface sculpture of body" as a distinctive character (see black and white squares fig.4, p.70) in the genera

Phthiracarus, *Calyptophthiracarus*, *Notophthiracarus*, and others (NIEDBALA, 1986a). However, also in this case I would like to point out to the evolutionary continuity of this character. This prevents a distinct hiatus. Such a character as "surface sculpture smooth" is undoubtedly a symplesiomorphy, and "surface sculpture foveolate or tuberculate" is a synapomorphy. This is evidenced by the position of two genera, *Steganacarus* and *Atropacarus*, which always possess the synapomorphic structure foveolate or tuberculate, at the end of the cladogram. Moreover, among the *Phthiracaridae* only one species is known (an exception!), *Phthiracarus papillosus* PARRY, 1979, with foveolate structure, and there are many examples of smooth symplesiomorphic structures among the *Steganacaridae*.

Page 192, Ad 3. It is not true that the genital setae g_1 - g_5 "have been left out of consideration" - see character 45, p. 68 (NIEDBALA, 1986a). Actually, the arrangement of genital setae in *Notophthiracarus cucundus* NIEDBALA, 1988, and *Austrophthiracarus flagellatus* (MAHUNKA, 1980) is 4+5:0 i. e. not even one in pregenital position, whereas that found in *Austrophthiracarus michaeli* (NIEDBALA, 1987) is 4+1:4, and in *Austrophthiracarus comosus* (AOKI, 1980) it is 4+2:3 i. e. respectively 4 and 3 setae in pregenital position. What are the implications of this fact? It is simply the case when it is impossible to be sure if the discussed character is primitive or derived (p. 65 in NIEDBALA 1986a). Below I present several examples of similar arrangements of genital setae in various genera:

- 5+4:0 *Plonaphacarus berlesei* NIEDBALA, 1987
- 4+5:0 *Plonaphacarus grandjeani* NIEDBALA, 1987
- 4+5:0 *Austrophthiracarus kochi* (NIEDBALA, 1987)
- 4+5:0 *Austrophthiracarus perti* (NIEDBALA, 1987)
- 3+5:0 *Arphthiracarus aokii* (NIEDBALA, 1987)
- 4+5:0 *Arphthiracarus contrarius* (NIEDBALA, 1984)
- 4+4:1 *Hoplophthiracarus montigenus* NIEDBALA, 1981
- 4+4:1 *Austrophthiracarus admirabilis* (NIEDBALA, 1982)
- 4+4:1 *Austrophthiracarus vicinus* (NIEDBALA, 1984)
- 4+1:4 *Austrophthiracarus michaeli* (NIEDBALA, 1987)
- 4+1:4 *Notophthiracarus schizocomus* (HAMMER, 1962)
- 4:5 *Notophthiracarus australis* RAMSAY, 1966
- 5:4 *Notophthiracarus robertsi* (SHEALS, 1965)
- 4:5 *Atropacarus (Hoplophorella) multirugosus* (MAHUNKA, 1978)

MAHUNKA (1990) mentioned difficulties in distinguishing genera *Hoplophthiracarus* JACOT, 1933 and *Plonaphacarus* NIEDBALA, 1986 referring to the similarity in the arrangement of genital setae in their type species: *Hoplophthiracarus histicinus* (BERLESE, 1908), and *Plonaphacarus kugohi* (AOKI, 1959). MAHUNKA referred to JACOT's (1933, figs. 14, 15) paper. However, these figures do not represent the type species. It is a specimen from North America, and may not even be *Hoplophthiracarus histicinus*. Note that seta g_5 in fig. 15 is remote from the paraxial margin of genito-aggenital plate. Usually it is seta g_6 that is remote from the paraxial

margin. I think that this may result from an imprecise drawing. The type species of the genus *Hoplophthiracarus*, *Hoplophthiracarus histricinum* BERLESE, 1908, has seta g_6 placed below g_5 , in the distance shorter than that between g_5 and g_4 (NIEDBALA 1991), and therefore all the genital setae form a row. The type species of the genus *Plonaphacarus*, *Hoplophthiracarus kugohi* AOKI, 1959, has four setae g_6 - g_9 remote from the paraxial margin of the plate. The difference in the state of this character between *Hoplophthiracarus* and *Plonaphacarus* is thus evident. Regardless of the above reasoning, the differences between *Hoplophthiracarus* and *Plonaphacarus* are rather small, and the hiatus is narrow. Still, they are the most closely related genera. This remark applies also to the closely related genera *Austrophthiracarus* BALOGH and MAHUNKA, 1978, and *Arphthiracarus* gen. nov.

Page 192, Ad 4. Why is the character "reduced seta d of tibia IV attached to the solenidion or detached state of this seta" not appropriate to distinguish higher categories? The character (No. 6, fig. 4, NIEDBALA 1986a) quite well distinguishes two subfamilies: *Steganacarinae*, and *Atropacarinae*. It is a very important character (GRANDJEAN 1935, KNÜLLE 1957), and the character "seta detached from solenidion" is a trace of previous segmentation. Moreover, parallel characters are quite common in animal kingdom.

Page 192, Ad 5. Under "a" Mahunka proposes a thesis, which does not disagree with my concept of neotrichy. Also, he does not explain why "the application of neotrichy in separating taxa in the case of gastronomic setae" can be rejected, but "neotrichy in the case of ano-adanal setae" can not. For MAHUNKA the decisive factor is whether the neotrichy exists or not. Basing on the presence of more than 5 ano-adanal setae he proposes to erect two genera (pp. 194-195)*. In my opinion, in this way MAHUNKA creates artificial, polyphyletic taxa, since neotrichy of setae, including ano-adanal ones, appears in various phylogenetic lineages. In creating his numerous genera, i. e. ordering and establishing sequences, MAHUNKA does not use any existing theoretical concepts and taxonomical methods: evolutionary, phylogenetic or phenetic. He does not propose any new concept either. Therefore, many genera created by Dr. Mahunka are artifacts. In the discussed work Dr. MAHUNKA had to give up his numerous genera erected earlier. Regrettably he did not include them in the synonymy. Under "b" MAHUNKA states that the neotrichy of ano-adanal setae is "geographically restricted to Gondwanaland" (I mentioned this in 1981). However this does not prove anything. Also another three genera: *Protophthiracarus* BALOGH, 1972, *Notophthiracarus* RAMSAY, 1966, and *Arphthiracarus* gen. nov. are of Gondwanan origin, with few species in the borderlands (Nepal, Kashmir, Iraq).

Page 192, Ad 6. MAHUNKA mentions the length variability of setae ad_1 , ad_2 on the ano-adanal plate, which can be long, short, or vestigial. He states that two genera can

* Dr. MAHUNKA is not consequent in this approach, since he allows the presence of neotrichy in the genus *Phthiracarus* PERTY, 1839 by the existence of the subgenus *Neophthiracarus* BALOGH and CSISZAR, 1963 (not BALOGH and MAHUNKA). In this way, according to MAHUNKA's definition, the genus *Neophthiracarus* quite unexpectedly included species with seta d on tibia IV detached from the solenidion, e.g. *Plonaphacarus feideri* NIEDBALA, 1987.

be distinguished based on this character alone, namely *Phthiracarus* PERTY, 1839, and *Archiphthiracarus* BALOGH and MAHUNKA, 1979 (previously regarded by MAHUNKA as genera, and in the paper discussed lowered to subgeneric rank). I still maintain that those taxa should not have been created, since the degree of development of the setae ad_1 and ad_2 is variable, even within population. For instance, it was observed in such species as *P. subdolos* NIEDBALA, 1983, *P. clavatus* PARRY, 1979, and *P. incertus* NIEDBALA, 1983 (NIEDBALA 1992). Also, I noticed a similar variability of setae ad_1 and ad_2 in Hawaiian populations of *P. anonymus* GRANDJEAN, 1933 (unpublished data). I am not convinced that *P. globosus* (C. L. KOCH, 1841), and *P. peristomaticus* WILLMANN, 1948, cited by MAHUNKA along with *P. longulus* (C. L. KOCH, 1941), do not have atypical setae ad_1 and ad_2 . The problem requires further detailed studies. PARRY (1979, p. 325) quoted "...VAN DER HAMMEN suggested that the arrangement of these interlocking lobes and the condition of setae ad_{1-2} (present or vestigial) could be useful taxonomic features. This view is not however supported by the present study, since these two features have been found to exhibit considerable intraspecific variation". It should be also noted that setae ad_1 and ad_2 break off easily, and this makes proper identification difficult. It was pointed out by BERG, WOAS, BECK (1990).

Page 193, Ad E. I do not understand why Dr. MAHUNKA encourages me to study *H. echinus* BALOGH, 1962, a species redescribed by him (p. 204), and included in the genus *Notophthiracarus* RAMSAY, 1966.

Page 193, Ad F. It is probably a case of lapsus lingua! I think it should read *Atropacarus* and *Atropacarini* instead of *Tropacarus* and *Tropacarini*. If so, it is not true that the genera *Steganacarus* EWING, 1917, and *Atropacarus* EWING, 1917 differ in the position of setae d on tibia IV only (in his key MAHUNKA accepts this point of view and distinguishes between both genera). Apart from this character, the genera differ in the arrangement of genital setae, length of seta ft'' on tarsus I (except subgenus *Hoplophorella*, which is shown in the cladogram, fig. 4, p. 70, NIEDBALA (1986a)). Also, different position of those two genera in the similarity diagram based on principal components is clearly shown (p. 72, fig. 6, NIEDBALA 1986a).

I would like to give several comments on the key presented on pp. 193-195. The key is probably meant to reflect the system proposed by MAHUNKA. It contains many mistakes. Ad characters 1(6) and 6(1). Basing on the selected interlamellar seta MAHUNKA distinguishes two families: *Phthiracaridae* and *Steganacaridae*. In this way many species of the genera *Notophthiracarus* RAMSAY, 1966, and *Austrophthiracarus* BALOGH and MAHUNKA, 1978 can not be classified properly, since they have smooth interlamellar setae and unsculptured body surface. Ad character 18(19)... Genital setae - except seta g_6 - arising in one longitudinal row... However, the type species of *Atropacarus* EWING, 1917, *A. striculus* (C. L. KOCH, 1836), as well as all the remaining members of *Atropacarus* have all the genital setae in one longitudinal row. Ad 21(20). With respect to this character, *Hoplophorella* BERLESE, 1923 does not fit into the cited formula, since it has all the genital setae in one longitudinal row. Ad 24(17). The statement "...more than five pairs of adanal setae present" should be replaced with: "...more than five pairs of setae on the ano-adanal plate present". Ad 25(26) and 26(25).

According to the key, the genera *Protophthiracarus* and *Austrophthiracarus* can be distinguished based on the neutrichy of adanal setae, having 8 and 7 pairs of genital setae on the inner margin, respectively. Such a point of view can not be accepted. For example *Austrophthiracarus sellnicki* (NIEDBALA, 1987) has 5 genital setae on the inner margin of plate only, and g_6 - g_9 are remote from the margin. According to MAHUNKA it could be classified neither with *Protophthiracarus* nor with *Austrophthiracarus*. The same pertains to such species as *A. tragardi* (NIEDBALA, 1987), *A. willmanni* (NIEDBALA, 1987), *A. kochi* (NIEDBALA, 1987), and many other, and they are no exceptions.

MAHUNKA undertook a task of redescribing the species described by himself, as well as those described by BALOGH (a supplementary description). Original descriptions of all those species are very brief, inadequate and purely morphological. Regrettably, the new, supplementary descriptions are still not satisfactory. For example, the location of lyrifissures and vestigial setae f_1 in *Hoplophorella cornuta* (MAHUNKA, 1978) is still unknown. The same is the case of *Notophthiracarus cavernosus* (MAHUNKA, 1987): the number of lyrifissures (in fact there are 4 pairs), and location of vestigial seta f_1 are not given. In *Notophthiracarus dactyloscopicus* (MAHUNKA, 1978) the location of lyrifissures ia , im , and vestigial setae f_1 is not included in the description. These characters are important for diagnosis of the species.

BERG, WOAS and BECK (1990) present, among others, morphology of four species of the genus *Phthiracarus*. In their paper the authors use the name *Phthiracarus piger* (SCOPOLI, 1763) instead of *Phthiracarus nitens* (NICOLET, 1855) referring to the priority, and determination of this species by SELLNICK (1928, 1960) and WILLMANN (1931). As a reference collection they choose STRENZKE's collection from the Senckerberg Museum, Frankfurt. At the same time the authors write (p. 88): "Da der Locus typicus beider Arten [*P. piger* and *P. laevigatus*] nicht hinreichend gekennzeichnet und durch die Beschreibungen keine eindeutige Identifizierung möglich ist, ist es sinnvoll sich auf neuere Autoren zu stützen und Vergleichssammlungen als Grundlage für die Festlegung von Neotypen zu verwenden". However, both *P. laevigatus* (C.L. KOCH, 1841), and *P. nitens* (NICOLET, 1855) were redescribed by HAMMEN (1963, 1964), and the neotypes were designated, based on the locus typicus, but it remains unknown what *P. piger* (SCOPOLI, 1763) really is. The German authors neither redescribed the species, nor presented materials from the locus typicus. One can not agree with the authors that papers by SELLNICK (1928, 1960), and WILLMANN (1931), as well as STRENZKE's reference collections enable the identification of *P. piger*. The neotype has not been designated! It is even possible that *P. piger* is a member of the another family, the *Euphthiracaroida*. It is undoubtedly a ptychoid species (PARRY 1979, p. 332). JACOT (1930, p. 217) supposes that this is a euphthiracaroid mite: "Thus it certainly does not belong to the *Phthiracarini*!".

BERG, WOAS and BECK (1990) used morphometric analysis as an evidence that *P. piger* (i. e. *P. nitens*), and *P. laevigatus* are probably conspecific. The differences between these two species are: different length of seta c_1 on notogaster, and the angle

in the anterior part of notogaster. This makes *Phthiracarus nitens* (NICOLET, 1855) a junior synonym of *Phthiracarus laevigatus* (C.L. KOCH, 1841). The same authors give a morphological description of another species - *Phthiracarus stramineus* (C.L. KOCH, 1841), but they do not designate a neotype. The presented species is similar to *P. clavatus* PARRY, 1979 or *P. opacus* NIEDBALA, 1986. It is not, however, *P. stramineus* sensu JACOT (1936). As long as JACOT's materials are not redescribed, *P. stramineus* (C.L. KOCH, 1841) should be considered *incertae sedis*. On p. 88 the authors claim that one morphological character i. e. location of setae c_1 and c_3 on the notogaster should not be considered an important character any longer. They agree that the character is variable, since it is connected with a region of growth. In globular morphotypes this region is placed in anterior and upper part of notogaster.

All the species presented in the paper by MAHUNKA and MIKO (1989) are synonyms. One of them: *Steganacarus (S.) punctulatus* SERGENKO, 1985 is a synonym of *Steganacarus (S.) spinosus* (SELLNICK, 1920), as it was pointed out in my earlier work (NIEDBALA, 1992). The remaining species are new synonyms.

AVANZATI and BERNINI (1989) suggest that *Steganacarus (S.) incomptus* NIEDBALA, 1983 is within the range of morphological variability of *S. (S.) spinosus* (SELLNICK, 1920). *S. (S.) incomptus* is an endemic Caucasian species. Speciation in Caucasian *Phthiracaroidea* is strongly pronounced (cf. NIEDBALA 1983). In my opinion *S. (S.) incomptus* is a local Caucasian species, quite distinct from widely distributed *S. (S.) spinosus*. It differs in the shape of dorsal region of prodorsum, smooth setae, and presence of seta a^* on tarsus I.

I studied 2 specimens labelled *Phthiracarus cf. piger* PEREZ-INIGO (1987). I think they represent *Phthiracarus montanus* PEREZ-INIGO, 1969. Both have vestigial setae ad_1 and ad_2 on the ano-adanal plate. This supports a thesis that taxa can not be described on the basis of this character (in the original description of *P. montanus* setae ad_1 and ad_2 are given as normally developed). All the remaining characters i. e. presence of 4 lyrifissures, arrangement of genital setae, serration on genital plate, location of setae d on femur I, curved setae a'' and ft'' on tarsi I and II, long setae d on femur III and genu IV are essentially the same as in *P. montanus*.

* Seta a' is often absent on tarsus I (not s as stated in my earlier papers).

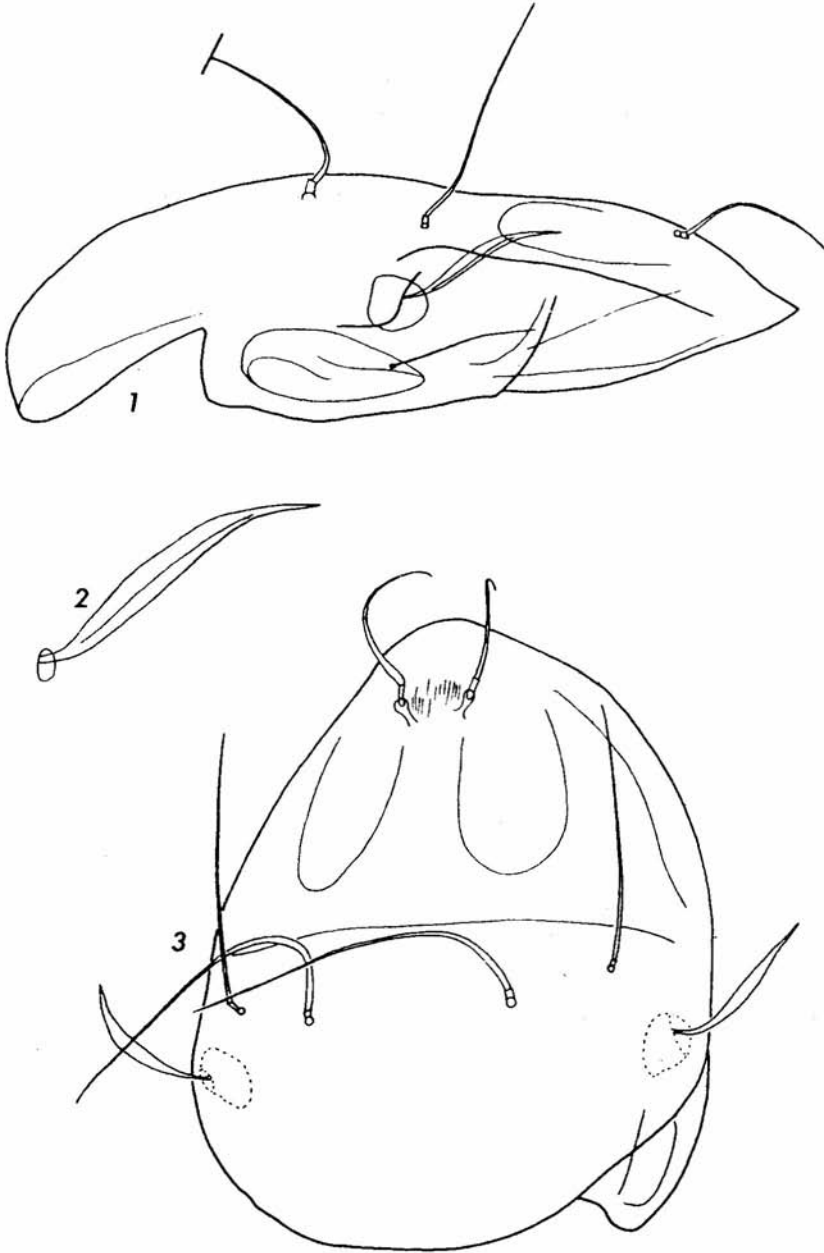
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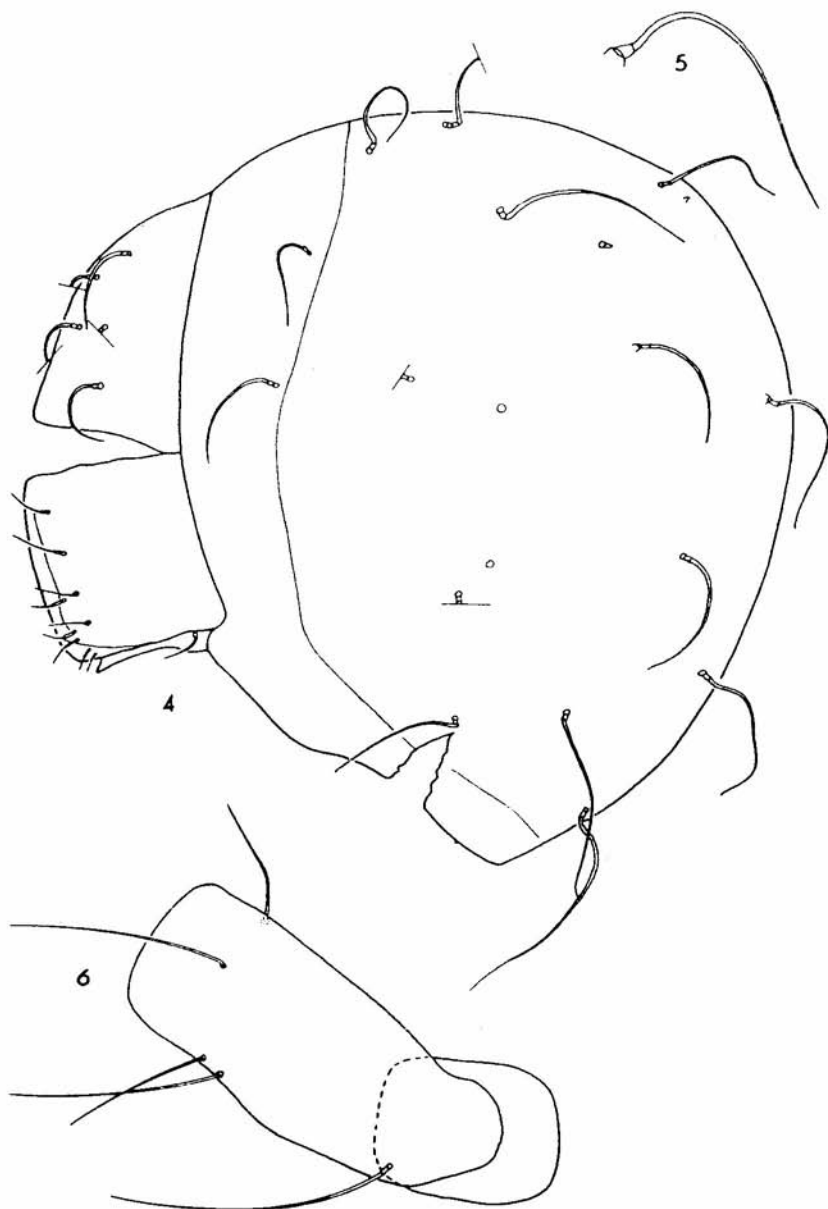
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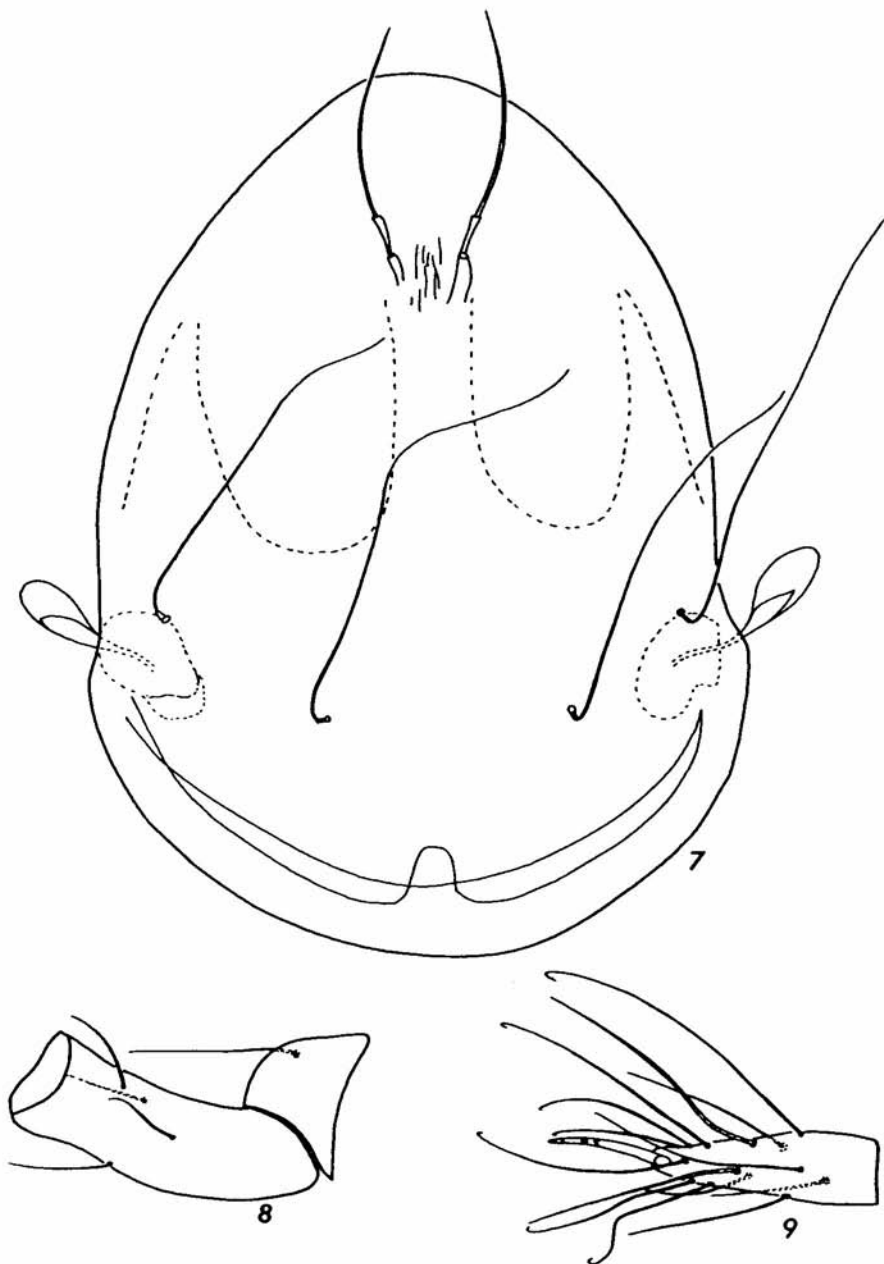
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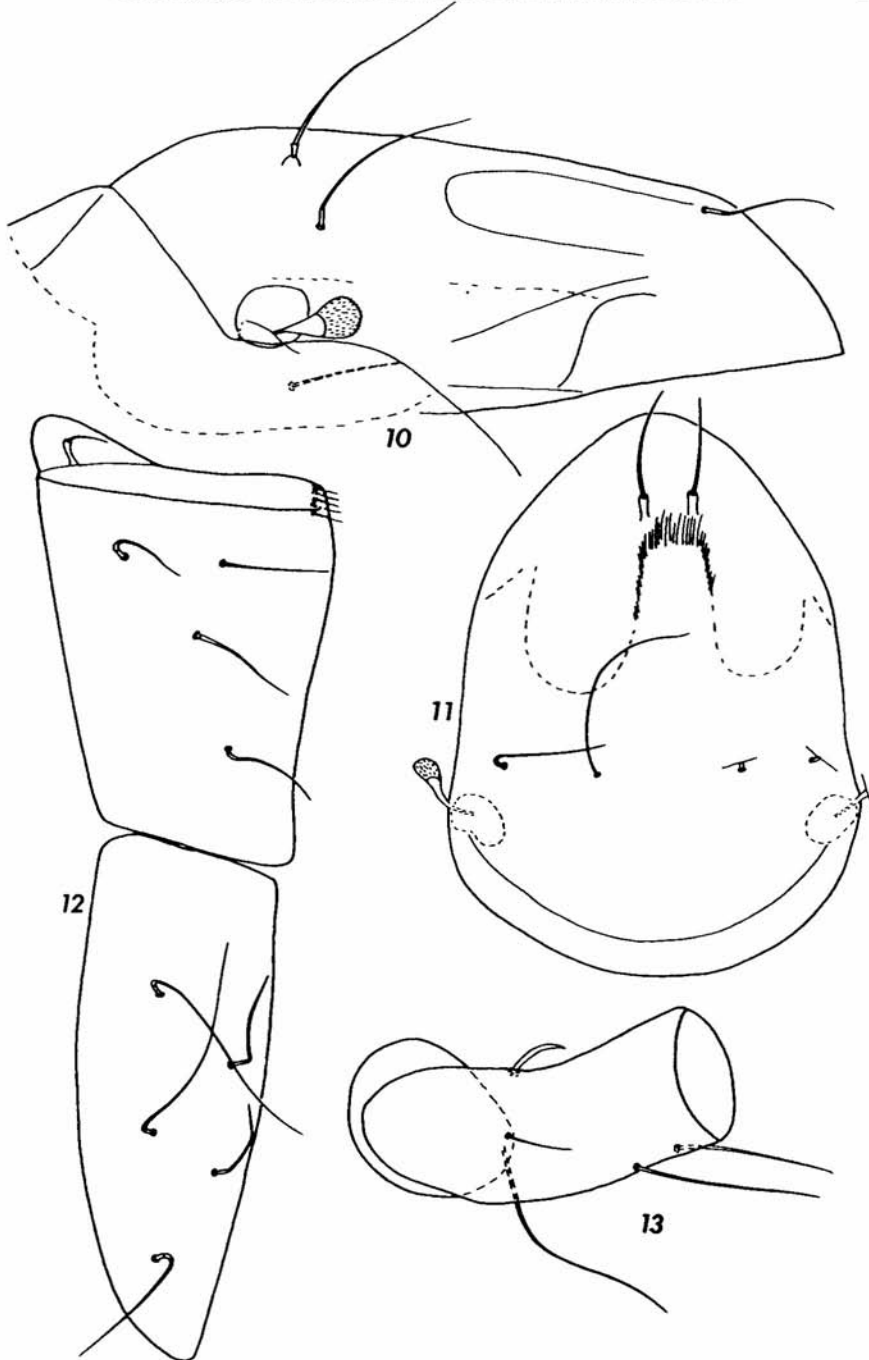
1-3. *Phthiracarus atlanticus* (PEREZ-INOJO, 1987) - syntype: 1 - prodorsum, lateral view, 2 - sensillus, 3 - prodorsum, dorsal view



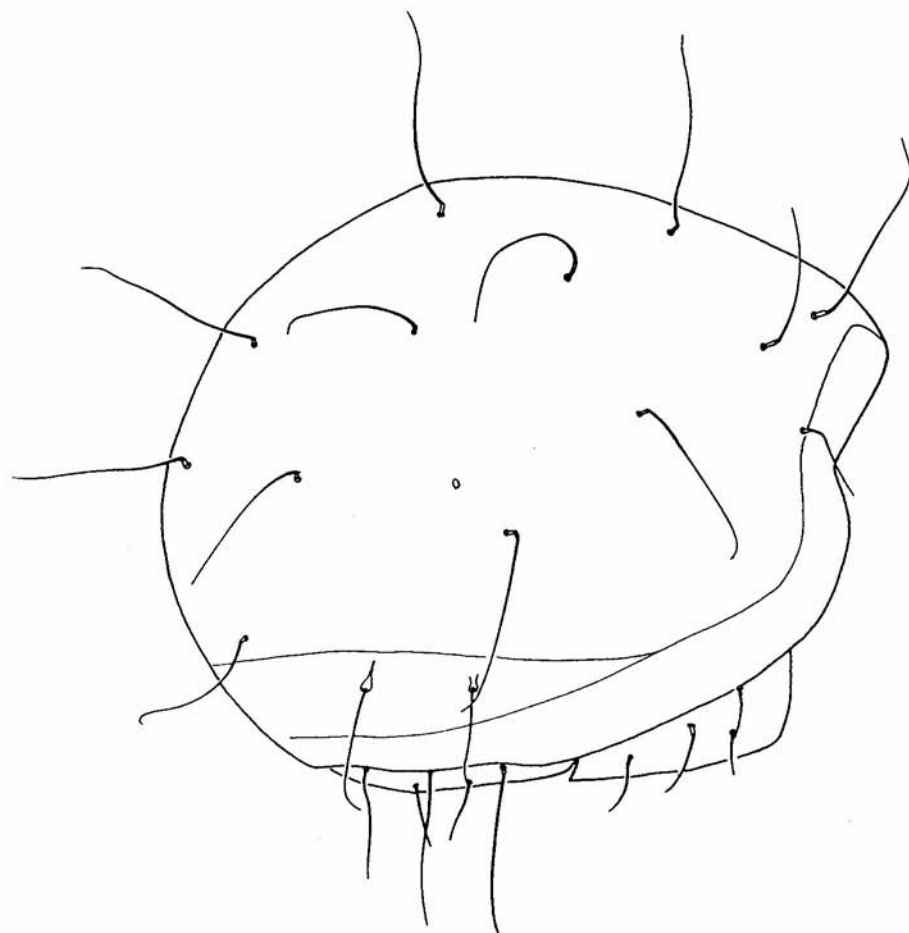
4-6. *Phthiracarus atlanticus* (PEREZ-INGO, 1987) - syntype: 4 - notogaster, lateral view, 5 - e1 seta, 6 - trochanter and femur of leg I



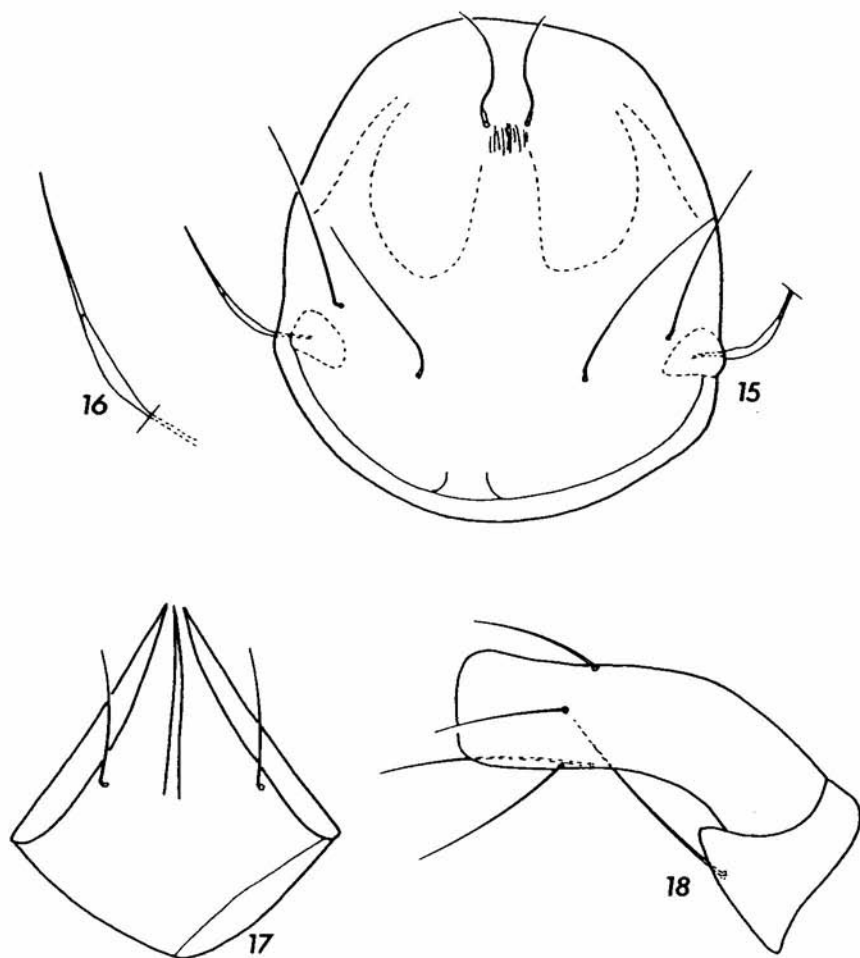
7-9. *Phthiracarus pilosus* SERGENKO, 1987 - holotype: synonym of *Phthiracarus bryobius* JACOT, 1930:
 7 - prodorsum, dorsal view, 8 - trochanter and femur of leg I, 9 - tarsus of leg II



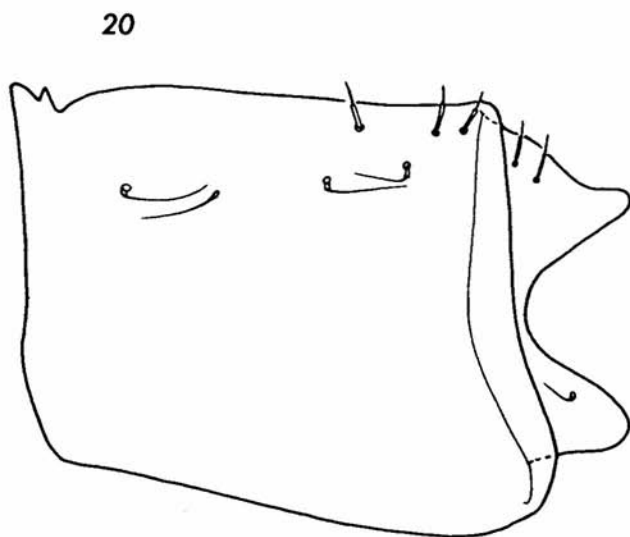
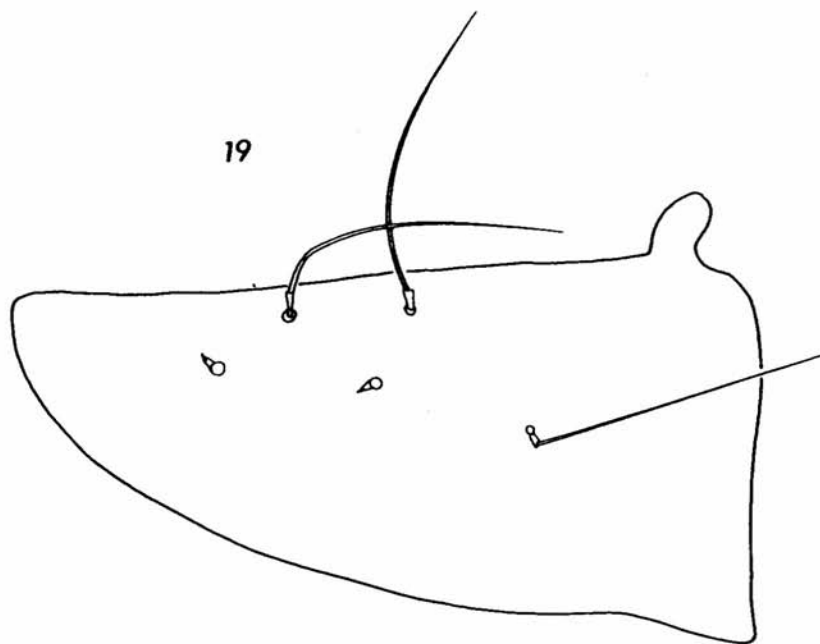
10-13. *Phthiracarus imbecilis* (МАЛУНКА, 1989) - paratype: 10 - prodorsum, lateral view, 11 - prodorsum, dorsal view, 12 - genito-aggenital and ano-adanal plates, 13 - trochanter and femur of leg I



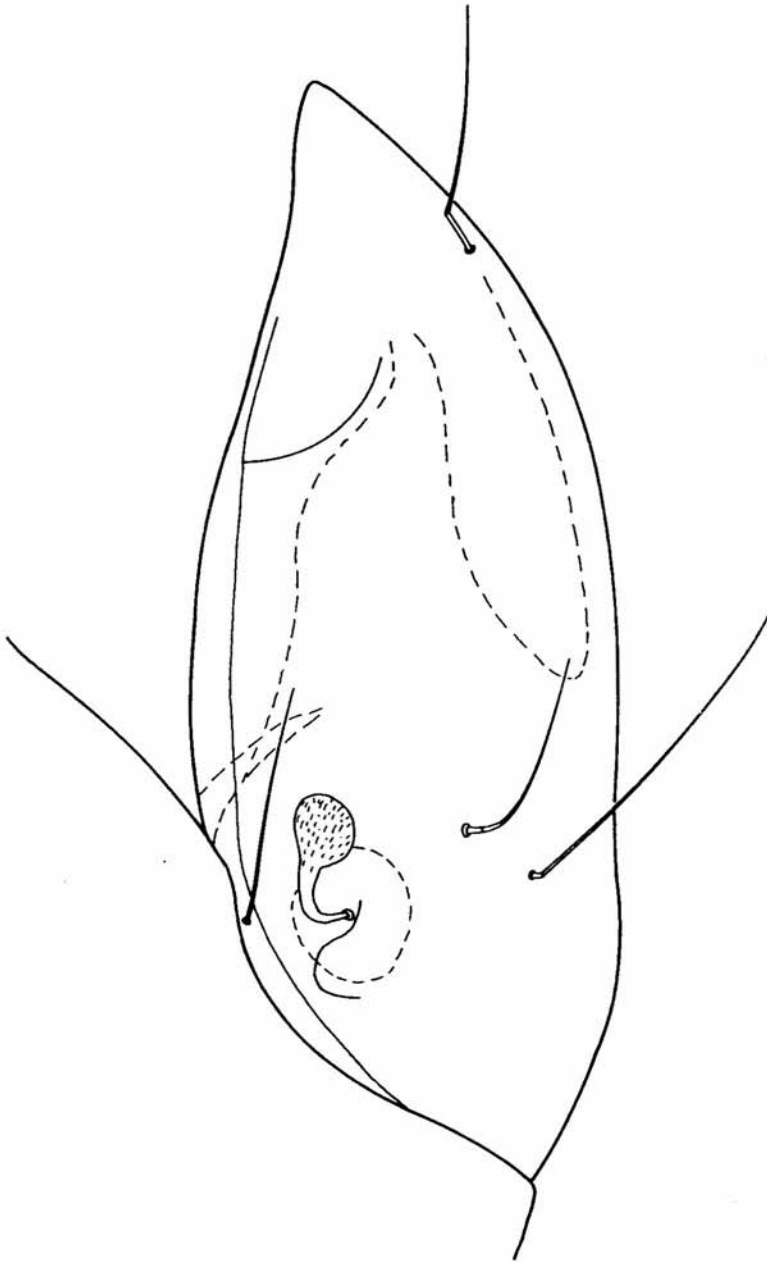
14. *Phthiracarus imbecilis* (МАЛИНКА, 1989) - paratype: notogaster, lateral view



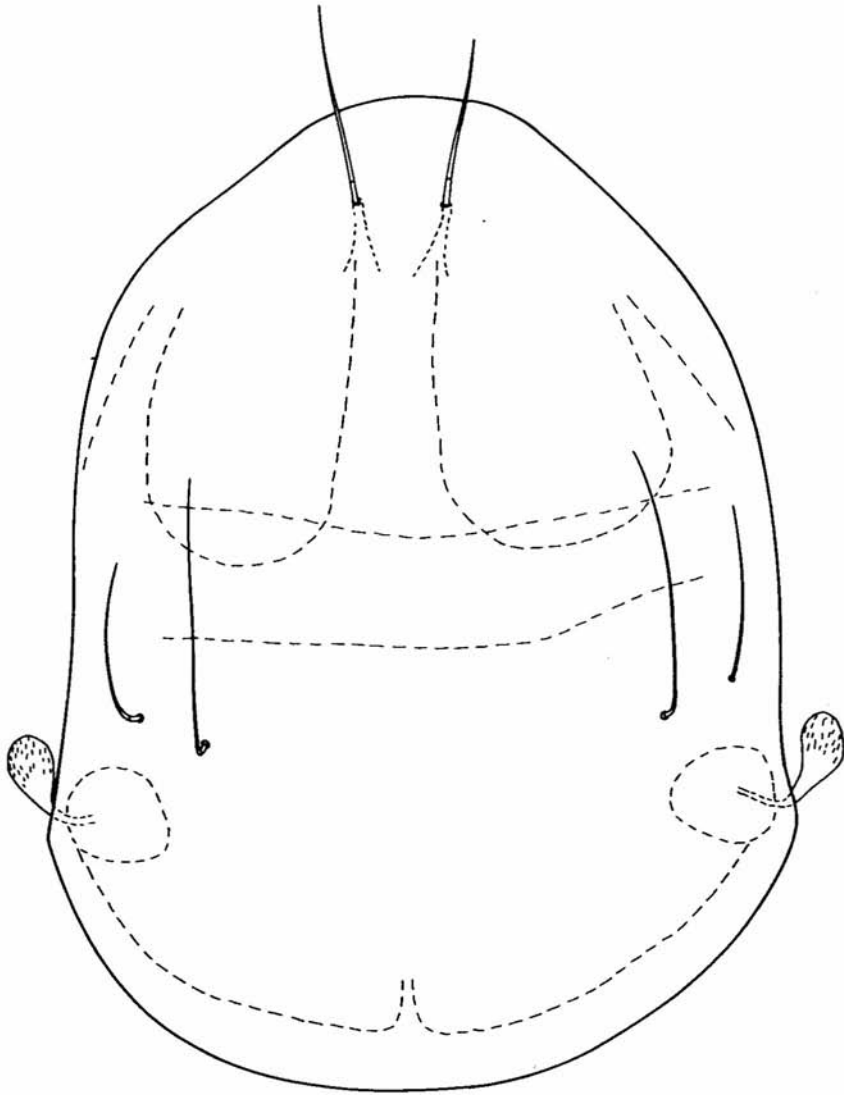
15-18. *Phthiracarus conformis* SERGENKO, 1987 - holotype: synonym of *Phthiracarus incertus* NIEDBALA, 1983: 15 - prodorsum, dorsal view, 16 - sensillus, 17 - infracapitular mentum, 18 - trochanter and femur of leg I



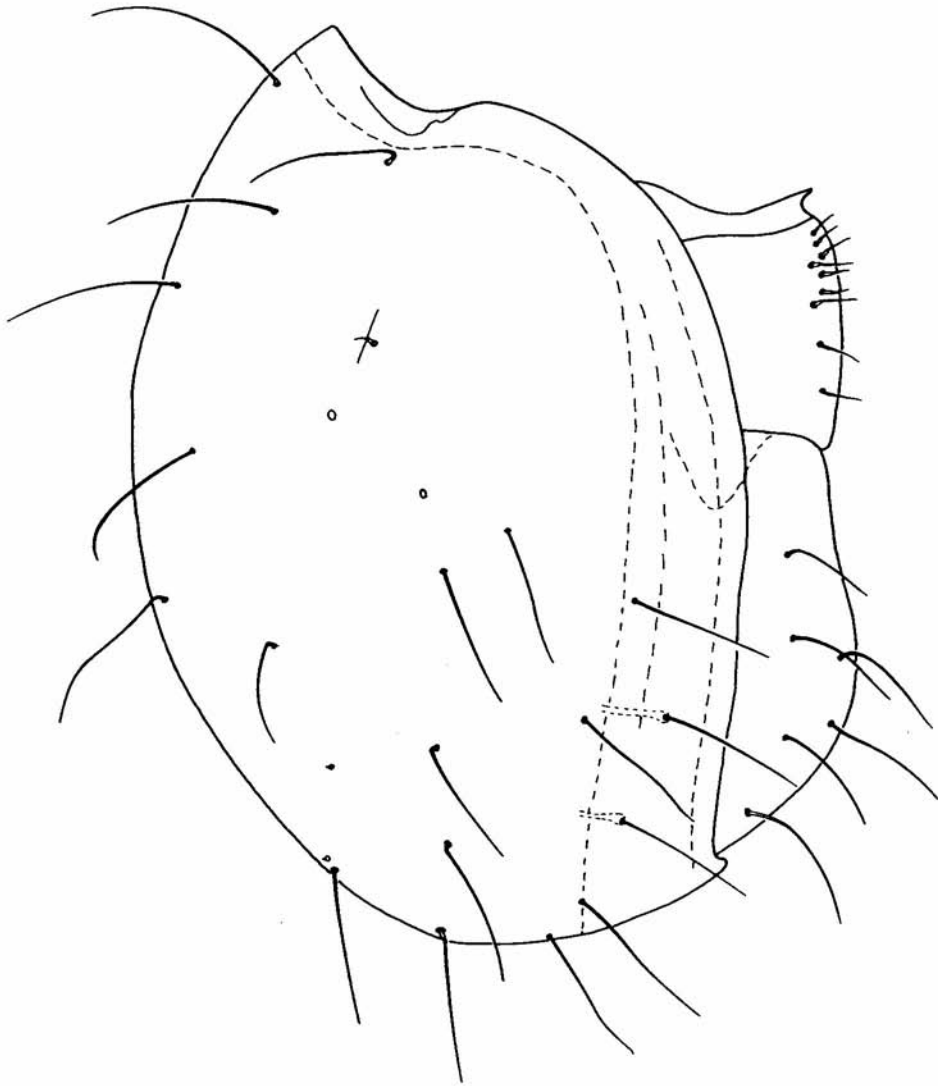
19-20. *Phthiracarus conformis* SERGENKO, 1987 - holotype: synonym of *Phthiracarus incertus* NIEDBALA, 1983: 19 - ano-adanal plate, 20 - genito-aggenital plate



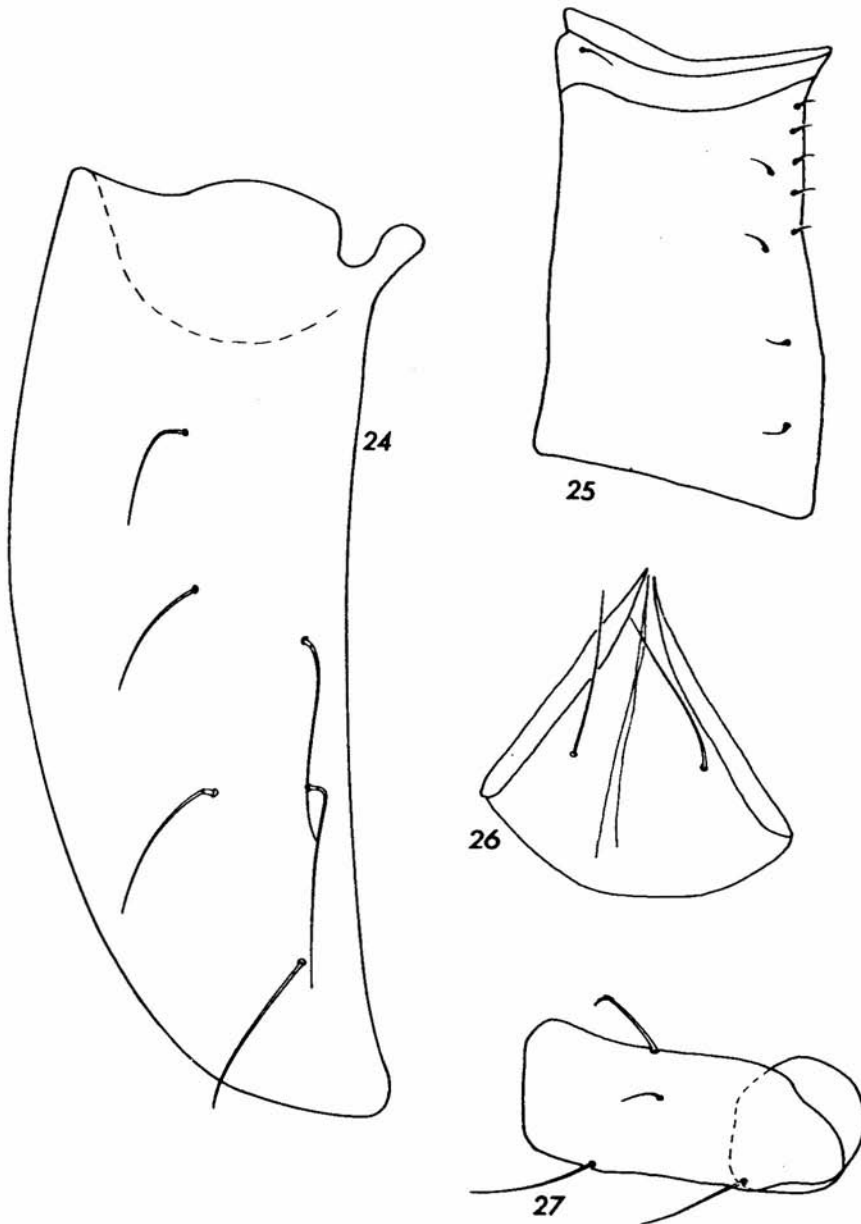
21. *Neoprotophthiracarus flagellatus* МАЛУНКА, 1980 - paratype: now: *Phthiracarus mahunkai* nov.
nom.: prodorsum, lateral view



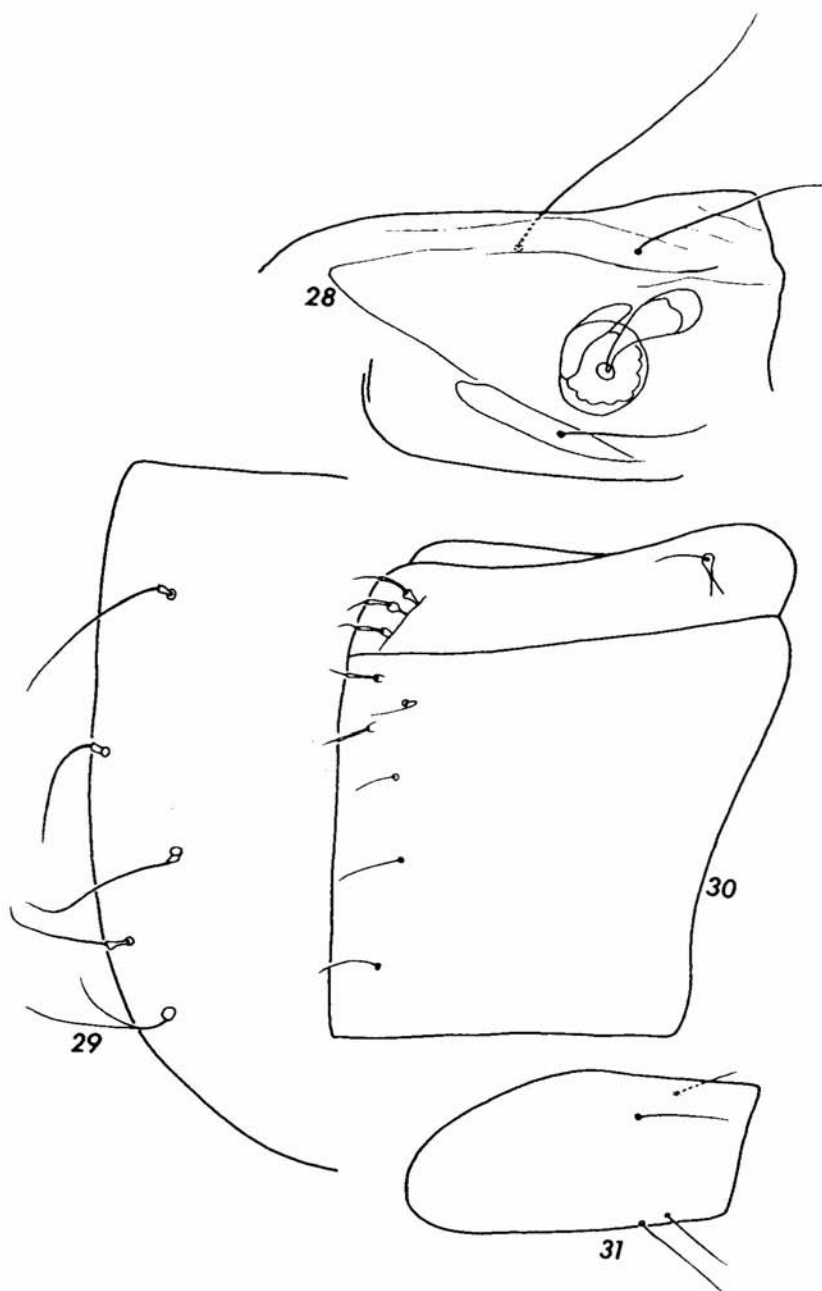
22. *Neoprotophthiracarus flagellatus* MAHUNKA, 1980 - paratype: now: *Phthiracarus mahunkai* nov.
nom.: prodorsum, dorsal view



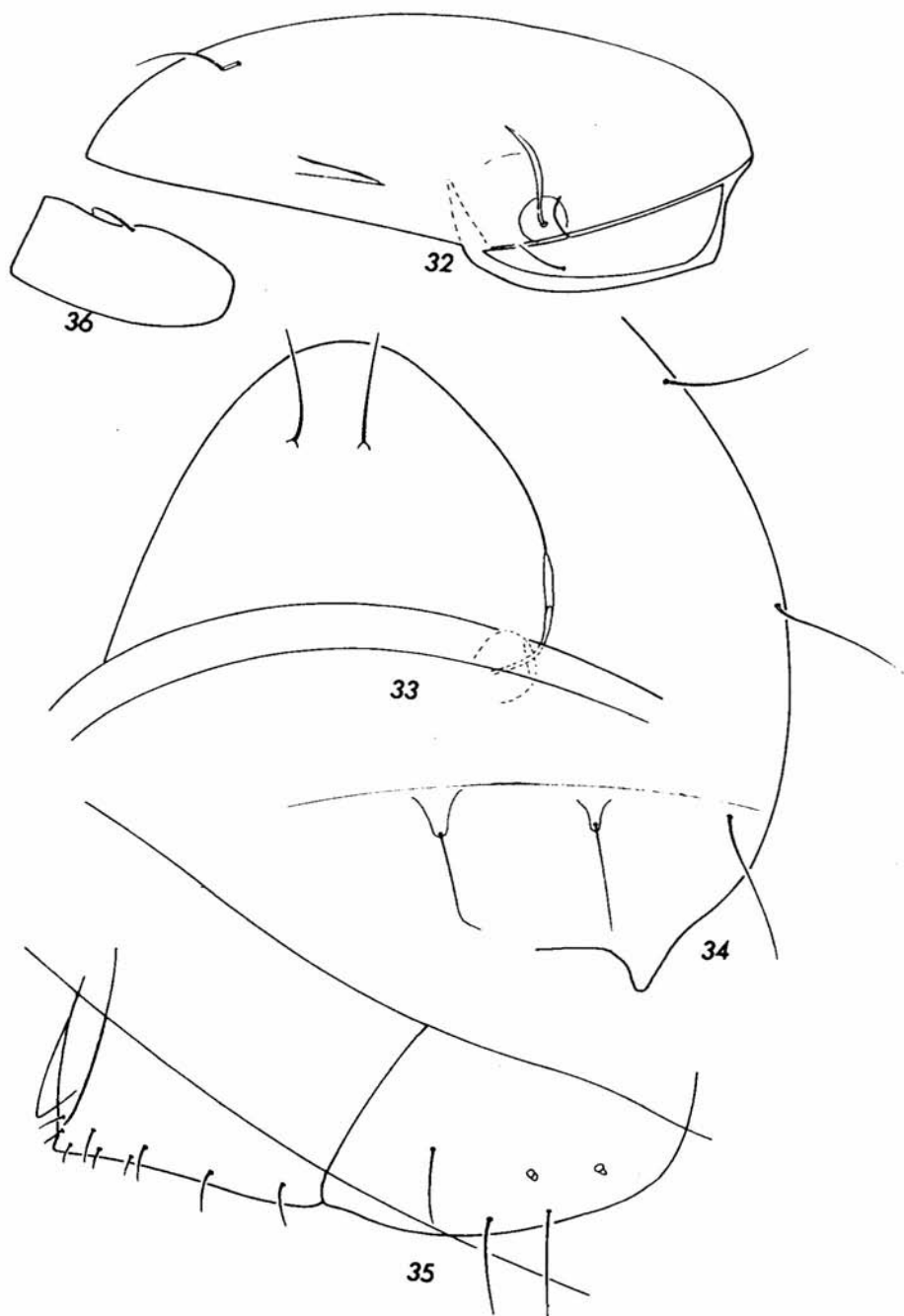
23. *Neoprotophthiracarus flagellatus* MAHUNKA, 1980 - paratype: now: *Phthiracarus mahunkai* nov.
nom.: notogaster, lateral view



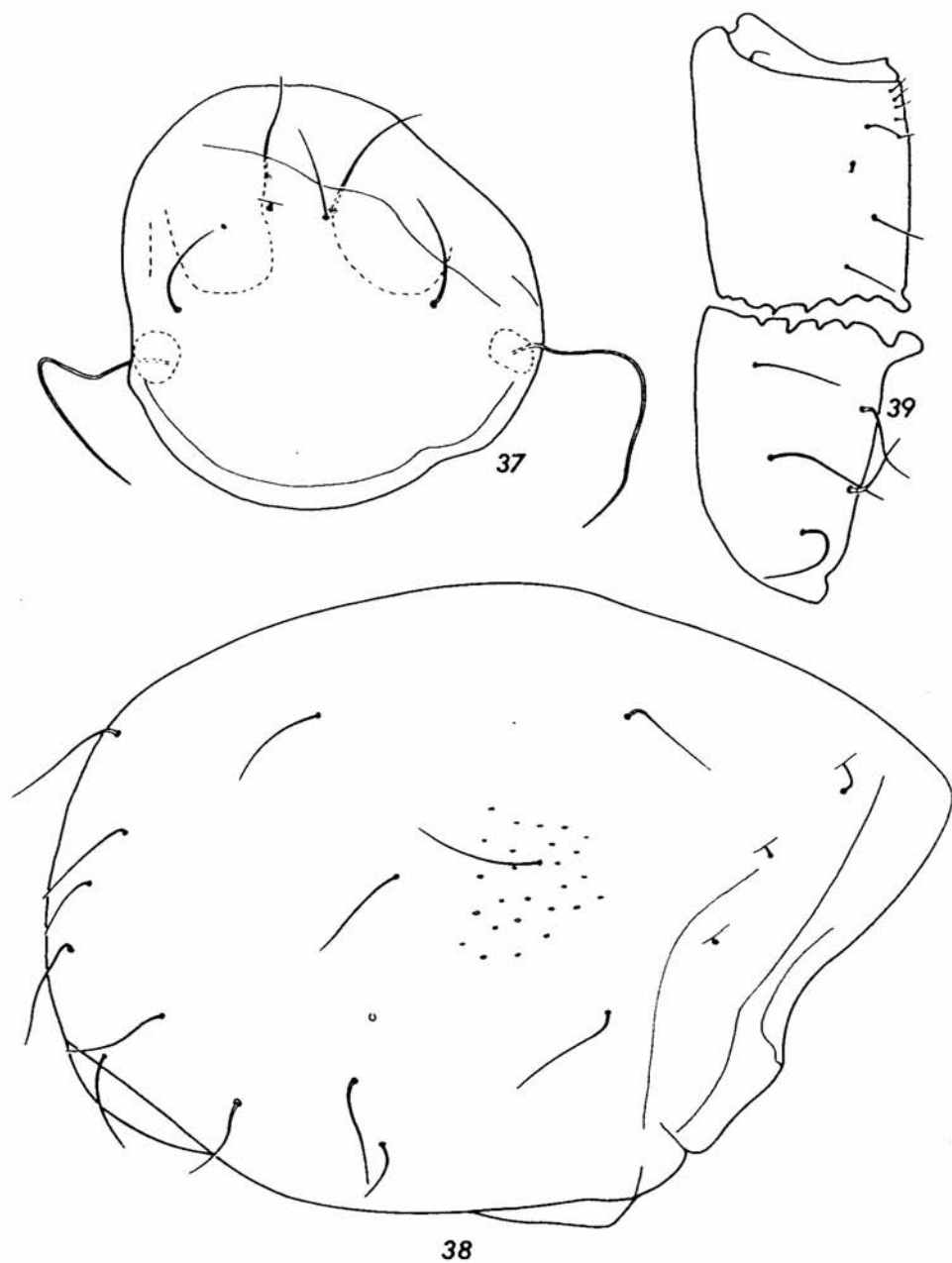
24-27. *Neoprotophthiracarus flagellatus* MAHUNKA, 1980 - paratype: now: *Phthiracarus mahunkai* nov. nom.: 24 - ano-adanal plate, 25 - genito-aggenital plate, 26 - infracapitular mentum, 27 - trochanter and femur of leg I



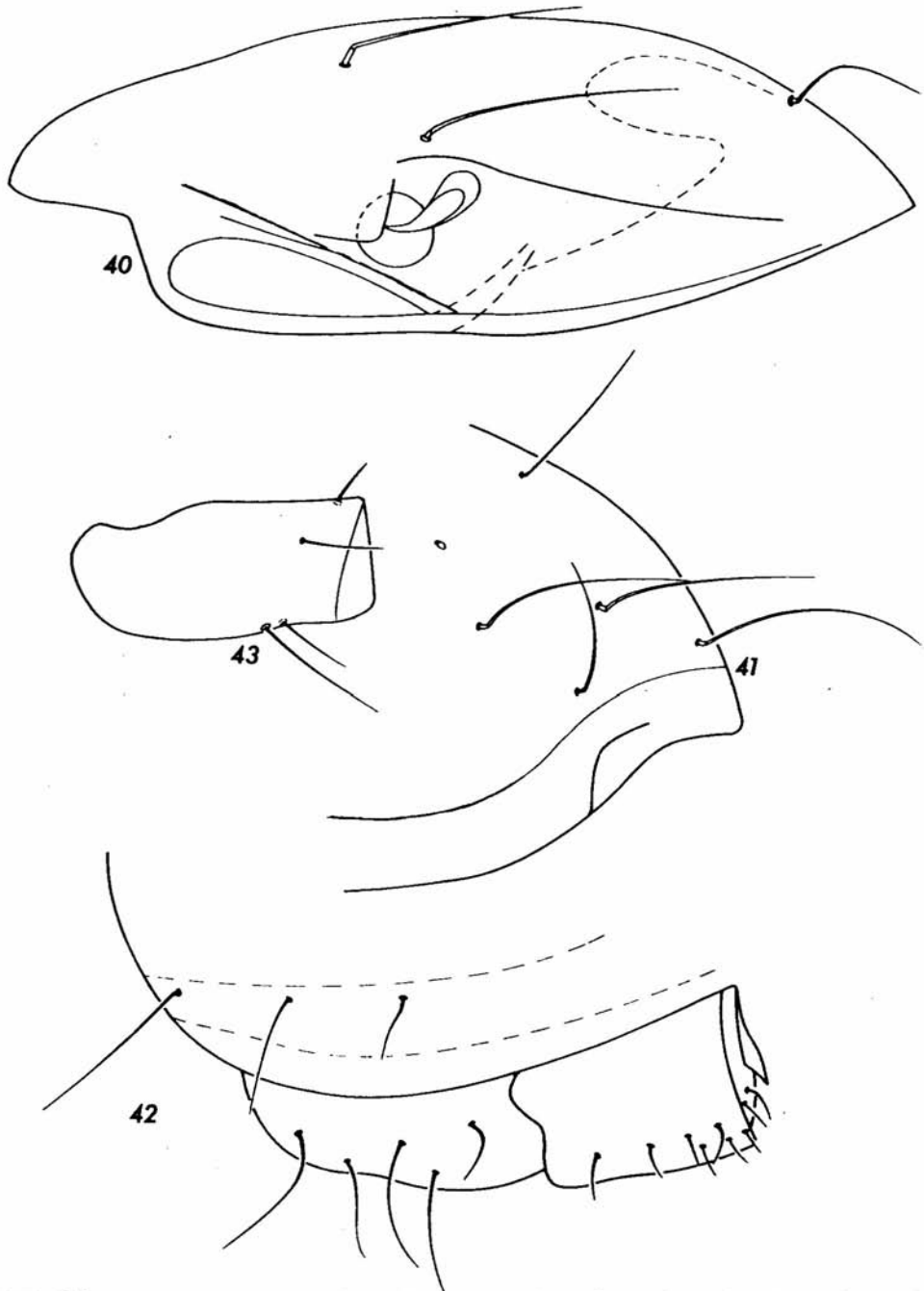
28-31. *Phthiracarus parmatus* (NAKATAMARI, 1985) - paratype: 28 - fragment of prodorsum with sensillus, lateral view, 29 - fragment of ano-adanal plate, 30 - genito-aggenital plate, 31 - femur of leg I



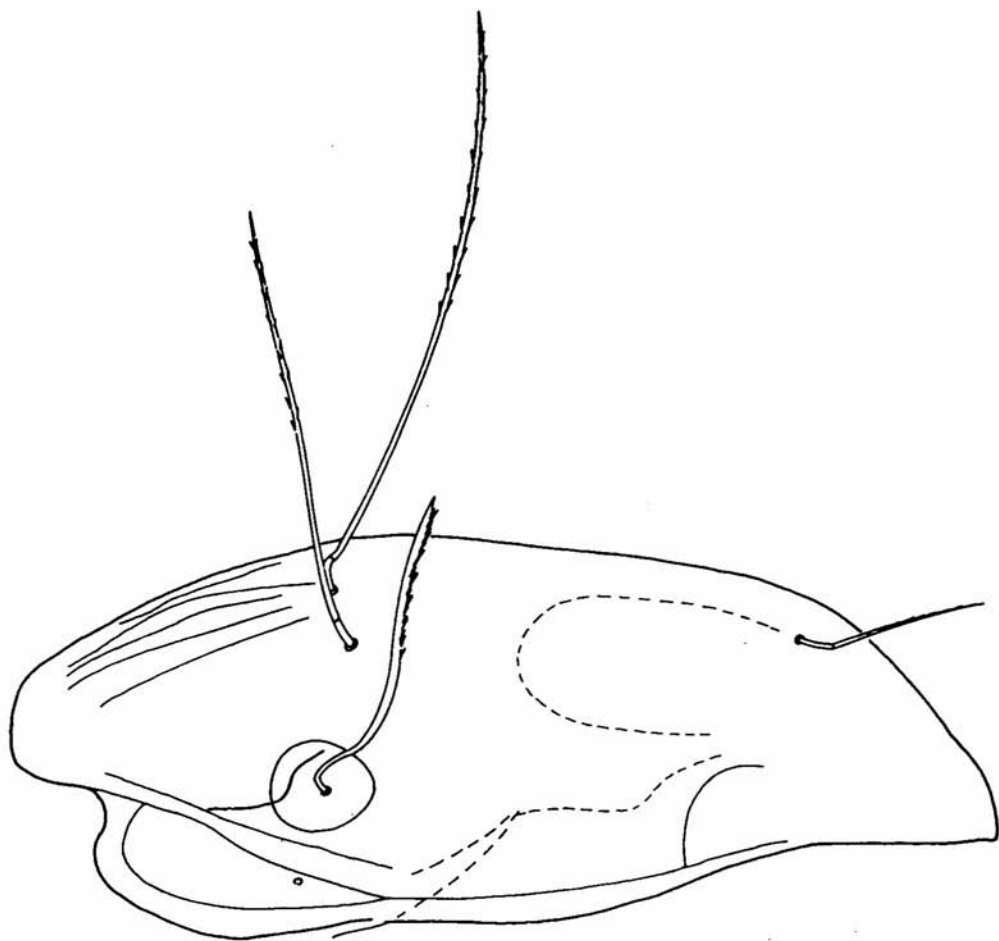
32-36. *Phthiracarus prior* JACOT, 1933 - "cotype": 32 - prodorsum, lateral view, 33 - prodorsum, dorsal view, 34 - posterior fragment of notogaster, lateral view, 35, 36 - genito-aggenital and ano-adanal plates, lateral view



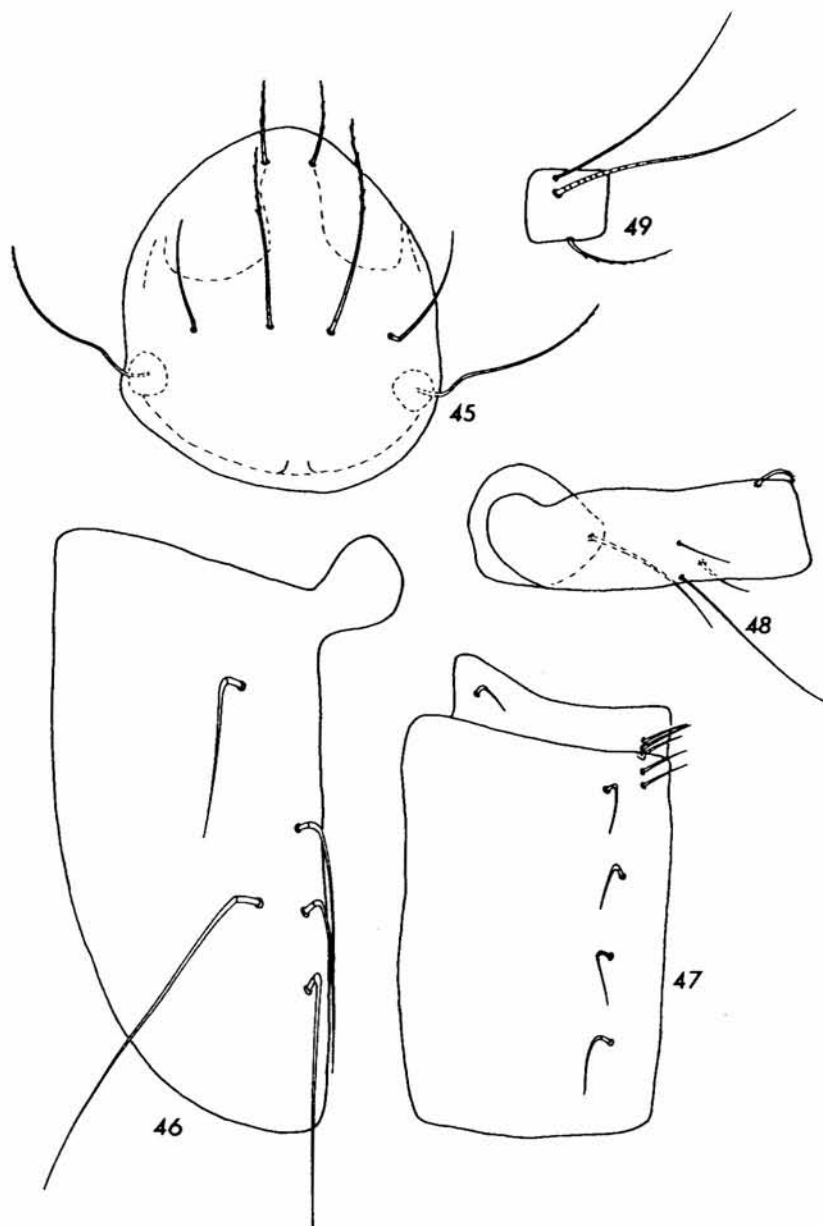
37-39. *Phthiracarus serrula* BALOGH and MAHUNKA, 1977 - holotype: synonym of *Phthiracarus pygmaeus* BALOGH, 1958: 37 - prodorsum, dorsal view, 38 - notogaster, lateral view, 39 - genito-aggenital and ano-adanal plates



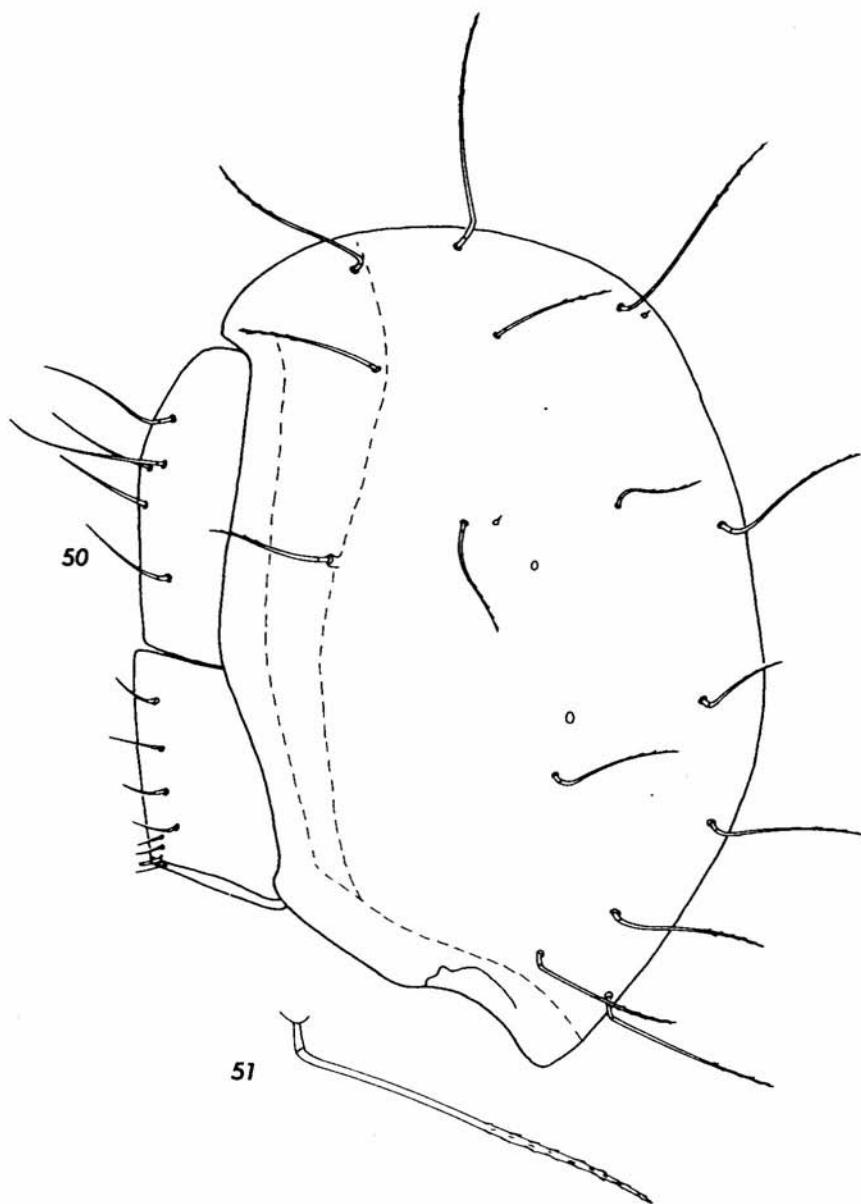
40-43. *Phthiracarus savicensis* SUBIAS and GIL, 1990 - paratype: 40 - prodorsum, lateral view, 41 - anterior fragment of notogaster, lateral view, 42 - genito-aggenital and ano-adanal plates and postero-lateral part of notogaster, 43 - femur of leg I



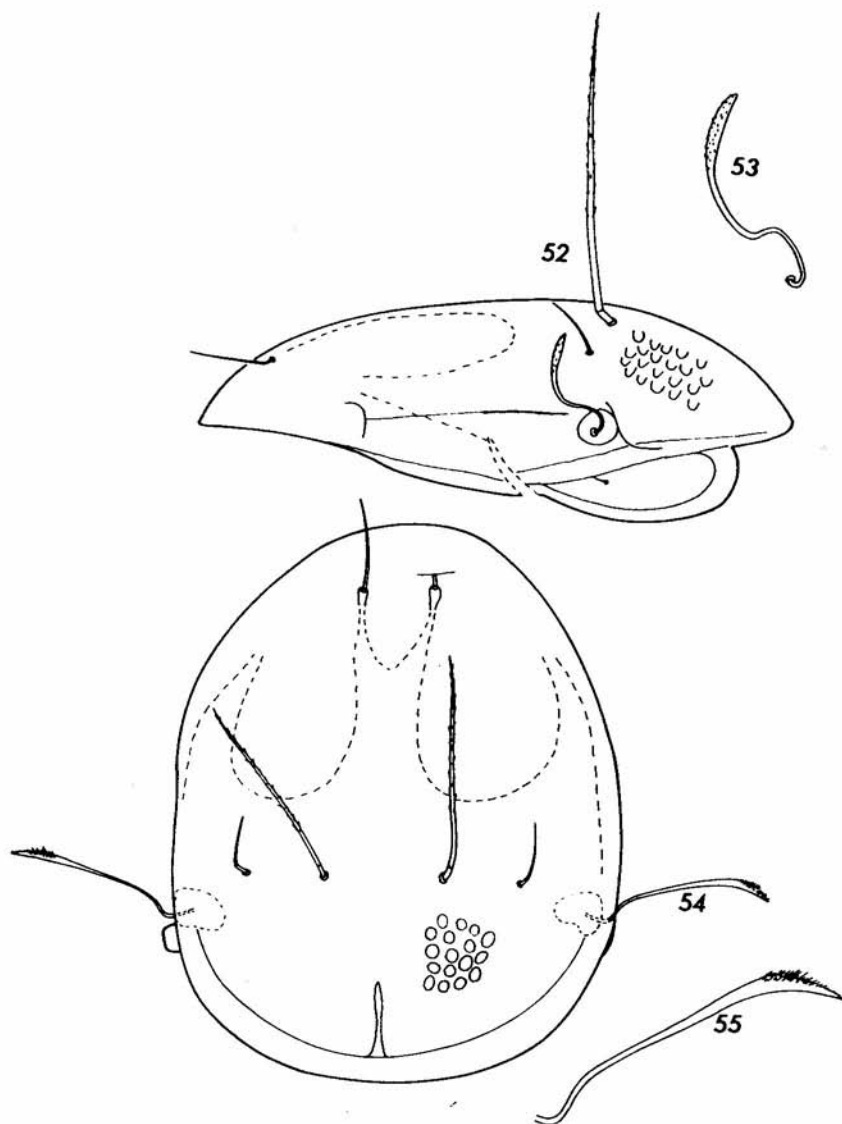
44. *Steganacarus politus* MAHUNKA, 1983 - paratype: synonym of *Plonaphacarus eximius* (NIEDBALA, 1982) - prodorsum, lateral view



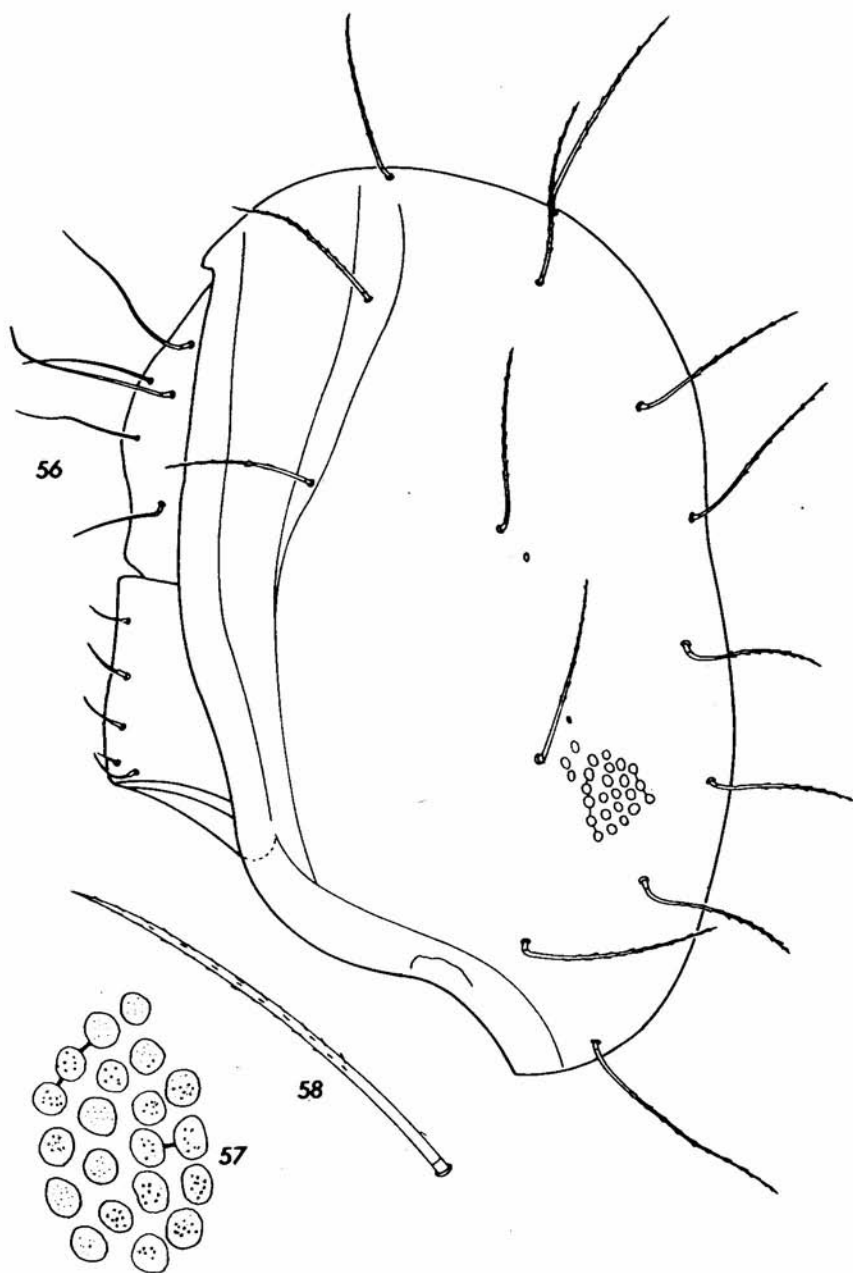
45-49. *Steganacarus politus* МАЛУНКА, 1983 - paratype: synonym of *Plonaphacarus eximius* (NIEDBALA, 1982): 45 - prodorsum, dorsal view, 46 - ano-adanal plate, 47 - genito-aggenital plate, 48 - trochanter and femur of leg I, 49 - tibia of leg IV



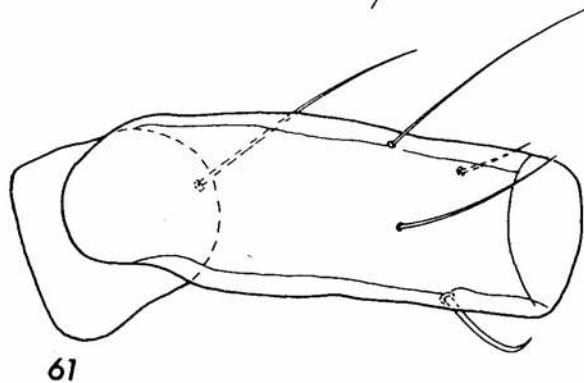
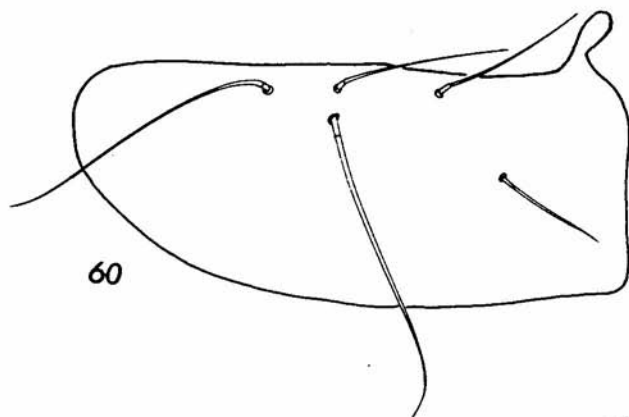
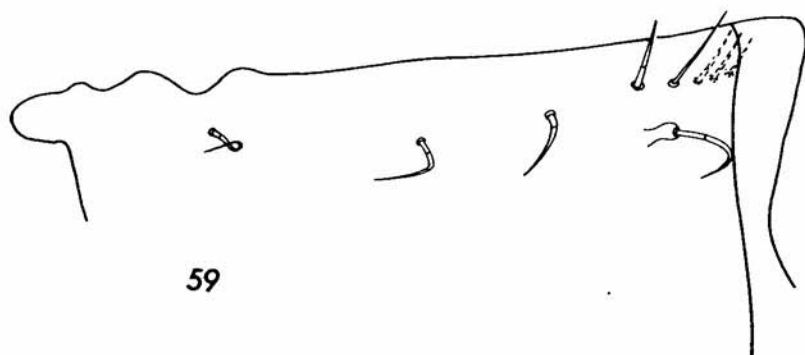
50-51. *Steganacarus politus* MAHUNKA, 1983 - paratype: synonym of *Plonaphacarus eximius* (NIEDBALA, 1982): 50 - notogaster, lateral view, 51 - c1 seta



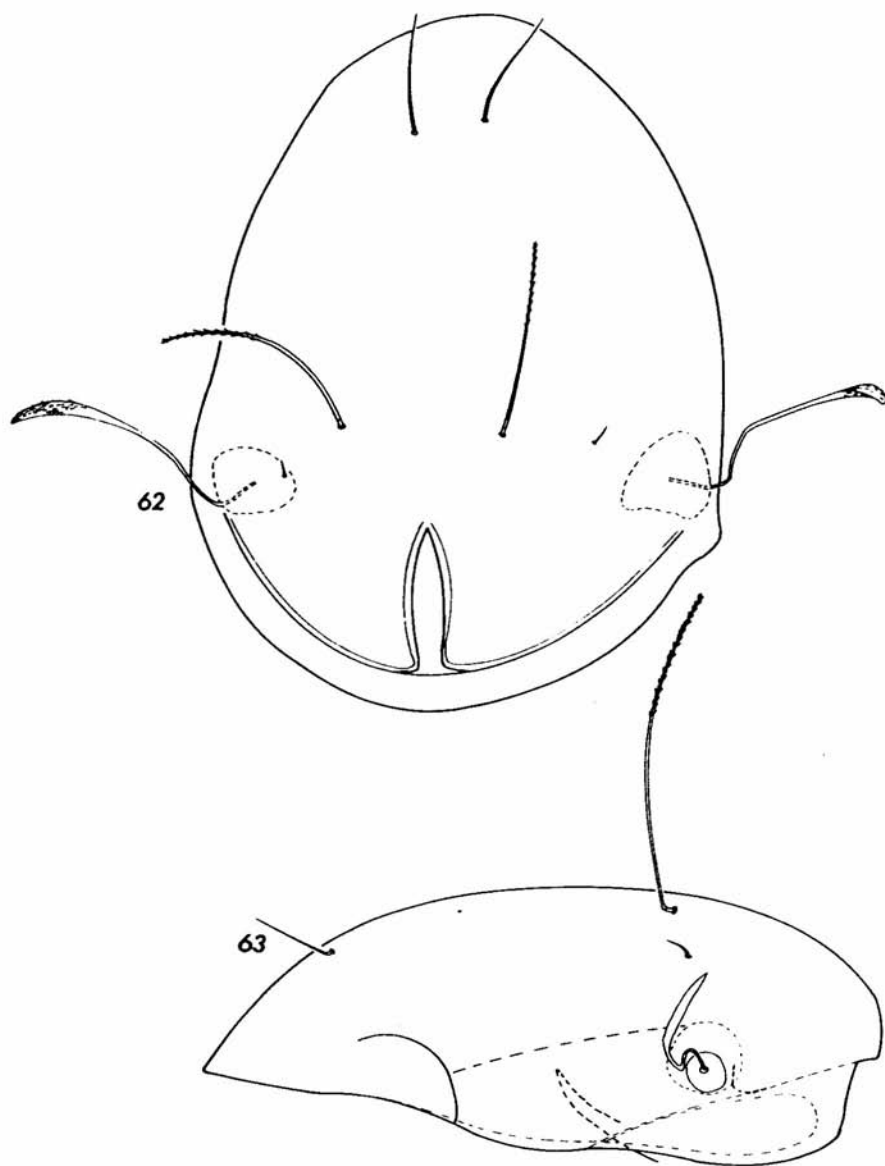
52-55. *Plonaphacarus loebli* (МАЛУНКА, 1985) - paratype: 52 - prodorsum, lateral view, 53 - sensillum, lateral view, 54 - prodorsum, dorsal view, 55 - sensillum, dorsal view



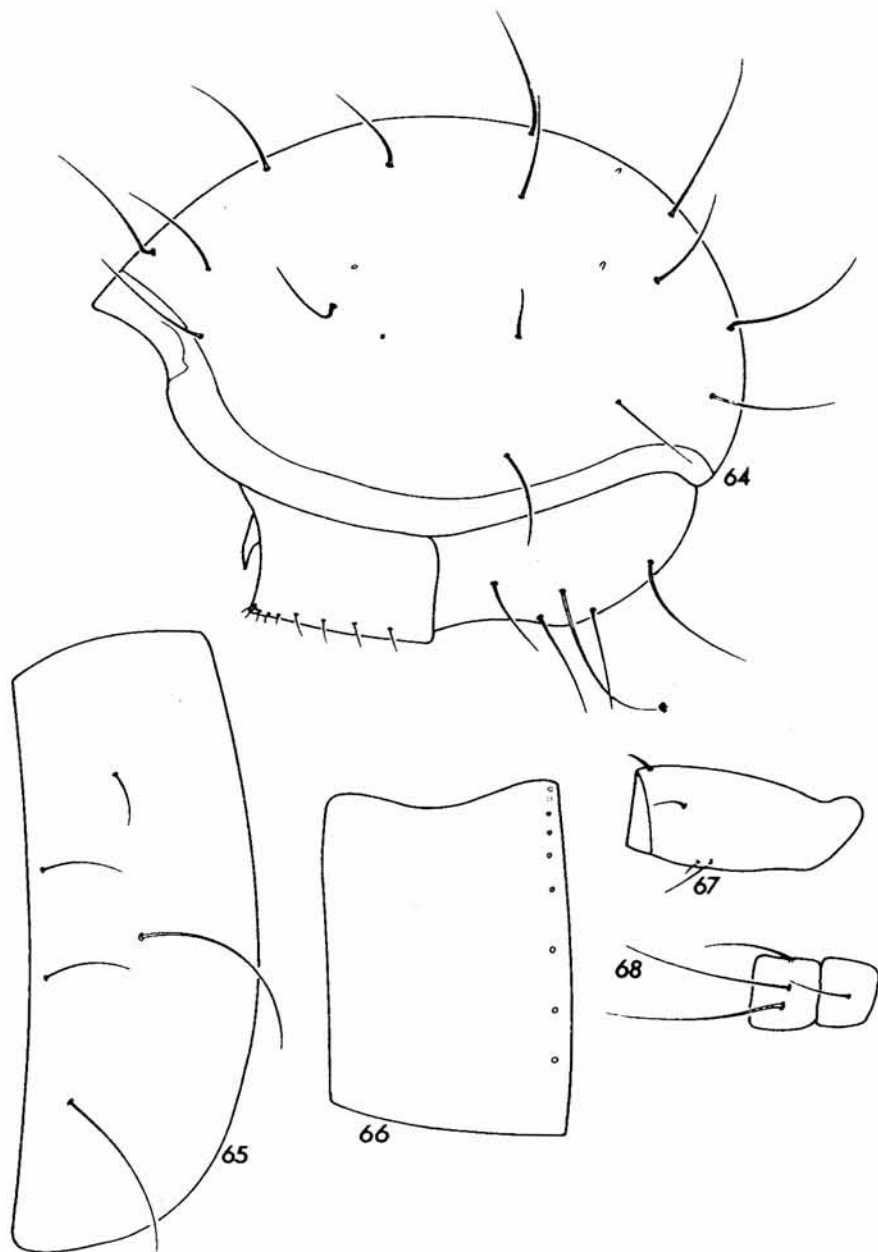
56-58. *Plonaphacarus loebli* (MAHUNKA, 1985) - paratype: 56 - notogaster, lateral view, 57 - sculpture of notogaster, 58 - cl seta



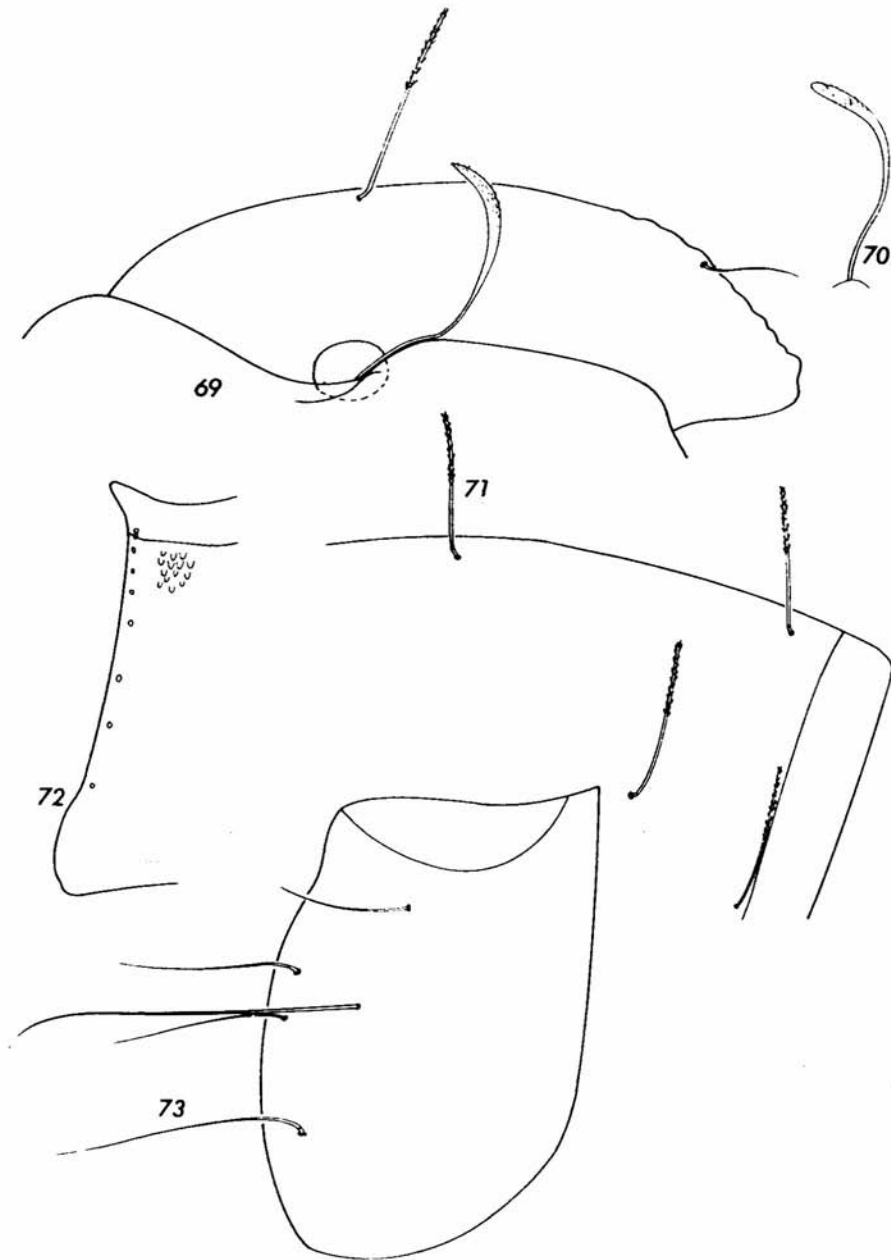
59-61. *Plonaphacarus loebli* (МАХУНКА, 1985) - paratype: 59 - fragment of genito-aggenital plate, 60 - ano-adanal plate, 61 - trochanter and femur of leg I



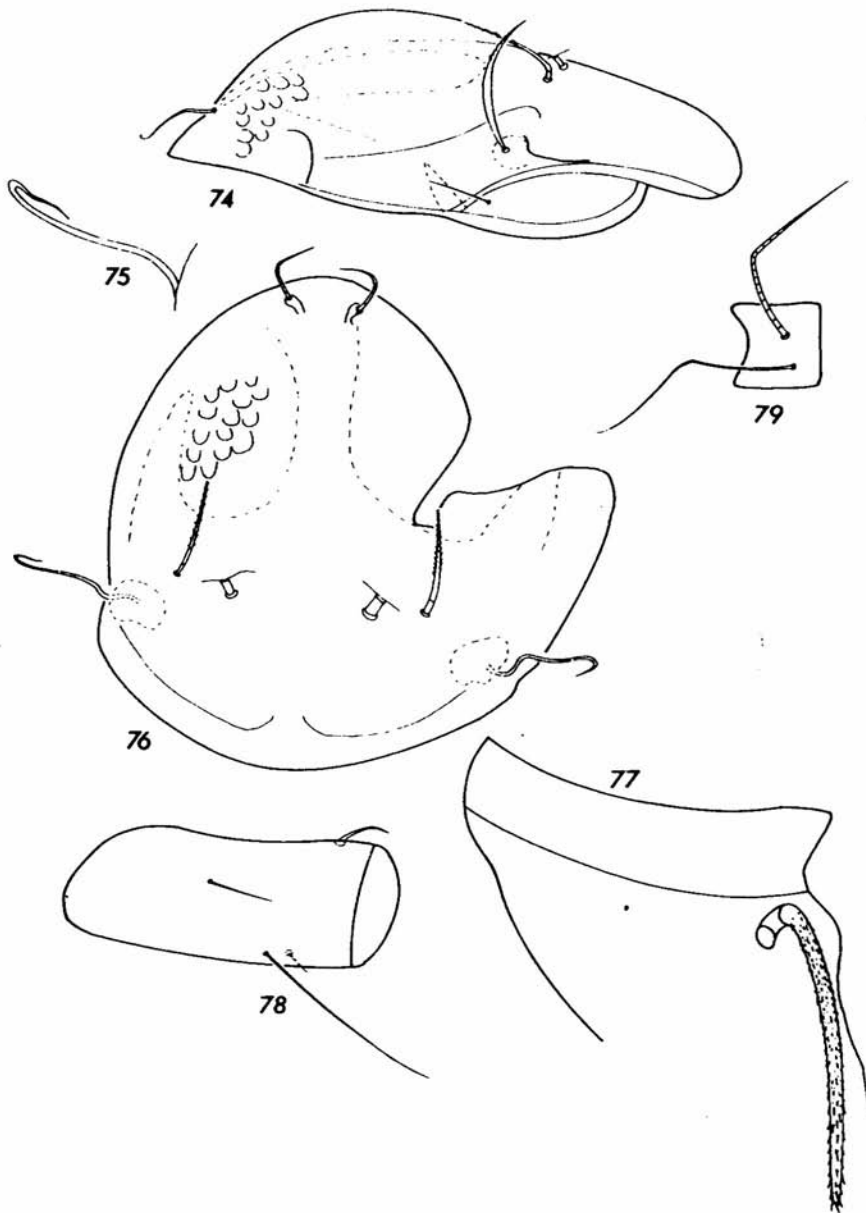
62-63. *Hoplophthiracarus paludis* Jancso, 1938 - "cotypes" (slide 3294h): 62 - prodorsum, dorsal view, 63 - prodorsum, lateral view



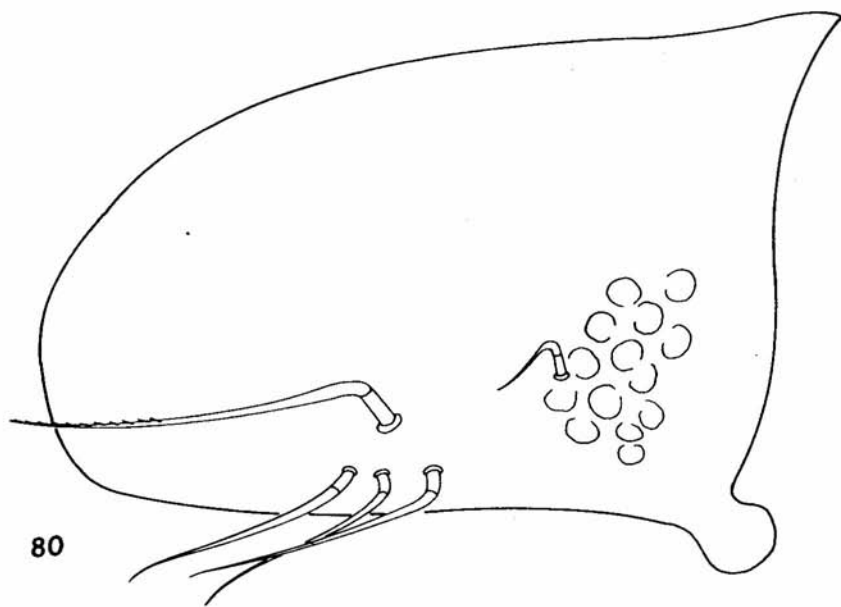
64-68. *Hoplophthiracarus paludis* JACOT, 1938 - "cotypes" (slide 3294h): 64 - notogaster, lateral view, 65 - ano-adanal plate, 66 - genito-aggenital plate, 67 - femur of leg I, 68 - genu and tibia of leg IV



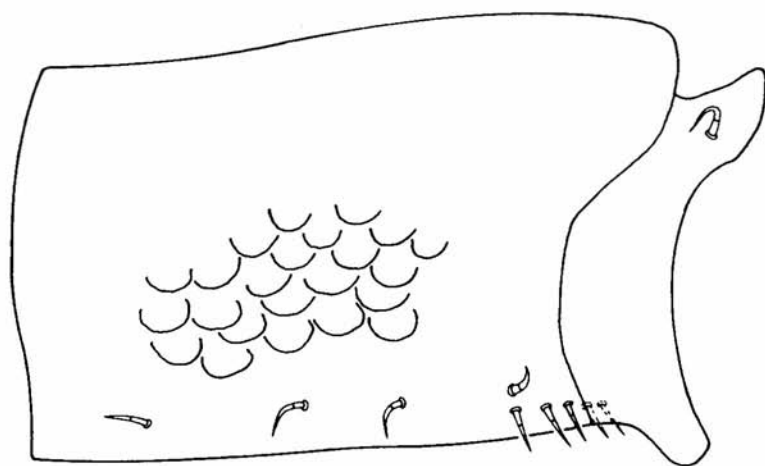
69-73. *Hoplophthiracarus robustior* JACOT, 1933 - "cotypes": 69 - prodorsum, lateral view, 70 - sensillus, 71 - anterior part of notogaster, lateral view, 72 - fragment of genito-aggenital plate, 73 - ano-adanal plate



74-79. *Steganacarus (Rhacaplacarus) granulatus* (BANKS, 1902) - "type": 74 - prodorsum, lateral view, 75 - sensillus, dorsal view, 76 - prodorsum, dorsal view, 77 - fragment of notogaster with c1 seta, 78 - femur of leg I, 79 - tibia of leg IV

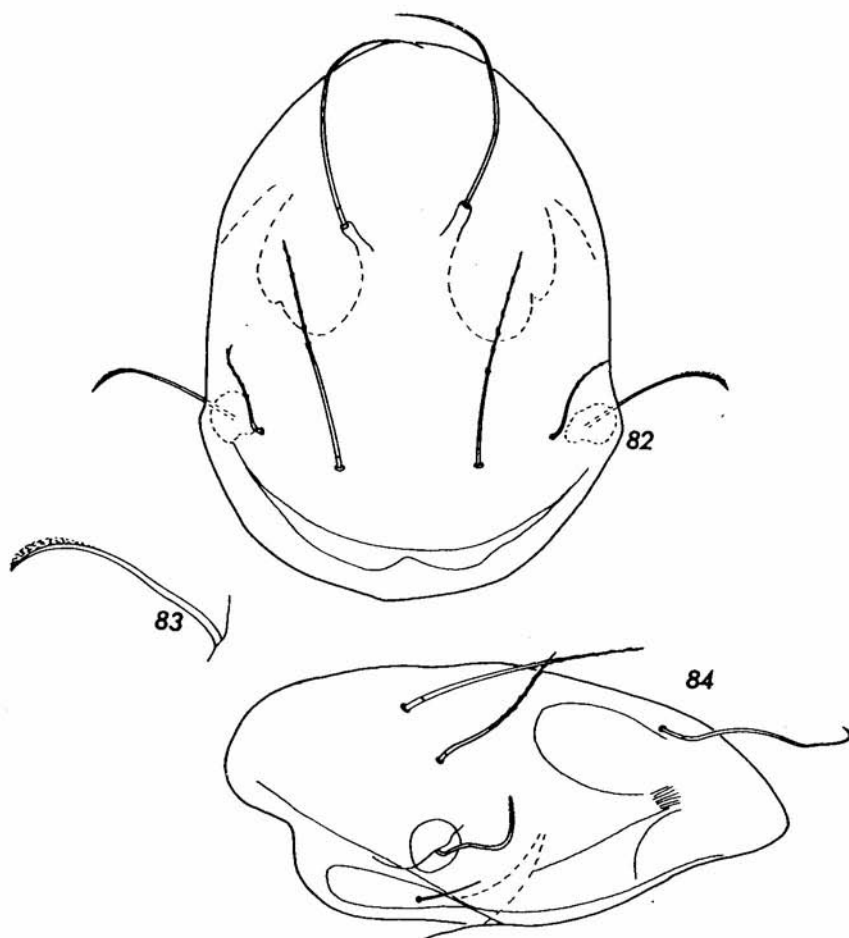


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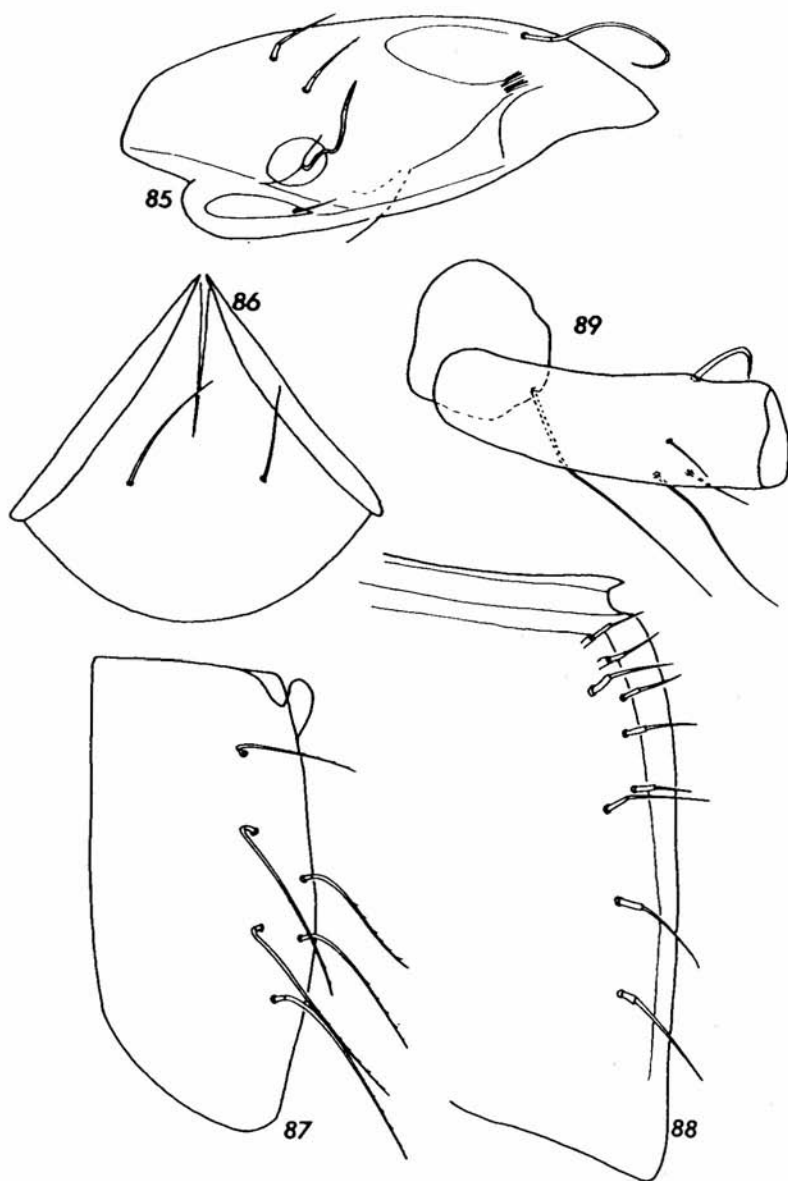


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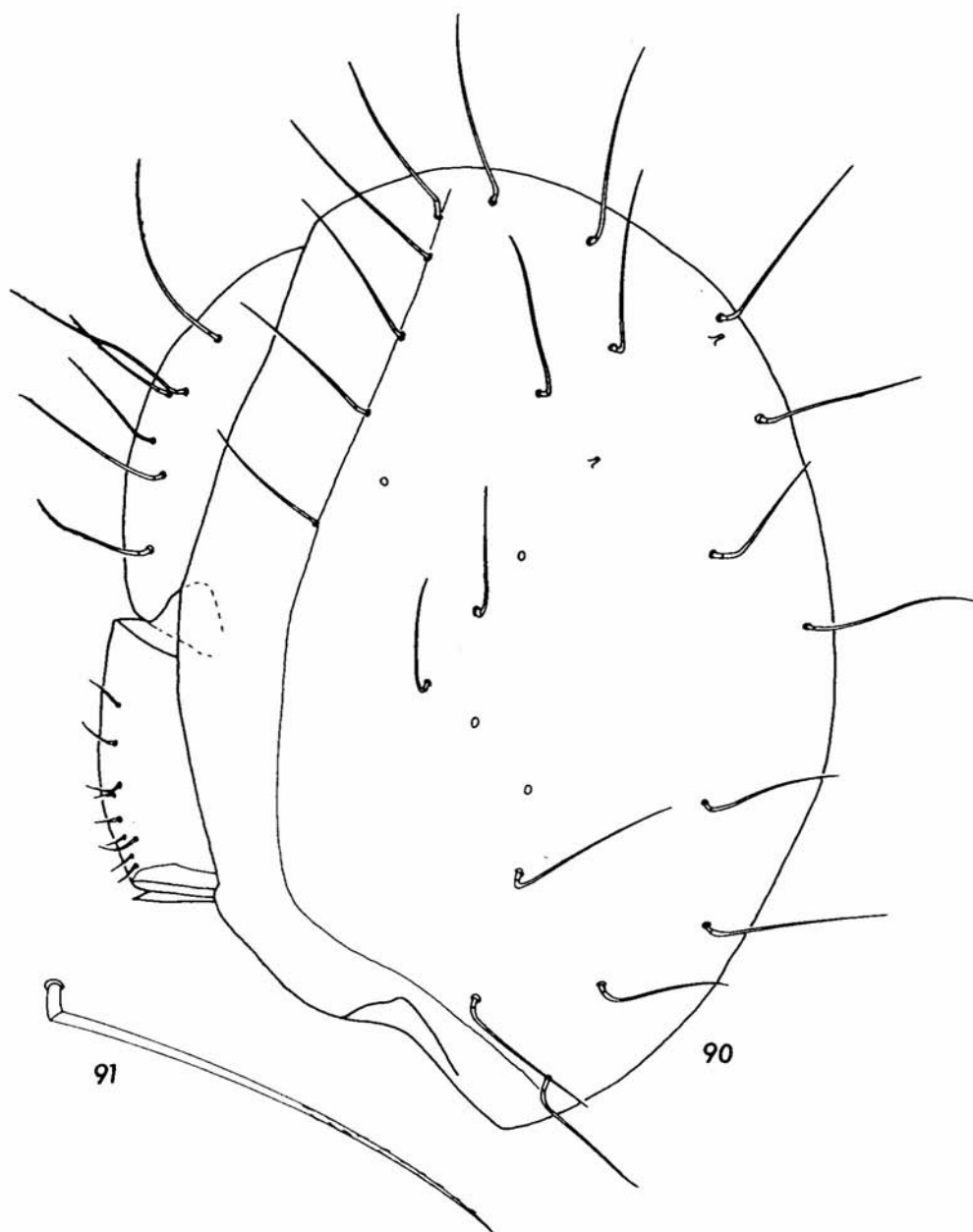
80-81. *Steganacarus (Rhacaplacarus) granulatus* (BANKS, 1902) - "type": 80 - ano-adanal plate,
81 - genito-aggenital plate



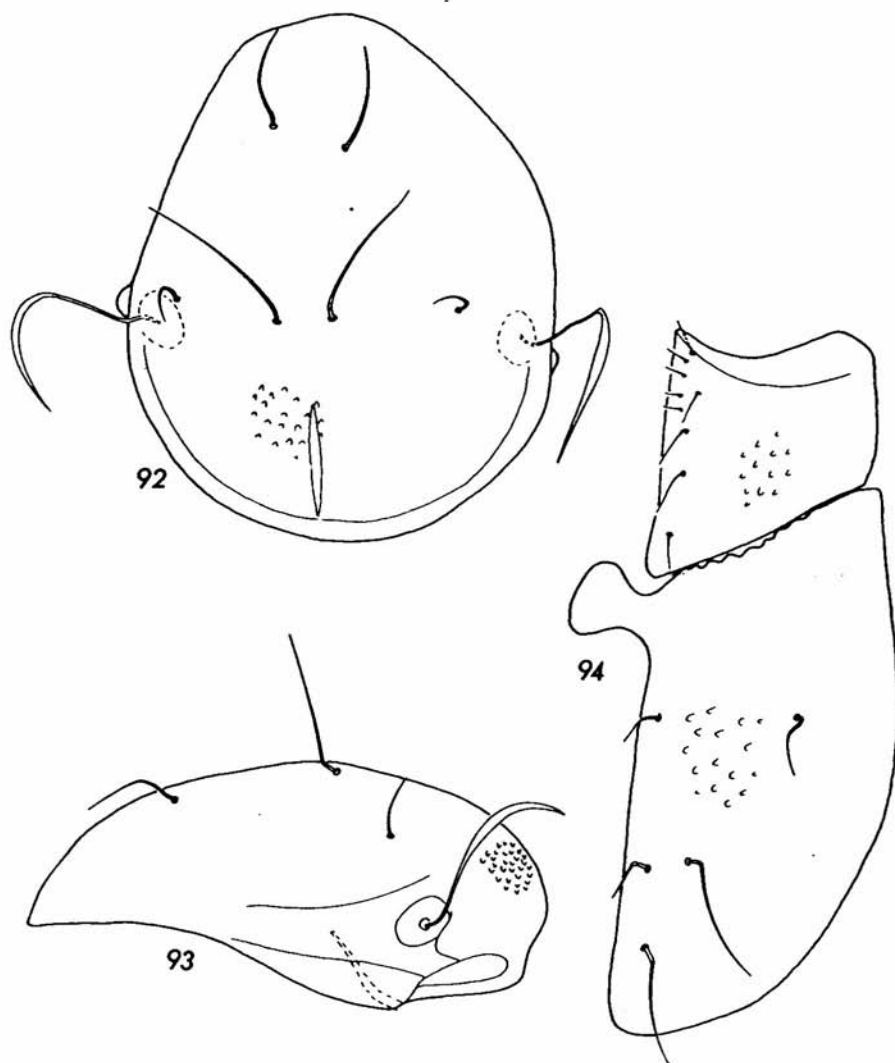
82-84. *Austrophthiracarus andinus* (BALOGH, 1984) - "type": 82 - prodorsum, dorsal view, 83 - sensillus, dorsal view, 84 - prodorsum, lateral view



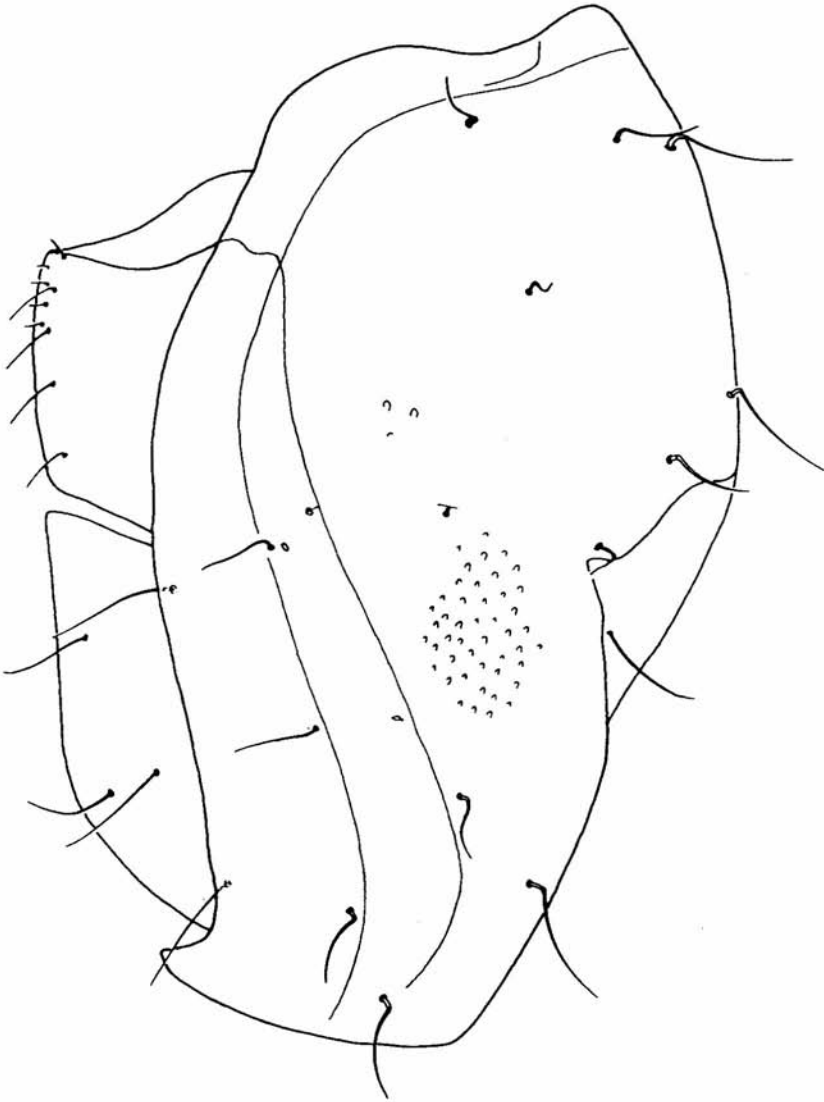
85-89. *Austrophthiracarus andinus* (BALOGH, 1984) - "type": 85 - prodorsum, lateral view, 86 - infracapitular mentum, 87 - ano-adanal plate, 88 - fragment of genito-aggenital plate, 89 - trochanter and femur of I



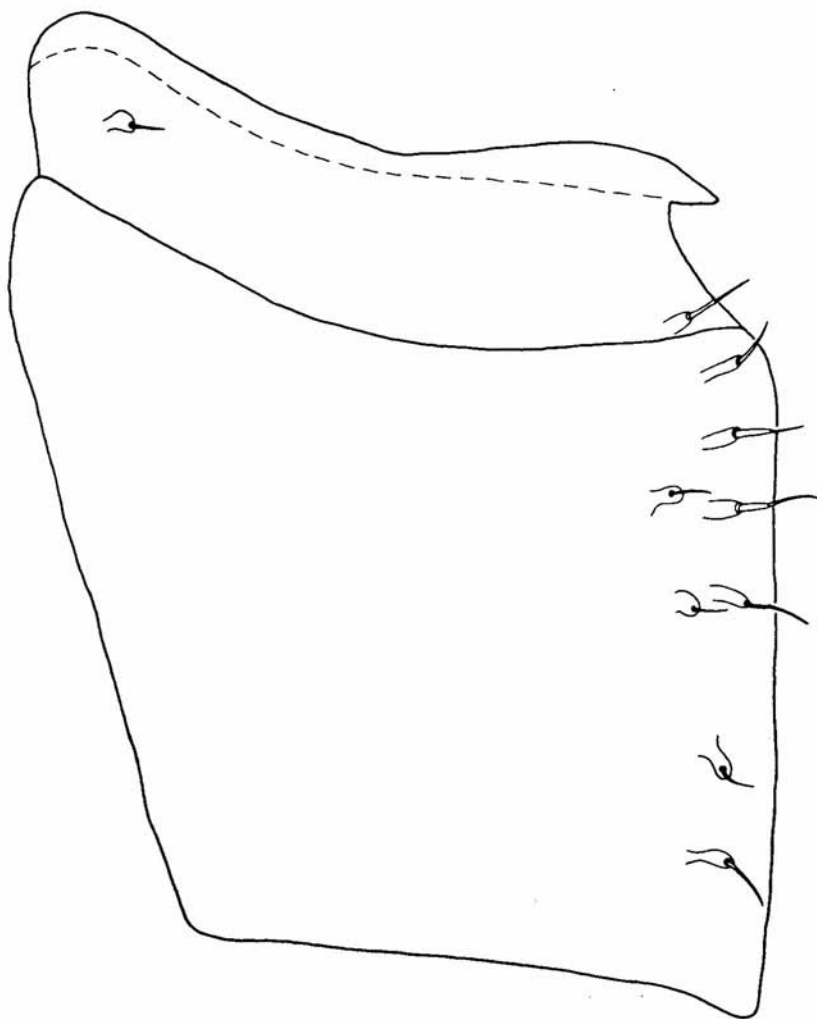
90-91. *Austrophthiracarus andinus* (BALOGH, 1984) - "type": 90 - notogaster, lateral view, 91 - h1 seta



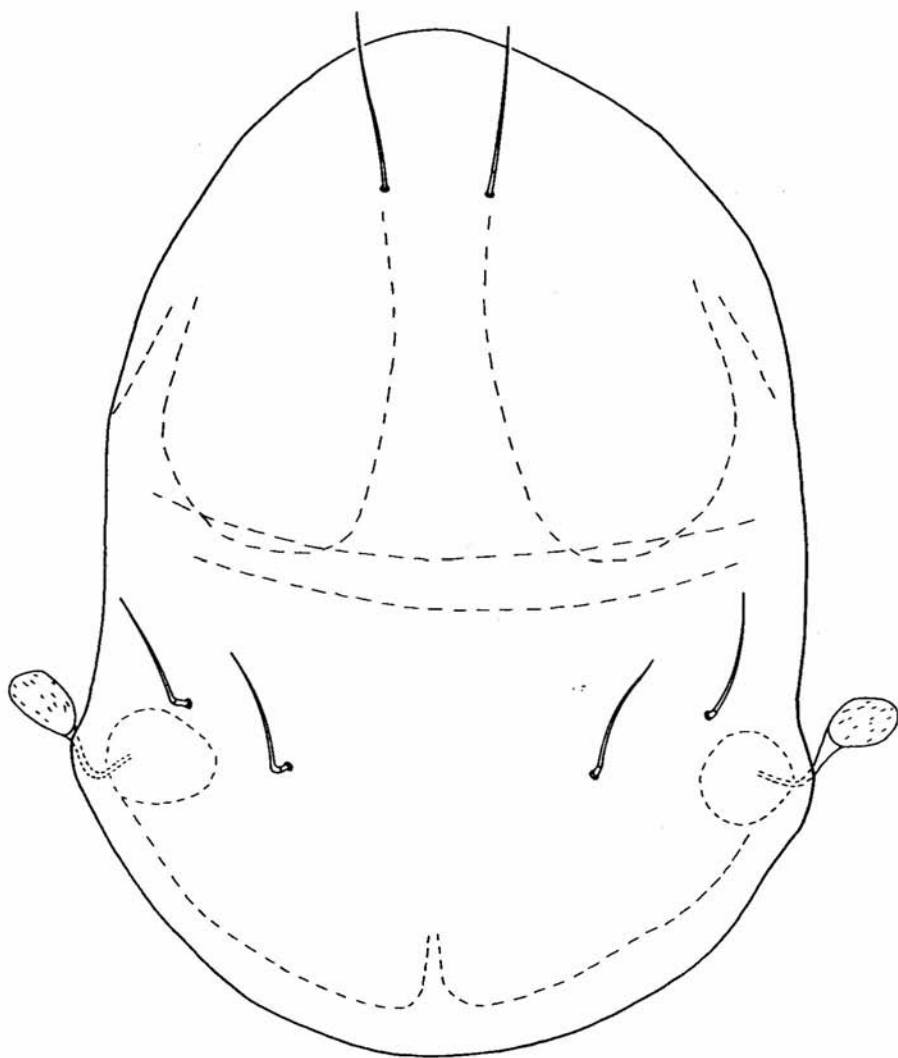
92-94. *Austrophthiracarus caudatus* (BALOGH and MAHUNKA, 1977) - holotype: 92 - prodorsum, dorsal view, 93 - prodorsum, lateral view, 94 - genito-aggenital and ano-adanal plates



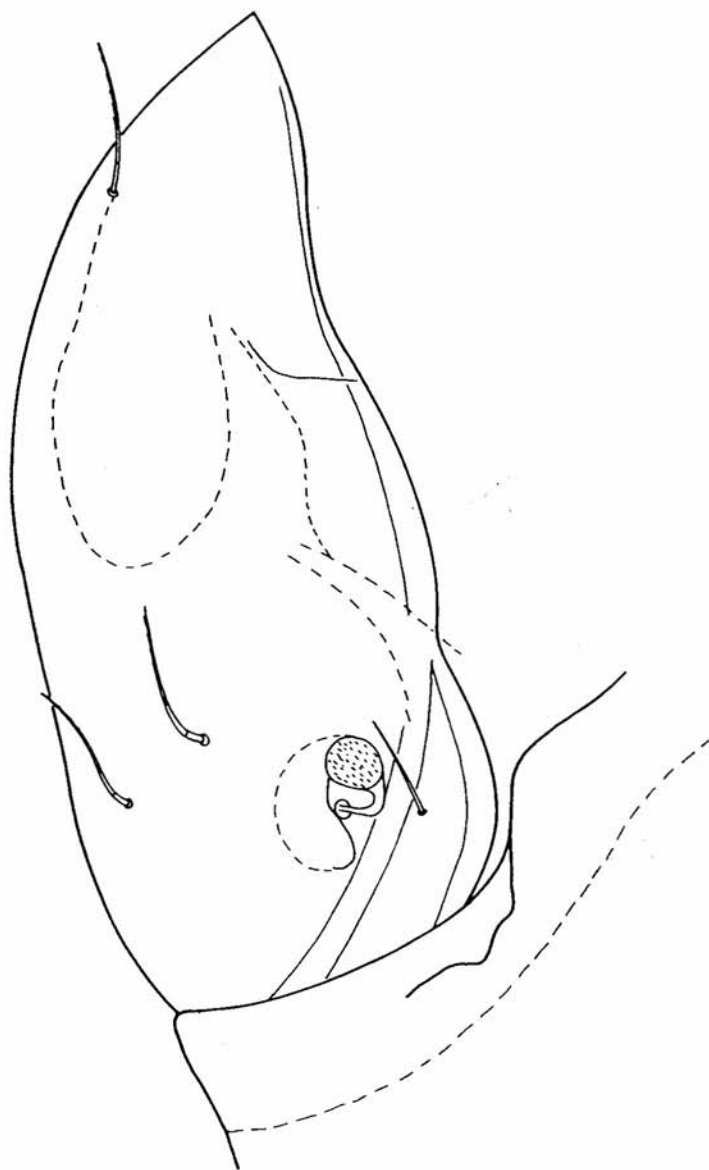
95. *Austrophthiracarus caudatus* (BALOGH and MAHUNKA, 1977) - holotype: notogaster, lateral view



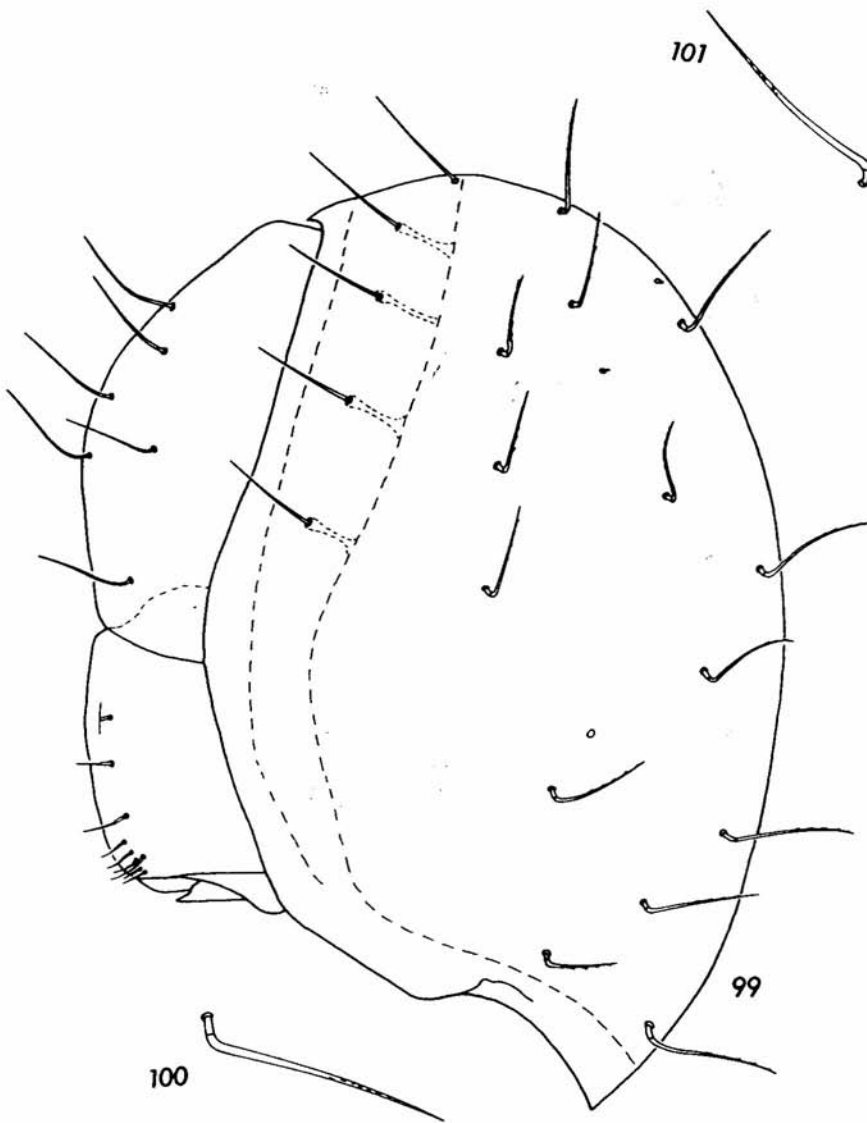
96. *Austrophthiracarus darwini* (МАЛУНКА, 1980) - paratype: genito-aggenital plate



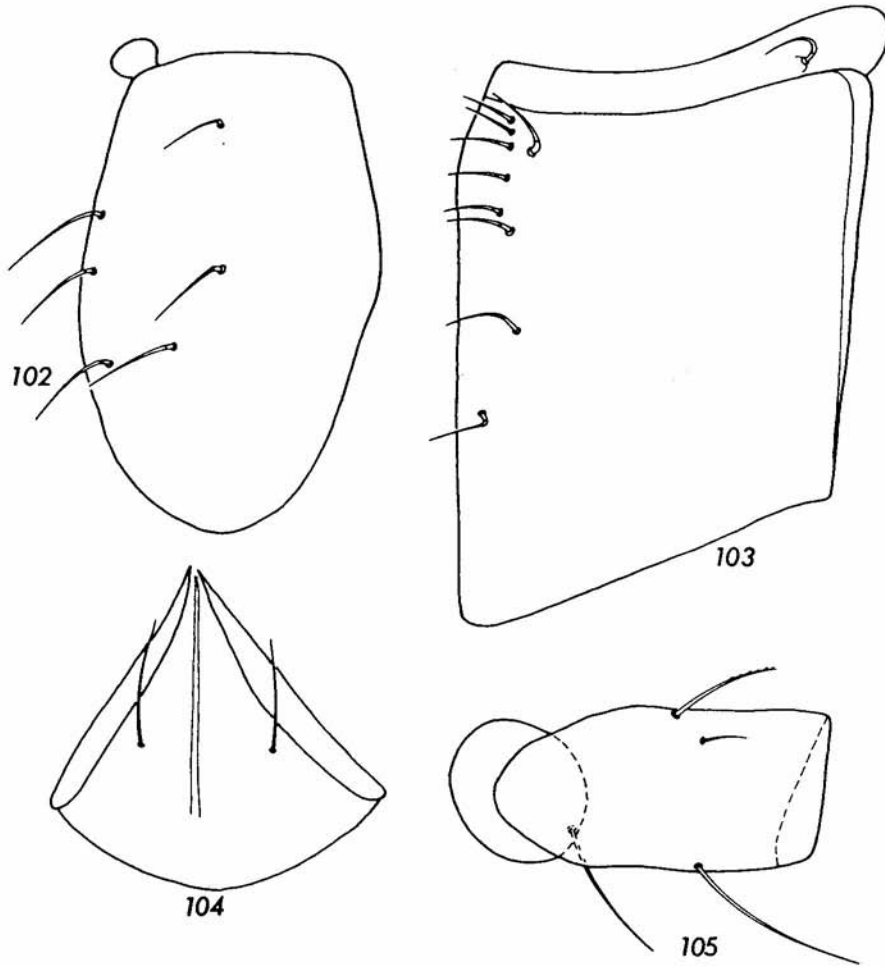
97. *Austrophthiracarus equisetosus* (MAHUNKA, 1980) - paratype: prodorsum, dorsal view



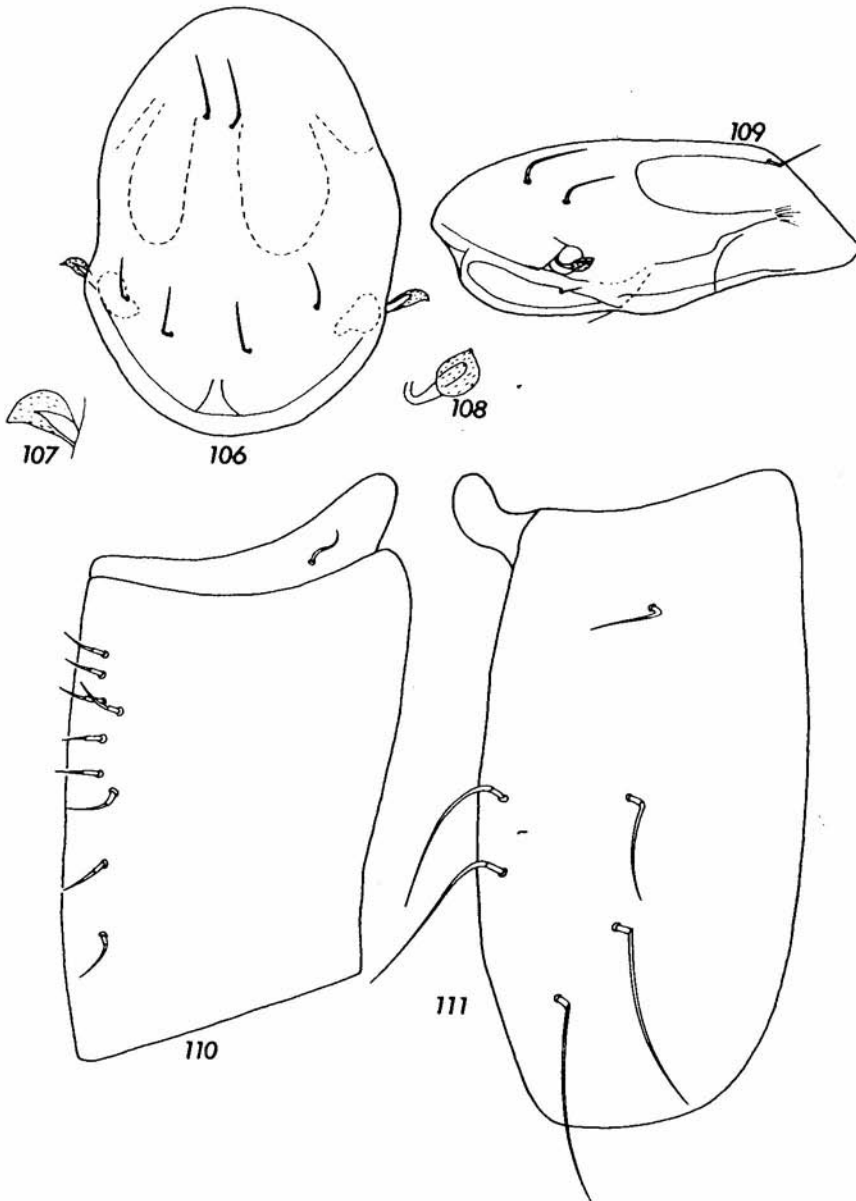
98. *Austrophthiracarus equisetosus* (МАХУНКА, 1980) - paratype: prodorsum, lateral view



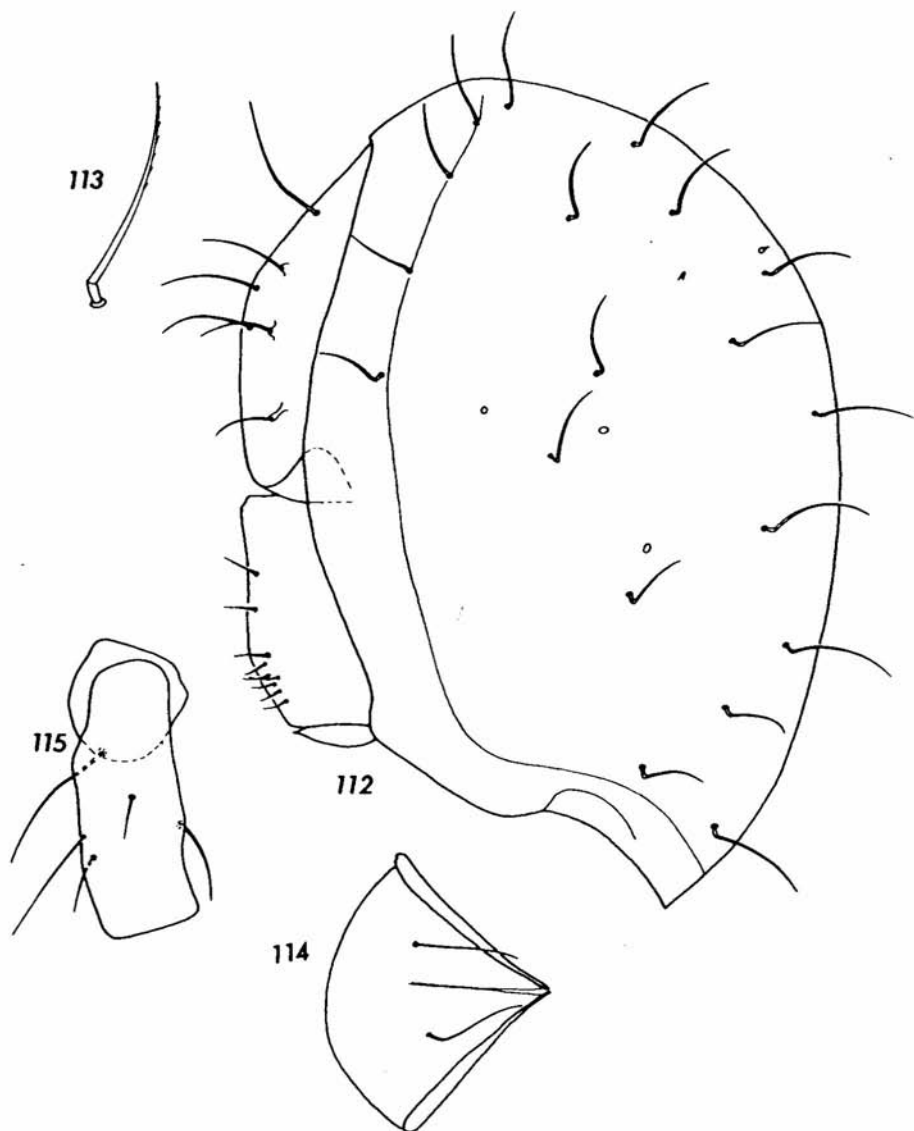
99-101. *Austrophthiracarus equisetosus* (MAHUNKA, 1980) - paratype: 99 - notogaster, lateral view, 100 - cl seta, 101 - hl seta



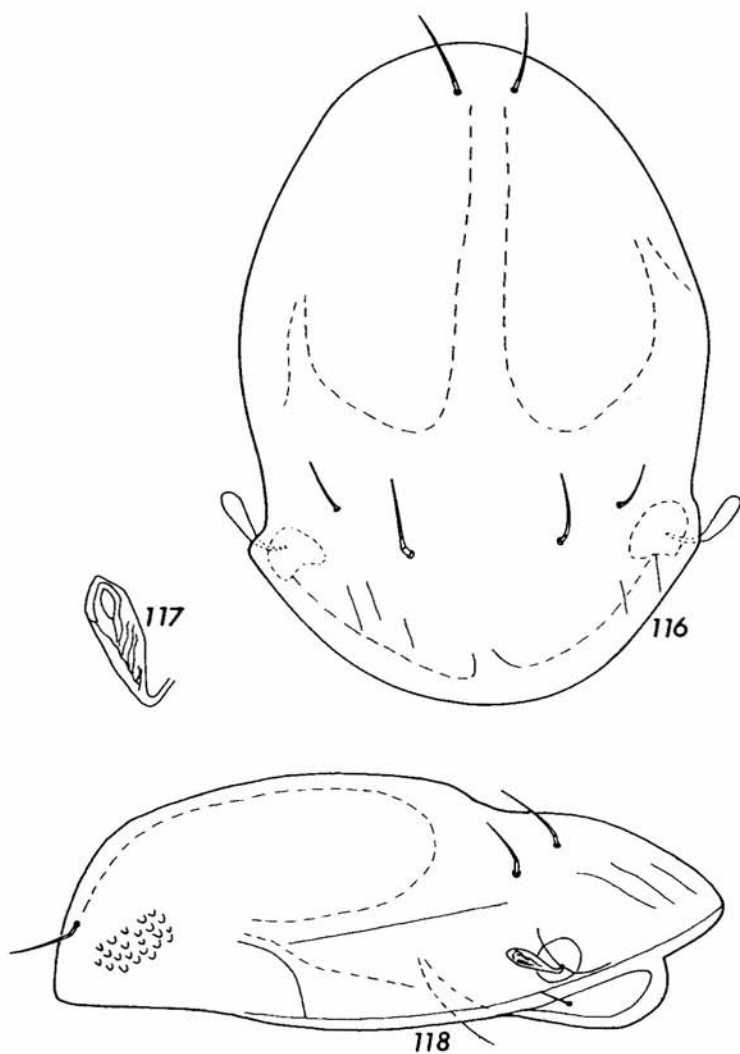
102-105. *Austrophthiracarus equisetosus* (MAHUNKA, 1980) - paratype: 102 - ano-adanal plate, 103 - genito-aggenital plate, 104 - infracapitular mentum, 105 - trochanter and femur of leg I



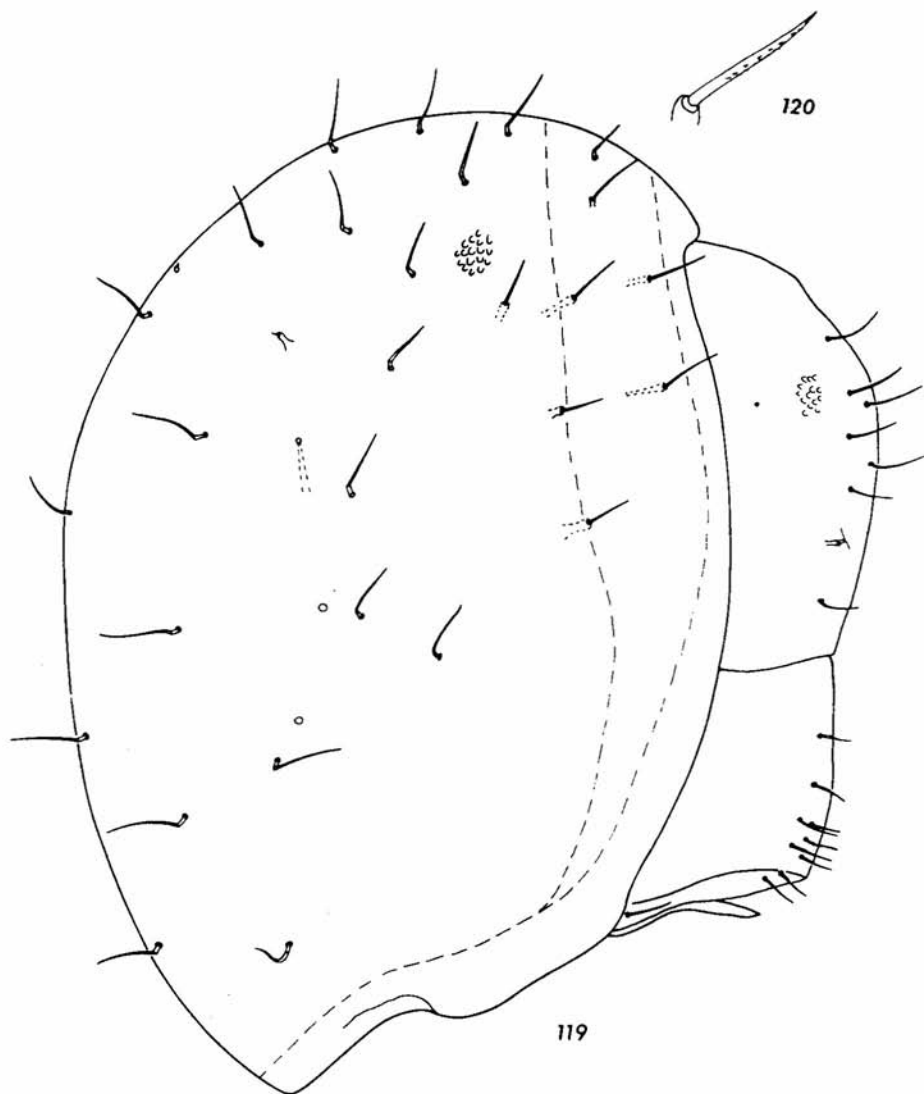
106-111. *Austrophthiracarus espeletius* (BALOGH, 1984) - "type": 106 - prodorsum, dorsal view, 107 - sensillus, dorsal view, 108 - sensillus, lateral view, 109 - prodorsum, lateral view, 110 - genito-aggenital plate, 111 - ano-adanal plate



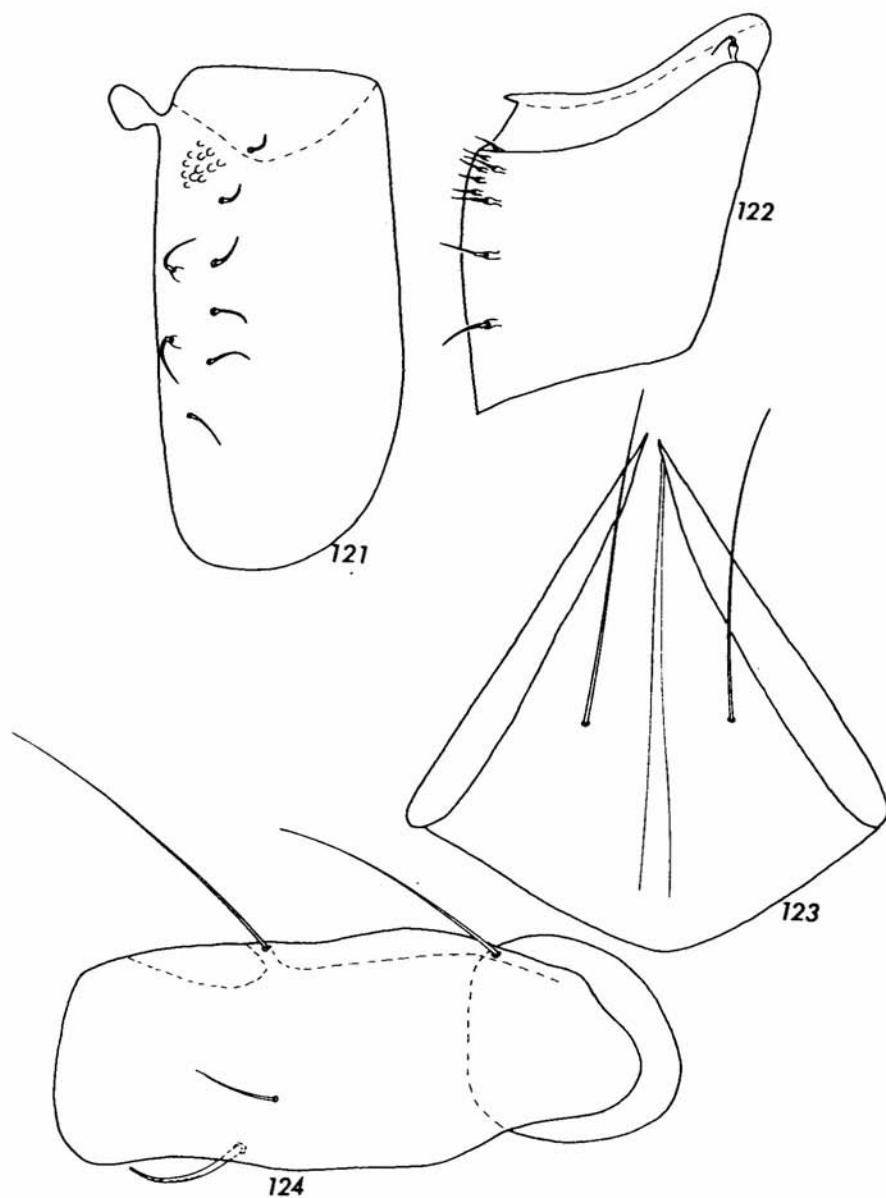
112-115. *Austrophthiracarus espeletius* (BALOGH, 1984) - "type": 112 - notogaster, lateral view, 113 - h1 seta, 114 - infracapitular mentum, 115 - trochanter and femur of leg I



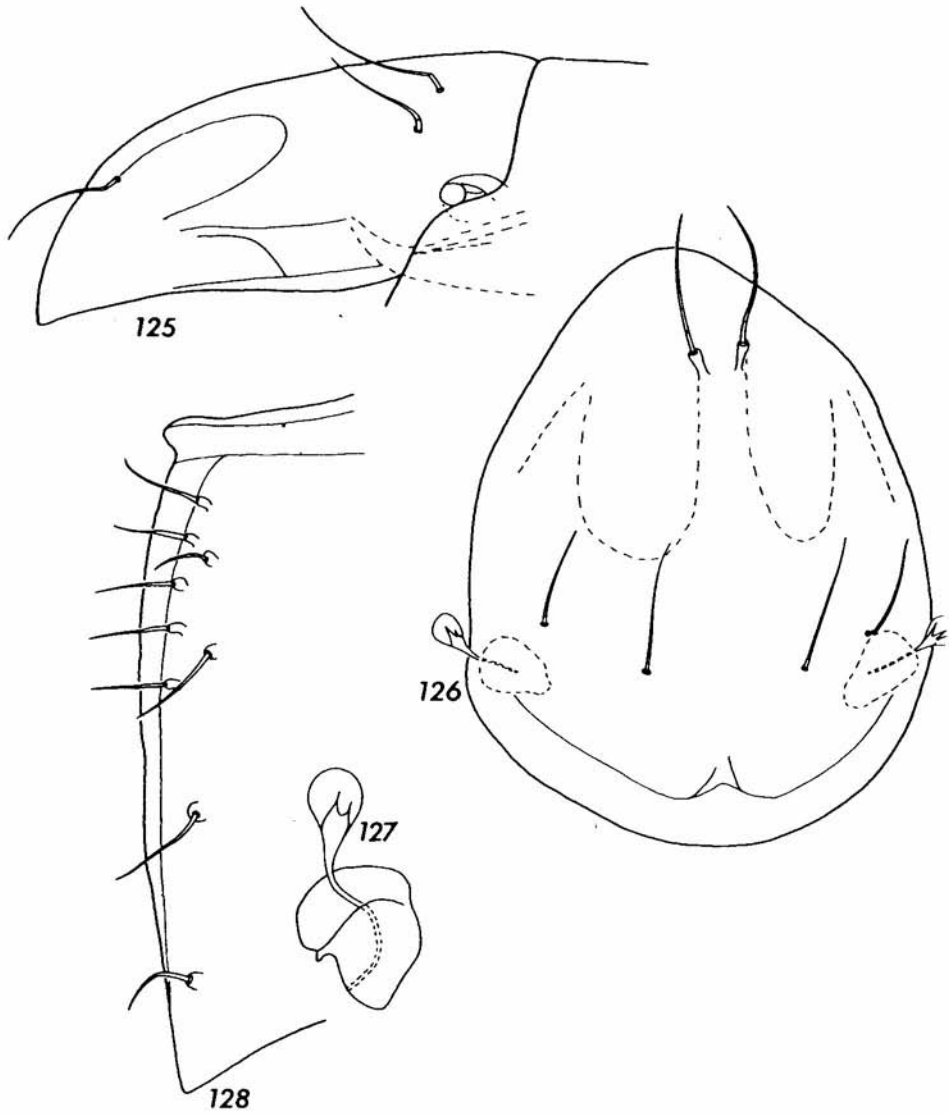
116-118. *Austrophthiracarus foveoreticulatus* (MAHUNKA, 1980) - paratype: 116 - prodorsum, dorsal view, 117 - sensillus, lateral view, 118 - prodorsum, lateral view



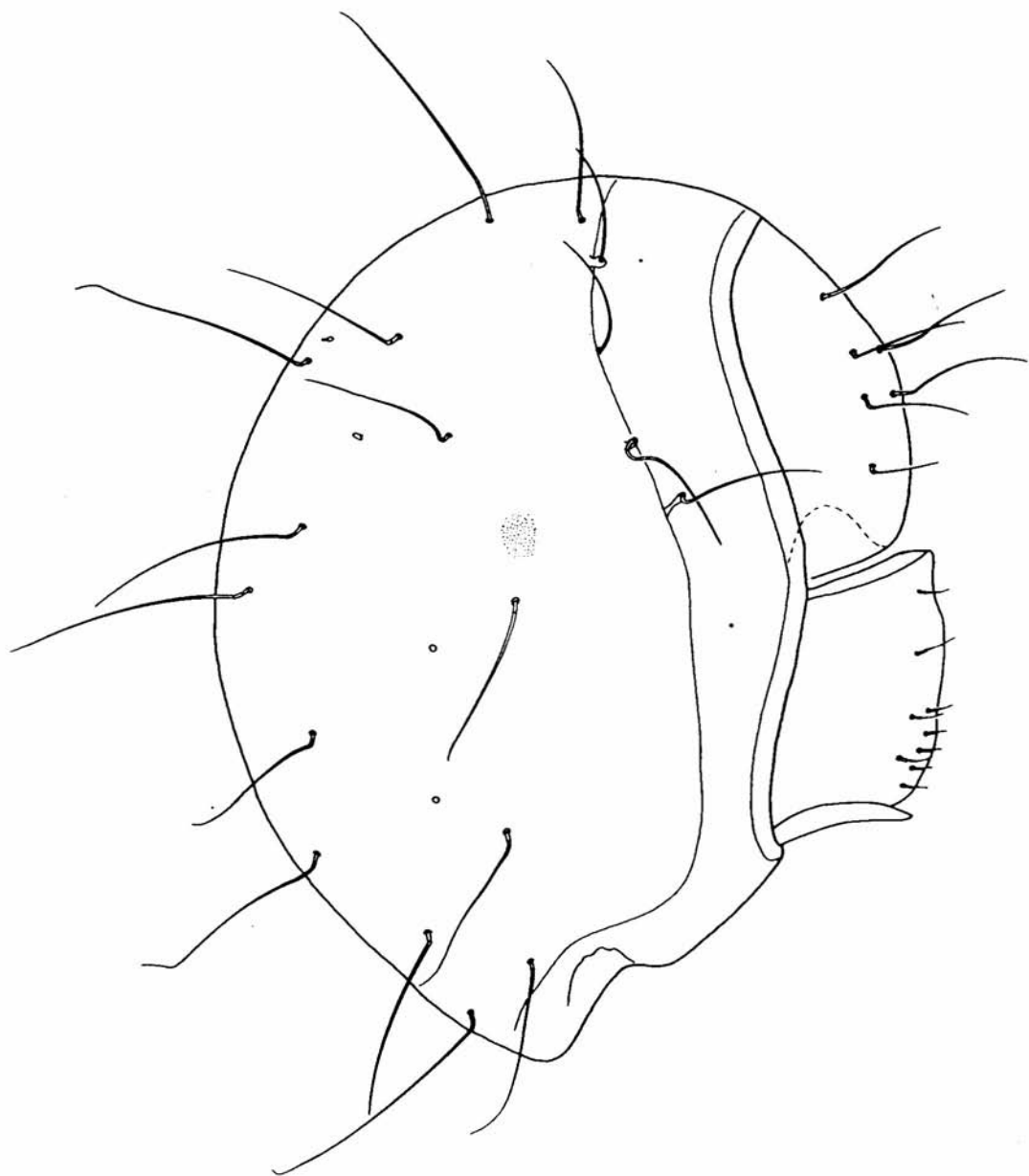
119-120. *Austrophthiracarus foveoreticulatus* (МАЛИНКА, 1980) - paratype: 119 - notogaster, lateral view,
120 - ps2 seta



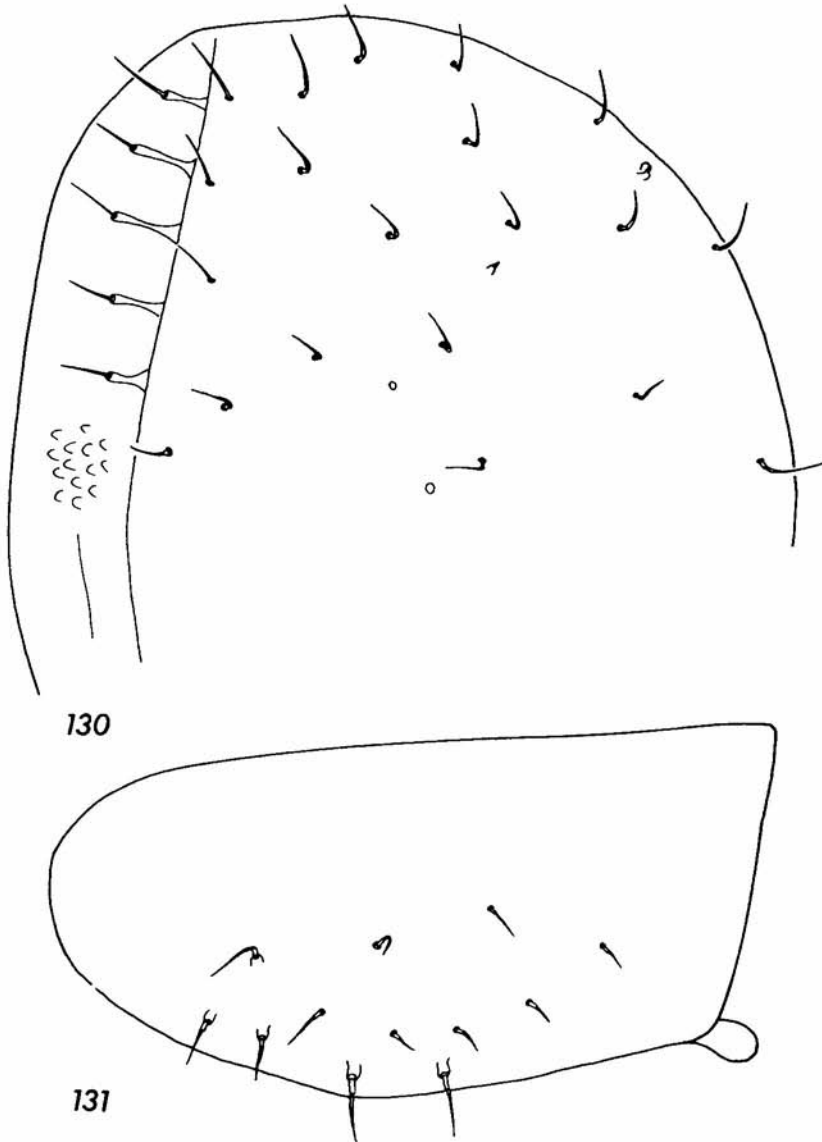
121-124. *Austrophthiracarus foveoreticulatus* (MAHUNKA, 1980) - paratype: 121 - ano-adanal plate, 122 - genito-aggenital plate, 123 - infracapitular mentum, 124 - trochanter and femur of leg I



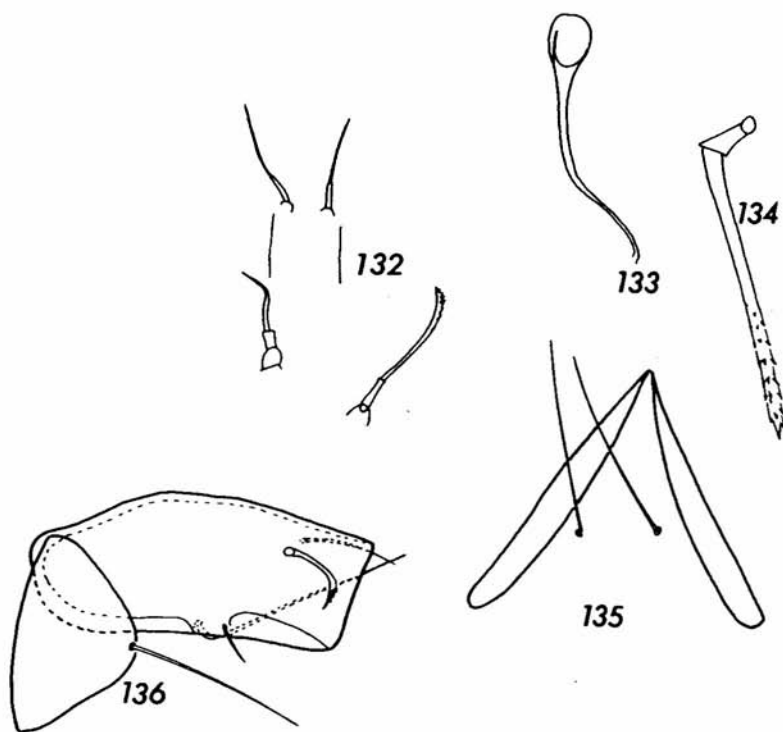
125-128. *Austrophthiracarus hirtus* (BALOGH, 1984) - holotype: 125 - prodorsum, lateral view, 126 - prodorsum, dorsal view, 127 - sensillus, dorsal view, 128 - fragment of genito-aggenital plate



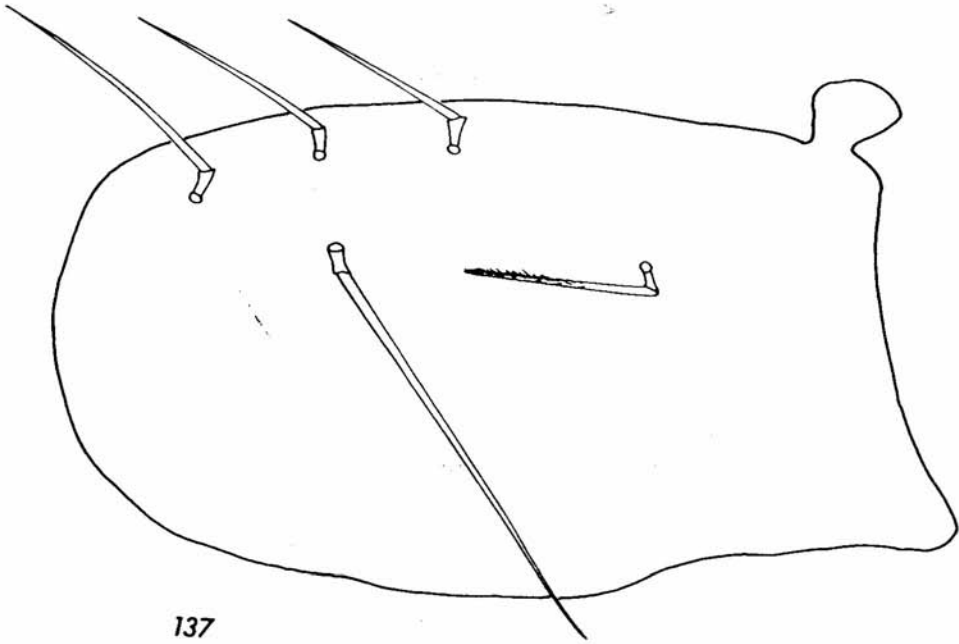
129. *Austrophthiracarus hirtus* (BALOGH, 1984) - holotype: notogaster, lateral view



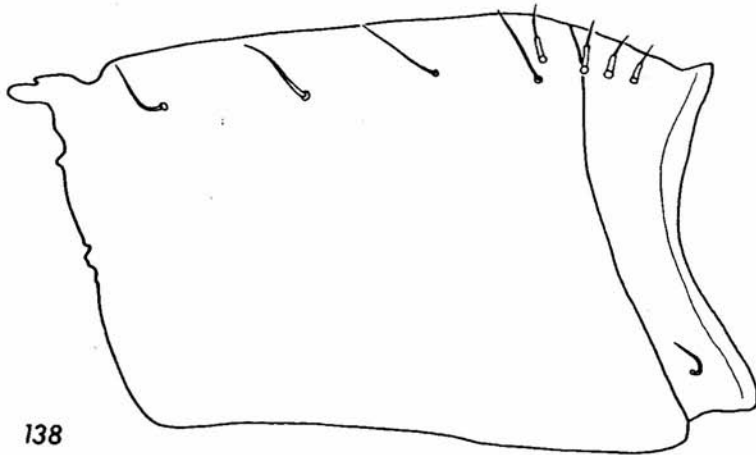
130-131. *Austrophthiracarus multiosetosus* BALOGH and BALOGH, 1983 - paratype: 130 - posterior part of notogaster, lateral view, 131 - ano-adanal plate



132-136. *Austrophthiracarus nitidus* (PEREZ-IMIO and BAGGIO, 1988) - paratype (?): 132 - distance between rostral setae and interlamellar and lamellar setae, 133 - sensillus, dorsal view, 134 - h3 seta, 135 - infracapitular mentum, 136 - trochanter and femur of leg I

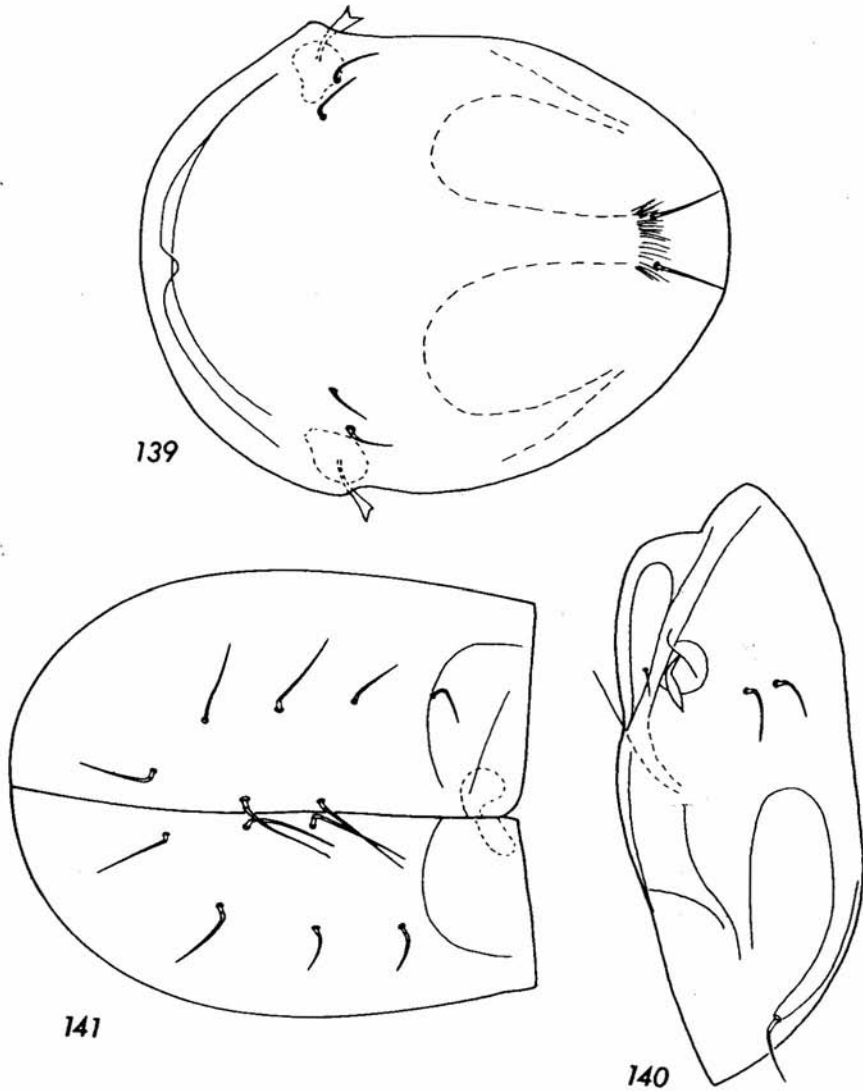


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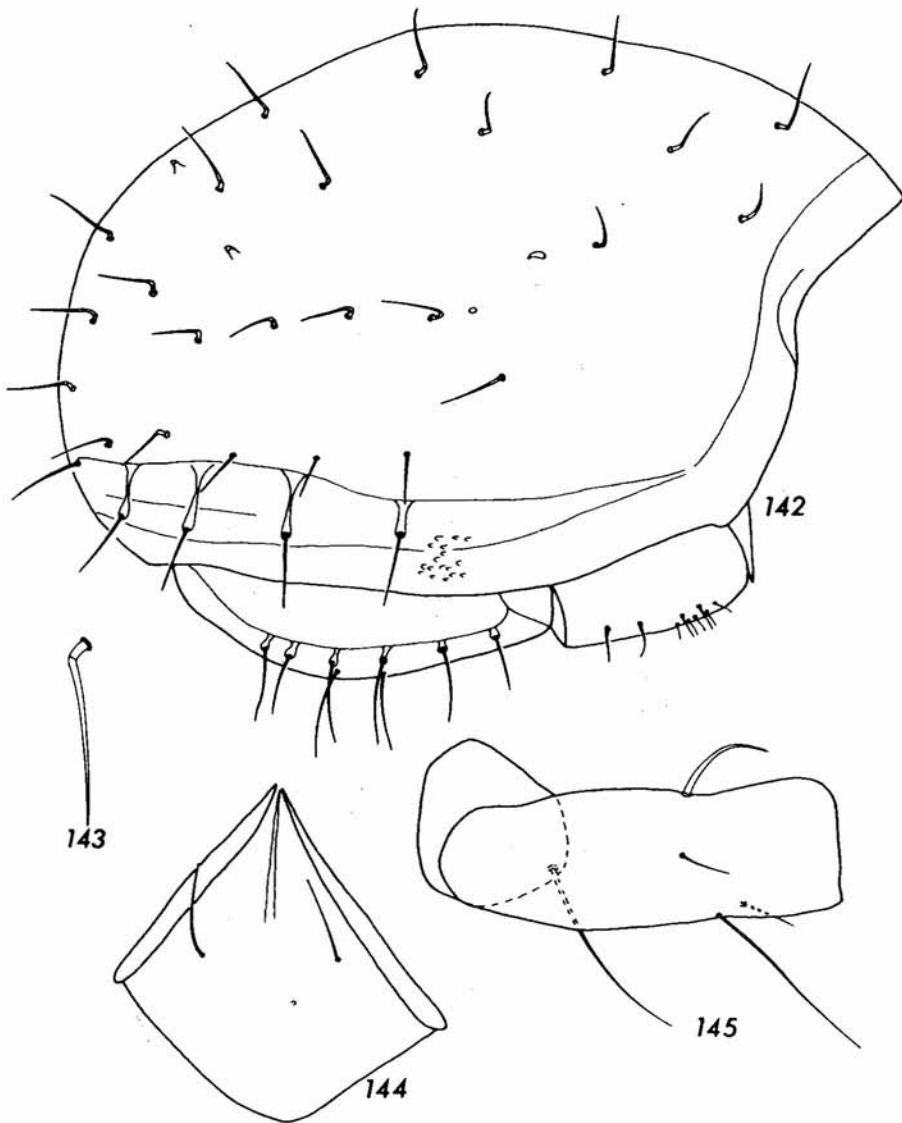


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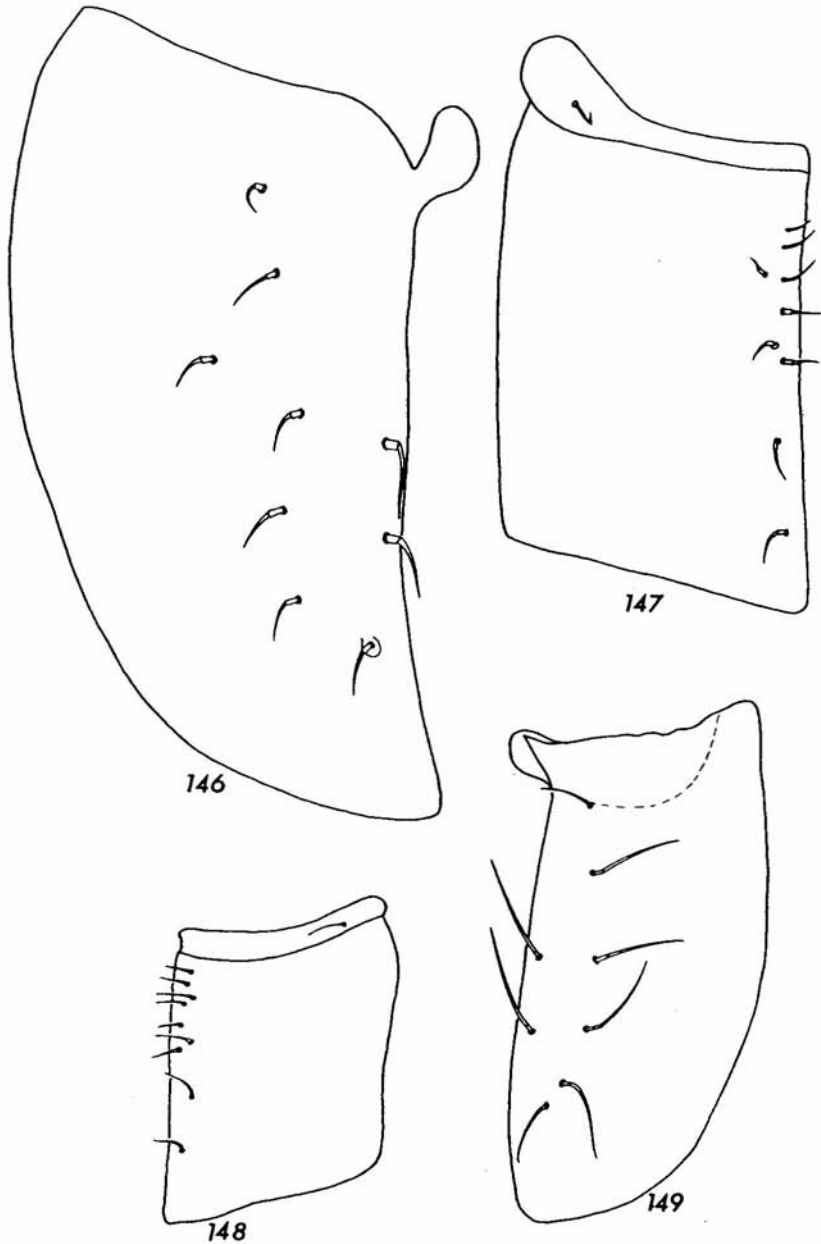
137-138. *Austrophthiracarus nitidus* (PEREZ-INIGO and BAGGIO, 1980) - paratype (?): 137 - ano-adanal plate, 138 - genito-aggenital plate



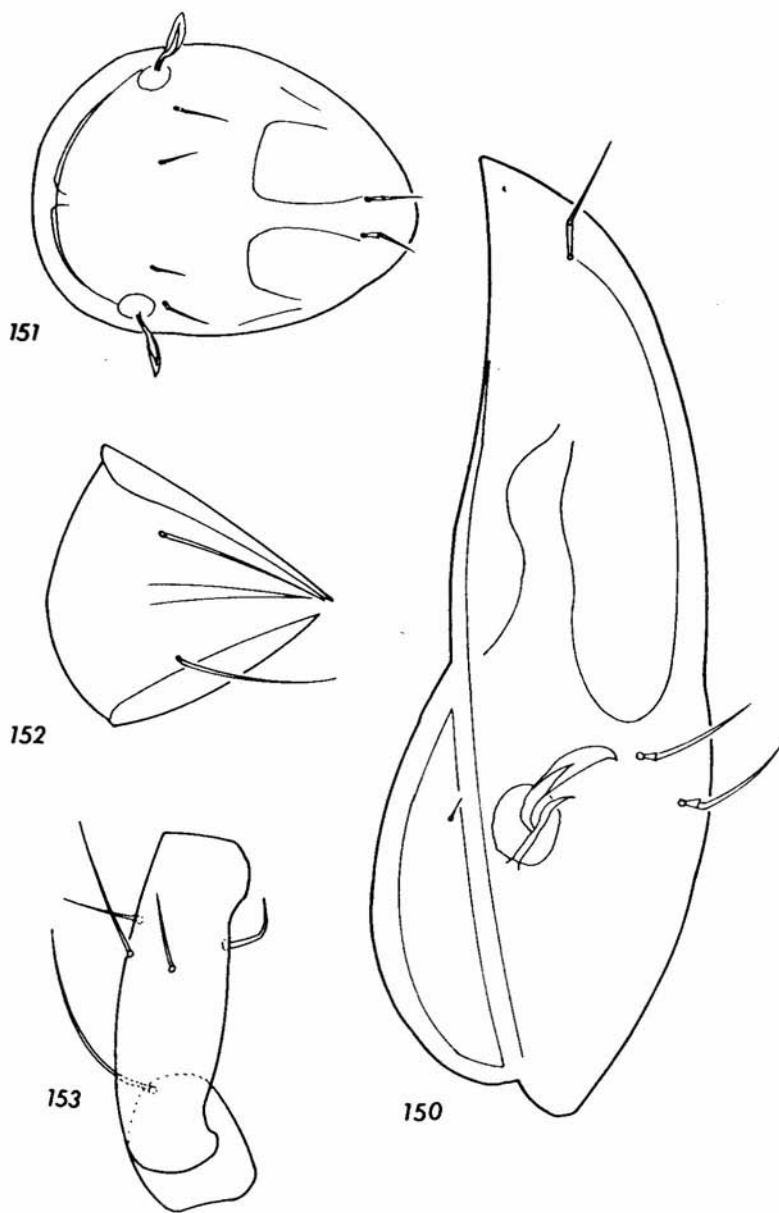
139-141. *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978 - paratype: 139 - prodorsum, dorsal view, 140 - prodorsum, lateral view, 141 - ano-adanal plates of a type of *Austrophthiracarus similis* BALOGH and BALOGH, 1983 - synonym of *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978



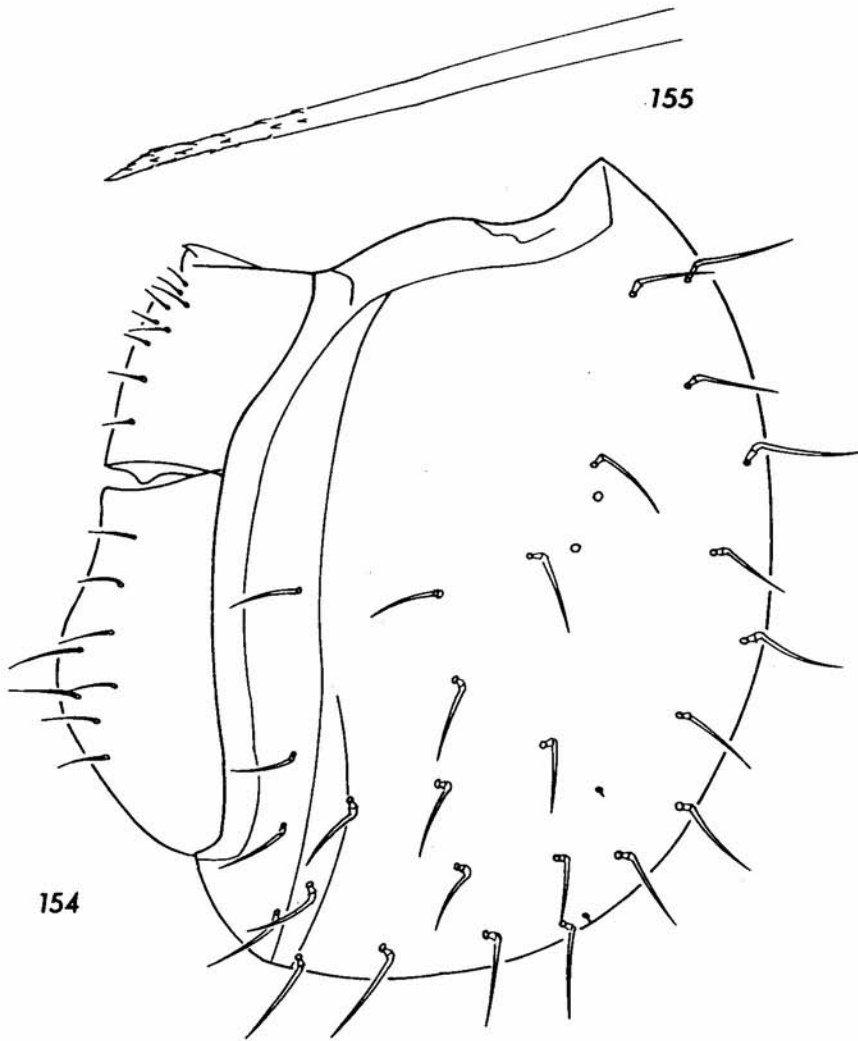
142-145. *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978 - paratype: 142 - notogaster, lateral view, 143 - h1' seta, 144 - infracapitular mentum, 145 - trochanter and femur of leg I



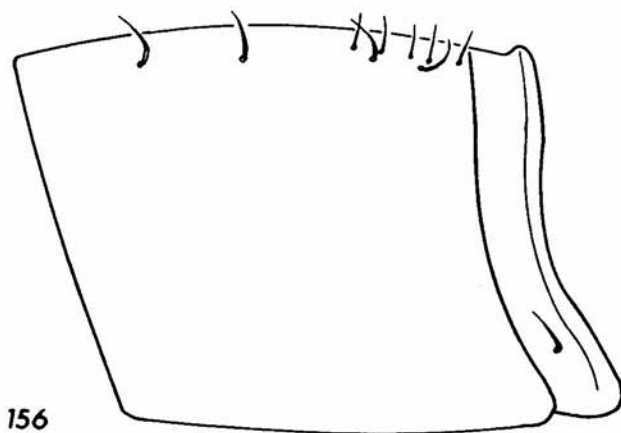
146-149. *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978 - genito-aggenital and ano-adanal plates of two paratypes: 146 - ano-adanal plate, 147 - genito-aggenital plate, 148 - genito-aggenital plate, 149 - ano-adanal plate



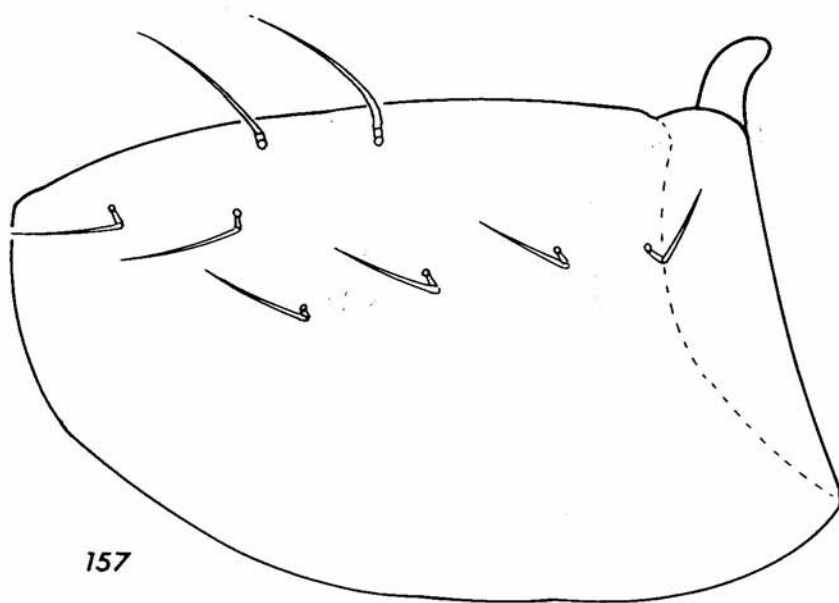
150-153. *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978 - specimen from new locality: 150 - prodorsum, lateral view, 151 - prodorsum, dorsal view, 152 - infracapitular mentum, 153 - trochanter and femur of leg I



154-155. *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978 - specimen from new locality:
154 - notogaster, lateral view, 155 - h1 seta, distal half

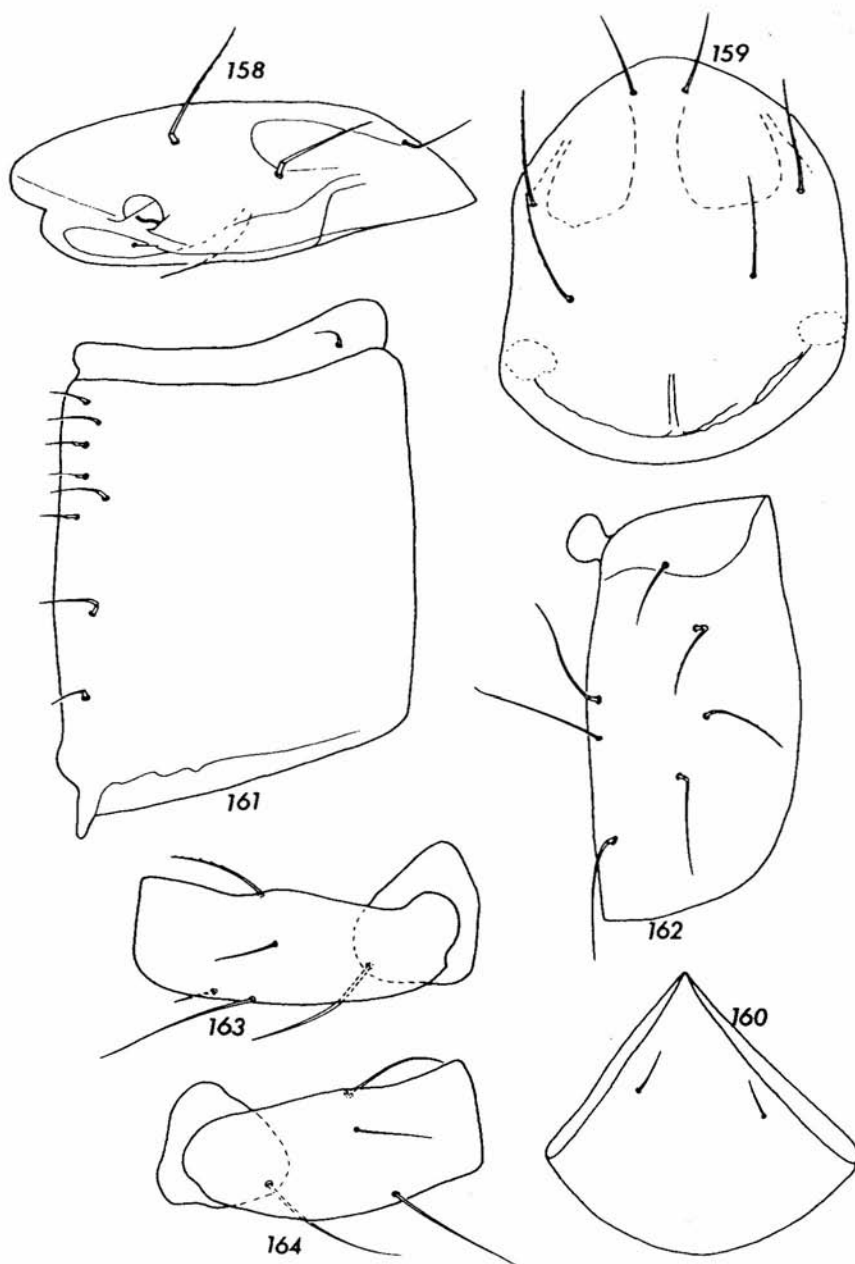


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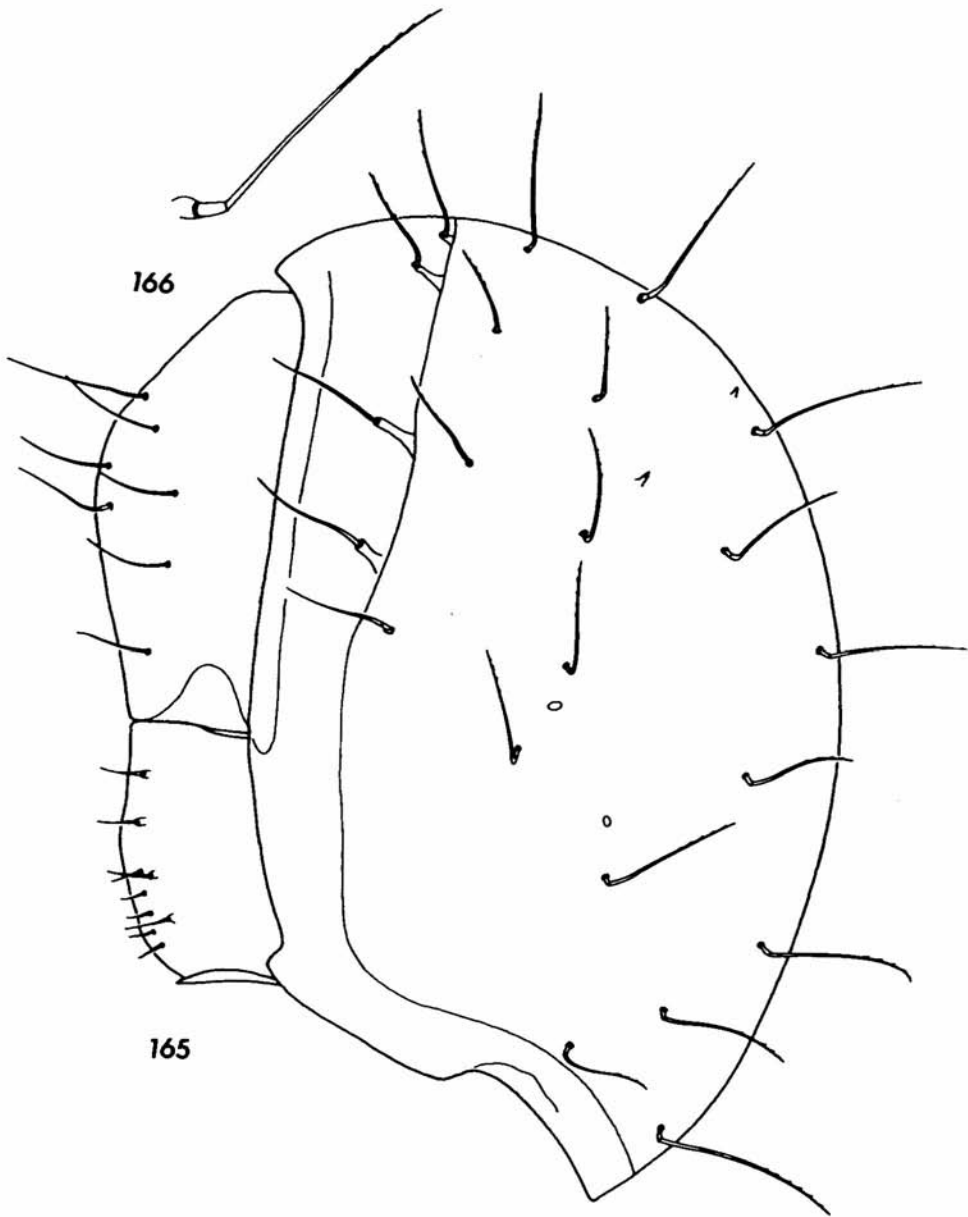


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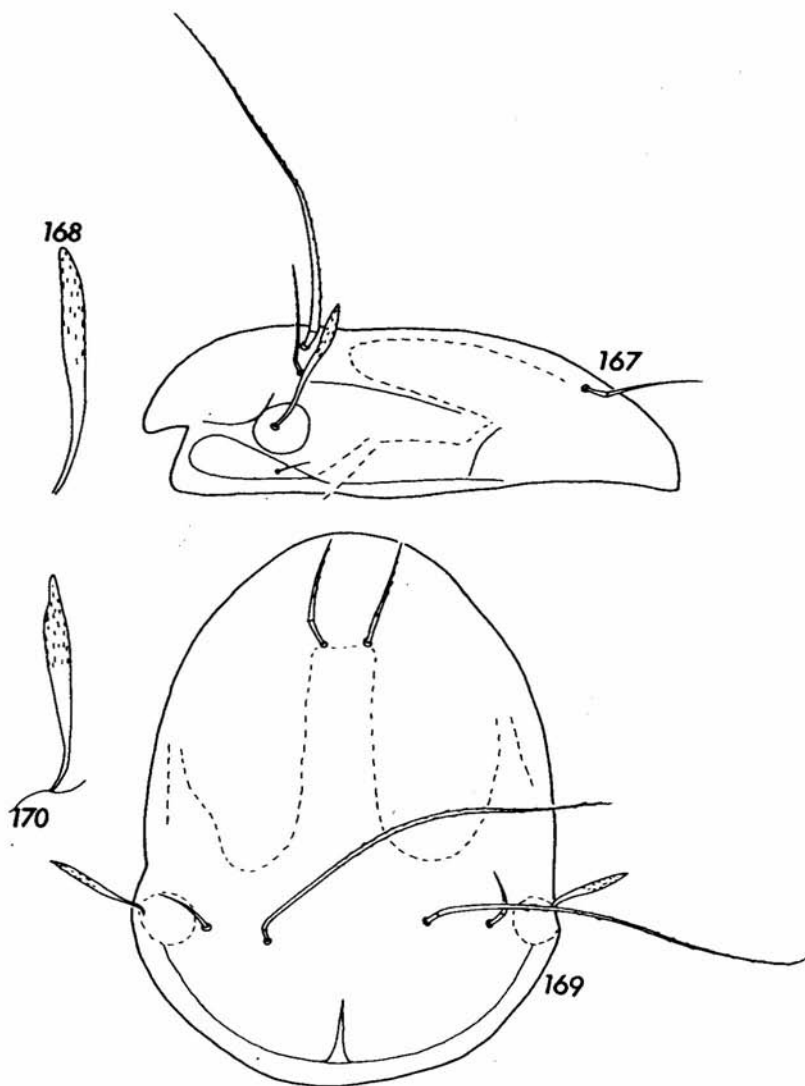
156-157. *Austrophthiracarus radiatus* BALOGH and MAHUNKA, 1978 - specimen from new locality:
156 - genito-aggenital plate, 157 - ano-adanal plate



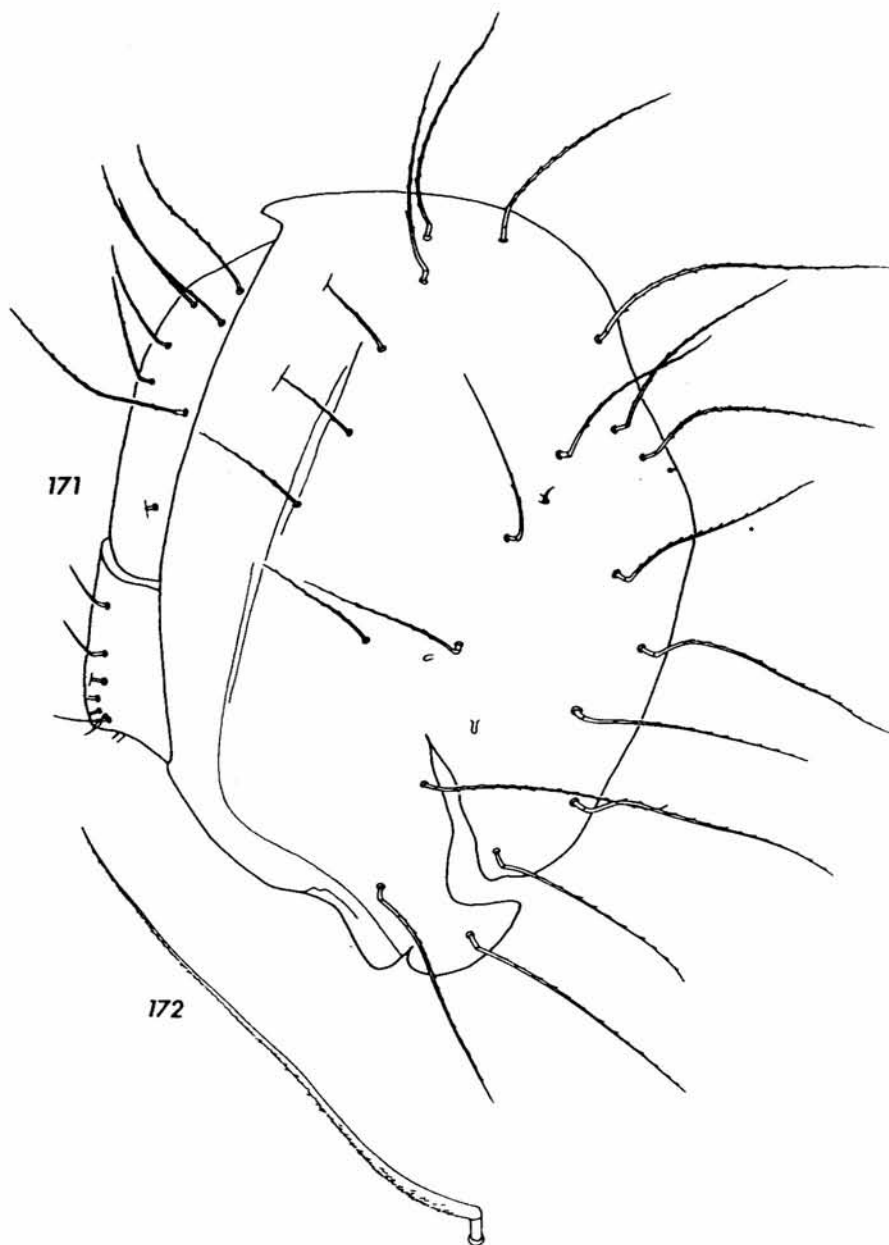
158-164. *Austrophthiracarus wallworki* BALOGH and BALOGH, 1983 - paratype: 158 - prodorsum, lateral view, 159 - prodorsum, dorsal view, 160 - infracapitulum, 161 - genito-aggenital plate, 162 - anadanal plate, 163 - trochanter and femur of leg I right



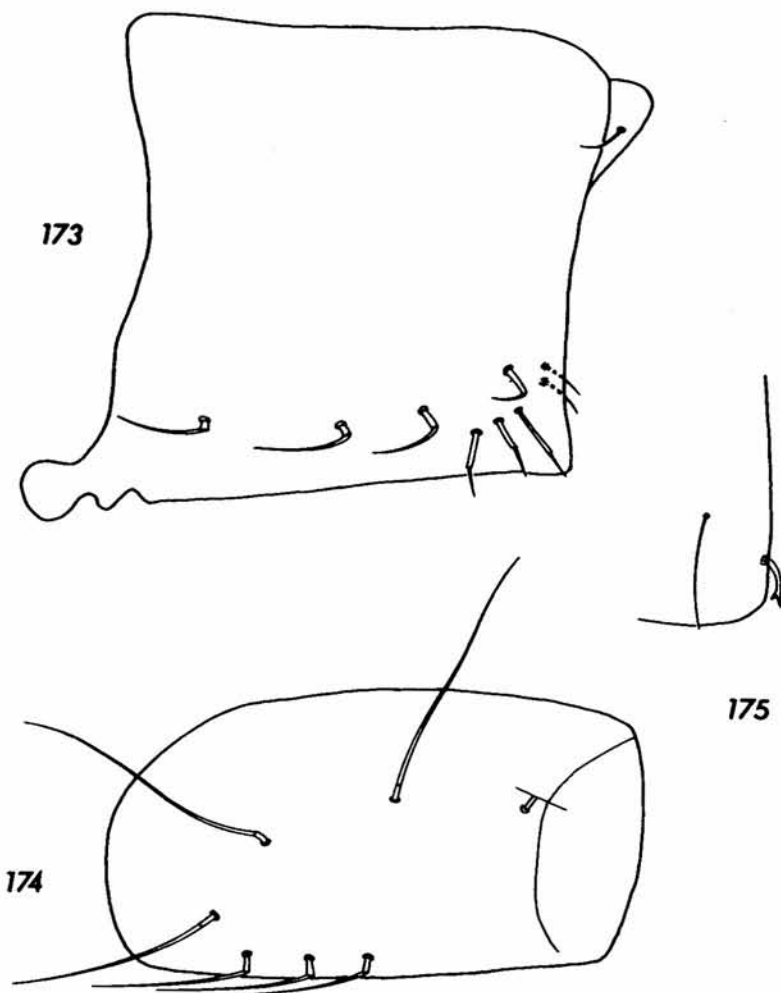
165-166. *Austrophthiracarus wallworki* BALOGH and BALOGH, 1983 - paratype: 165 - notogaster, lateral view, 166 - ps1 seta



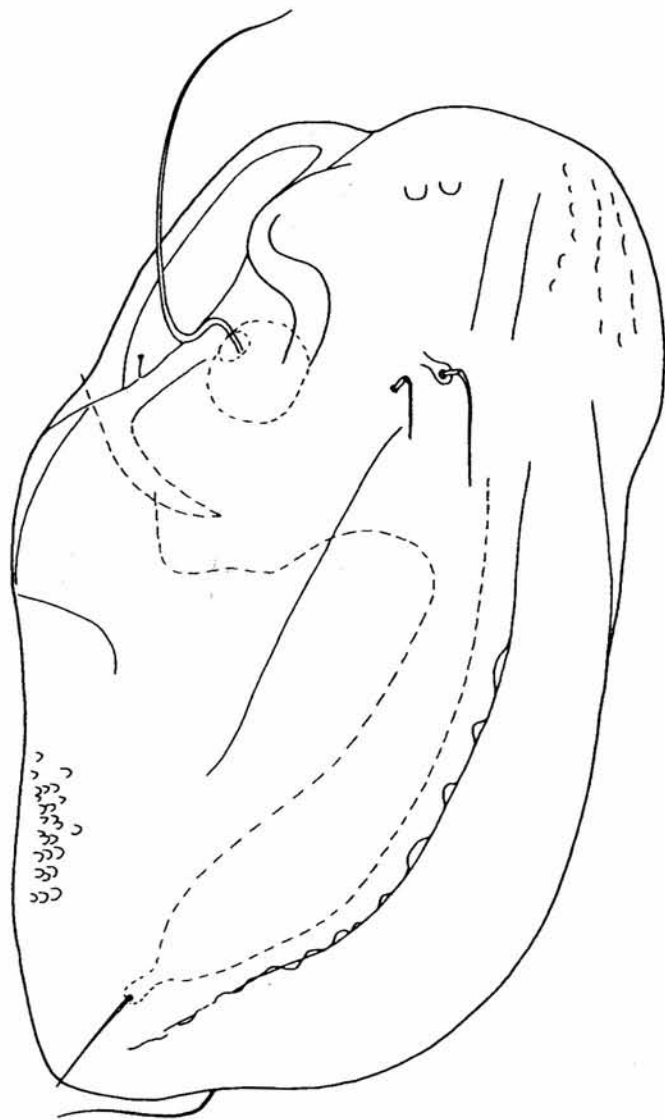
167-170. *Protophthiracarus chilensis* (BALOGH and MAHUNKA, 1967) - holotype: 167 - prodorsum, lateral view, 168 - sensillus, lateral view, 169 - prodorsum, dorsal view, 170 - sensillus, dorsal view



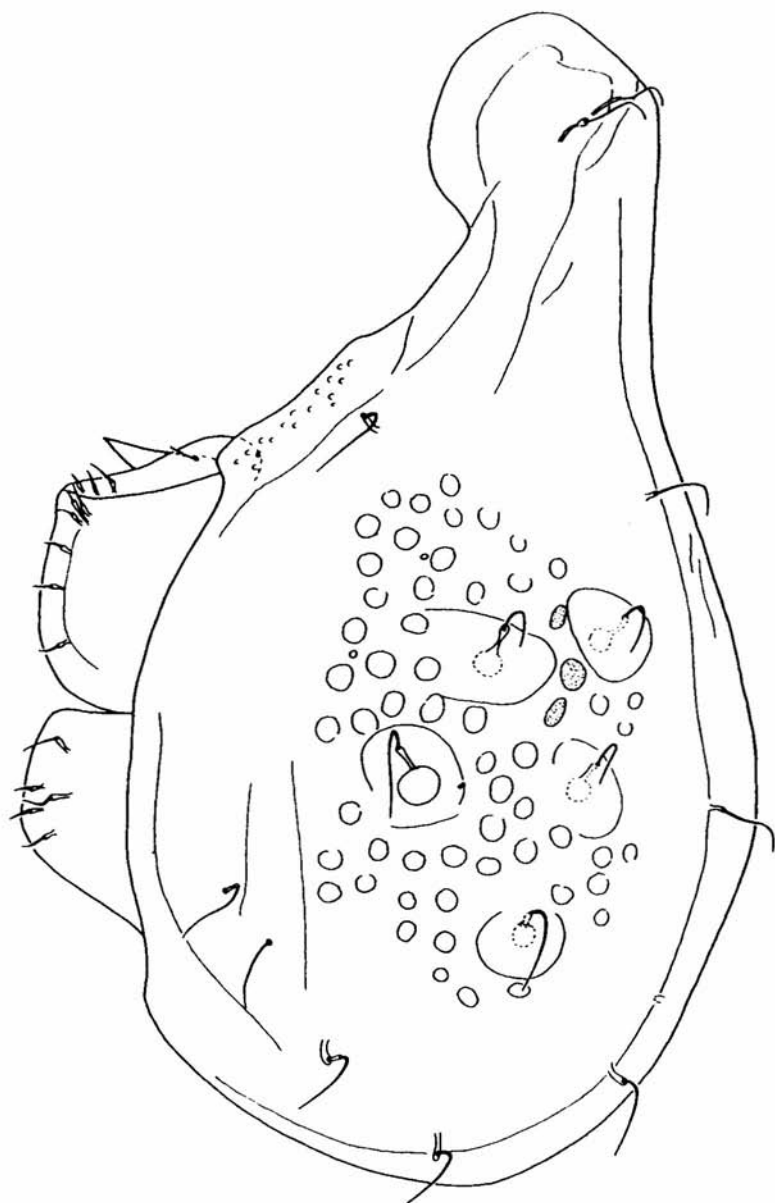
171-172. *Protophthiracarus chilensis* (BALOGH and MAHUNKA, 1967) - holotype: 171 - notogaster, lateral view, 172 - c2 seta



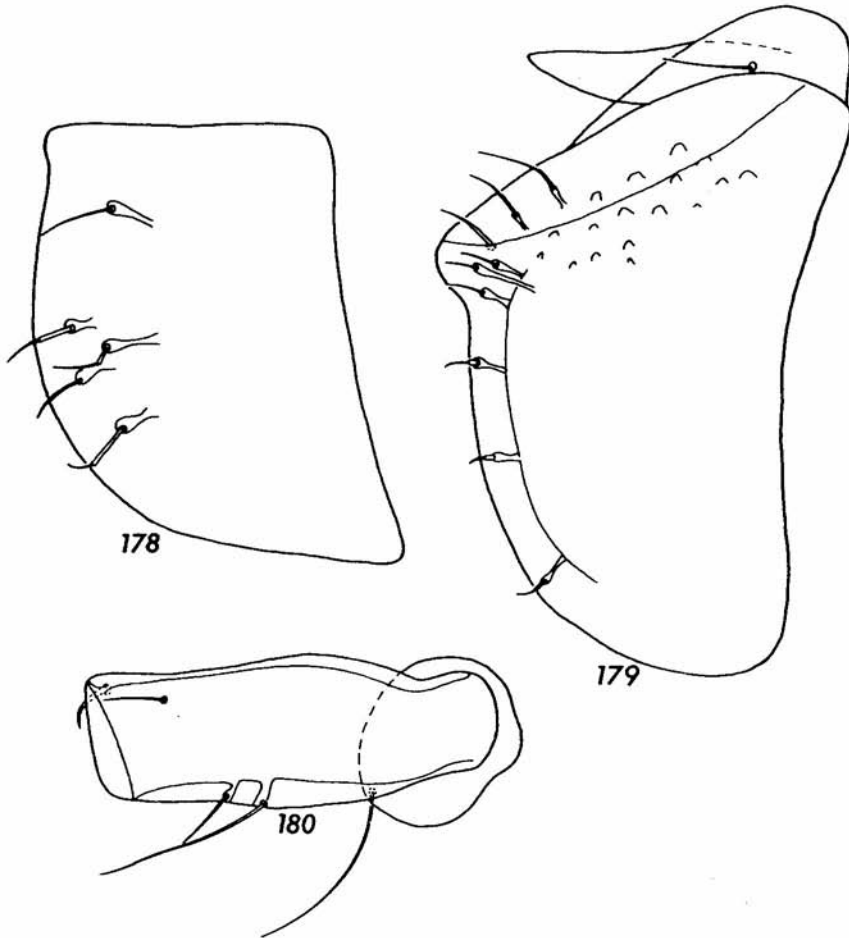
173-175. *Protophthiracarus chilensis* (BALOGH and MAHUNKA, 1967) - holotype: 173 - genito-aggenital plate, 174 - ano-adanal plate, 175 - anterior part of femur of leg I with d and l setae



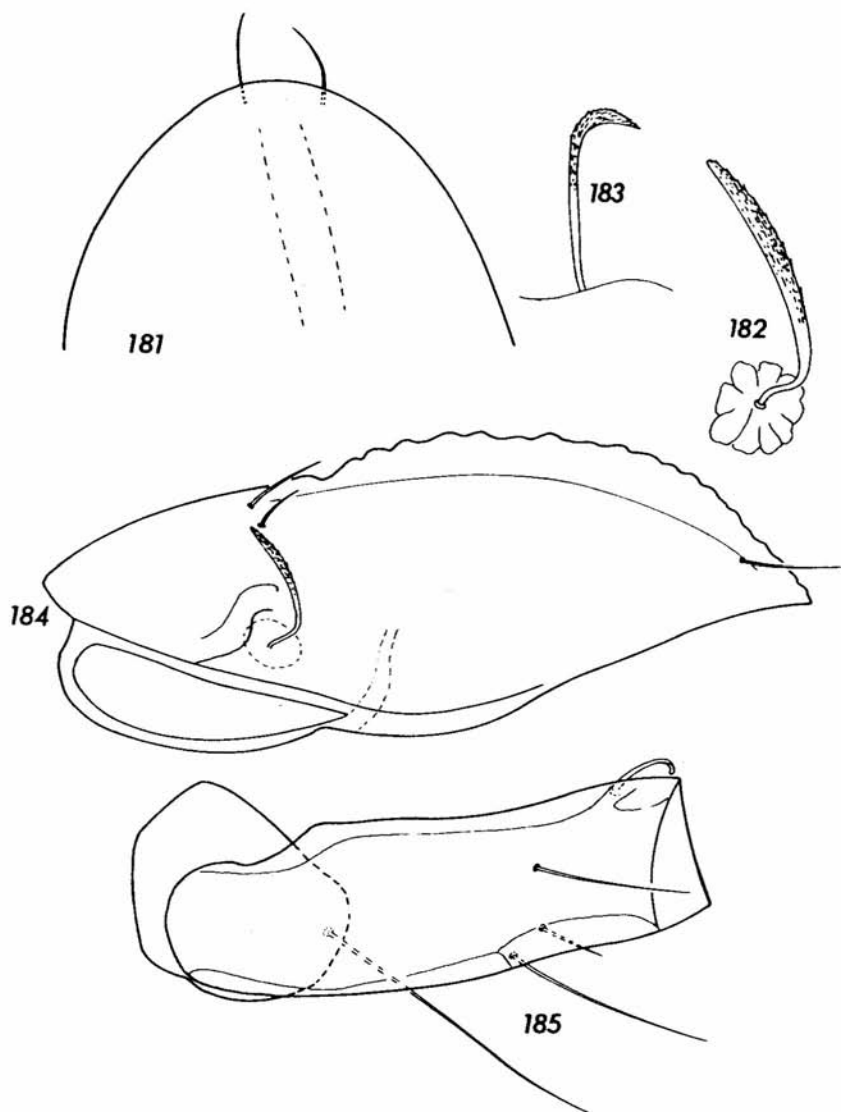
176. *Protophthiracarus echippiger* (BALOGH and MAHUNKA, 1978) - holotype: prodorsum, lateral view



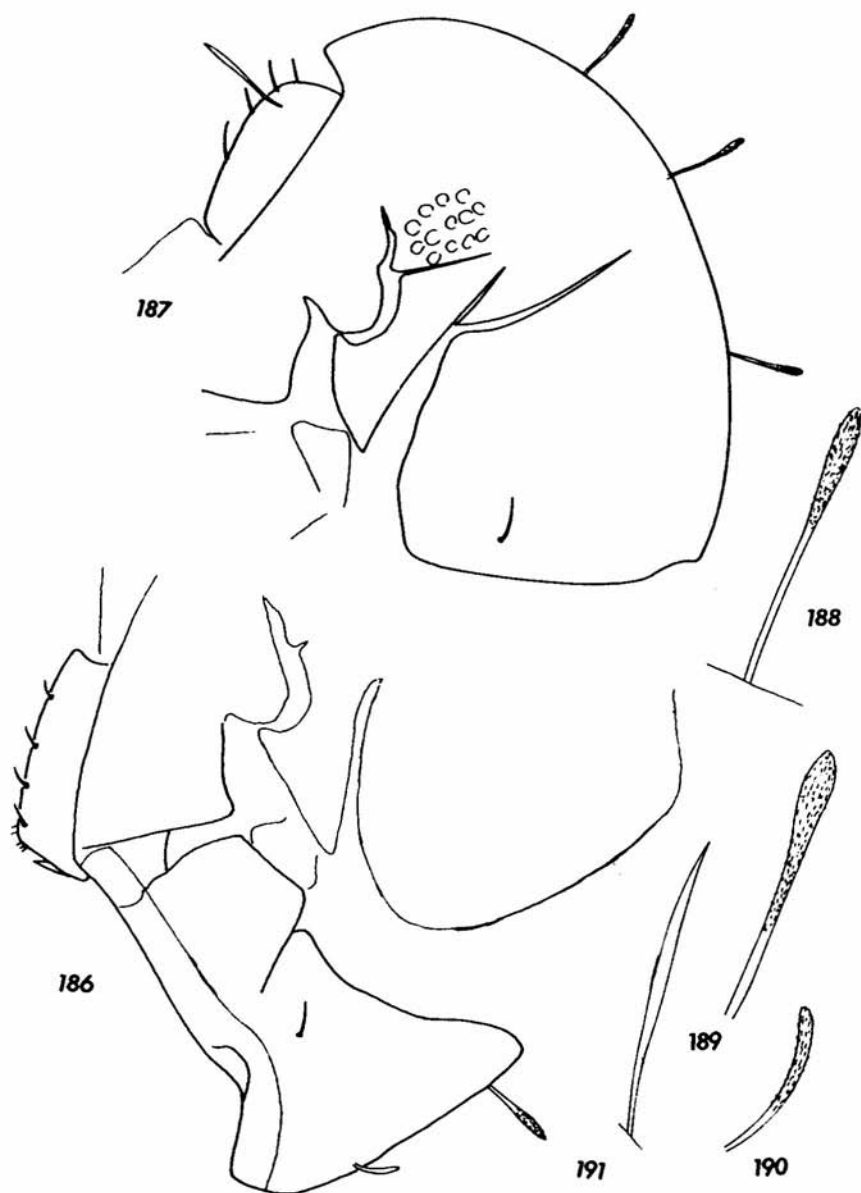
177. *Protophthiracarus echippiger* (BALOGH and MAHUNKA, 1978) - holotype: notogaster, lateral view



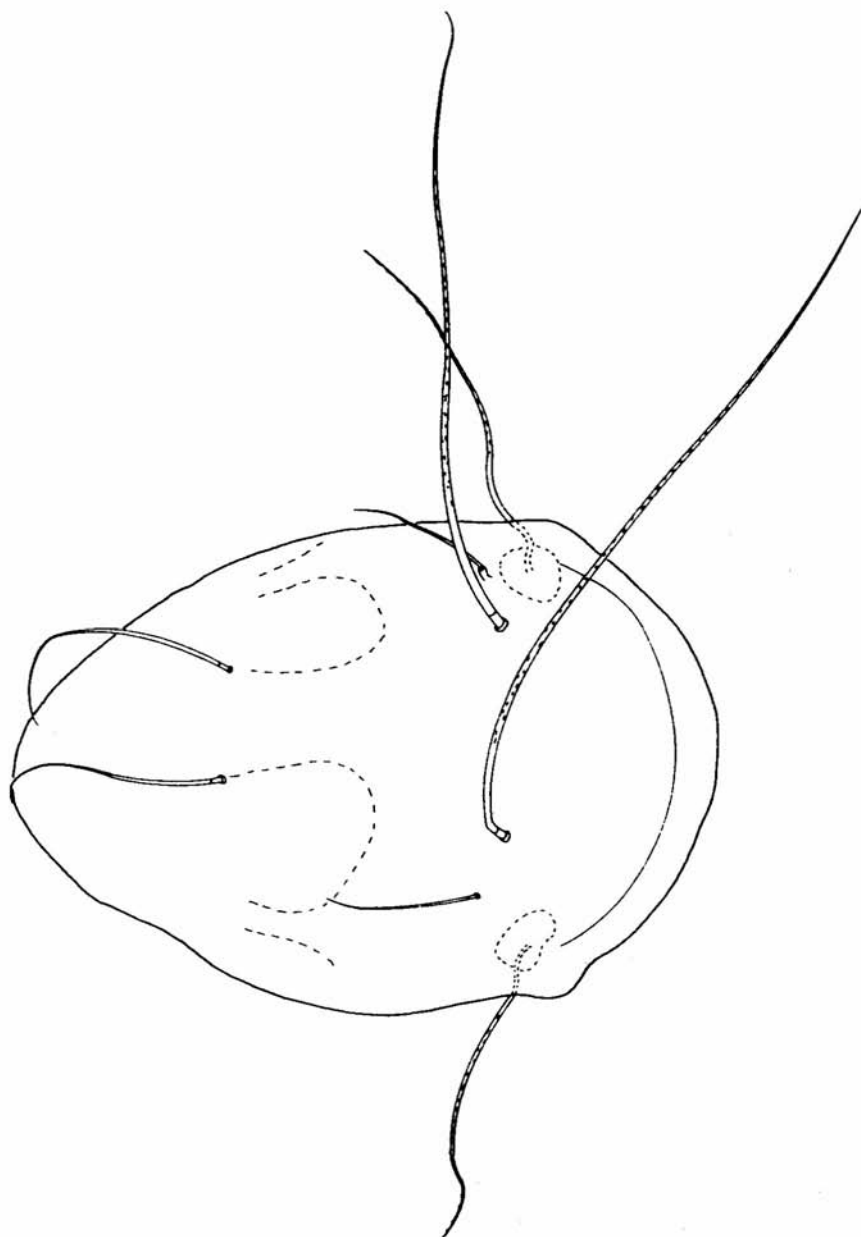
178-180. *Protophthiracarus echippiger* (BALOGH and MAHUNKA, 1978) - holotype: ano-adanal plate, 179 - genito-aggenital plate, 180 - trochanter and femur of leg I



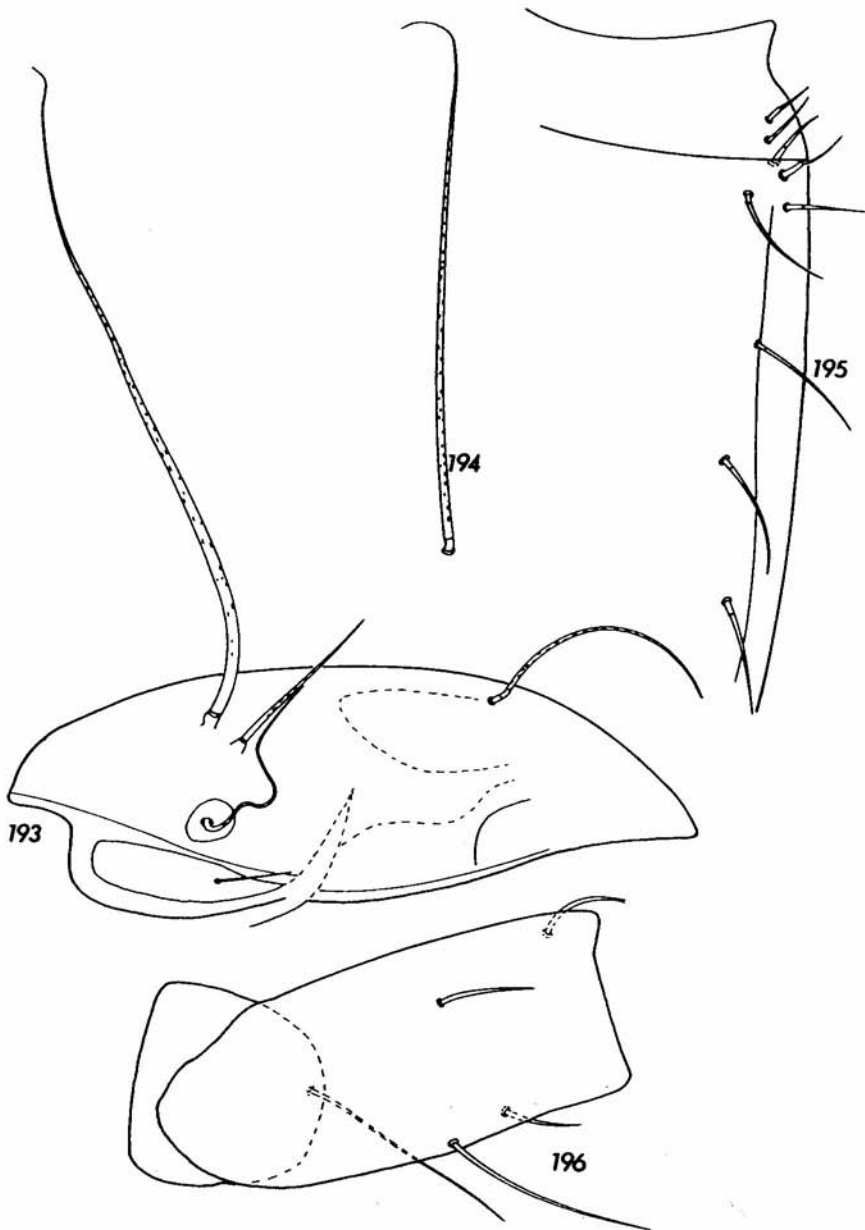
181-185. *Protophthiracarus varians* (JACOT, 1933) - "cotypes": 181 - anterior part with rostral setae, dorsal view (slide G75P8), 182 - sensillus, lateral view (slide G63P2), 183 - sensillus, dorsal view (slide G75P8), 184 - prodorsum, lateral view (slide G63P2), 185 - trochanter and femur of leg I (slide G63P2)



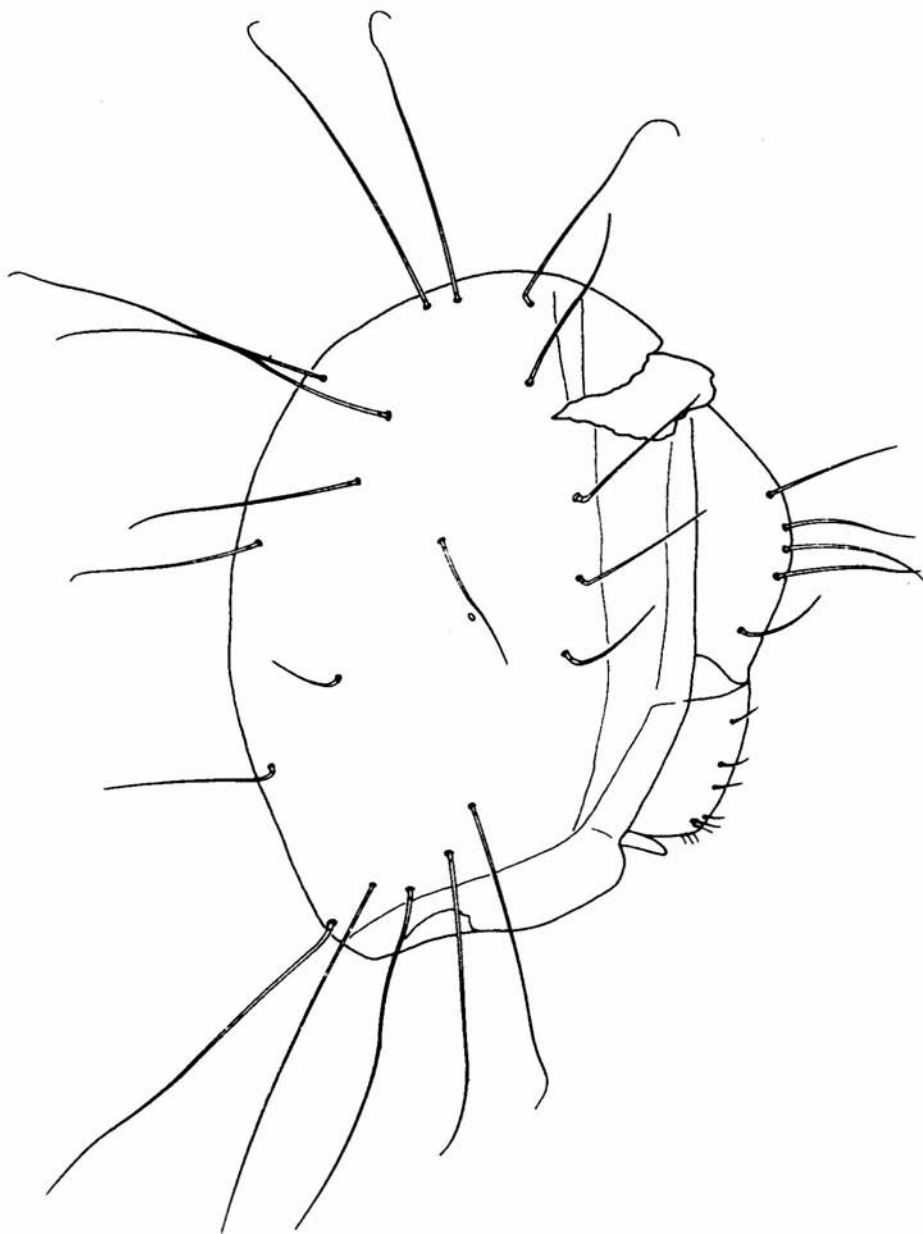
186-191. *Protophthiracarus varians* (Jacot, 1933) - "cotype": slide G63P2: 186 - anterior part of notogaster, lateral view, 187 - posterior part of notogaster, lateral view, 188 - ps1 seta, 189 - d1 seta, 190 - c1 seta, 191 - ad2 seta



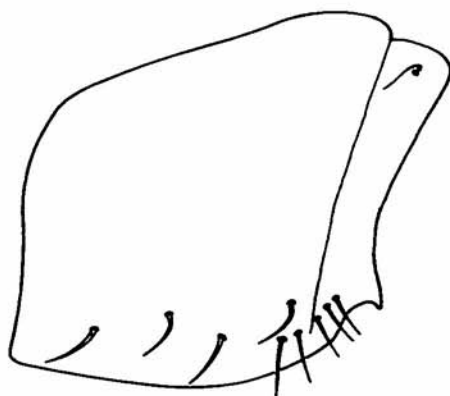
192. *Phrathicarus inflatus* sp. nov. - paratype: prodorsum, dorsal view



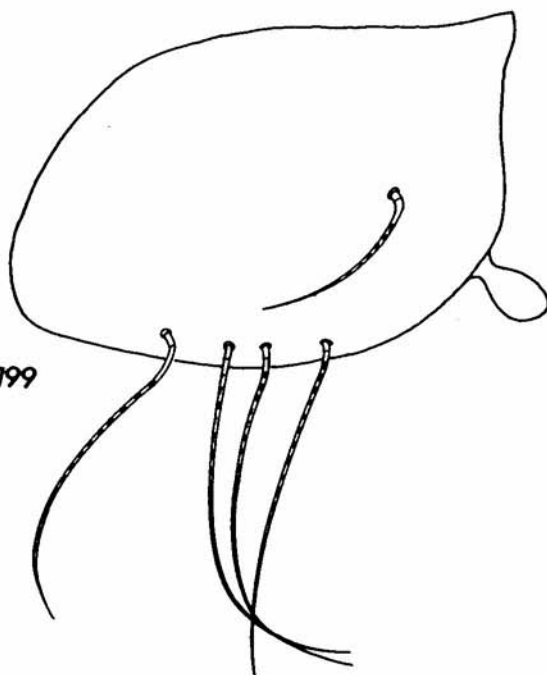
193-196. *Phrathicarus inflatus* sp. nov. - paratype: 193 - prodorsum, lateral view, 194 - ps1 seta, 195 - fragment of genito-aggenital plate, 196 - trochanter and femur of leg I



197. *Phrathicarus inflatus* sp. nov. - paratype: notogaster, lateral view

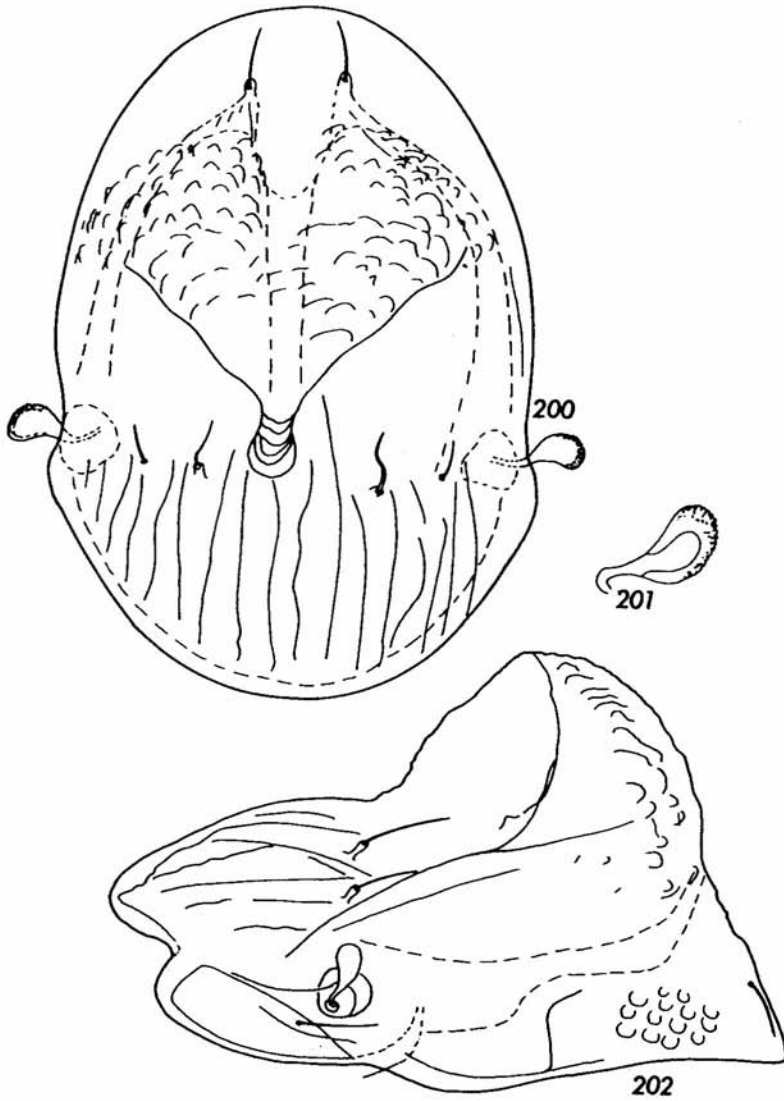


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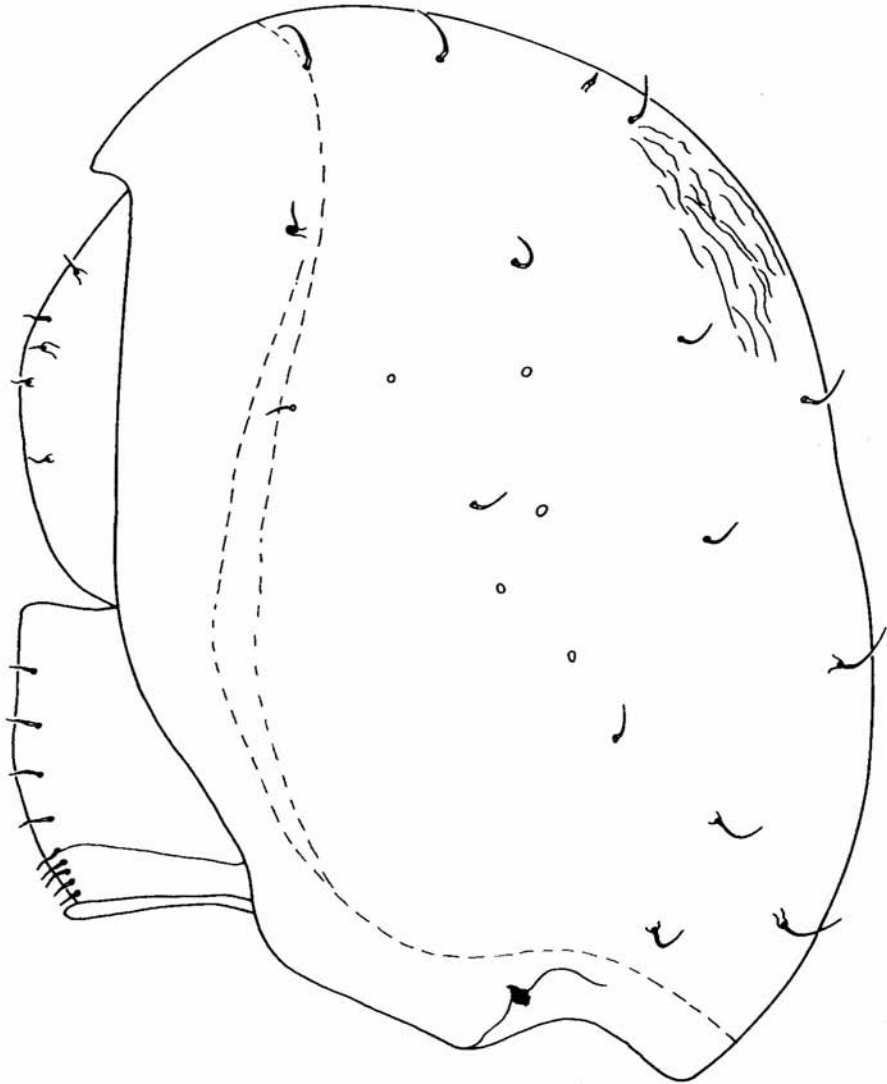


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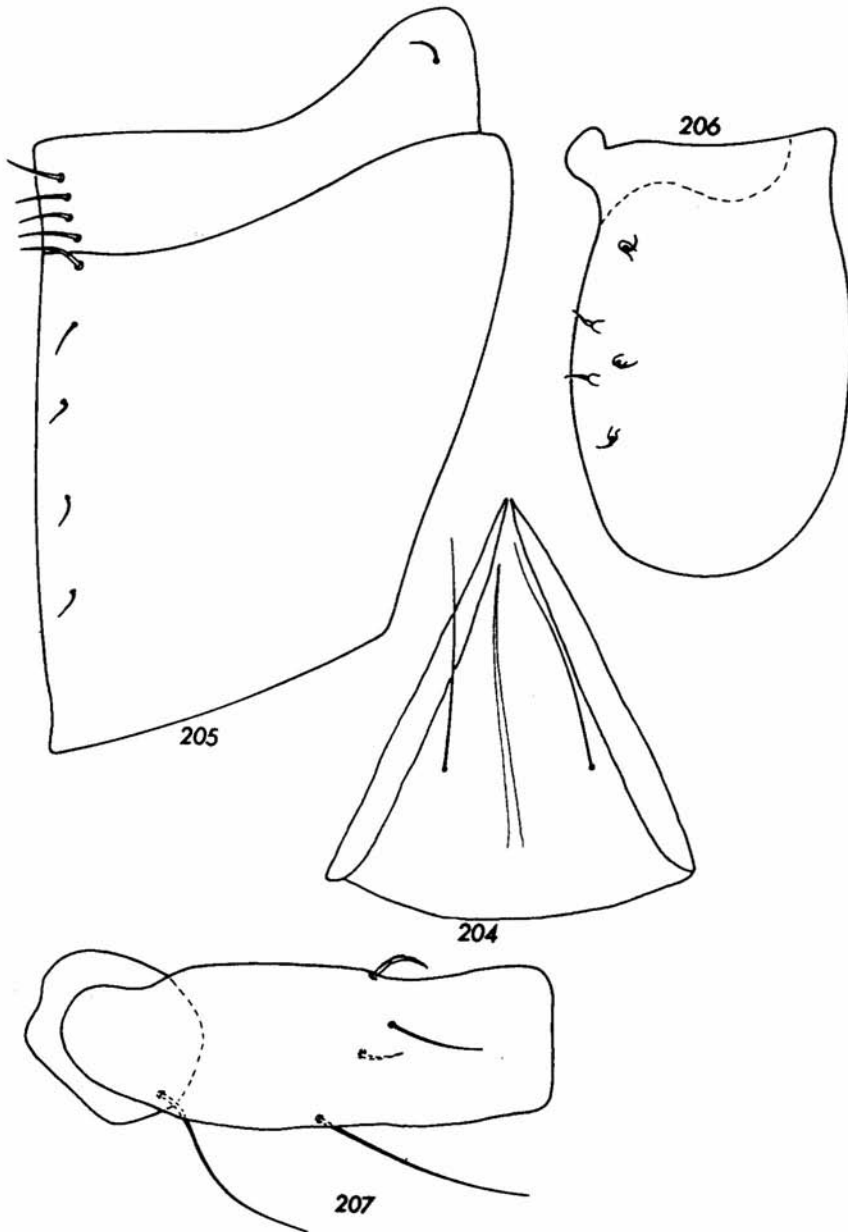
198-199. *Phrathicarus inflatus* sp. nov. - paratype: 198 - genito-aggenital plate, 199 - ano-adanal plate



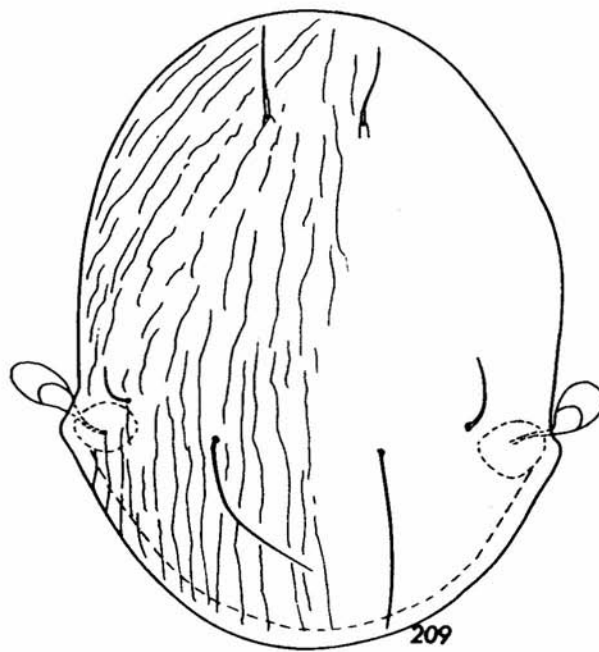
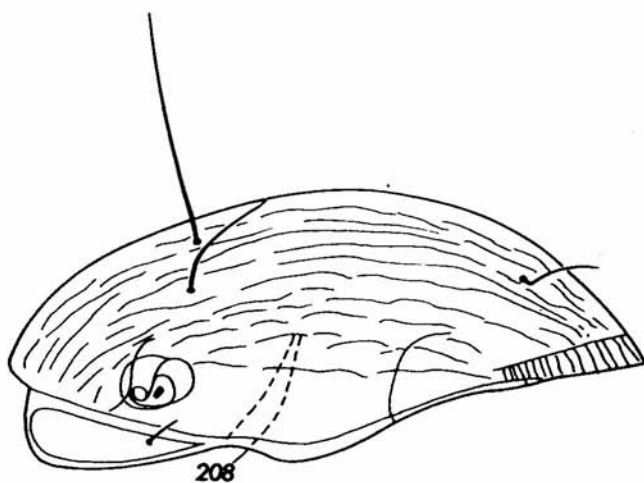
200-202. *Notophthiracarus cavernosus* (МАЛУНКА, 1987) - paratype: 200 - prodorsum, dorsal view, 201 - sensillus, dorsal view, 202 - prodorsum, lateral view



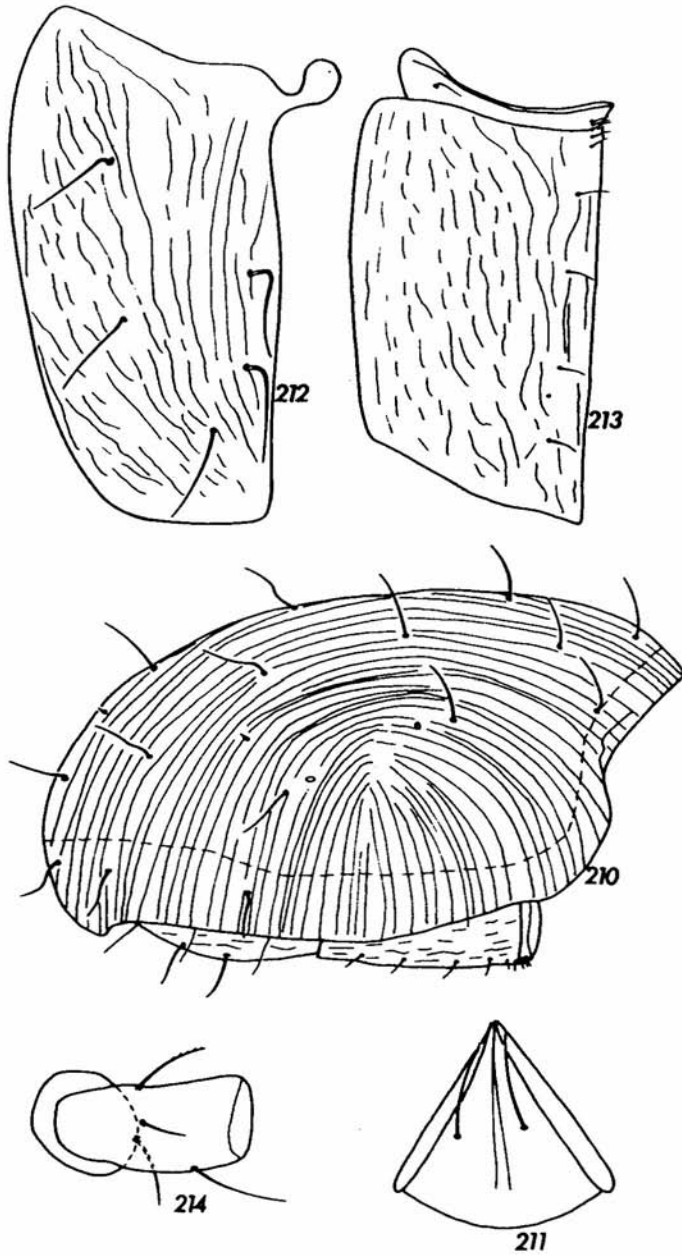
203. *Notophthiracarus cavernosus* (MAHUNKA, 1987) - paratype: notogaster, lateral view



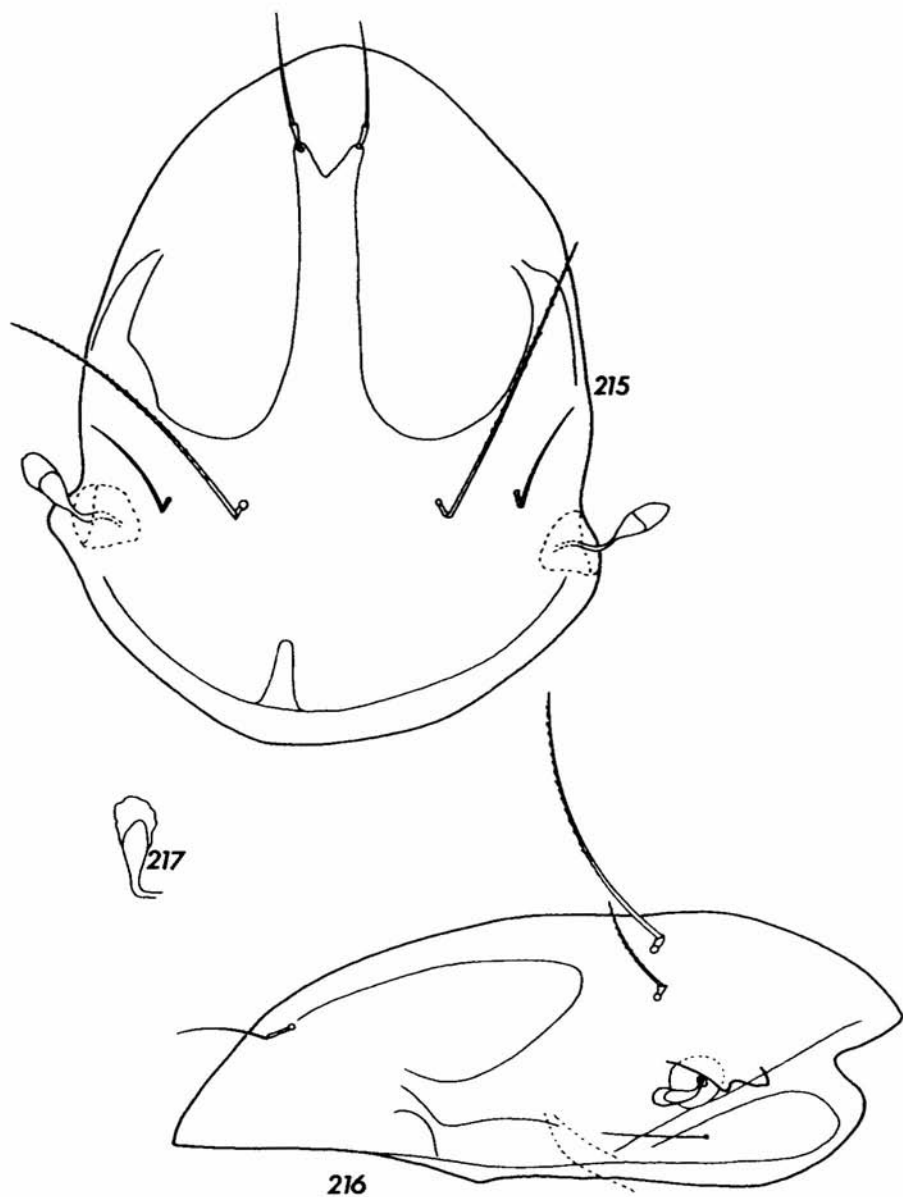
204-207. *Notophthiracarus cavernosus* (MAHUNKA, 1987) - paratype: 204 - infracapitular mentum, 205 - genito-aggenital plate, 206 - ano-adanal plate, 207 - trochanter and femur of leg I



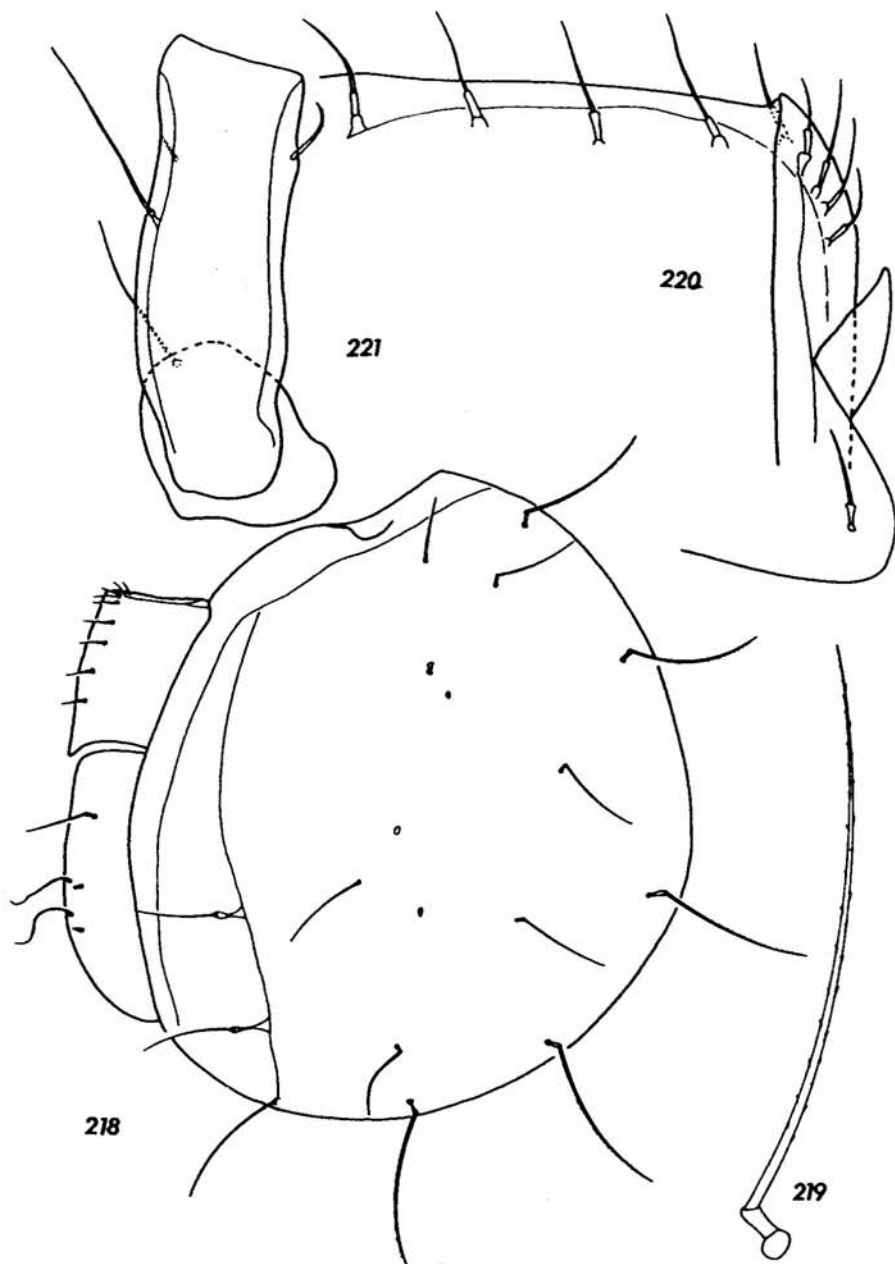
208-209. *Notophthiracarus dactyloscopicus* (МАШУНКА, 1978) - paratype: 208 - prodorsum, lateral view, 209 - prodorsum, dorsal view



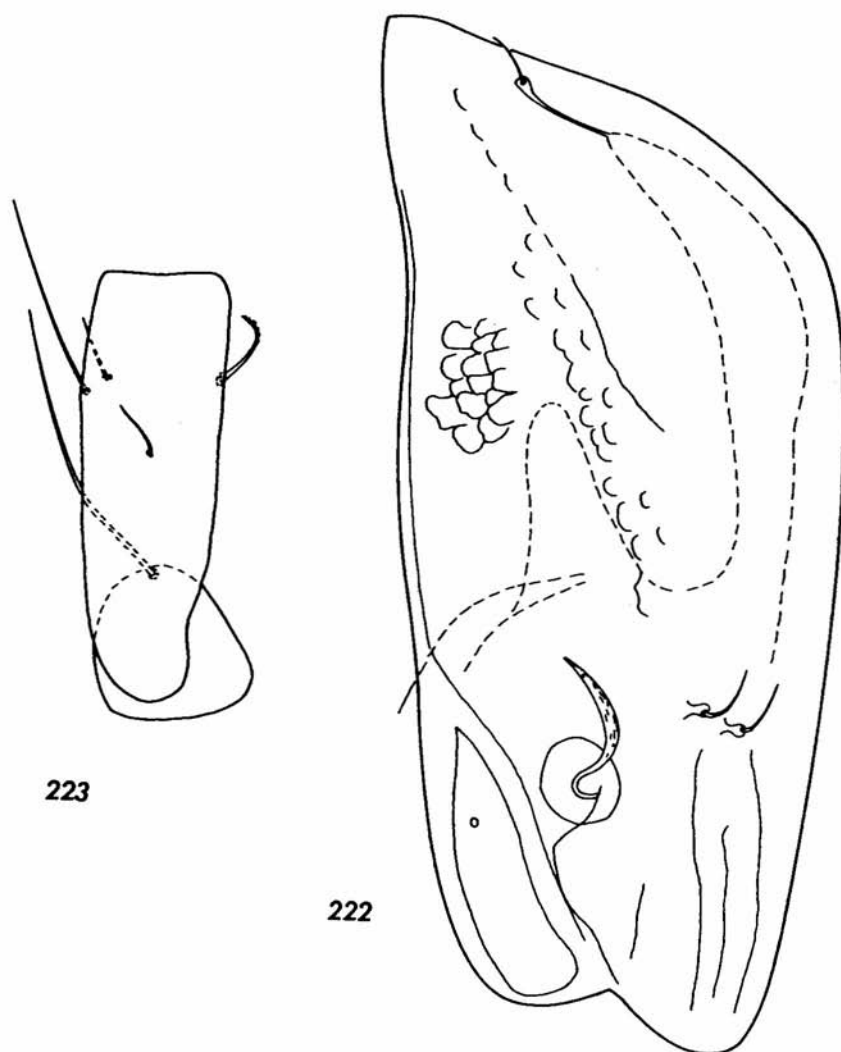
210-214. *Notophtiracarus dactyloscopicus* (MAHUNKA, 1978) - paratype: 210 - notogaster, lateral view, 211 - infracapitular mentum, 212 - ano-adanal plate, 213 - genito-aggenital plate, 214 - trochanter and femur of leg I



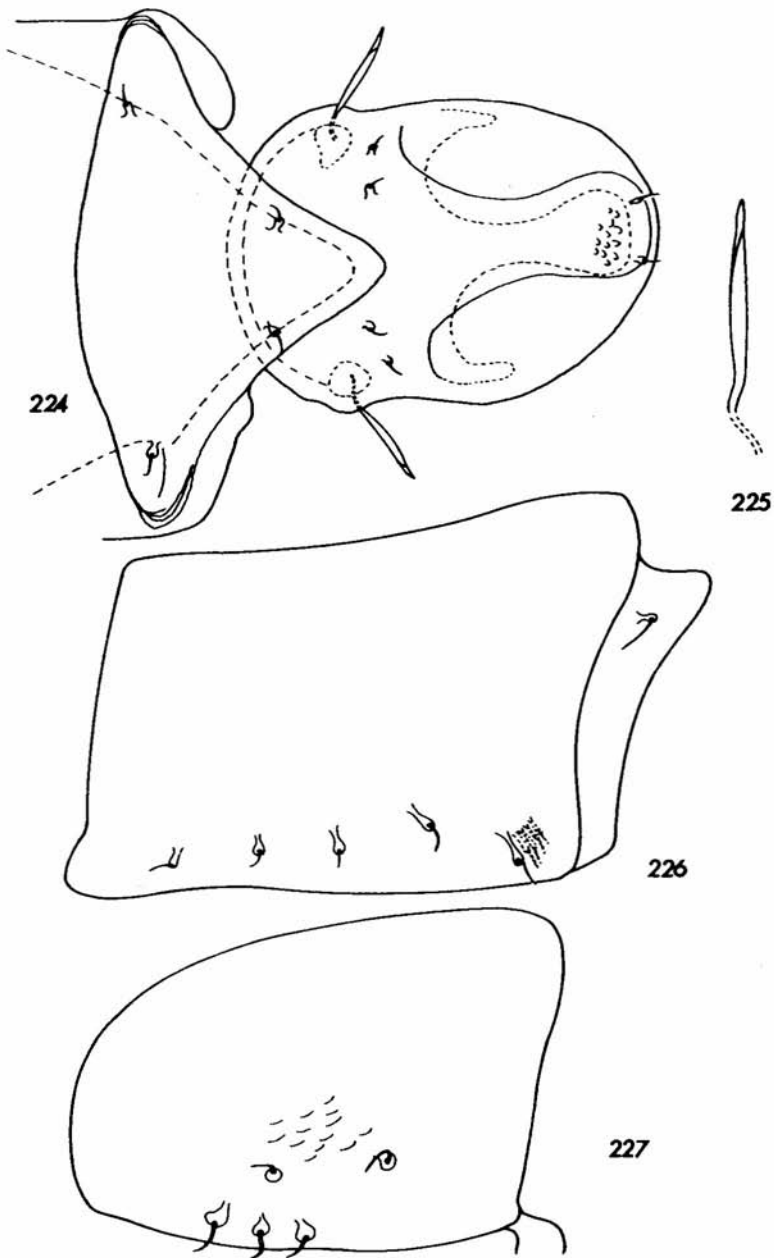
215-217. *Notophthiracarus maculatus* (TRAGARDH, 1931) - "otype": 215 - prodorsum, dorsal view, 216 - prodorsum, lateral view, 217 - sensillus, lateral view



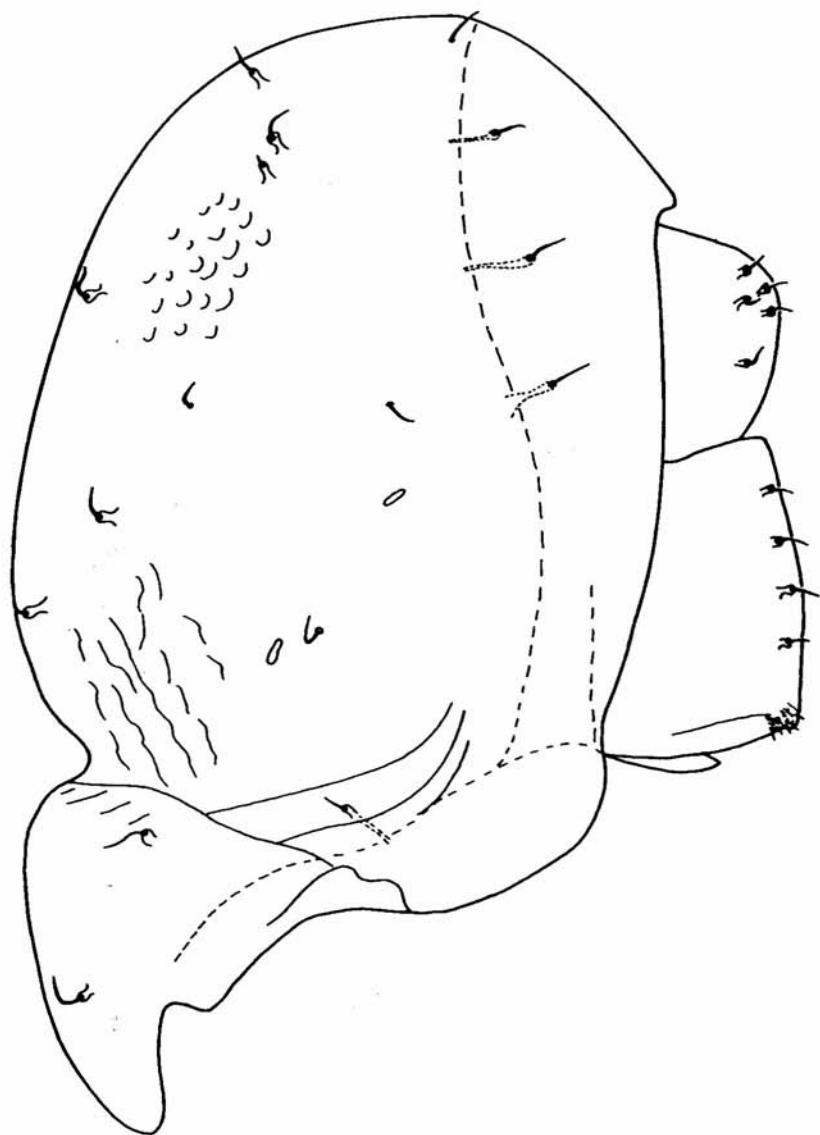
218-221. *Notophthiracarus maculatus* (TRAGARDH, 1931) - "cotype": 218 - notogaster, lateral view, 219 - h1 seta, 220 - fragment of genito-aggenital plate, 221 - trochanter and femur of leg I



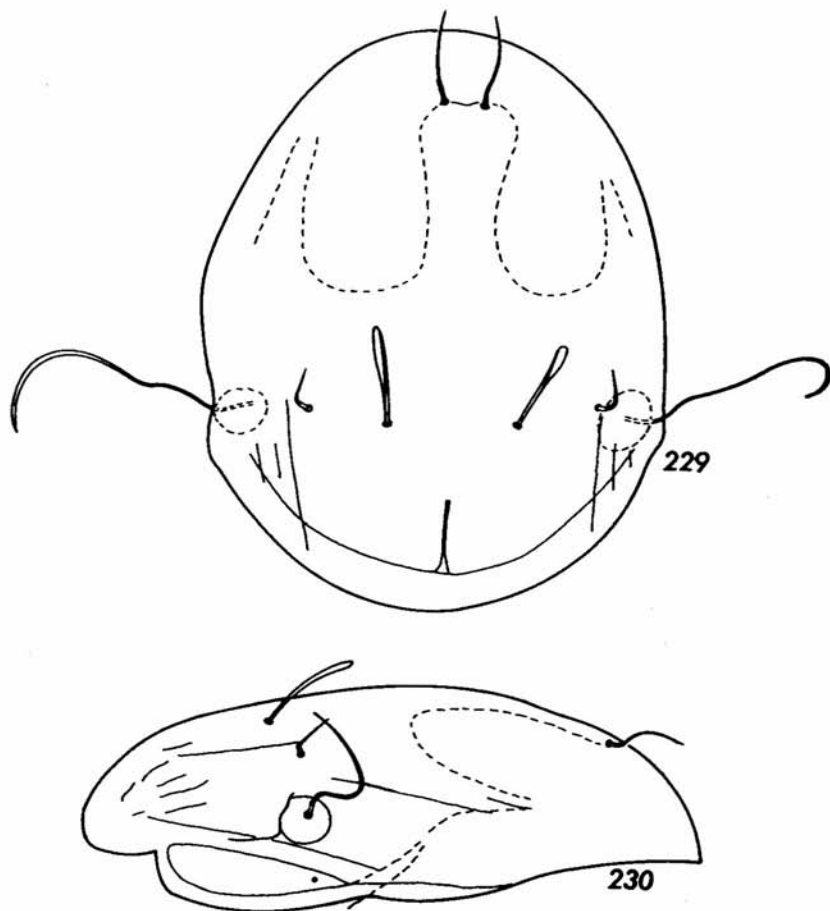
222- 223. *Atropacarus (Hoplophorella) cornutus* (MAHUNKA, 1978) - paratype: 222 - prodorsum, lateral view, 223 - trochanter and femur of leg I



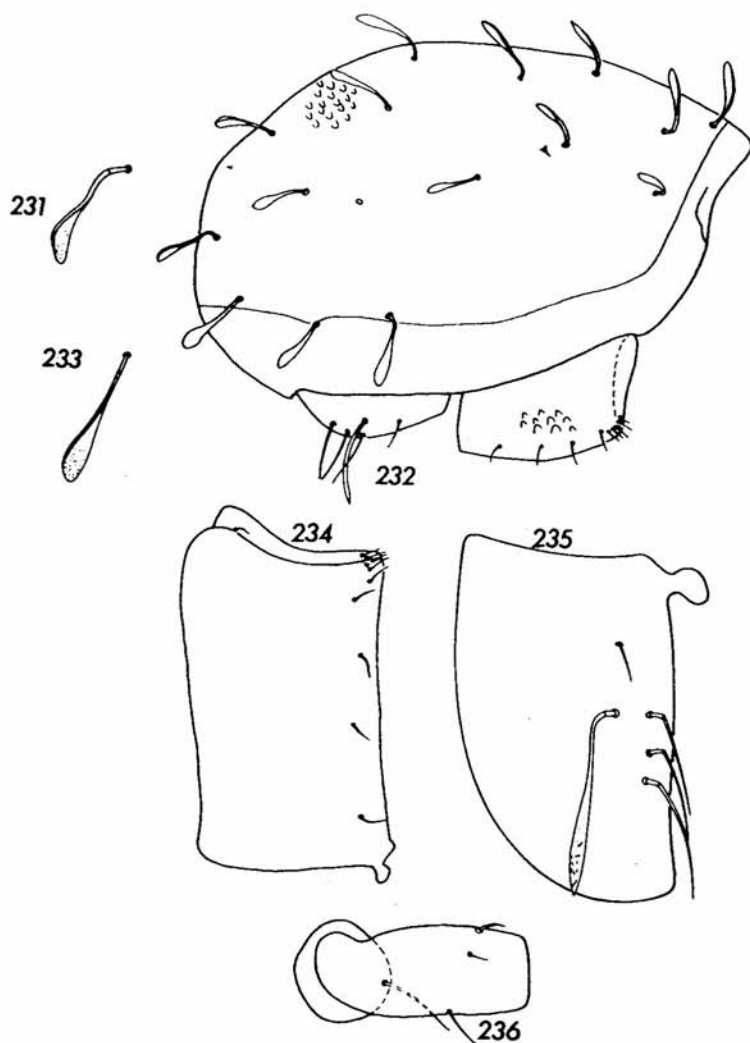
224-227. *Atropacarus (Hoplophorella) cornutus* (MAJUNKA, 1978) - paratype: 224 - prodorsum and anterior part of notogaster, dorsal view, 225 - sensillus, dorsal view, 226 - genito-aggenital plate, 227 - ano-adanal plate



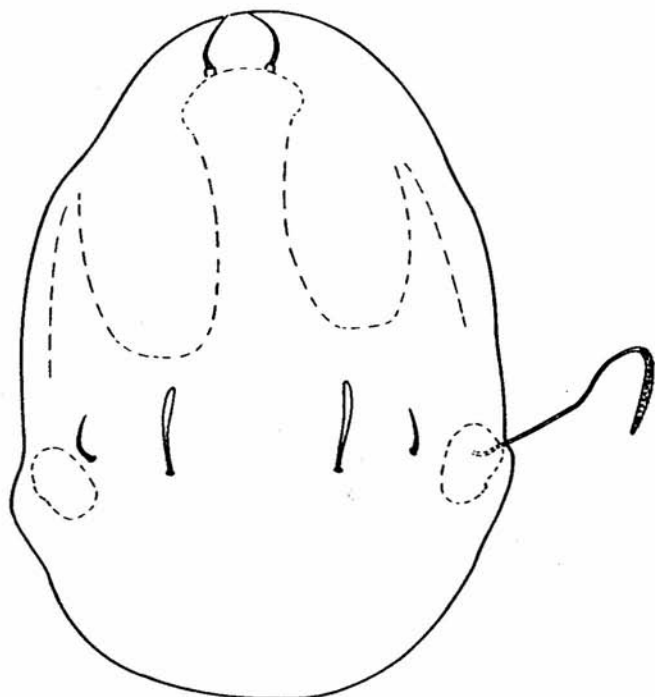
228. *Atropacarus (Hoplophorella) cornutus* (MAHUNKA, 1978) - paratype: notogaster, lateral view



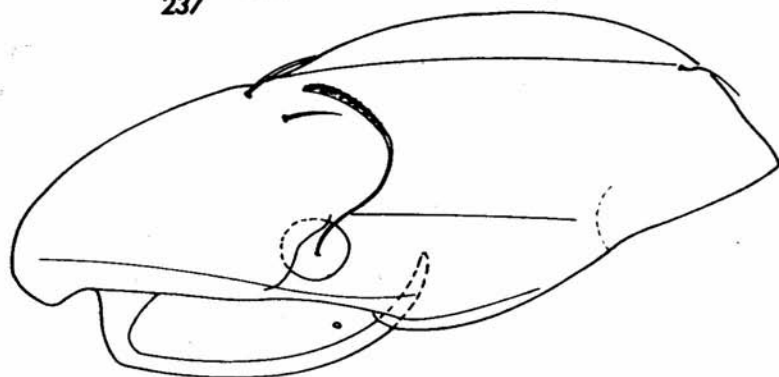
229-230. *Atropacarus (Hoplophorella) cuneisetus* (MAHUNKA, 1988) - holotype: 229 - prodorsum, dorsal view, 230 - prodorsum, lateral view



231-236. *Atropacarus (Hoplophorella) cuneisetus* (МАНУКА, 1988) - holotype: 231 - ps1 seta, 232 - notogaster, lateral view, 233 - ps2 seta, 234 - genito-aggenital plate, 235 - ano-adanal plate, 236 - trochanter and femur of leg I

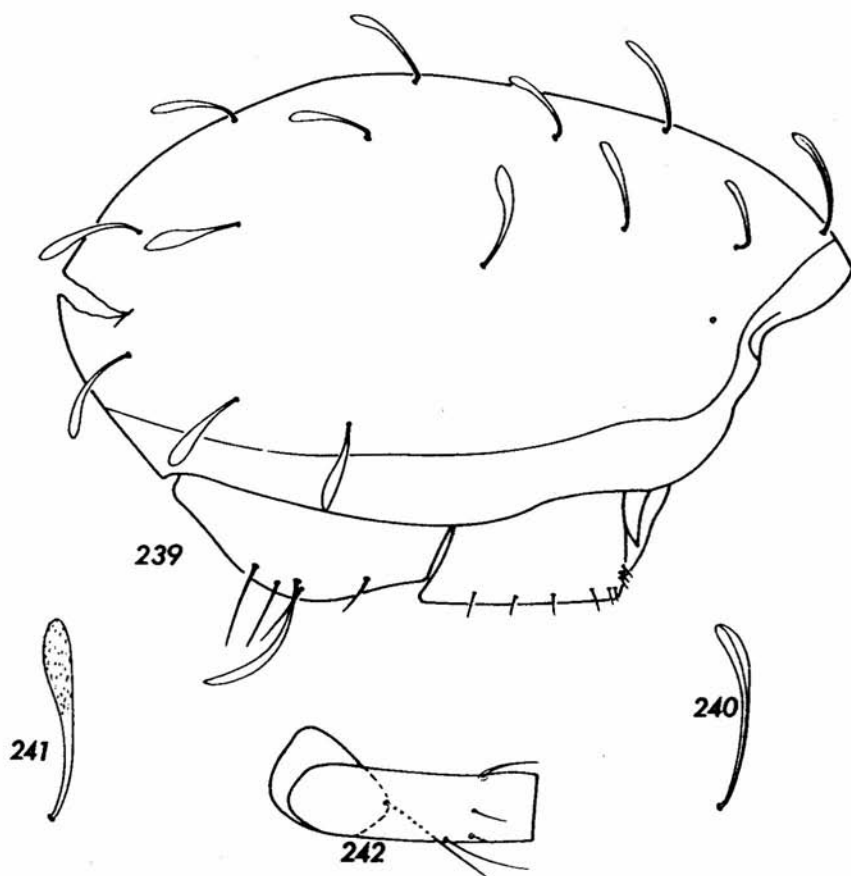


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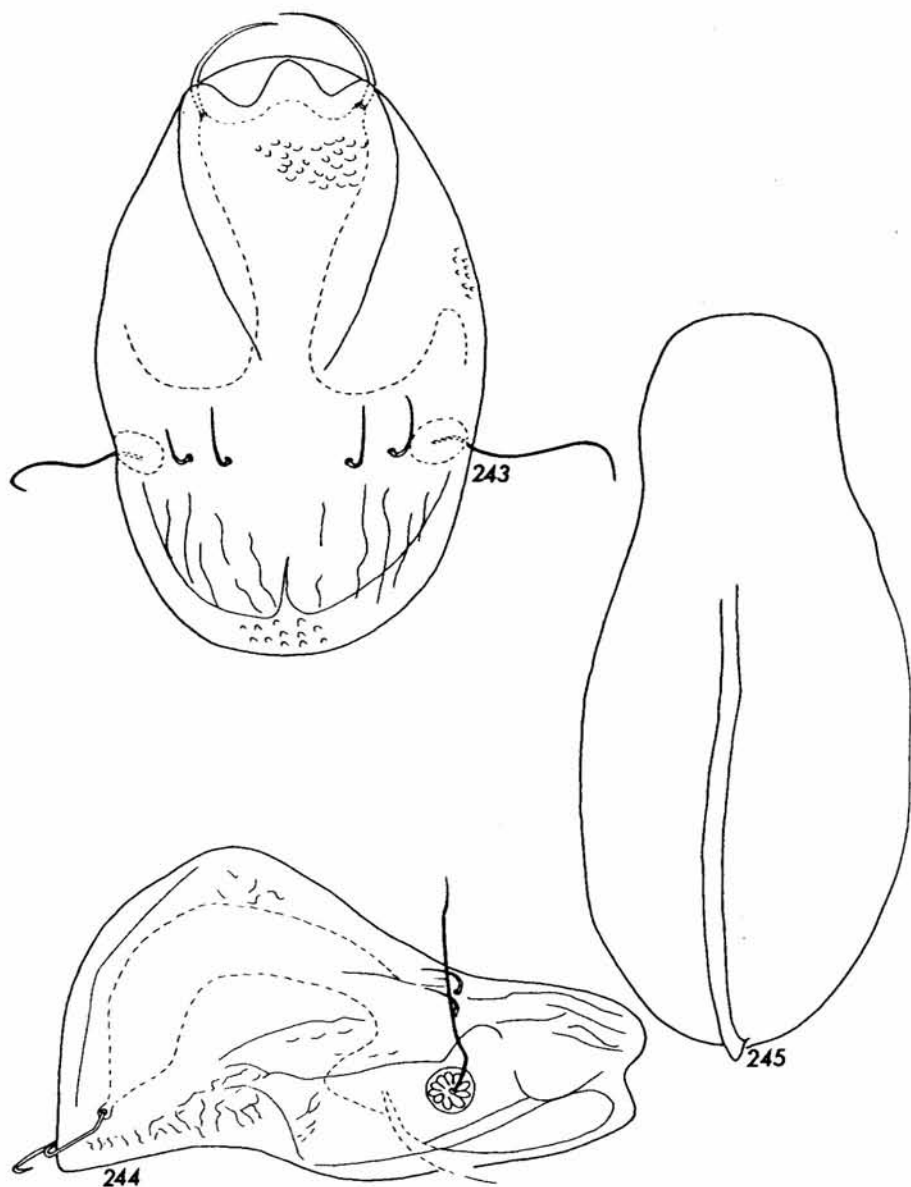


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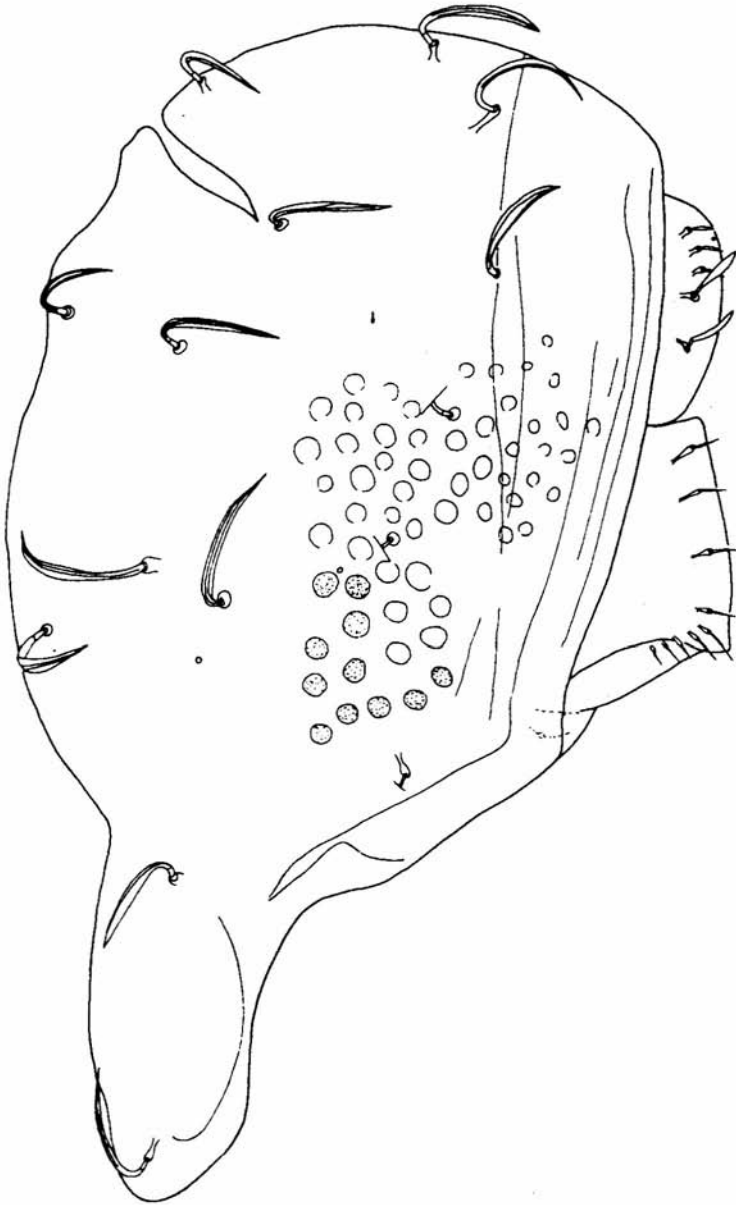
237-238. *Atropacarus (Hoplophorella) floridus* (JACOT, 1933): 237 - prodorsum, dorsal view (slide G6P16), 238 - prodorsum, lateral view (slide G87P5)



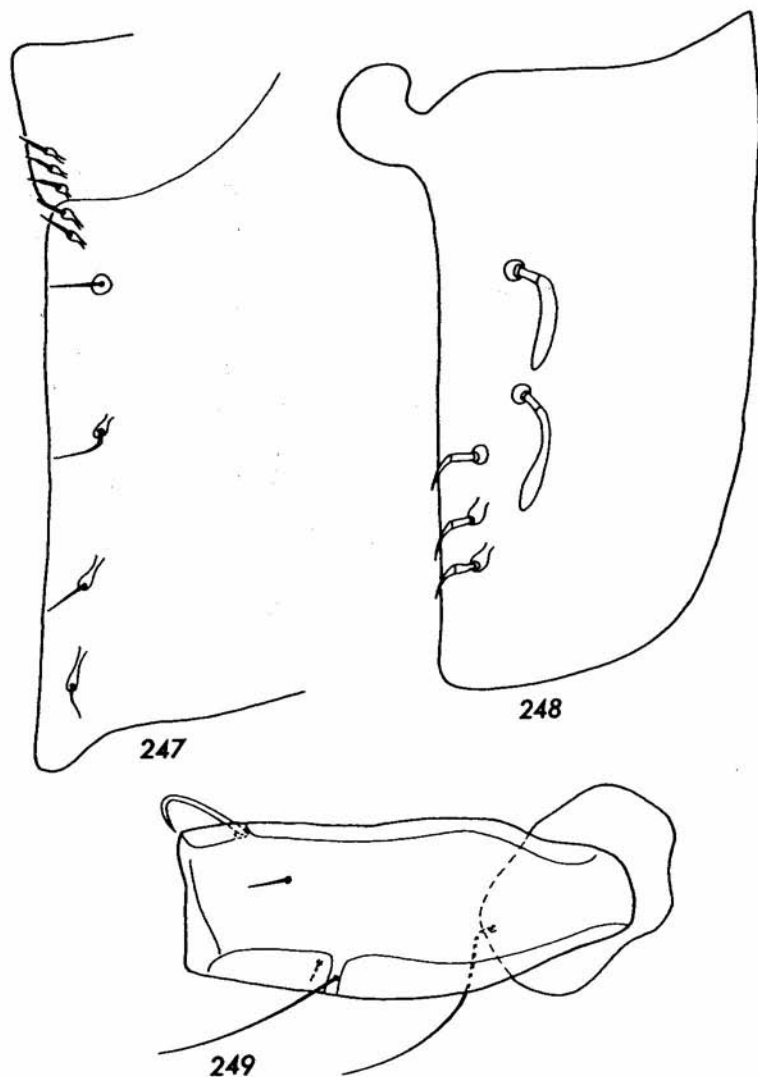
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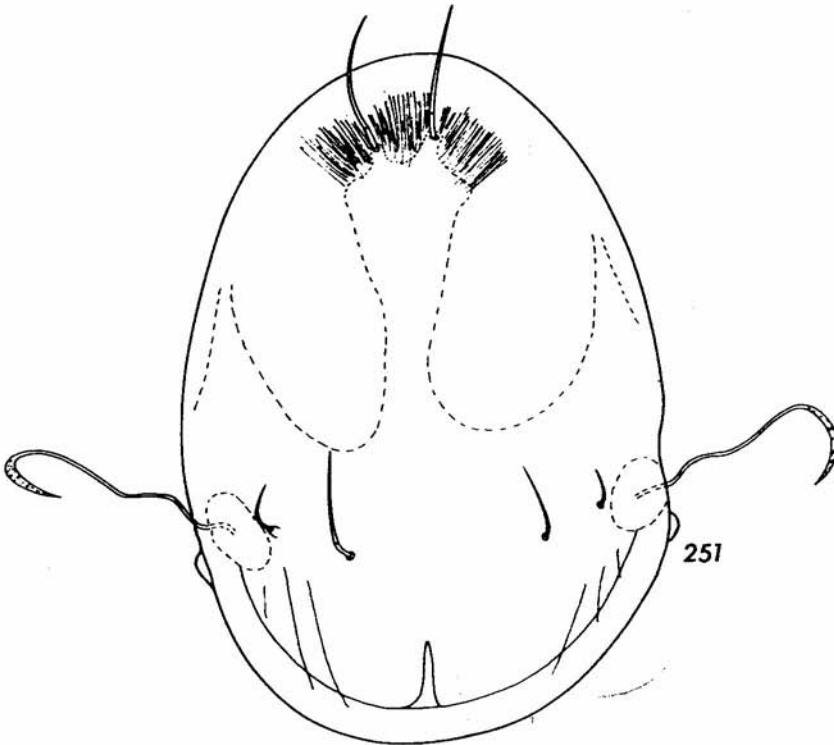
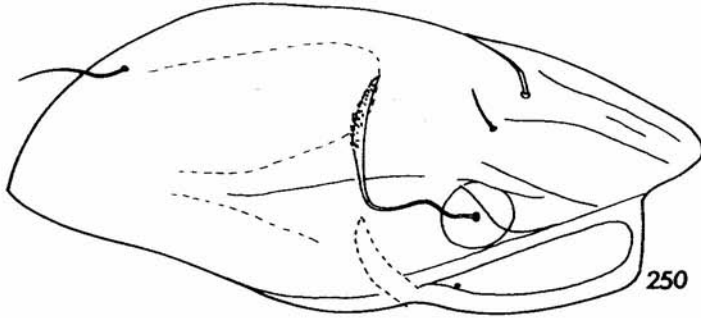
243-245. *Atropacarus (Hoplophorella) galeatus* (BALOGH and MAJUNKA, 1978) - holotype: 243 - prodorsum, dorsal view, 244 - prodorsum, lateral view, 245 - notogaster, dorsal view



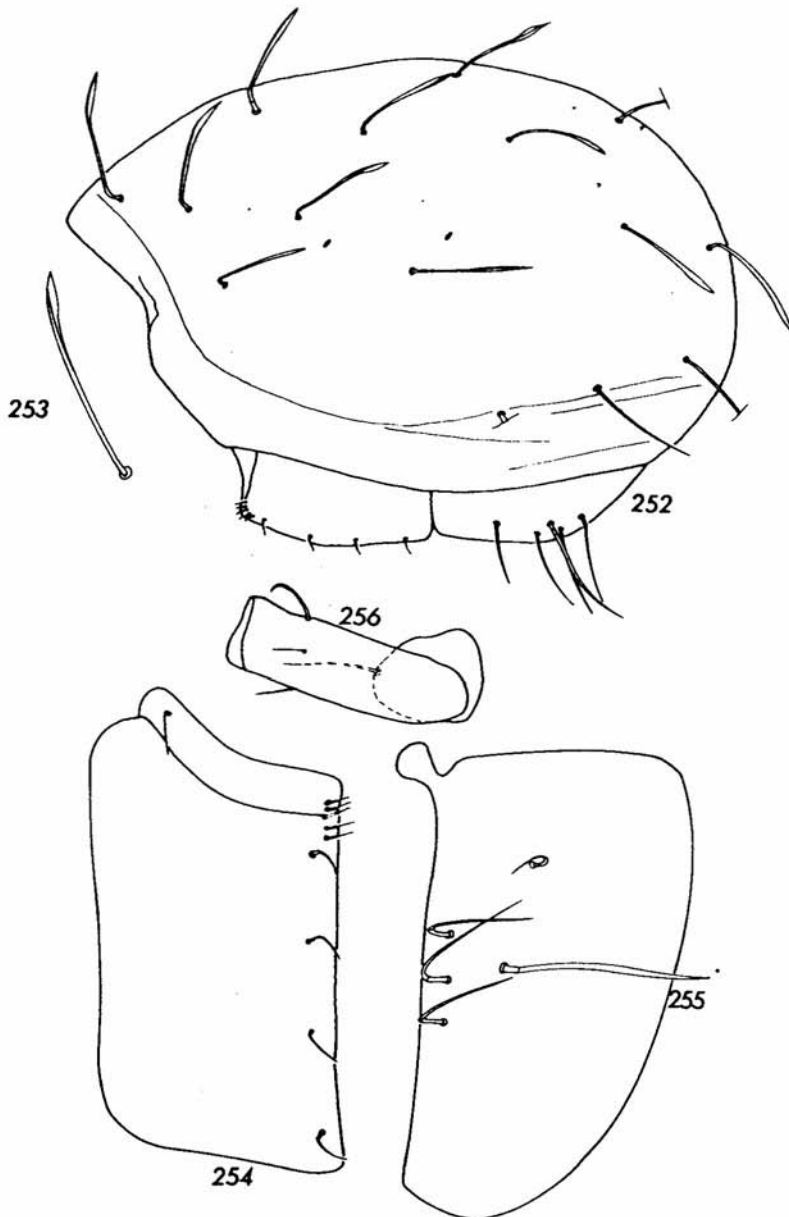
246. *Atropacarus (Hoplophorella) galeatus* (BALOGH and MAHUNKA, 1978) - holotype: notogaster, lateral view



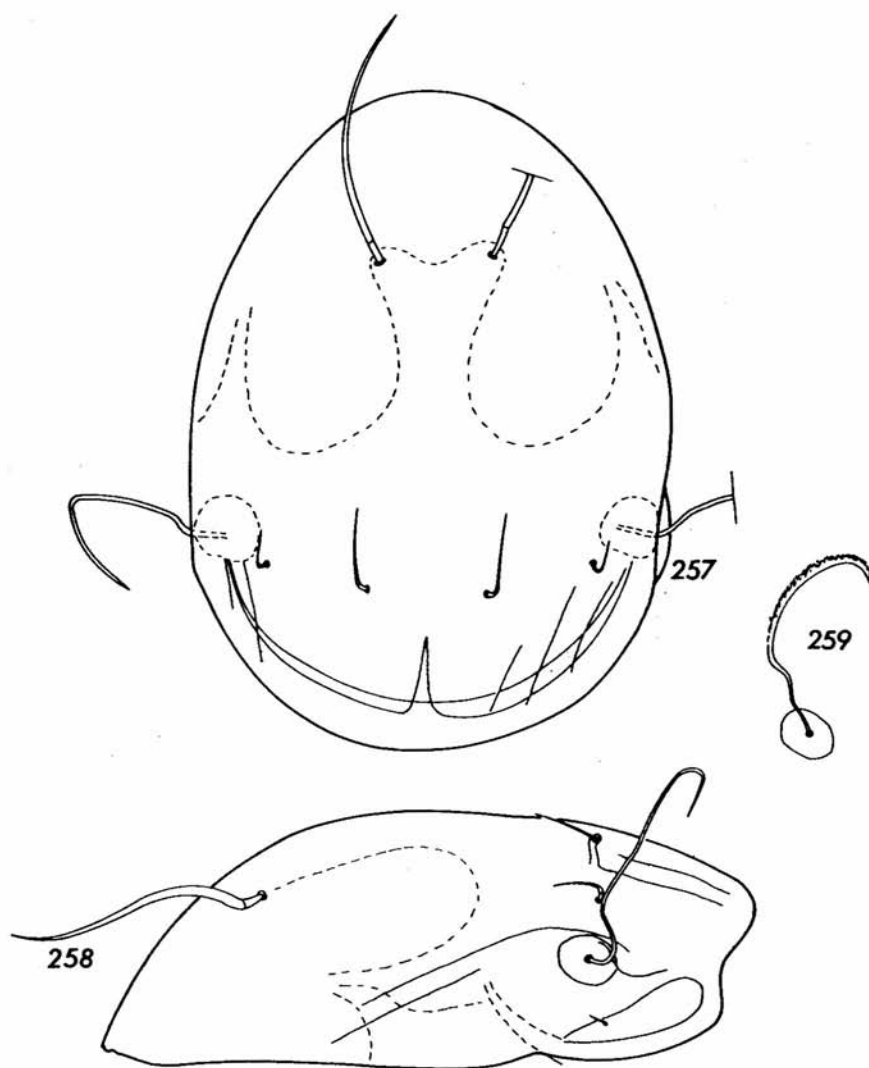
247-249. *Atropacarus (Hoplophorella) galeatus* (BALOGH and MAHUNKA, 1978) - holotype: 247 - fragment of genito-aggenital plate, 248 - ano-adanal plate, 249 - trochanter and femur of leg I



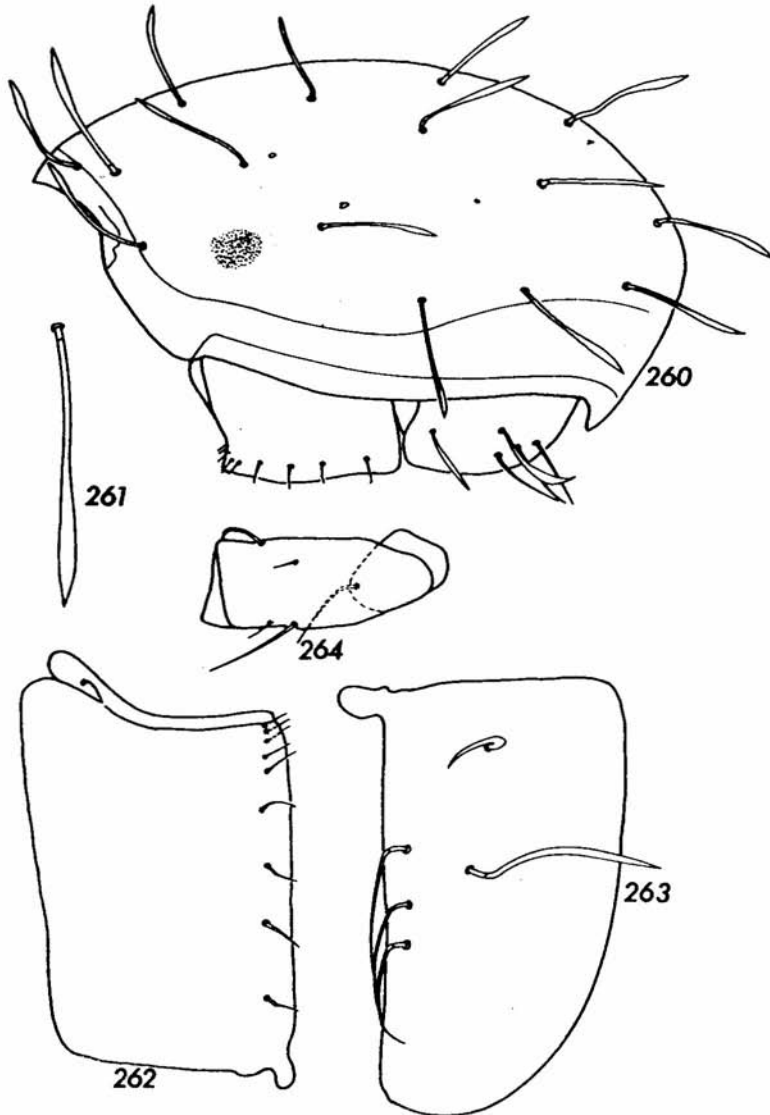
250-251. *Atropacarus (Hoplophorella) lanceosetus* (BALOGH and MAHUNKA, 1981) - holotype:
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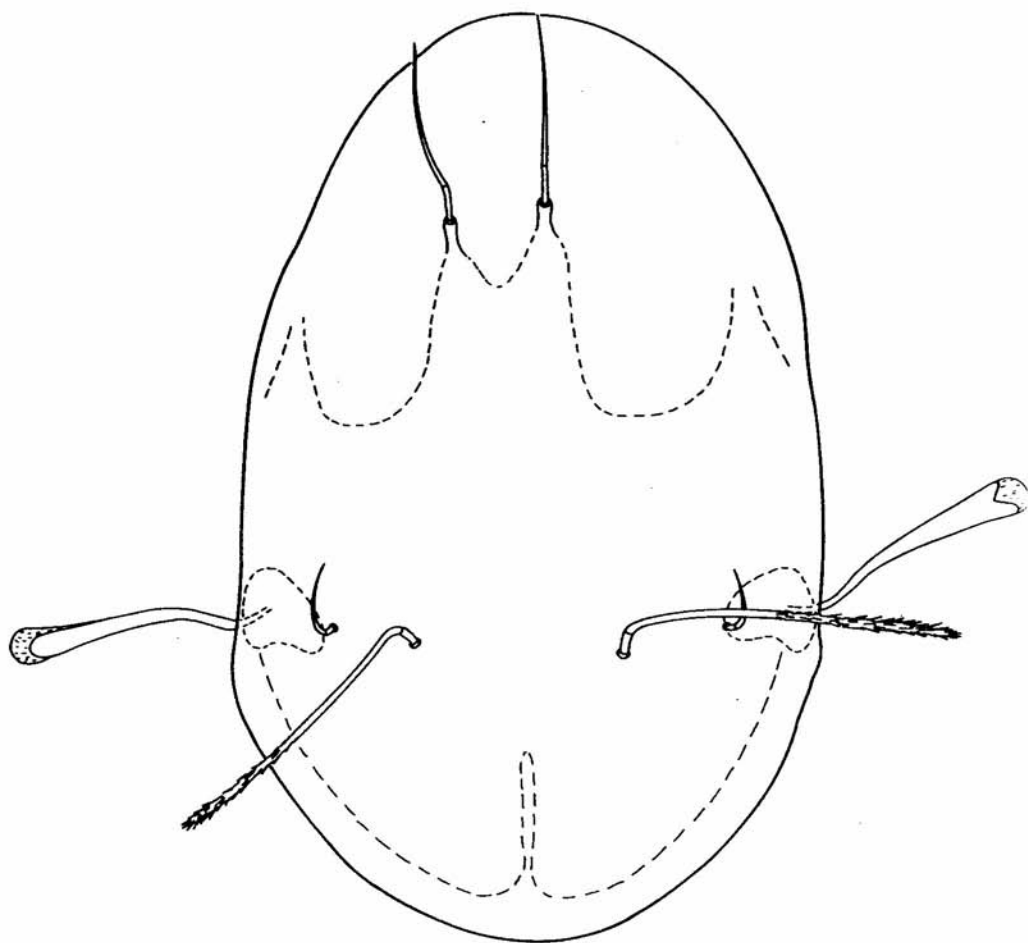
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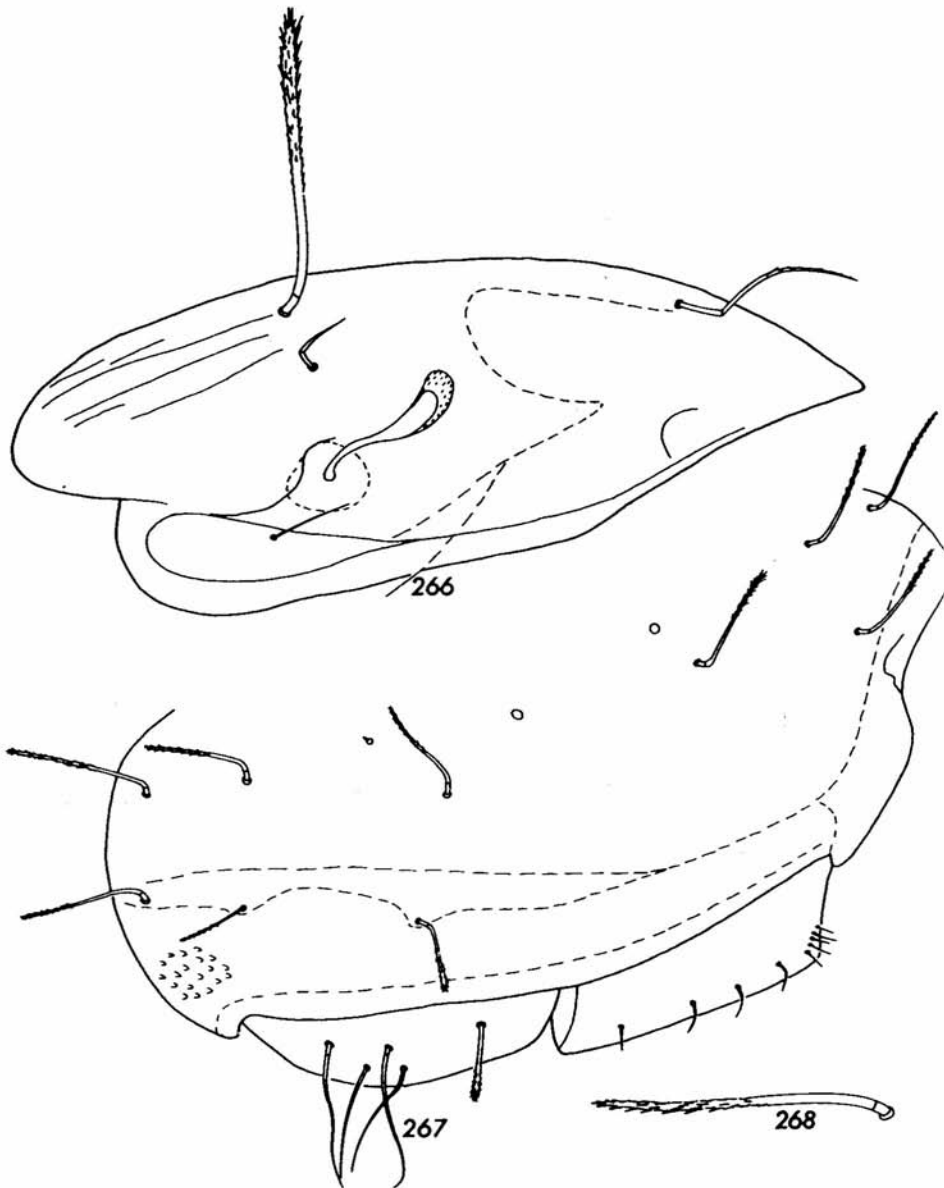
257-259. *Atropacarus (Hoplophorella) lanceosetoides* (МАЛУНКА, 1985) - paratype: 257 - prodorsum, dorsal view, 258 - prodorsum, lateral view, 259 - sensillus



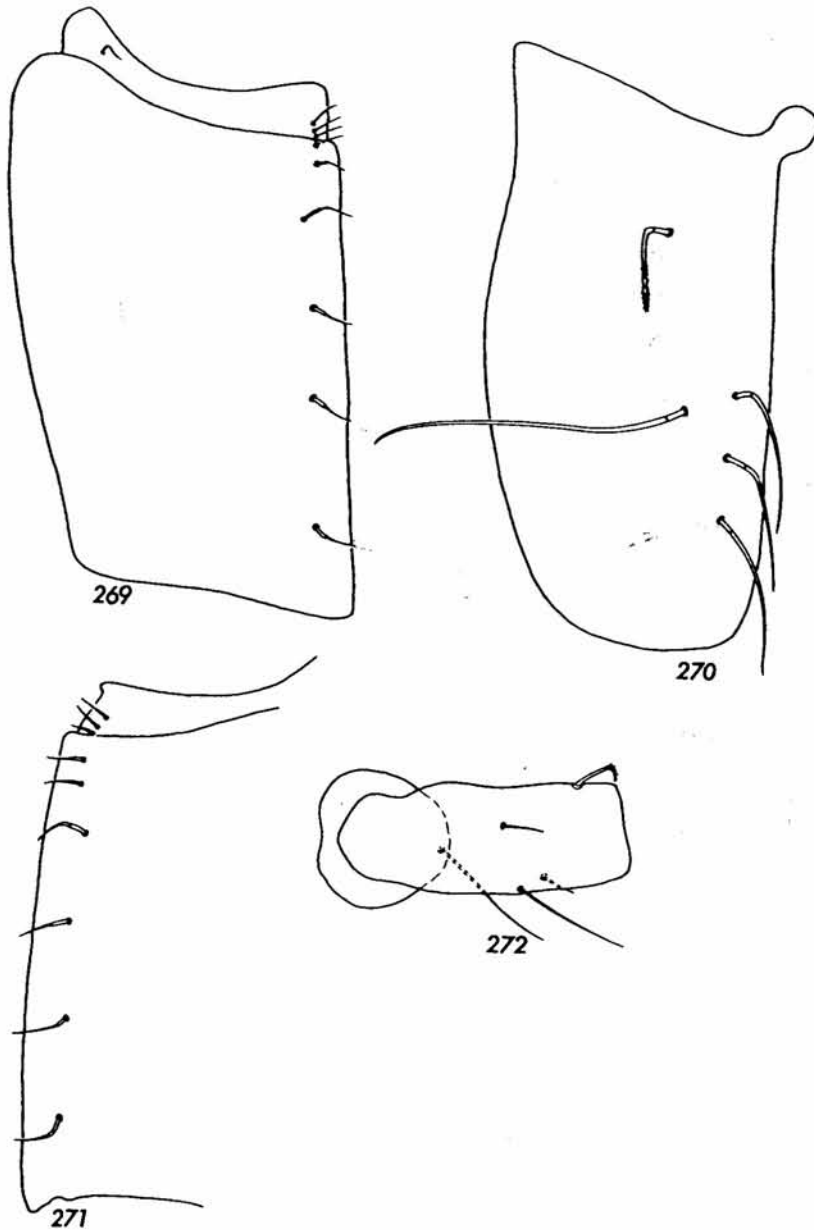
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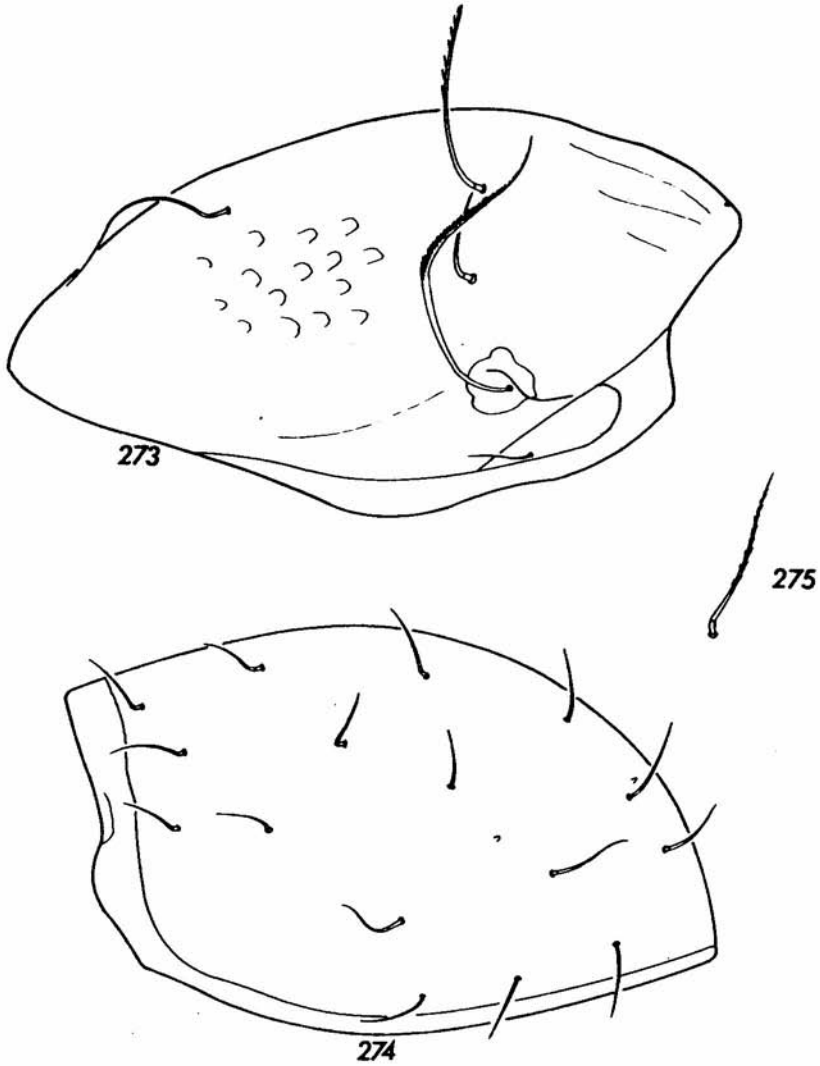
265. *Hoplophthiracarus regalis* MAHUNKA, 1978 - paratype: synonym of *Atropacarus* (*Hoplophorella*) *singularis* (SELLNICK, 1959) - prodorsum, dorsal view



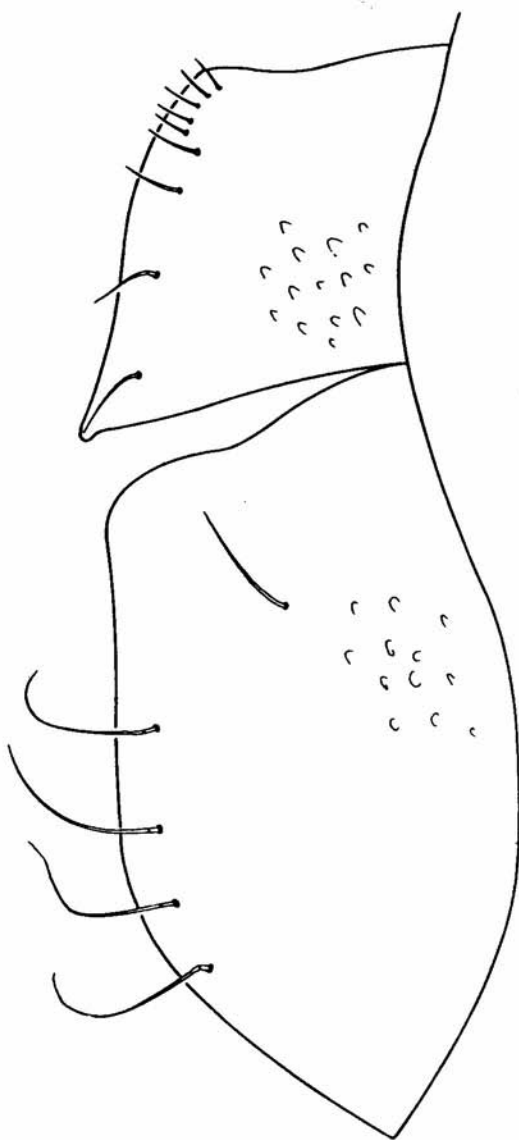
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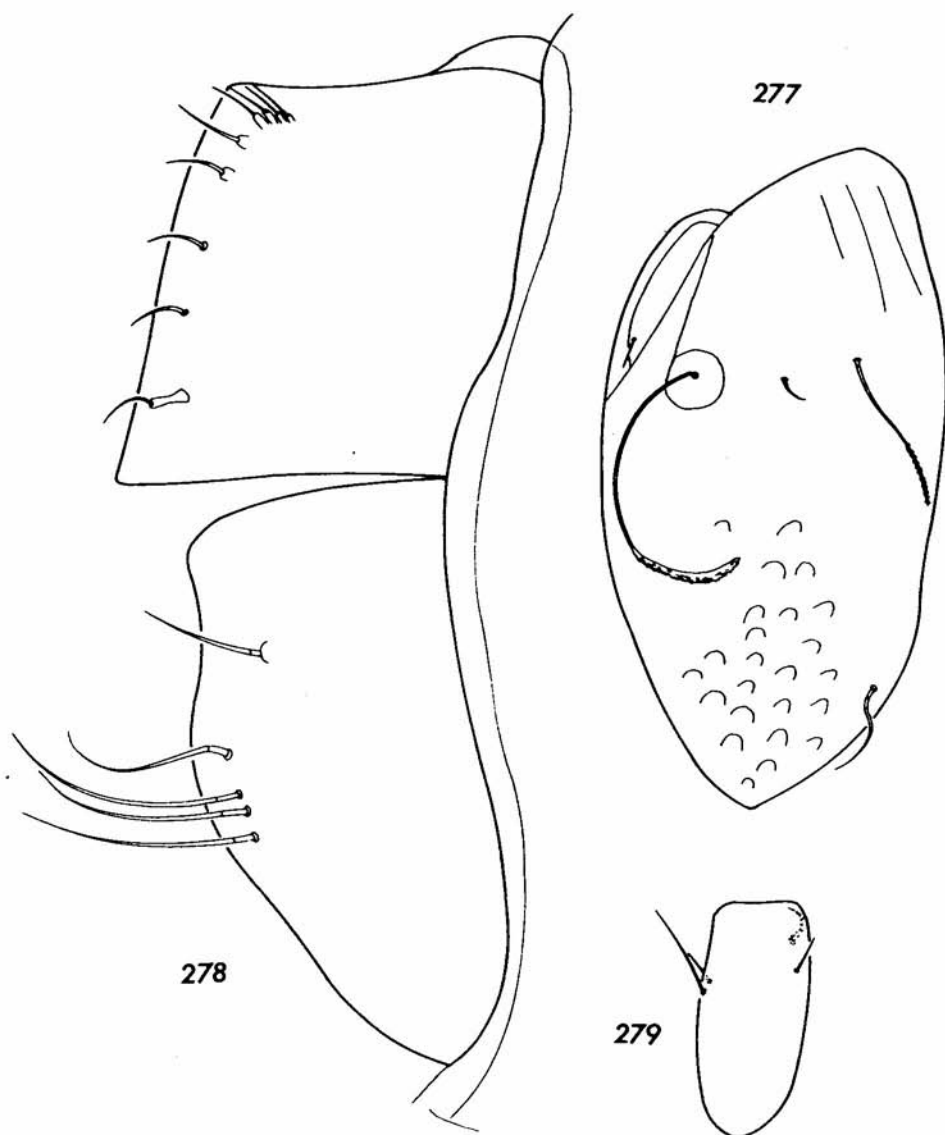
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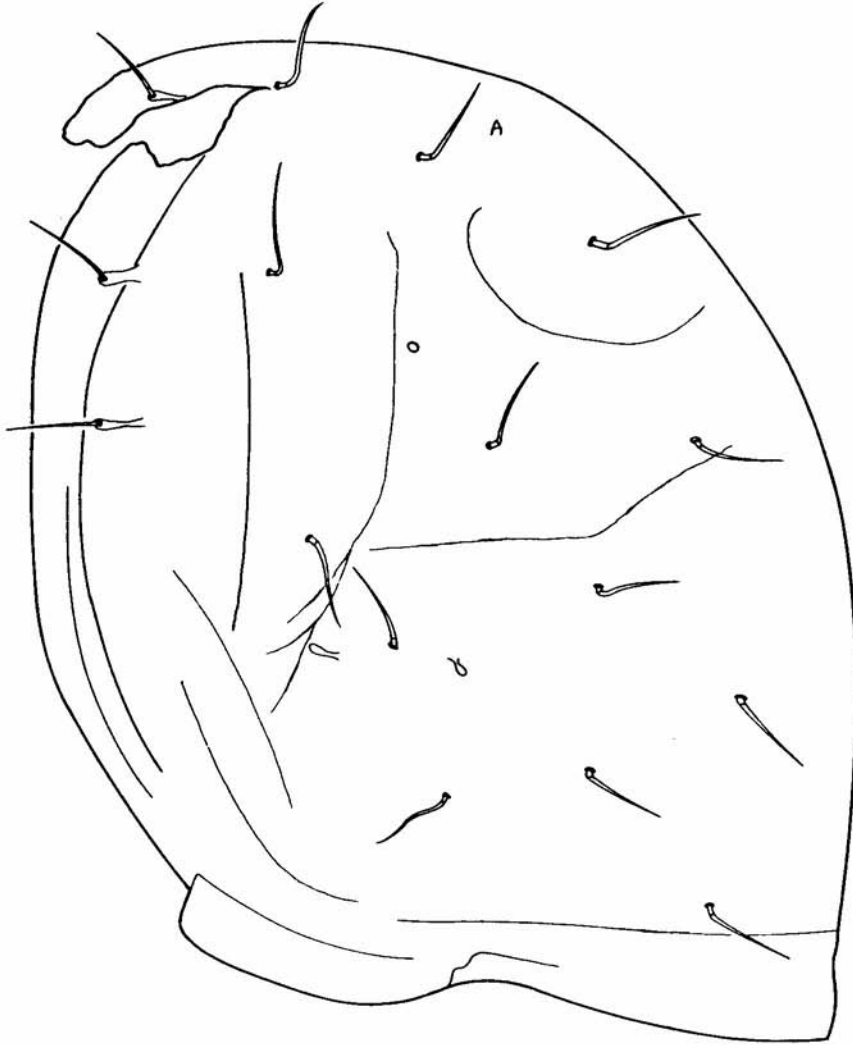
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Errata to NIEDBALA (1992)

page	line	is	should be
35	8 from bottom	d	l'
35	15 from bottom	absent	remote
39	5 from bottom	<i>Neophthiracarus</i>	<i>Notophthiracarus</i>
40	13 from top	<i>Neophthiracarus</i>	<i>Notophthiracarus</i>
41	11 from top	ad1	ad2
49	8 from bottom	<i>Neophthiracarus</i>	<i>Notophthiracarus</i>
186	5 from bottom	s	a'
252	4 from top	g4	g6
299	11 from bottom	Balogh J.	Balogh P.
303	22 from bottom	HENNING	HENNIG
596	3 from bottom	<i>cancius</i>	<i>saucius</i>
602	6 from bottom	<i>Neophthiracarus</i>	<i>Notophthiracarus</i>
602	12 from bottom	<i>caucius</i>	<i>saucius</i>
283	column 8 should be moved one line up, except for the last cross		