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A systematic review of the feather mite genus *Pteroherpus* GAUD, 1981 (Astigmata: Pteronyssidae)

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Abstract

A systematic review of the feather mite genus *Pteroherpus* GAUD, 1981 is given, including improved diagnoses of the genus and species-groups, a key to known species, and description of three new species. In total, the genus currently includes 18 valid species arranged into four species-groups (*diploplax, josephi, hoplophorus*, and *nicator*) and one species inquerenda, *Pteroherpus aciaepigynius* GAUD, 1964. *Pteroherpus oxyplax* (GAUD & MOUCHET, 1959) is synonymized with *P. pallens* (BERLESE, 1886). New species are described from African passerines as follows: *Pteroherpus chlorocichlae* sp.n. from *Chlorocichla simplex* (HARTLAUB, 1855) (Pycnonotidae), *P. gabonensis* sp. n. from *Pycnonotus barbatus gabonensis* SHARPE, 1871 (Pycnonotidae) and *P. turdoides* sp. n. from *Turdoides jardineii* (SMITH A., 1836) (Timalidae).

Host-parasite associations of *Pteroherpus* species are briefly discussed. The *hoplophorus* and *nicator* species-groups are almost entirely associated with bulbuls (Pycnonotidae) with only one species from the *hoplophorus* group, *P. hipposathes* (TROUESSART, 1887), occurring on birds of paradise (Paradisaeidae). The *diploplax* group is distributed on warblers of the Old World, babblers and white eyes (Sylvioidea: Sylviidae, Timaliidae, and Zosteropidae). The sole species of the *josephi* group occurs on Muscicapidae (Muscicapoidea). It is hypothesized that the genus *Pteroherpus* probably originated from the common ancestor of the sylvioid families Pycnonotidae, Sylviidae, Timaliidae, and Zosteropidae.

Introduction

The feather mite family Pteronyssidae (Astigmata: Analgoidea) currently includes approximately 150 species in 23 genera (FACCINI & ATYEO, 1981; GAUD & ATYEO, 1996; MIRONOV, 2001, 2003, 2005; MIRONOV & WAUTHY, 2005a). Mites of this family are mainly distributed on hosts from the orders Passeriformes and Piciformes, with only a few species recorded from the Coraciiformes. In the plumage of their hosts, pteronyssids inhabit the ventral surfaces of the flight feathers and the large upper coverts of wings.

Among seven pteronyssid genera restricted to passerines, four closely related genera, *Dicrurobius* MIRONOV, 2001, *Micropteroherpus* MIRONOV 2001, *Pteroherpus* GAUD, 1981, and *Vanginyssus* MIRONOV, 2001, constitute the *Pteroherpus* generic group, which is clearly characterized by having a bifurcate palpal setae *dp2*, a unique feature within the family Pteronyssidae. Within this group, the genus *Pteroherpus* is currently the most species-rich taxon, which prior to this work included 17 species (GAUD & MOUCHET, 1959; FACCINI & ATYEO, 1981; MIRONOV, 1992, 2001; MIRONOV & KOPIJ, 2000; MIRONOV & WAUTHY, 2006a).

In the context of this grouping, the genus *Pteroherpus* is characterized by the following combination of diagnostic features: in males, tarsus III has a bidentate apex, supranal concavity is relatively short and does not extend to the level of dorsal setae *e1*, opisthosomal lobes are short and rounded, commonly close to each other (Figs 1A, B, 2A-F); in females, the hysteronotal shield is represented by a set of 4-9 paired and unpaired sclerites, among which the pygidial sclerite is always paired and the opisthosomal sclerites are entire or split into inner and lateral fragments and the hysteronotal gland openings *gl* are always situated on opisthosomal sclerites (Figs 3A, 8A-C, 19B-D). *Pteroherpus* species are known from avian hosts of six families belonging to "higher" passerines (oscines) in the Old World; almost all known species (14) are associated with hosts from the superfamily Sylvioidea (Old World warblers and related families). The majority of species (12) are known from passerine hosts distributed in Africa, while just a few species are known from other regions (GAUD & TILL, 1961; FACCINI & ATYEO, 1981; MIRONOV, 1992).

In the course of our investigation dealing with feather mites associated with passerines in Africa (MIRONOV & WAUTHY, 2005a-d; 2006 a-c), we revised almost all genera of Pteronyssidae associated with this avian order. Phylogenetic analysis of the *Pteroherpus* generic group (MIRONOV & WAUTHY, 2008, in press) confirmed monophyly of its genera and revealed four species-groups within the genus *Pteroherpus*. In the present paper, we give an improved diagnosis of the

genus *Pteroherpus* and its species-groups, together with a taxonomic review and key to all known species. Three new species found in the course of this study in materials from African passerines are described. Host associations of *Pteroherpus* species are also briefly discussed.

Material and methods

The main part of the material used in the present study was borrowed from the Musée Royal de l'Afrique Centrale (Tervuren, Belgium); other materials were represented by feather mite specimens from the Zoological Institute of the Russian Academy of Sciences (Saint Petersburg, Russia), Institut royal des Sciences naturelles de Belgique (Brussels, Belgium), National Museum of Bloemfontein (Bloemfontein, South Africa), University of Georgia (Athens, USA) and Muséum national d'Histoire naturelle (Paris, France).

The general morphological terms and nomenclature of leg and idiosomal chaetotaxy follow GAUD & ATYEO (1996). Descriptions of new species are given in the standard format used for this genus (MIRONOV, 1992, 2001, MIRONOV & WAUTHY, 2006a). All measurements in the descriptions are in micrometers (μm). A full set of standard measurements is given only for the holotype (male) and one paratype (female); the range of idiosomal size (length, width) is displayed for other paratype specimens of the type series.

Measuring techniques for particular structures:

(i) distance between different pairs of setae is the shortest distance between the transverse levels formed by setae of respective pairs.

(ii) prodorsal shield length is measured along midline, and width is greatest width at posterior margin.

(iii) hysterosoma is measured from the level of sejugal furrow to bases of setae *h3*.

(iv) hysteronotal shield length in males is the greatest length from the anterior margin to bases of setae *h3*; width is measured at anterior margin.

(v) distance between prodorsal and humeral shield and the length of transventral sclerite in males are measured along midline.

Specimen depositories and reference accession numbers are cited using the following abbreviations: IRSNB - non-catalogued collection of Prof. A. FAIN in the Institut royal des Sciences naturelles de Belgique (Brussels, Belgium), MRAC - Musée Royal de l'Afrique Centrale (Tervuren, Belgium); NMB – National Museum of Bloemfontein (Bloemfontein, South Africa); NU– Nebraska University (Lincoln, USA); TRT - TROUESSART collection in the Muséum national d'Histoire naturelle (Paris, France); ZISP - Zoological Institute of the Russian Academy of Sciences (Saint Petersburg, Russia). Location data are given in original spelling; when a country or even a continent was not mentioned in original labels, they are added in rectangular brackets. Scientific names of birds follow "The Howard and Moore Complete Checklist" (DICKINSON, 2003). Phylogenetic hypotheses for higher taxa of passerines used in the discussion follow BARKER *et al.* (2004) and BERESFORD *et al.* (2005).

Systematics

Pteronyssidae OUDEMANS, 1941
Pteroherpus GAUD, 1981

Pteronyssus: GAUD & MOUCHET, 1959: 513 (in part).
Pteroherpus GAUD in: FACCINI & ATYEO, 1981: 47; MIRONOV, 1989: 110; 1992: 257; MIRONOV & KOPIJ, 2000: 319; MIRONOV & WAUTHY, 2006a: 65.

TYPE SPECIES: *Pteronyssus hoplophorus* GAUD, 1952.

DIAGNOSIS: *Both sexes*: Epimerites I fused as a Y. Unpaired seta *vi* present. Prodorsal shield trapezoidal or pear-shaped, variable in size: occupies only median part of prodorsum or covers almost all prodorsum and encompasses setae *c1* (Figs 1A, 3 A, 8A-D); scapular setae *se, si* on the shield. Setae *c2* hair-like, short, length less than half the distance between setae *se*. Setae *c3* lanceolate. Setae *dp2* of palps bifurcate with unequal branches (Fig. 2D). Setae *ba* of tarsi I-II hair-like, short. Genual solenidion σ*1* longer than tarsal solenidion ω*1* on legs I. Solenidion σ*2* of genu I usually absent (present in *Pteroherpus josephi,* Fig. 23G). Tarsus III with 5 setae. Ventral membrane of tarsus I as long as this segment (Figs 2E, F). Surface of coxal fields I, II covered with striated tegument.

Male. Opisthosomal lobes short, posterior margin bluntly rounded or truncated (Figs 1A, B, 9A, B, 15A, B). Posterior and inner margins of opisthosomal lobes with entire narrow membrane. Terminal cleft small, usually U-shaped. Supranal concavity short, commonly not extending beyond level of setae *e2*, open posterior into terminal cleft. Setae *c2* in antero-median angle of humeral shields or slightly mesal to it. Setae *ps1* anterior to the level of setae *h3*. Hysteronotal shield

without heavily sclerotized ridges, anterior part of this shield may be split from main body of this shield (Figs 6A, 13A). Coxal fields III closed. Transventral sclerite present, usually Y-shaped (Fig. 1B), rarely a transverse band with convex anterior margin (Fig. 9B). Epiandrium present, horseshoe-shaped, always fused with posterior end of transventral sclerite; branches of epiandrium usually well developed and encompassing genital apparatus. Anal discs circular or slightly ovate, large, with finely striated membrane. Adanal shield present, entire, usually represented by transverse plate (Figs 2B, 15E, 18E), median part may be sclerotized much more strongly than lateral parts. Adanal membranes present, wide, situated on inner margin of opisthoventral shields (Fig. 2B). Setae *h3* long setiform. Tarsus III elongated, slightly curved, commonly with bidentate apex (Fig. 2G), rarely with acute apex (*P. dentilobus*) (Fig. 16F). Setae *r* slightly longer than tarsus III. Bases of solenidia σ1 and φ situated on ventral side of genu and tibia III, respectively. Tarsus IV slightly shorter or subequal in length to tibia IV; setae *d, e* modified into barrel-shaped suckers (Fig. 2H).

Female. Idiosoma elongated (1.8-2.2 times longer than wide), without opisthosomal lobes. Hysteronotal shield represented by a set of 4-9 sclerites: unpaired central sclerite, a pair of opisthosomal sclerites and a pair of pygidial sclerites always present (Figs 3A); unpaired or paired anterior hysteronotal sclerite present (in most species of *hoplophorus* group) or absent (Figs 24C, D); opisthosomal sclerites may be entire (Figs 3A, 8A-C) or split into lateral and inner fragments (*diploplax* group) (Figs 19B-D); in rare cases (*P. megathyrus, P. pycnonoti*) central and opisthosomal shields not split and form large λ-shaped shield occupying median part of hysterosoma (Figs 8D, 14B). Hysteronotal glands openings *gl* on anterior end of opisthosomal sclerites, or on their lateral fragment if these sclerites split into inner and outer fragments (Figs 14D, 19 A-C). Epigynum trapezium-shaped or π-shaped, transverse piece slightly convex anteriorly, tips of epigynum divergent, commonly not touching epimerites IIIa, sclerotized apodemes of oviporus short, slightly extending beyond level of epimerites IIIa (Fig. 3B). External copulatory tube absent.

Hosts. Passeriformes: Monarchidae, Muscicapidae, Paradisacidae, Pycnonotidae, Sylviidae Timaliidae, and Zosteropidae.

Key to *Pteroherpus* species

Females

1. Prodorsum almost completely covered with large shield consisting of proper prodorsal shield and anterior hysteronotal sclerite; this complex shield extending beyond sejugal area and encompassing bases of setae *c1, c2* (Figs 8D, 14B) 2

- Prodorsum covered in median part only with prodorsal shield; anterior hysteronotal sclerite(s) in sejugal area absent or present; if present, it is clearly separated from prodorsal shield (Figs 8A, C). Setae *c1, c2* situated on striated tegument (Figs 19B, C) or on anterior hysteronotal sclerite (Figs 3A, 8A, C) 3

2. Shield covering prodorsum almost touching anterior margin of λ-shaped shield in median part of hysterosoma (Fig. 14B). Setae *e1* situated at level of openings *gl* or slightly anterior to it. Setae *c3* 45-50 long, noticeably longer than trochanter III .....
..... *P. megathyrus* (GAUD & MOUCHET, 1959)
- Shield covering prodorsum separated from anterior margin of λ-shaped shield by narrow band of striated tegument (Fig. 8D). Setae *e1* situated anterior to level of openings *gl* by 15-20. Setae *c3* 30-35 long, equal to or shorter than trochanter III ..... *P. gabonensis* sp. n.

3. Anterior hysteronotal sclerite represented by unpaired transverse plate encompassing bases of setae *c1, c2* (Figs 8A, C)..... 4
Anterior hysteronotal sclerite absent (Figs 19B, C) or represented by pair of plates in sejugal region (Figs 8B, 14A). Setae *c1, c2* on striated tegument or on anterior hysteronotal sclerites 9

4. Opisthosomal sclerites not separated from central sclerite; median part of hysteronotum occupied by large shield shaped like an inverted Y (Fig. 14C) .....
..... *P. pycnonoti* MIRONOV, 1992
- Opisthosomal sclerites separated from central sclerite (Figs 8B, 14D) 5

5. Opisthosomal sclerites split into inner and outer fragments of ovate form (Fig. 19A) .....
.....*P. trinoton* MIRONOV & WAUTHY, 2006
- Opisthosomal sclerites not split into inner and outer fragments (Fig. 8A, C), or only small outer fragments split from the main body of hysteronotal shield (Fig. 14D) 6

6. Small ovate plates (outer fragments of opisthosomal sclerite) bearing setae *e2* and gland openings *gl* split from the main body of hysteronotal shield; areas of hysteronotal shield corresponding to inner fragments not split from the main body of hysteronotal shield, which has bifurcate posterior end extending beyond the level of setae *e1* (Fig. 14D) .... *P. pyrrhuri* MIRONOV & WAUTHY, 2006
- Opisthosomal sclerites represented by pair of relatively large plates in posterior quarter of hysterosoma. Posterior end of central sclerite rounded, extending to level of setae *e1*, but not encompassing their bases 7

7. Opisthosomal sclerites shaped as thick C's, inner branch of each sclerite with longitudinal groove (Fig. 8C)..... *P. doleoplax* (GAUD & MOUCHET, 1959)
- Opisthosomal sclerites represented by plates of irregular form and covered with several longitudinal striae..... 8

8. Anterior hysteronotal sclerite very close to prodorsal shield and even may be fused with it in midline (Fig. 8A). Setae *c3* 45-50 long, noticeably longer than trochanters III .....*P. hoplophorus* (GAUD, 1952)
- Anterior hysteronotal sclerite separated from prodorsal shield by narrow band of striated tegument with 2-3 striae (Fig. 3A). Setae *c3* 35-40 long, approximately equal in length to trochanters III .... *P. chlorocichlae* sp. n.

9. Paired anterior hysteronotal sclerites present (Figs 8B, 19D) 10
- Anterior hysteronotal sclerites absent (Figs 19B, C) 13

10. Setae *c1, c2* situated on anterior hysteronotal sclerites. Opisthosomal sclerites connected to central sclerite with narrow sclerotized bands (Fig. 14A)..... *P. hipposathes* (TROUESSART, 1877)
- Setae *c1, c2* or only *c1* off anterior hysteronotal sclerites. Opisthosomal sclerites clearly separated from central sclerite 11

11. Opisthosomal sclerites entire, represented by plates of irregular forms with sparse longitudinal striae (Fig. 8B) ..... *P. africanus* MIRONOV & KOPIJ, 2000
- Opisthosomal sclerites completely or almost completely split into inner and outer fragments (Figs 19B-E) 12

12. Posterior ends of inner and outer fragments of opisthosomal sclerites connected by narrow bridge (Fig. 19D). Anterior hysteronotal sclerites usually bear *c2* on lateral margin, rarely these setae off these sclerites ... . *P. krivolutskii* MIRONOV, 1992
- Inner and outer fragments of opisthosomal sclerites clearly separated from each other (Fig. 24B). Anterior hysteronotal sclerites situated noticeably posterior to setae *c2* ..... *P. zosteropis* MIRONOV, 1992

13. Prodorsal shield with straight posterior margin and with clearly expressed posterolateral angles; posterior end of this shield almost extending to setae *c1*. Opisthosomal sclerites entire, represented by large plates of roughly triangular form (Fig. 24 D) .... *P. josephi* (GAUD & MOUCHET, 1959)
- Prodorsal shield with convex posterior margin and without posterolateral angles; its posterior end distant from the level of setae *c1*. Opisthosomal shields represented by oblique narrow plates (Fig. 24C) or split into inner and outer fragments (Figs 19C, 24A) 14

14. Opisthosomal sclerites entire, not split into inner and outer fragments. Central sclerite small, roughly ovate, not encompassing bases of setae *d1* (Fig. 24C)... ..... *P. nicator* MIRONOV & WAUTHY, 2006
- Opisthosomal shields split into inner and outer fragments (Figs19C, 24A) 15

15. Central sclerite pentagonal, its surface with network pattern. Inner fragment of opisthosomal sclerites with 2-3 longitudinal striae (Fig. 19E)..... ..... *P. pallens* (BERLESE, 1886)
- Central sclerites represented by longitudinal plate with parallel lateral margins and at least twice longer than wide. Inner fragments of hysteronotal shield with longitudinal groove-like lacuna (Fig. 19B) 16

16. Posterior margin of central sclerite convex. Outer fragment of opisthosomal sclerites approximately twice as long as inner fragment (Fig. 19C) .... *P. dentilobus* MIRONOV, 1992.
- Posterior margin of central sclerite concave or with median incision. Outer and inner fragments of opisthosomal sclerites are approximately equal in length..... 17

17. Anterior margin of central sclerite convex; posterior margin of this sclerite concave, posterior angles acute (Fig 19B)..... *P. diploplax* (GAUD & MOUCHET, 1959)
- Central sclerite with obliquely cut anterior angles; posterior end of this sclerite with median incision and

rounded posterior angles (Fig. 24A) .... *P. turdoides* sp. n.

Males

1. Opisthosoma strongly narrowed, its width at level of setae *e2* distinctly less than half of greatest width of idiosoma; opisthosomal lobes longer than wide (Figs 15D, E, 16D, E) 2
- Opisthosoma approximately as wide as half of greatest width of idiosoma; opisthosomal lobes short and wide, bluntly rounded (Fig. 2A, B) 4

2. Setae *ps2* setiform; terminal membrane with rounded teeth; tarsus III with acute apex (Figs 16A-E) ..... *P. dentilobus* MIRONOV, 1992
- Setae *ps2* spiniform; terminal membrane with smooth margin; tarsus III with bidentate apex (Figs 15D-F) 3

3. Prodorsal shield without incision posterior to setae *se*. Distance between prodorsal and hysteronotal shields as half of prodorsal shield length (Fig. 15A) ....*P. diploplax* (GAUD & MOUCHET, 1959)
- Prodorsal shield with incision posterior to or around setae *se*. Distance between prodorsal and hysteronotal shields over 2/3 of prodorsal shield length (Fig. 20A) ..... *P. turdoides* sp. n.

4. Opisthosomal lobes with acute triangular membranes on apices. Genital apparatus as enormous hook (Figs 9D, E) ..... *P. hipposathes* (TROUESSART, 1887)
- Opisthosomal lobes with narrow entire membrane on distal and inner margins. Genital apparatus normally developed, represented by relatively small and elongated arch bearing stiletto-like or hook-like aedeagus, which is always shorter than this arch (Figs 1B, 2A, B)..... 5

5. Prodorsal shield with well-developed posterolateral angles; posterior margin straight and almost touching setae *c1* (Fig. 23A) .... *P. josephi* (GAUD & MOUCHET, 1959)
- Prodorsal shield with convex posterior end, posterior angles not expressed; setae *c1* on hysteronotal shield or on striated tegument and distant from prodorsal shield (Figs 1A, 6A, 12A) 6

6. Hysteronotal shield or its anterior fragment encompassing bases of setae *c1* (Figs 6A, 12A) ... 7
- Setae *c1* situated on soft striated tegument between prodorsal and hysteronotal shields (Figs 1A, 5A) ... 9

7. Hysteronotal shield entire (Fig. 12A) .... *P. pyrrhuri* MIRONOV & WAUTHY, 2006
- Transverse plate bearing setae *c1* split from anterior part of hysteronotal shield (Fig. 6A) 8

8. Branches of epiandrium present, short; supranal concavity short, not extending to the level of setae *e2* (Figs 5B, D). Length of idiosoma 340-360 .... *P. doleoplax* (GAUD & MOUCHET, 1959)
- Branches of epiandrium not developed (Figs 13B, D); supranal concavity long, extending to the level of setae *e2*. Length of idiosoma 425-435 .... *P. trinoton* MIRONOV & WAUTHY, 2006

9. Opisthosomal lobes narrowed apically, roughly triangular in form, and rounded on most apices (Figs 22A-E) ..... *P. nicator* MIRONOV & WAUTHY, 2006
- Terminal lobes wide and bluntly rounded (Figs. 2A, B, 4 D, E) 10

10. Distance between prodorsal and hysteronotal shields equal to or longer than half of prodorsal shield length (Fig. 16A) 11
- Distance between prodorsal and hysteronotal shields less than half of prodorsal shield length (Figs 1A, 4A).....14

11. Adanal shield with acute lateral extensions (Fig. 18B). Idiosoma 1.7-1.8 times longer than greatest width .....*P. pallens* (BERLESE, 1886)
- Lateral extensions of adanal shield bluntly rounded (Figs 17E, 21E). Idiosoma narrow, 2-2.3 times longer than greatest width 12

12. Branches of epiandrium short, not extending to the level of apex of genital arch. Setae *c1* approximately equidistant from prodorsal and hysteronotal shields (Figs 5A, B) ..... *P. africanus* MIRONOV & KOPIJ, 2000
- Branches of epiandrium extending beyond the level of genital arch apex. Setae *c1* closer to posterior margin of prodorsal shield than to hysteronotal shield (Figs 17A, B) 13

13. Transventral sclerite along midline 1.5 times longer than length of genital apparatus; branches of epiandrium extending to the level of base of genital apparatus (Fig. 21B)..... *P. zosteropis* MIRONOV, 1992
- Transventral sclerite along midline approximately equal to length of genital apparatus; branches of epiandrium extending to midlevel of genital apparatus (Fig. 17B) ..... *P. krivolutskii* MIRONOV, 1992

14. Transventral sclerite along midline equal to or less than its width in neck (narrowest) part (Fig. 10B) .... *P. megathyrus* (GAUD & MOUCHET, 1959)
- Transventral sclerite along midline 1.5-2 times longer than its width in neck part (Figs 1B, 4B) 15

15. Setae *c3* slightly curved, long and narrow, about 45-50 x 4.5-5. Sejugal area between prodorsal and hysteronotal shields without any additional sclerites (Figs 4A-C) ..... *P. hoplophorus* (GAUD, 1952)
- Setae *c3* narrowly lanceolate, straight, about 28-36 x 6-6.5. Sejugal area between prodorsal and hysteronotal shields with one or two pairs of small additional sclerites (Figs 1A, 2C, 7A, C) 16

16. Sejugal area between prodorsal and hysteronotal shield with two pairs of small additional sclerites; tips of epiandrium usually extending to level of base of genital arch (Figs 7A, B) ..... *P. gabonensis* sp. n.
- Sejugal area between prodorsal and hysteronotal shield with one pair of small additional sclerites; branches of epiandrium not extending to midlevel of genital arch (Figs 1A, B, 11A, B) 17

17. Setae *e1* and openings *gl* approximately at the same transverse level; anterior end of supranal concavity extending beyond the level of setae *e2* (Figs 11A, D) ..... *P. pycnonoti* MIRONOV, 1992
- Setae *e1* situated posterior to the level of openings *gl*; anterior end of supranal concavity not extending to level of setae *e2* (Figs 1A, 2A) .....*P. chlorocichlae* sp. n.

Group *hoplophorus*

DIAGNOSIS: *Male*: Prodorsal shield: posterior part short, posterior margin convex or bluntly rounded, posterolateral angles not expressed, distance between setae *se* longer than or equal to distance from level of these setae to anterior end of shield. Opisthosomal lobes short and wide, posterior margin bluntly rounded. Terminal cleft shaped as an inverted V or narrow U. Terminal membrane on opisthosomal lobes represented by narrow and entire membrane on inner and distal margins of lobes (Figs 2A, B) or shaped as triangular terminal extensions on lobar apices (*P. hipposathes*) (Figs 9D, E). Setae *ps2* setiform. *Female*: Anterior hysteronotal sclerite (paired or unpaired) always present (Figs 8A, B); this sclerite may be partly or completely fused with prodorsal shield to form complex shield covering entire prodorsum (Figs 8D, 14B). Width of central sclerite at least of one third of idiosoma greatest width. Opisthosomal sclerites entire (not split into inner and outer fragments), separated or not from central sclerite; if not separated, median part of hysterosoma covered with large λ-shaped shield (Figs 8D, 14B, C).

The group includes 10 species; most species are associated with Pycnonotidae (Table 1).

Pteroherpus hoplophorus (GAUD, 1952)
(Figs 4A-F, 8A)

Pteronyssus hoplophorus GAUD, 1952: 100, Fig. 7; GAUD & MOUCHET, 1959: 519; GAUD & TILL, 1961: 277. *Pteroherpus hoplophorus*: FACCINI & ATYEO, 1981: 49, Figs 37-40 (in part).

MATERIAL EXAMINED: Male lectotype, 3 male and 4 female paralectotypes (MRAC 180 143) ex *Hypsipetes madagascariensis* (MÜLLER, 1776) (Pycnonotidae), [Madagascar], Tulear, XI.1951, coll. unknown.

DIAGNOSIS: *Male*: Prodorsal shield moderately elongated (slightly longer than wide), with rounded posterior margin, posterolateral angles poorly expressed, lateral margins with incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles rounded. Distance between prodorsal and hysteronotal shields shorter than half of prodorsal shield length. Opisthosoma moderately narrowed, approximately half as wide as greatest width of idiosoma; terminal cleft U-shaped; opisthosomal lobes wide and short, bluntly rounded, with rounded membrane on posterior and inner margins. Supranal concavity extending to or beyond level of setae *e2*. Setae *e1* slightly posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 1.8-2 times longer than wide at neck part. Branches of epiandrium extending to base of genital apparatus. Adanal shield with concave anterior margin and rounded lateral parts, poorly sclerotized. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, represented by large transverse plate encompassing bases of setae *c1, c2*, separated from prodorsal shield by very narrow band of soft tegument. Opisthosomal sclerites separated from central sclerite, represented by large plates of irregular form, bearing setae *e2*, surface of this shield with 4-6 oblique striae. Central sclerite elongated, about half-length of hysterosoma, anterior margin at level of humeral setae *cp*, posterior end attenuated, rounded apically, extending to but not encompassing bases of setae *e1*. Setae *d2* near lateral margins of central sclerite. Subhumeral setae *c3* slightly curved, narrow, 45-52 x 4.5-5, longer than trochanter III.

REMARK: *Pteroherpus hoplophorus*, the type species of the genus *Pteroherpus*, was originally described from the Madagascan bulbul, *Hypsipetes madagascariensis,* in Madagascar (GAUD, 1952). Further, Gaud and co-authors (GAUD & MOUCHET, 1959; GAUD & TILL, 1961) reported this species from several pycnonotids and a few of hosts from other passerine families in Africa: *H. madagascariensis*, *Pycnonotus barbatus* (DESFONTAINES, 1789), *Chlorocichla falkensteini* (REICHENOW, 1874), *C. simplex* (HARTLAUB, 1855), *C. flavicollis* (SWAINSON, 1837), *Baeopogon indicator* (VERRAUX J. & VERRAUX E., 1885) (all Pycnonotidae), *Laniarius ferrugineus* (GMELIN, 1788) (Laniidae), *Prinia leucopogon* (CABANIS, 1785) (Cisticolidae), and *Turdoides plebejus* (CRETZSCHMAR, 1825) (Timaliidae). GAUD and TILL (1961) stressed that the records of *P. hoplophorus* from hosts rather than bulbuls (Pycnonotidae) are apparently accidental contaminations. In the original description, GAUD (1952) also mentioned that *P. hoplophorus* was recorded on *Iole olivacea propinqua* (OUSTALET, 1903) (Pycnonotidae) in Indochina. Re-examination of mentioned materials from African hosts (deposited in MRAC) revealed that *H. madagascariensis* is the only host of *P. hoplophorus*, while other pycnonotid hosts actually bear other *Pteroherpus* species. A sole male of a *Pteroherpus* species from *Iole olivacea propinqua* from Vietnam (ZISP 16 912, slide from J. GAUD) belongs to the *hoplophorus* group but also represents a separate species.

In their generic revision of pteronyssids, FACCINI and ATYEO (1981: Figs 37-40) re-examined materials of J. GAUD from Cameroon and gave new drawings of *P. pteroherpus*; however it is clear that these authors illustrated another species, most likely *P. gabonensis* (see below). Both sexes of the figured mite have distinctly lanceolate setae *c3*, and in female, the prodorsal shield is completely fused with the anterior hysteronotal sclerite. In both sexes of the true *P. hoplophorus*, setae *c3* are narrow and curved, and in females the prodorsal shield and anterior hysteronotal sclerite are not fused, while the opisthosomal sclerites are split from the central sclerite (Fig. 8A).

Pteroherpus africanus MIRONOV & KOPIJ, 2000
(Figs 5A-E, 8B)

Pteroherpus africanus MIRONOV & KOPIJ, 2000: 319, Figs 1a, b, 2a, b.

MATERIAL EXAMINED: Male holotype and 3 female paratypes (NMB 00199) ex *Pycnonotus barbatus* (DESFONTAINES, 1789) (Pycnonotidae), South Africa, Free State, Pafuri, 12.I. 1989 R.A. EARLE; 4 males, 1 female (ZISP 15 055), same host, [Morocco], Mogador, II.1952, coll. unknown; 1 female (ZISP 15 105), same host, [Africa], Lynnwood, 30.VII.1969, coll. unknown; 2 males and 2 females (NMB 00241) ex *P. nigricans* (VIELLOT, 1818) (Pycnonotidae), South Africa, Free State, Pafuri, 12.I.1989, R.A. EARLE.

DIAGNOSIS: *Male*: Prodorsal shield moderately elongated, 1.3-1.4 times longer than wide, with rounded posterior margin, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Additional sclerites between prodorsal and hysteronotal shields absent. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles almost rectangular. Distance between prodorsal and hysteronotal shields about 1.5 times longer than half of prodorsal shield length. Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft small U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margin. Supranal concavity short, anterior end not extending beyond level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 1.6-1.7 times longer than wide at neck part. Branches of epiandrium short, not extending to level of apex of genital arch. Adanal shield with concave anterior margin, rounded lateral margins, noticeably sclerotized median part and poorly sclerotized lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, paired, represented by drop-shaped plates situated in sejugal area posterior to level of setae *c1, c2*. Opisthosomal sclerites separated from central sclerite, represented by large plates of irregular form, bearing setae *e2,* surface of opisthosomal sclerites with 4-6 oblique striae. Central sclerite elongated, about half-length of hysterosoma; anterior margin slightly posterior to level of humeral setae *cp*; posterior end attenuated, rounded apically, extending to but not encompassing bases of setae *e1*. Setae *d2* on lateral margins of central sclerite. Subhumeral setae *c3* lanceolate, slightly curved apically, 34-36 x 5-7, approximately equal in length to trochanter III.

REMARK: This species is known only from the two species of bulbuls, *Pycnonotus barbatus* (type host) and *P. nigricans*, in Africa (MIRONOV & KOPIJ, 2000).

***Pteroherpus chlorocichlae* sp. n.**
(Figs 1A, B, 2A-G, 3A, B)

TYPE MATERIAL: Male holotype, 3 male and 2 female paratypes (MRAC 180 147) ex *Chlorocichla simplex* (HARTLAUB, 1855) (Pycnonotidae), South Cameroon, XI.1955, coll. unknown; 19 male and 22 female paratypes (MRAC 180 145, 180 146, 180 148 – 180 153, 8 slides), same data.

ADDITIONAL MATERIAL: 3 males and 1 female (MRAC 180 167) ex *C. flavicollis* (SWAINSON, 1837), South Cameroon, XI.1956, coll. unknown.

DIAGNOSIS: *Male*: Prodorsal shield slightly longer than wide (1.1-1.2 times), with rounded posterior margin, posterolateral angles not expressed. Additional sclerites between prodorsal and hysteronotal shields absent. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles rounded. Distance between prodorsal and hysteronotal shields shorter than half of prodorsal shield length, striated area between these shields with pair of very small additional sclerites situated near posterior end of prodorsal shield (Fig. 1 A). Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margins. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 1.8-2 times longer than wide at neck part. Branches of epiandrium extending to midlevel of genital apparatus. Adanal shield with concave anterior margin and with rounded lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, represented by large transverse plate encompassing bases of setae *c1, c2*, separated from prodorsal shield by narrow band of soft tegument with 3-5 striae. Opisthosomal sclerites separated from central sclerite, represented by large plates of irregular form, bearing setae *e2,* surface of opisthoventral sclerites with 4-5 oblique striae. Central sclerite elongated, about half-length of hysterosoma, slightly attenuated posteriorly, anterior margin at level of anterior margin of trochanters III; posterior end with rounded margin, extending to level of setae *e1,* but not encompassing their bases. Setae *d2* on lateral margins of central sclerite or near them. Subhumeral setae *c3* lanceolate, 35-40 x 6-6.5, approximately equal in length to trochanter III.

REMARK. The new species is most similar to *Pteroherpus hoplophorus* by the stricture of hysteronotal shields in females (Figs 3A, 8A), from which it differs by the following features. In females, setae *c3* (35-40 long) are approximately equal to the length of trochanter III and the anterior hysteronotal sclerite is separated from prodorsal shield by narrow band of striated tegument with 2-3 striae; in males, a pair of little additional sclerites is present in sejugal area between the prodorsal and hysteronotal shields (Fig. 1A). In the females of *P. hoplophorus*, setae c3 (45-50) are longer than trochanters III and anterior hysteronotal sclerite is very close to prodorsal shield and even may be fused with it in midline; in the males, additional sclerites in sejugal area are absent.. In having little additional sclerites in sejugal area, the males of *P. chlorocichlae* sp. n. are similar to those of *P. pycnonoti* (Fig. 11A), from which they differ by having setae *e1* situated posterior to the level of openings *gl*, and by the supranal concavity not extending to the level of setae *e2*.

DESCRIPTION: *Male (holotype)*: Idiosoma length x width 370 x 205 (idiosomal length in 21 paratypes 330-367 x 175-200). Length of hysterosoma 220. Prodorsal shield: posterolateral angles not expressed, lateral margins with small incision posterior to setae *se*, posterior margin distinctly convex, size 110 x 95, setae *se* separated by 80; pair of small additional sclerites situated near posterior margin. Setae *c2* hair-like, 38 in length; setae *c3* lanceolate, 33 x 6.5. Hysteronotal shield: entire, not encompassing bases of setae *c1*, with anterior margin slightly convex at level of setae *c2*, (Fig. 1A), with rounded anterior angles, length along midline 212, width at anterior margin 102; distance between prodorsal and hysteronotal shields about 37. Opisthosomal lobes short, rounded; terminal cleft small U-shaped, 20 long, length of this cleft including supranal concavity 35; distal and inner margins of lobes with narrow entire membrane. Setae *f2* situated dorsally. Dorsal measurements: *c2:d2* 54, *d2:e2* 100, *d2:gl* 34, *gl:e1* 14-16, *e2:h3* 54, *h2:h2* 57, *h3:h3* 40. Transventral sclerite Y-shaped, 27 along midline, 16 in width in neck part; tips of epiandrium extending to level of setae *4a*; genital arch excluding aedeagus 25 x 14; aedeagus thin, as long as quarter of length of genital arch. Adanal shield as transverse plate with ends slightly bent anteriorly (Fig. 1 B). Diameter of anal suckers 17-19. Ventral measurements: *ps2:ps2* 62, *ps3:ps3* 25, *ps3:h3* 56. Tarsus III 69 long, with narrow bidentate apex, all setae setiform, seta *w* 30 long, seta *s* 19, seta *r* slightly longer than segment (Fig. 2G). Tarsus IV subequal in length to tibia IV; setae *d, e* with apical caps, seta *d* in distal half of segment (Fig. 2H).

Female (paratype): Idiosoma length x width 390 x 172 (other 21 paratypes: 400-430 x 175-200). Length of hysterosoma 270. Prodorsal shield as in male, 115 x 100, setae *se* separated by 77. Setae *c2* short hair-like, about 30 long; setae *c3* lanceolate, 35 x 6.5. Arrangement of hysteronotal shields: unpaired anterior hysteronotal sclerite, central sclerite, pair of lateral opisthosomal sclerites, and pair of pygidial sclerites (Fig. 3A). Anterior hysteronotal sclerite as large transverse plate with slightly narrowed median part, encompassing bases of setae *c1, c2* , separated from prodorsal shield by narrow band of soft tegument with 3-5 striae. Central sclerite longitudinal, large, 192 x 122, anterior end at level of anterior margin of trochanters III, anterior margin straight or slightly convex, posterior end rounded and extending to level of setae *e1*. Lateral opisthosomal sclerites represented by plates of irregular form, with openings *gl* in anterior part and setae *e2* in center, 65-75 long, 42-50 wide. Setae *d1* on central sclerite, setae *d2* on striated tegument near its lateral margins (in some specimens on lateral margins), setae *e1* on striated tegument between central and lateral sclerites. Setae *ps1* anterior to level of setae *h2*. Dorsal measurements: *c2:d2* 100, *d2:e2* 98, *d2:gl* 73, *e1:gl* 3-5, *e2:h3* 80, *h2:h2* 77, *h3:h3* 60. Epigynum with short lateral extensions; posterior ends with blunt tips, 50 x 75 (Fig. 3B).

ETYMOLOGY: The specific epithet derives from the generic name of the type host and is a noun in the genitive case.
REMARK: Type and additional materials were originally labeled by J. GAUD as *Pteroherpus hoplophorus*.

Pteroherpus doleoplax (GAUD & MOUCHET, 1959)
(Figs 6A-E, 8C)

Pteronyssus doleoplax GAUD & MOUCHET, 1959: 519, Figs 10B, 11B; GAUD & TILL, 1961: 276.
Pteroherpus doleoplax: FACCINI & ATYEO, 1981: 49.

MATERIAL EXAMINED: Male lectotype, 2 male and 2 female paralectotypes (MRAC 180 141) ex *Thescelocichla leucopleura* (CASSIN, 1855) (Pycnonotidae), Cameroon, Ambam, IX.1955, coll. unknown; 4 male and 2 female paralectotypes (MRAC 180 140, 180 142), same data.

DIAGNOSIS: *Male*: Prodorsal shield not elongated (slightly longer than wide), with rounded posterior margin, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Anterior hysteronotal sclerite split from main body of hysteronotal shield, having form of transverse plate and encompassing setae *c1*; anterior angles of this sclerite rounded. Prodorsal shield and anterior hysteronotal sclerite separated by narrow transverse band of striated tegument (Fig. 6A). Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margins. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline equal to or less than width at neck part. Branches of epiandrium short and acute, extending to level of apex of genital apparatus. Adanal shield with concave anterior margin and rounded lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, represented by large transverse plate encompassing bases of setae *c1, c2*, separated from prodorsal shield by narrow band of soft tegument with 2-3 striae. Opisthosomal sclerites separated from central sclerite, represented by pair of thick C-shaped plates bearing setae *e2* on inner margins, inner parts of these shields with longitudinal lacuna, posterolateral parts crossed by several oblique striae. Central sclerite elongated, about two thirds of hysterosoma length, anterior margin at level of humeral setae *cp*, posterior end rounded, extending to level of setae *e1* but not encompassing their bases. Setae *d2* on lateral margins of central sclerites. Subhumeral setae *c3* lanceolate, slightly curved on apex, 30-35 x 5, equal or longer than trochanter III.

REMARK: This species is known only from the type host, the swamp palm bulbul *Thescelocichla leucopleura,* in Cameroon (GAUD & MOUCHET, 1959).

Pteroherpus gabonensis sp. n.
(Figs 7A-F, 8D)

TYPE MATERIAL: Male holotype, 1 male and 4 female paratypes (MRAC 180 156) ex *Pycnonotus barbatus gabonensis* SHARPE, 1871 (Pycnonotidae), [Cameroon], Yaoundé, VII.1955, coll. unknown; 1 male and 2 female paratypes (MRAC 180 157), same data.

ADDITIONAL MATERIAL: 7 males and 7 females (MRAC 180 154, 180 155) ex *P. barbatus* (DESFONTAINES, 1789), [Cameroon], Yaoundé, VII.1955, coll. unknown; 6 males and 8 females (MRAC 180 158 – 180 160) ex *Chlorocichla falkensteini* (REICHENOW, 1874) (Pycnonotidae), South Cameroon, XI.1955, coll. unknown.

DIAGNOSIS: *Male*: Prodorsal shield slightly longer than wide, with rounded posterior margin, posterolateral angles not expressed, lateral margins with small incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior margin convex, anterior angles rounded. Distance between prodorsal and hysteronotal shields shorter than half of prodorsal shield length, striated area between these shields with two pairs of small additional sclerites (Fig. 7A). Opisthosoma moderately narrowed, slightly wider than half of greatest width of idiosoma; terminal cleft U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margin. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 1.8-2 times longer than wide at neck part. Branches of epiandrium extending to midlevel or to base of genital apparatus. Adanal shield with rounded lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, fused with prodorsal shield forming complex shield covering entire prodorsum; setae *c1, c2* on this shield. Central sclerite and opisthosomal sclerites not separated from each other and represented by entire shield as a thick inverted Y covering median part of hysterosoma; anterior margin of this shield slightly posterior to level of humeral setae *cp*, posterior branches encompassing bases of setae *e1, e2*, opisthosomal areas of this shield more strongly sclerotized than remaining part and bearing 4-6 oblique striae; setae *d2* on lateral margins of the central area of this shield. Subhumeral setae *c3* lanceolate, straight, 28-32 x 6, equal or shorter than trochanter III.

REMARK. The new species is most similar to *P. megathyrus* by the stricture of hysteronotal shields in females (Figs 8D, 14B), from which it differs by the following features. In the females of *P. gabonensis*, the shields covering prodorsum and median part of hysterosoma are separated by a narrow band of striated tegument, and setae *e1* are situated distinctly anterior to the level of openings *gl*. In the females of *P. megathyrus*, these shields are almost touching, and setae *e1* situated at the level of openings *gl*. The males of *P. gabonensis* easily differ from that species and other species of the *hoplophorus* group by having two pairs of additional sclerites between the prodorsal and hysteronotal shields (Fig. 7A).

DESCRIPTION: *Male (holotype)*: Idiosoma length x width 340 x 190 (idiosomal size in 2 paratype 325-335 x 165-190). Length of hysterosoma 200. Prodorsal shield: posterior part with slightly convex margin, posterolateral angles not expressed, lateral margins with small incision posterior to bases of setae *se*, size 110 x 95, setae *se* separated by 80. Striated area between prodorsal and hysteronotal shields with two pairs of small additional sclerites (Fig. 7A). Setae *c2* hair-like, about 30 long; setae *c3* lanceolate, 28-29 x 5. Hysteronotal shield: entire, not encompassing bases of setae *c1*, anterior end extending to level of setae *c2*, with anterior margin convex, with rounded anterior angles, length 212, width at anterior margin 115; distance between prodorsal and hysteronotal shields about 32. Opisthosomal lobes short, rounded; terminal cleft small U-shaped, 16 long, length of cleft including supranal concavity 40; distal and inner margins of lobes with narrow entire membrane. Setae *f2* situated laterally. Setae *ps2* setiform. Dorsal measurements: *c2:d2* 53, *d2:e2* 88, *d2:gl* 32, *gl:e1* 7-8, *e2:h3* 50, *h2:h2* 65, *h3:h3* 46. Transventral sclerite Y-shaped, 30 along midline, 16 in width in neck part; tips of epiandrium (unequal in holotype) extending at least to midlevel of genital apparatus; genital arch excluding aedeagus 29 x 22; aedeagus thin, as long as quarter of length of genital arch. Adanal shield as transverse plate with concave anterior margin and rounded lateral parts (Fig. 7E). Diameter of anal suckers 15-16. Ventral measurements: *ps2:ps2* 86, *ps3:ps3* 24, *ps3:h3* 41. Tarsus III 62 long, with narrow bidentate apex, all setae setiform, seta *w* 28 long, seta *s* 17 long, seta *r* slightly longer than segment (Fig. 7F). Tarsus IV subequal in length to tibia IV; seta *d* in distal half of segment.

Female (paratype): Idiosoma length x width 425 x 210 (other 4 paratypes: 420-430 x 195-205). Length of hysterosoma 290. Prodorsal shield fused with anterior hysteronotal sclerite into complex shield encompassing setae *c1*, *c2* and covering almost entire prodorsum and anterior part of hysterosoma (Fig. 8D), 148 x 146; setae *se* separated by 77. Setae *c2* short hair-like, about 26 long; setae *c3* lanceolate, 32 x 5. Arrangement of hysteronotal shields: anterior hysteronotal sclerite fused with prodorsal shield, main body of hysteronotal sclerite represented by areas corresponding to central sclerite and lateral opisthosomal sclerites, and pair of pygidial sclerites (Fig. 8D). Main body of hysteronotal shield represented by large sclerite having form of a thick inverted Y and covering median part of hysterosoma; anterior end of this shield at level of anterior margins of trochanters III, anterior margin straight, length of this shield along midline 151, width at anterior margin 80; areas of opisthosomal sclerites sclerotized more strongly than area of central sclerite and bearing several

oblique striae; distance between inner margins of opisthosomal areas 28. Setae *d1, d2* on area of central sclerite, setae *e1* on posterior margin of central sclerite; setae *e2* in central part of opisthosomal sclerites. Setae *ps1* at level of setae *h2*. Dorsal measurements: *c2:d2* 116, *d2:e2* 100, *d2:gl* 80, *e1:gl* 13-15, *e2:h3* 82, *h2:h2* 85, *h3:h3* 64. Epigynum with short lateral extensions, posterior ends with blunt tips, 55 x 100.

ETYMOLOGY: The specific epithet is taken from the subspecific name of the type host and is a noun in apposition.

REMARK: Type and additional materials were originally labeled by J. GAUD as *Pteroherpus hoplophorus*.

Pteroherpus hipposathes (TROUESSART, 1887)
(Figs 9A-F, 14A)

Pteronyssus hipposathes TROUESSART, 1877: 121; RADFORD, 1953: 205; 1958: 151.
Pteroherpus hipposathes: FACCINI & ATYEO, 1981: 49.

MATERIAL EXAMINED: Male lectotype, 2 male and 3 female paralectotypes (TRT 37F15) ex *Astrapia nigra* (GMELIN, 1788) (Paradisaeidae), New Guinea, no other data; 4 male and 3 female paralectotypes (TRT 37F16, 37G1, 37G2), same data.

DIAGNOSIS: *Male*: Prodorsal shield slightly longer than wide, with bluntly rounded posterior margin, posterolateral angles not expressed, lateral margins without incision. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles acute. Distance between prodorsal and hysteronotal shields about half of prodorsal shield length; additional sclerites between these shields absent. (Fig. 9A). Opisthosoma gradually narrowed to posterior end, approximately as wide as half of greatest width of idiosoma; terminal cleft V-shaped; opisthosomal lobes short and rounded apically, with small triangular terminal membrane on lobar apices. Supranal concavity not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Genital apparatus hypertrophied, represented by large hook-shaped structure going backward from its base, which bears setae *g*, and then curved anteriorly (Fig. 9E). Transventral sclerite as wide transverse band with concave anterior margin and large triangle-shaped branches of epiandrium on its posterior margin; distance between outer margins of epiandrium branches exceeds 3.5-4 times length of this sclerite along midline; branches of epiandrium extending to level of subhumeral setae. Adanal shield with slightly concave anterior margin, lateral parts with rounded angles; median area of this shield sclerotized more strongly than lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex and slightly convex inner margin between setae *w* and *s* (Fig. 9F). *Female*: Anterior hysteronotal sclerite present, paired, represented by large transverse plates encompassing bases of setae *c1, c2* and occupying almost all area between prodorsal shield and central sclerite of hysterosoma (Fig. 14A). Opisthosomal sclerites represented by large longitudinal plates connected with central sclerite by narrow longitudinal bands; surface of opisthosomal sclerites with 4-6 oblique striae and setae *e2* in central part. Central sclerite almost rectangular in form, shorter than half-length of hysterosoma, anterior margin at level of humeral setae *cp*, posterior end extending to midlevel of trochanters IV. Setae *e1* on striated tegument between bands connecting opisthosomal sclerites and central sclerite. Setae *d2* on lateral margins of central sclerite. Subhumeral setae *c3* lanceolate, straight, 35-38 x 6-6.5, shorter than trochanter III.

REMARKS: Among all known species of the genus, *Pteroherpus hipposathes* is characterized by a unique stricture of genital apparatus, transventral sclerite and terminal membranes in males, while females have a set of hysteronotal sclerites typical for the *hoplophorus* group.

This species is known from the type host, the Arfak astrapia *A. nigra* (Corvoidea: Paradisaeidae), in New Guinea (TROUESSART, 1887); and this is the only known case of occurrence of *Pteroherpus* species on a representative of the infraorder Corvida.

Pteroherpus megathyrus (GAUD & MOUCHET, 1959)
(Figs 10A-F, 14B)

Pteronyssus megathyrus GAUD & MOUCHET, 1959: 521, Figs 10D; 11D; GAUD & TILL, 1961: 277.
Pteroherpus megathyrus: FACCINI & ATYEO, 1981: 49.

MATERIAL EXAMINED: Male lectotype, 1 male and 3 female paralectotypes (MRAC 180 114) ex *Bleda eximius notatus* (CASSIN, 1856) (Pycnonotidae), Cameroon, Yaoundé, VIII.1955, coll. unknown; 1 male and 1 female (MRAC 180 115), same host, South Cameroon, V.1959, coll. unknown.

DIAGNOSIS: *Male*: Prodorsal shield with length and width approximately equal, with rounded posterior margin, posterolateral angles not expressed, lateral

margins without incision. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles rounded, anterior margin convex. Distance between prodorsal and hysteronotal shields about 1/5 of prodorsal shield length (Fig. 10A). Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft narrow U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margin. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 1.2-1.3 times longer than wide at neck part. Branches of epiandrium thin, extending beyond midlevel of genital apparatus. Adanal shield with concave anterior margin and rounded lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, represented by large transverse sclerite encompassing bases of setae *c1, c2* and fused to prodorsal shield forming complex shield covering all prodorsum (Fig. 14B). Central sclerite and opisthosomal sclerites not separated from each other and represent entire λ-shaped shield covering greater part of hysterosoma; anterior margin of this shield at level of humeral setae *cp*, posterior branches encompass bases of setae *e1, e2*, area of shield at level of openings *gl* and setae *e1* with numerous oblique striae; setae *d2* mesal to lateral margins of this shield. Subhumeral setae *c3* narrowly lanceolate, slightly curved apically, 42-46 x 5-5.5, longer than trochanter III.

REMARK: This species is known only from the type host, the green-tailed bristlebill *Bleda eximius notatus*, in Cameroon (GAUD & MOUCHET, 1959).

Pteroherpus pycnonoti MIRONOV, 1992
(Figs 11A-E, 14C)

Pteroherpus pycnonoti MIRONOV, 1992: 264, Figs 7, 8, 18, 19.

MATERIAL EXAMINED: Male holotype (ZISP 4138), 6 male and 9 female paratypes (ZISP 4135-4137) ex *Pycnonotus sinensis* (GMELIN, 1789) (Pycnonotidae), Vietnam, Ha Nam Ninh Province, Kim Shon, 6.VII.1989, S.V. MIRONOV; 7 males, 8 females (ZISP 4131, 4132) ex *P. jocosus* (LINNAEUS, 1758), Vietnam, Ha Nam Ninh Province, Kim Shon, 6.VII.1989, S.V. MIRONOV; 8 males, 11 females (ZISP 4128-4130) ex *P. aurigaster* (VIEILLOT, 1818), Vietnam, Ha Tay Province, Ba Vi District, 9.VIII.1989, S.V. MIRONOV.

DIAGNOSIS: *Male*: Prodorsal shield slightly longer than wide, with short and rounded posterior end, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles rounded. Distance between prodorsal and hysteronotal shields shorter than half of prodorsal shield length, striated area between these shields with pair of very small additional sclerites (Fig. 11A). Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margin. Anterior end of supranal concavity extending beyond level of setae *e2*. Setae *e1* approximately at level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 2.2-2.4 times longer than wide at neck part. Branches of epiandrium extending to midlevel of genital apparatus. Adanal shield with concave anterior margin, lateral parts rounded, median area sclerotized more strongly than lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, represented by a large transverse dumbbell-shaped plate encompassing bases of setae *c1, c2*, and separated from prodorsal shield by narrow band of soft tegument (Fig. 14C) (in specimens from *P. jocosus* and *P. aurigaster*, prodorsal shield and anterior hysteronotal sclerite commonly connected by median bridge). Central sclerite and opisthosomal sclerites not separated from each other and represented by entire λ-shaped shield covering median part of hysterosoma; anterior margin of this shield slightly posterior to level of humeral setae *cp*, posterior branches encompass bases of setae *e1, e2*, area of opisthosomal sclerites with 3-6 oblique striae; setae *d2* mesal to lateral margins of these shield. Subhumeral setae *c3* narrowly lanceolate, 30-35 x 6-6.5, longer than trochanter III.

REMARK: This species is known from bulbuls of the genus *Pycnonotus* in Vietnam (MIRONOV, 1992); the type host is the light-vented bulbul *Pycnonotus sinensis*.

Pteroherpus pyrrhuri MIRONOV & WAUTHY, 2005
(Figs 12A-F, 14D)

Pteroherpus pyrrhuri MIRONOV & WAUTHY, 2006a: 68-69, Figs 2A-D, 4C.

MATERIAL EXAMINED: Male holotype, 1 male and 2 female paratypes (MRAC 180 112) ex *Pyrrhurus scandens* (SWAINSON, 1837) (Pycnonotidae), Western

Cameroon, V.1959, coll. unknown; 4 male and 5 female paratypes (MRAC 180 111 and 180 113), same data.

DIAGNOSIS: *Male:* Prodorsal shield slightly longer than wide, with posterior margin almost straight, posterolateral angles poorly expressed, widely rounded, lateral margins with poorly expressed incision posterior to setae *se*. Hysteronotal shield entire, anterior end encompassing setae *c1*, anterior margin straight, anterior angles rounded. Prodorsal and hysteronotal shields separated by narrow band of striated tegument, which is not wider than one quarter of prodorsal shield length (Fig. 12A). Opisthosoma moderately narrowed, wide as half of greatest width of idiosoma; terminal cleft U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margin. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus slightly shorter than half of length of genital apparatus. Transventral sclerite along midline 1.3-1.4 times longer than wide at neck part. Branches of epiandrium not developed. Adanal shield poorly sclerotized, with rounded lateral parts. Setae *ps2* setiform.

Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, represented by large transverse plate encompassing bases of setae *c1, c2*; separated from prodorsal shield by band of soft tegument with 2-5 striae (Fig. 14D). Main body of hysteronotal shield occupying almost entire median part of hysterosoma, anterior end of this shield slightly posterior to level of setae *cp*; posterior end of this shield with two divergent lobes separated by deep triangle-shaped incision; little lateral plates corresponding to outer fragments of opisthosomal sclerites and bearing setae *e2* and openings *gl* separated from main body of hysteronotal shield at midlevel of opisthosoma. Setae *e1* situated on main body of hysteronotal shield, slightly posterior to level of openings *gl*. Subhumeral setae *c3* lanceolate, 28-33 x 6-6.5, approximately equal in length to trochanter III.

REMARK: This species is known only from the type host, the leaf-love *Pyrrhurus scandens*, in Cameroon (MIRONOV & WAUTHY, 2006a).

Pteroherpus trinoton MIRONOV & WAUTHY, 2006
(Figs 13A-F, 19A)

Pteroherpus trinoton MIRONOV & WAUTHY, 2006a: 67-68, Figs 1A-E, 4A, B.

MATERIAL EXAMINED: Male holotype and 1 female paratype (NU 3824, deposited in MRAC) from *Phyllastrephus terrestris* SWAINSON, 1837 (Pycnonotidae), South Africa, Cape Province, Storms River, 31.XII.1953, F. ZUMPT; 1 male paratype (NU 3611, deposited in ZISP), same data.

DIAGNOSIS: *Male*: Prodorsal shield slightly longer than wide, with posterior margin almost straight, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Anterior hysteronotal sclerite split from main body of hysteronotal shield, having form of wide, trapezoidal transverse plate and encompassing setae *c1*; anterior angles of this sclerite blunt-angular (Fig. 13A). Prodorsal shield and anterior hysteronotal sclerite separated by narrow transverse band of striated tegument, which is narrower than one-quarter length of prodorsal shield. Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft a wide U with divergent branches; opisthosomal lobes wide and short, bluntly rounded, with extremely narrow membrane on posterior and inner margin. Anterior end of supranal concavity extending beyond level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus about half of length of genital arch. Transventral sclerite along midline 1.3-1.4 times longer than wide at its neck part. Branches of epiandrium not developed. Adanal shield with poorly distinct and slightly concave anterior margin, lateral parts rounded, median part sclerotized more strongly than lateral areas. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite present, unpaired, represented by large transverse plate encompassing bases of setae *c1, c2*, separated from prodorsal shield by narrow band of soft tegument with 4-5 striae. Opisthosomal sclerites separated from central sclerite and split into two approximately equal ovate fragments, lateral fragment bears setae *e2* in posterior part, inner fragment bears setae *e1* on anterior margin. Central sclerite almost rectangular, about half as long as hysterosoma, anterior margin at level of humeral setae *cp*, posterior margin at level of openings *gl*. Setae *d2* on lateral margins of central sclerite. Subhumeral setae *c3* lanceolate, 35-38 x 7.5-8, approximately equal in length to trochanter III.

REMARK: This species is known only from the type host, the terrestrian brownbul *Phyllastrephus terrestris*, in South Africa (MIRONOV & WAUTHY, 2006a).

Group *diploplax*

DIAGNOSIS: *Male*: Prodorsal shield: posterior part short, posterior margin convex or bluntly rounded, posterolateral angles usually not expressed. Opisthosomal lobes wide and short, bluntly rounded (Figs 17D, E, 18D, E) or slightly elongated (Figs 15D, E, 16D, E). Terminal cleft shaped as narrow trapezium or a narrow U. Membrane on opisthosomal lobes developed along inner and distal margins; free margin of these membranes smooth or indented. Setae *ps2* setiform or spiniform. *Female*: Anterior hysteronotal sclerites present or absent. Central sclerite relatively narrow, equal to or less than one third of idiosoma width. Opisthosomal sclerites always separated from central sclerite and split into inner and outer fragments (Figs 19B-E); posterior ends of these fragments may remain connected by very thin bridge; inner fragment usually more darkly sclerotized than outer one.

The group includes 6 species (Table 1) recorded from Sylviidae, Monarchidae, Timaliidae, and Zosteropidae.

Pteroherpus diploplax (GAUD & MOUCHET, 1959)
(Figs 15A-E, 19B)

Pteronyssus diploplax GAUD & MOUCHET, 1959: 517, Figs 10A; 11A; GAUD & TILL, 1961: 276.
Pteroherpus diploplax: FACCINI & ATYEO, 1981: 49.

MATERIAL EXAMINED: Male lectotype, 3 female paralectotypes (MRAC 180 132) ex *Turdoides plebejus* (CRETZSCHMAR, 1828) (Timaliidae), Southern Cameroon, XI.1955, coll. unknown; 1 male, 3 female paralectotypes (MRAC 180 133), same data; 20 males and 29 females (MRAC 180 134 – 180 139), same host, Morocco, Dakar, XI.1954, coll. unknown.

DIAGNOSIS: *Male*: Prodorsal shield elongated, 1.4-1.5 times longer than wide, with very short posterior part and rounded posterior margin, posterolateral angles short, rounded, lateral margins without incision. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles almost rectangular. Distance between prodorsal and hysteronotal shields approximately equal to half of prodorsal shield length. Opisthosoma strongly narrowed to posterior end, constituting about one third of greatest width of idiosoma (Fig. 15A); terminal cleft U-shaped; opisthosomal lobes relatively small, bluntly rounded; distal and inner margins of lobes with entire narrow membrane slightly enlarged in terminal part. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 5-5.5 times longer than wide at neck part. Branches of epiandrium long, extending beyond base of genital apparatus. Adanal shield represented by large plate with rounded lateral parts and strongly sclerotized median area. Setae *ps2* spiniform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite absent, setae *c1, c2* situated on soft tegument. Opisthosomal shields separated from central sclerite and split into lateral and inner fragments; lateral fragment equal in length but wider than inner fragments, with setae *e2* in posterior part; inner fragments approximately bean-shaped, with longitudinal groove-like lacuna. Central sclerite roughly rectangular, approximately as long as prodorsal shield; anterior extending to level of setae *cp*; anterior margin convex; posterior margin shallowly concave, slightly extending beyond level of trochanters IV. Setae *e1*, equidistant from central sclerite and inner opisthosomal sclerites; setae *d2* on soft tegument near to lateral margins of central sclerites. Subhumeral setae *c3* lanceolate, 30-35 x 6-6.5, longer than trochanter III.

REMARK: This species is known only from the type host, the brown babbler *Turdoides plebejus*, in Africa (GAUD & MOUCHET, 1959).

Pteroherpus dentilobus MIRONOV, 1992
(Figs 16A-F, 19C)

Pteroherpus dentilobus MIRONOV, 1992: 262, Figs 9, 10, 16, 17.

MATERIAL EXAMINED: Male holotype, 2 male and 2 female paratypes (ZISP 4127) ex *Timalia pileata* HORSFIELD, 1821 (Timaliidae), Vietnam, Ha Tay Province, Ba Vi District, 27.V.1989, S.V. MIRONOV; 5 female paratypes (ZISP 4126), same data.

DIAGNOSIS: *Male*: Prodorsal shield elongated, 1.4-1.5 times longer than wide, with very short posterior part, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles rounded, anterior margin convex; median part with three longitudinal grooves (Fig. 16A). Distance between prodorsal and hysteronotal shields approximately equal to prodorsal shield length. Opisthosoma strongly narrowing to posterior end, wide as one third of greatest width of hysterosoma; terminal cleft parallel-sided; opisthosomal lobes relatively small, slightly elongated, rounded apically; distal and inner margins of lobes

with entire narrow membrane having indented margin (Figs 16D, E). Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 4-4.5 times longer than wide at neck part. Branches of epiandrium extending to base of genital apparatus. Setae *ps2* setiform, not extending beyond level of lobar apices. Tarsus III with acute apex (Fig. 16F). *Female*: Anterior hysteronotal sclerite absent, setae *c1, c2* situated on soft tegument. Opisthosomal shields separated from central sclerite and split into lateral and inner fragments; lateral fragment almost twice as long as inner fragments, with setae *e2* in anterior part; inner fragments narrowly ovate, with acute anterior end, with longitudinal groove-like lacuna. Central sclerite roughly rectangular, short, approximately as long as prodorsal shield; anterior end extending to level of trochanters III; anterior margin of central sclerite convex; posterior end slightly extending beyond level of trochanters IV; posterior margin convex, more strongly sclerotized than remaining area of this sclerite. Setae *e1, d2* situated on striated tegument; setae *e1* equidistant from central sclerite and inner opisthosomal sclerites; setae *d2* near lateral margins of central sclerites. Subhumeral setae *c3* narrowly lanceolate, 26-30 x 5-5.5, approximately equal in length to trochanter III.

REMARK: *Pteroherpus dentilobus* clearly differs from other *Pteroherpus* species known so far by having two unique features in males: tarsus III with acute apex and opisthosomal lobes with indented terminal membrane. This species is known only from the type host, the chestnut-capped babbler *T. pileata*, in Vietnam (MIRONOV, 1992).

Pteroherpus krivolutskii MIRONOV, 1992
(Figs 17A-F, 19D)

Pteroherpus krivolutskii MIRONOV, 1992: 257-260, Figs 1-4.

MATERIAL EXAMINED: Male holotype, 2 male and 1 female paratypes (ZISP 4123) ex *Stachyris nigriceps* BLYTH, 1844 (Timaliidae), Vietnam, Vin Fu Province, Tam Dao, 4.IX.1989, S.V. MIRONOV; 6 male and 6 female paratypes (ZISP 4124, 4125), same data.

DIAGNOSIS: *Male*: Prodorsal shield 1.4-1.5 times longer than wide, with rounded posterior margin, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles almost rectangular, anterior margin straight. Distance between prodorsal and hysteronotal shields longer than half of prodorsal shield length (Fig. 17A). Opisthosoma moderately narrowed, wider than half of greatest width of idiosoma; terminal cleft U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margins. Anterior end of supranal concavity extending beyond level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 1.8-2.1 times longer than wide at neck part. Branches of epiandrium nearly extending to midlevel of genital apparatus. Adanal shield with rounded lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerites present, represented by pair of plates of irregular form, setae *c2* on anterolateral margin of these sclerites, setae *c1* off these sclerites. Opisthosomal shields separated from central sclerite and almost completely split into lateral and inner fragments of equal size; posterior ends of respective inner and outer fragments connected by thin bridge crossed by numerous striae; inner fragments with 1-2 longitudinal striae (Fig. 19D). Central sclerite about half as long as hysterosoma length; anterior end at level of trochanters III; anterior margin straight; posterior end attenuated and rounded terminally, extending to level of setae *e1* but not encompassing them. Setae *d2* on lateral margins of central sclerites, setae *e1* on striated tegument. Subhumeral setae *c3* lanceolate, slightly curved, 30-24 x 5-6, equal or slightly longer than trochanter III.

REMARK: This species is known only from the type host, the grey-throated babbler *S. nigriceps*, in Vietnam (MIRONOV, 1992).

Pteroherpus pallens (BERLESE, 1886)
(Figs 18A-F, 19E)

Pteronyssus pallens BERLESE, 1886: Fasc. 24, No 8.
Pteronyssoides pallens: HULL, 1934: 203; RADFORD, 1953: 205; 1958: 151.
Pteroherpus pallens: FACCINI & ATYEO, 1981: 49.
Pteronyssus oxyplax GAUD & MOUCHET, 1959: 524, Figs 10E, 11E; GAUD & TILL, 1961: 278, **syn. n.**
Pteroherpus oxyplax: FACCINI & ATYEO, 1981: 49.

MATERIAL EXAMINED: 3 males, 3 females (ZISP 1471-1470) ex *Acrocephalus arundinaceus* (LINNEAUS, 1758) (Sylviidae), USSR, Georgia, mountain Sharon, 7.VI, 1938, O.N. BAUER; 1 male (ZISP 1473), same host,

Bulgaria, Srebrna, 1955, I. VASSILEV; 4 males (IRSNB) ex *A. rufescens* (SHARPE & BOUVIER, 1876), Rwanda, Akanyaru, 22.II.1956, A. FAIN; 1 female (IRSNB) same host and location, 22.VI.1956, A. FAIN;1 male and 4 female syntypes (*Pteronyssus oxyplax*, MRAC 180 110) ex *Terpsiphone viridis* (MÜLLER, 1766) (Monarchidae), Cameroon, Yaoundé, V.1956, coll. unknown.

DIAGNOSIS: *Male*: Prodorsal shield slightly longer than wide, with short and rounded posterior margin, posterolateral angles poorly expressed, widely rounded, lateral margins without incision. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles rectangular, anterior margin straight. Distance between prodorsal and hysteronotal shields slightly longer than half of prodorsal shield length (Fig. 18A). Opisthosoma moderately narrowed, slightly wider than half of greatest width of idiosoma; terminal cleft wide U-shaped; opisthosomal lobes wide and short, bluntly rounded, with narrow entire membrane on posterior and inner margins. Anterior end of supranal concavity extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorted than genital arch. Transventral sclerite along midline 1.5-1.6 times longer than wide at neck part. Branches of epiandrium extending to base of genital apparatus. Adanal shield with strongly concave anterior margin and acute lateral branches. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerites absent, setae *c1, c2* on striated tegument. Opisthosomal shields separated from central sclerite and split into lateral and inner fragments of ovate form; inner and outer fragments approximately equal in size; inner fragments with 2-3 longitudinal striae; setae *e2* situated on striated tegument between inner and outer fragments. Central sclerite shorter than prodorsal shield, pentagonal in form (rarely quadrangular); anterior margin at level of trochanters III; posterior end commonly blunt-angular, extending to level of trochanters IV; surface of central sclerite with faint network pattern. Setae *d2* on lateral margins of central sclerites; setae *e1* on striated tegument, equidistant from central sclerite and inner opisthosomal sclerites. Subhumeral setae *c3* lanceolate, 25-30 x 5.5-6, equal to or shorter than trochanter III.

REMARK: *Pteroherpus pallens* is common on some warblers of the genus *Acrocephalus* NAUMANN J.A. & NAUMANN J.F., 1811 (Sylviidae) in Europe and Africa (BERLESE, 1886; FACCINI & ATYEO, 1981; MIRONOV, 1989). GAUD and MOUCHET (1959) described *Pteronyssus oxyplax* from the African paradise-flycatcher, *Terpsiphone viridis*, (Monarchidae). We compared the type series of this species to various specimens of *P. pallens* and did not find differences between them; therefore *P. oxyplax* is synonymized here with *P. pallens*. As representatives of the genus *Pteroherpus* have never otherwise been recollected from the paradise-flycatchers, the only record of *P. oxyplax* on avian host from that family could be an accidental contamination.

Pteroherpus turdoides **sp.n.**

(Figs 20A-G, 24A)

TYPE MATERIAL: Male holotype and female paratype (NU 3984) ex *Turdoides jardineii* (SMITH A., 1836) (Timaliidae), South Africa, East Transvaal, Newington, 13.VII.1957, F. ZUMPT.

DIAGNOSIS: *Male*: Prodorsal shield elongated, 1.6-1.7 times longer than wide, with rounded posterior margin, lateral margins with incision posterior to or around setae *se*, posterolateral angles not expressed. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles almost rectangular. Distance between prodorsal and hysteronotal shields longer than half of prodorsal shield length (Fig. 20A). Opisthosoma strongly narrowing to posterior end, as wide as one third of greatest width of hysterosoma; terminal cleft as a wide U; opisthosomal lobes relatively small, rounded; distal and inner margins of lobes with narrow entire membrane forming short apical extension. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 4-4.5 times longer than wide at neck part. Branches of epiandrium long, extending beyond base of genital apparatus. Adanal shield represented by large plate with straight anterior margin and rounded lateral parts; median area of shield sclerotized much more strongly than lateral parts. Setae *ps2* spiniform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite absent, setae *c1, c2* situated on soft tegument. Opisthosomal shields separated from central sclerite and split into lateral and inner fragments; lateral fragments equal in length to inner fragments, but wider than them, with setae *e2* on inner margin; inner fragments narrowly ovate, with longitudinal groove-like lacuna (Fig. 24A). Central sclerite shaped as roughly rectangular plate, approximately as long as prodorsal shield; anterior end, extending to level of trochanters III, with obliquely cut angles; posterior end extending beyond level of

trochanters IV; posterior margin with small median incision. Setae *e1* and *d2* on striated tegument; setae *e1* equidistant from central sclerite and inner opisthosomal sclerites; setae *d2* close to lateral margins of central sclerites. Subhumeral setae *c3* lanceolate, 29-30 x 7, approximately equal in length to trochanter III.

REMARK: This species is most close to *P. diploplax* (see above), from which it differs by the following features: in males, the prodorsal shield has incisions posterior to or around scapular setae *se*, and the distance between the prodorsal and hysteronotal shields is over 2/3 of the prodorsal shield length (Fig. 20A); in females, the central sclerite with obliquely cut anterior angles and with rounded posterior angles (Fig. 24A). In males of *P. diploplax*, the prodorsal shield has no incisions on lateral margins, and the distance between the prodorsal and hysteronotal shields is approximately equal to half of prodorsal shield length (Fig. 15A); in females, the central sclerite with semi-circular anterior margin and with acute posterior angles (Fig. 15B).

DESCRIPTION: *Male (holotype)*: Idiosoma length x width 460 x 240. Length of hysterosoma 275. Prodorsal shield: elongate, 1.6-1.7 times longer than wide, with very short posterior part, with rounded posterior margin, posterolateral angles not expressed, lateral margins with small incision posterior to or around setae *se*, posterior margin slightly convex, size 118 x 75, setae *se* separated by 64. Setae *c2* hair-like, about 60 long; setae *c3* narrowly lanceolate, 31 x 7. Hysteronotal shield: entire, not encompassing bases of setae *c1*, anterior end extending to level of setae *c2*, anterior margin almost straight, anterior angles rectangular, length along midline 232, width at anterior margin 110, distance between prodorsal and hysteronotal shields about 90, additional sclerites in sejugal area absent (Fig. 20A). Opisthosomal lobes small, rounded; terminal cleft small widely U-shaped, 20 long, length of the cleft including supranal concavity 44; distal and inner margins of lobes with narrow entire membrane having short apical extension (Fig. 20D, E). Setae *f2* situated dorsally. Setae *ps2* spine-like. Dorsal measurements: *c2:d2* 67, *d2:e2* 117, *d2:gl* 40, *gl:e1* 10-17, *e2:h3* 82, *h2:h2* 62, *h3:h3* 44. Transventral sclerite Y-shaped, 60 along midline, 13 in width at neck part; branches of epiandrium extending beyond base of genital arch; genital apparatus excluding aedeagus 25 x 17; aedeagus thin, as long as one-quarter of genital arch. Adanal shield represented by large plate with almost straight anterior margin and rounded lateral margins; median part of this shield and posterior extension more strongly sclerotized than other parts of this shield (Figs 20B, E). Diameter of anal suckers 14. Ventral measurements: *ps2:ps2* 64, *ps3:ps3* 35, *ps3:h3* 49. Tarsus III 66 long, conical, with narrow bidentate apex, seta *w* spiculiform, 31 long, seta *s* narrowly lanceolate, 22 long, other setae setiform, seta *r* slightly longer than segment (Fig. 20F). Tarsus IV subequal in length to tibia IV; seta *e* with apical cap, seta *d* without apical cap (Fig. 20G).

Female (paratype): Idiosoma length x width 450 x 236. Length of hysterosoma 385. Prodorsal shield as in male, 122 x 82, setae *se* separated by 65. Setae *c2* short hair-like, about 25 long; setae *c3* lanceolate, 29-30 x 7. Arrangement of hysteronotal shields: central sclerite, pair of opisthosomal sclerites split into inner and outer fragment, and pair of pygidial sclerites (Fig. 24A). Central sclerite roughly rectangular, 120 x 62; anterior end at level of trochanters III, with obliquely cut anterior angles; posterior end extending beyond level of setae *e1*, posterior margin with median incision and rounded posterior angles. Inner and outer fragments of opisthosomal sclerites approximately equal in size; inner fragments narrowly ovate, 68-70 x 20-22, with longitudinal groove-like lacuna; lateral fragment with acute posterior end, with setae *e2* on inner margin, 80-82 x 30-34. Setae *d1* on anterolateral margin of central sclerite; setae *e1* and *d2* on striated tegument, setae *e1* approximately at level of anterior ends of outer opisthosomal sclerites, setae *d2* near lateral margins of central sclerites. Setae *ps1* anterior to level of setae *h2*. Dorsal measurements: *c2:d2* 133, *d2:e2* 142, *d2:gl* 108, *e1:gl* 27, *e2:h3* 115, *h2:h2* 86, *h3:h3* 70. Epigynum with short lateral extensions; posterior branches straight with acute tips, 51 x 86.

ETYMOLOGY: The specific epithet derives from the generic name of the type host and is a noun in apposition.

***Pteroherpus zosteropis* MIRONOV, 1992**
(Figs 21A-F, 24B)

Pteroherpus zosteropis MIRONOV, 1992: 260, Figs 5, 6, 14, 15.

MATERIAL EXAMINED: Male holotype and female paratype (ZISP 4120) ex *Zosterops japonicus* TEMMINCK & SCHLEGEL, 1847 (Zosteropidae), Vietnam, Ha Nam Ninh Province, Kim Shon, 6.VII.1989, S.V. MIRONOV; 3 male and 3 female paratypes (ZISP 4121), same data.

DIAGNOSIS: *Male*: Prodorsal shield 1.3-1.4 times longer than wide, with short posterior part, with

rounded posterior margin, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles blunt-angular, anterior margin straight. Distance between prodorsal and hysteronotal shields longer than half of prodorsal shield length, additional sclerites in this area absent (Fig. 21A). Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft as a narrow U; opisthosomal lobes wide and short, bluntly rounded, with narrow entire membrane on posterior and inner margins. Anterior end of supranal concavity extending beyond level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 3-3.2 times longer than wide at neck part. Branches of epiandrium extending to base of genital apparatus. Adanal shield with concave anterior margin and with rounded lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerites present, represented by small roughly ovate plates at level of humeral shields, setae *c1, c2* on striated tegument. Opisthosomal shields separated from central sclerite and split into two outer and inner fragments; lateral fragments almost twice as long as than inner fragments, with setae *e2* on inner margin, posterior ends of these sclerites crossed by several oblique striae; inner fragment without striae. Central sclerite elongated, slightly longer than prodorsal shield; anterior end at level of trochanters III, anterior margin straight; posterior end attenuated and rounded terminally, extending to level of setae *e1* but not encompassing them. Setae *d2* on lateral margins of central sclerites, setae *e1* on striated tegument. Subhumeral setae *c3* lanceolate, 28-30 x 5.5-6, approximately equal in length to trochanter III.

Group *nicator*

DIAGNOSIS: *Male*: Prodorsal shield: posterior part short, posterior margin convex; postero-lateral angles not expressed. Opisthosomal lobes roughly triangular with bluntly rounded posterior ends. Terminal cleft shaped as trapezium. Narrow opisthosomal membrane developed on inner and distal margins of opisthosomal lobes. Setae *ps2* setiform. *Female*: Anterior hysteronotal sclerites absent. Central sclerite small, ovate in form, not wider than a quarter of idiosoma width. Opisthosomal shields entire, narrow, distant from central sclerite.

The group includes a sole species, *P. nicator* MIRONOV & WAUTHY, 2005; hosts: Pycnonotidae.

Pteroherpus nicator MIRONOV & WAUTHY, 2006
(Figs 22A-F, 24C)

Pteroherpus nicator MIRONOV & WAUTHY, 2006a: 69, Figs 3A-D, 4D.

MATERIAL EXAMINED: Male holotype, 1 male paratype (MRAC 180 125) ex *Nicator gularis* HARTLAUB & FINSCH, 1870 (Pycnonotidae), South Africa, Zululand, Ndumu 22.IX.1967, coll. unknown; 5 male and 12 female paratypes (MRAC 180 121 – 180 124, 180 126 – 180 130), same data.

DIAGNOSIS: *Male*: Prodorsal shield slightly longer than wide, with short posterior part, with rounded posterior margin, posterolateral angles not expressed, lateral margins with incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles acute or rectangular, anterior margin straight. Distance between prodorsal and hysteronotal shields exceeds half of prodorsal shield length (Fig. 22A). Opisthosoma moderately narrowed, as wide as half of greatest width of idiosoma; terminal cleft wide U-shaped; opisthosomal lobes roughly triangular with rounded apices, with narrow entire membrane along all margins of lobes. Supranal concavity short, not extending to level of setae *e2*. Setae *e1* approximately at level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline 1.1-1.2 times longer than wide at neck part. Branches of epiandrium extending beyond midlevel of genital apparatus. Adanal shield T-shaped, with acute lateral extension. Setae *ps2* setiform. Tarsus III with bidentate apex. *Female*: Anterior hysteronotal sclerite absent, setae *c1, c2* on striated tegument. Opisthosomal sclerites separated from central sclerite, represented by oblique elongated plates situated distantly posterior from central sclerite, surface of opisthosomal sclerites with single longitudinal groove; setae *e2* in anterior part of these sclerites (Fig. 24C). Central sclerite narrowly ovate, not longer and much narrower than prodorsal shields; anterior end at level of trochanters III; posterior end beyond level of trochanters IV. Setae *d1, d2* and *e1* situated on soft tegument. Subhumeral setae *c3* slightly curved, 40-45 x 4.5-5, longer than trochanter III.

REMARK: *Pteroherpus nicator* is known only from the type host, the eastern nicator *Nicator gularis* (Pycnonotidae, incertae sedis), in Africa (MIRONOV & WAUTHY, 2006a).

Group *josephi*

DIAGNOSIS: *Male*: Prodorsal shield: posterior part well developed, almost extending to level of setae *c1*, posterior margin straight, posterolateral angles well expressed. Opisthosomal lobes wide and short, posterior margin bluntly rounded. Terminal cleft shaped as narrow trapezium. Narrow membrane on opisthosomal lobes developed along inner and distal margins. Setae *ps2* setiform. *Female*: Anterior hysteronotal sclerites absent. Central sclerite large, anterior part wider than one third of greatest width of idiosoma. Opisthosomal shields entire, large, close to posterior end of central sclerite.

The group includes a sole species, *P. josephi* (GAUD & MOUCHET, 1959); hosts: Muscicapidae.

Pteroherpus josephi (GAUD & MOUCHET, 1959)
(Figs 23A-F, 24D)

Pteronyssus josephi GAUD & MOUCHET, 1959: 519, Figs 10C, 11C; GAUD & TILL, 1961: 278.
Pteroherpus josephi: FACCINI & ATYEO, 1981: 49.

MATERIAL EXAMINED: Male holotype and female paratype (MRAC 180 116) ex *Muscicapa comitata* (CASSIN, 1857) (Muscicapidae), Southern Cameroon, XII.1955, coll. unknown; 2 male and 4 female paratypes (MRAC 180 117, 180 118), same data.

DIAGNOSIS: *Male*: Prodorsal shield of trapezoidal form, slightly wider than long, posterolateral angles well developed, posterior margin straight or slightly sinuous, lateral margins with incision posterior to setae *se*. Hysteronotal shield entire, anterior end not encompassing setae *c1*, anterior angles acute, anterior margin straight or slightly concave. Distance between prodorsal and hysteronotal shields about one quarter of prodorsal shield length (Fig. 23A). Opisthosoma moderately narrowed, half as wide as greatest width of idiosoma; terminal cleft trapezoidal; opisthosomal lobes wide and short, bluntly rounded, with narrow membrane on posterior and inner margin. Anterior end of supranal concavity almost extending to level of setae *e2*. Setae *e1* posterior to level of hysteronotal gland openings *gl*. Aedeagus much shorter than genital arch. Transventral sclerite along midline approximately equal to its width at neck part. Branches of epiandrium extending to midlevel of genital apparatus. Adanal shield with rounded lateral parts. Setae *ps2* setiform. Tarsus III with bidentate apex.
Female: Anterior hysteronotal sclerites absent, setae *c1*, *c2* on striated tegument. Opisthosomal shields separated from central sclerite by narrow band of striated tegument and represented by large plates of roughly triangular form; setae *e2* on opisthosomal sclerites, close to their lateral margins (Fig. 24D). Central sclerite large, elongated, longer than half of hysterosoma length; anterior end at level of humeral setae *cp*, anterior margin straight; posterior end extending beyond level of opening *gl*, posterior margin blunt-angular. Setae *d2*, *e1* on central sclerite. Subhumeral setae *c3* lanceolate 33-36 x 6.5-7, slightly shorter than trochanter III.

This species is known only from the type host, the dusky-blue flycatcher *M. comitata,* in Africa (GAUD & MOUCHET, 1949).

Species inquerenda

Pteroherpus aciaepigynius (GAUD, 1964)

Pteronyssus aciaepigynius GAUD, 1964: 126 (in part, male), Figs 3a, c, d.
Pteroherpus aciaepigynius: FACCINI &, ATYEO, 1981: 48.

This species was described from *Cisticola brachypterus* (SHARPE, 1870) (Cisticolidae) in Zaire (GAUD, 1964). FACCINI and ATYEO (1981) re-examined the type material and found that the male and female were not conspecific. The name *Pteroherpus aciaepigynius* was fixed to the male holotype, while a species represented by the female was given a new name, *Pteroherpus benoiti* FACCINI & ATYEO, 1981. Further, the latter species was moved to the genus *Micropteroherpus* (MIRONOV, 2001). As mites corresponding to *P. aciaepigynius* have never been recollected from the type host, FACCINI and ATYEO (1981) concluded that the occurrence of this species on *C. brachyptera* could be a contamination, and suggested that a true host is probably from Sylviidae, because the male is similar or conspecific to *P. pallens*. The type material was not available for the present study and its depository is currently unknown.

Discussion

Feather mites of the *Pteroherpus* generic group are associated with higher passerine birds (oscines). Among four genera of this group, the genus *Pteroherpus* is most widely distributed on higher host taxa; its species occur on birds of seven passerine families belonging to different superfamilies (Table 1). At the species-group level, *Pteroherpus* also displays

distinct restriction to particular avian taxa. Most species of the *hoplophurus* group, with one exception, are associated with bulbuls, Pycnonotidae (Passerida: Sylvioidea). An aberrant species of the *hoplophorus* group, *P. hipposathes,* inhabits one species of birds of paradise, Paradisaeidae (Corvida: Corvoidea). The sole representative of the *nicator* group, which is suggested to be closely related to *hoplophorus* group (MIRONOV & WAUTHY, 2008, in press), is also associated with a pycnonotid host, although representing a divergent lineage within Pycnonotidae (BERESFORD *et al.*, 2005). It is possible to suggest that the lineage of *hoplophorus*- and *nicator*-group species was formed on the ancestor of bulbuls, while the association of *P. hipposathes* (*hoplophorus* group) with a bird of paradise *Astrapia nigra* is secondary in origin. The *diploplax* group is associated with avian hosts of three closely related families, Old World warblers, babblers and white-eyes (Sylvioidea: Sylviidae, Timaliidae and Zosteropidae), and quite probably was formed on the ancestor of these families. The origin of the sole species of the *josephi* group, with one host from Muscicapidae (Passerida: Muscicapoidea), is unclear and may also be a result of transfer from another host taxon. Thus, based on observed host associations of the genus *Pteroherpus* and taking into consideration the phylogenetic relationships of its hosts, it is possible to hypothesize that this genus was probably formed on the ancestors of the four closely related families of sylvioids, Pycnonotidae, Sylviidae, Timaliidae and Zosteropidae, and has become dispersed on their representatives mainly owing to cospeciation events.

In contrast to *Pteroherpus*, the three other genera of the group, *Dicrurobius, Micropteroherpus* and *Vanginyssus*, each is restricted to a particular passerine family. The genera *Dicrurobius* (3 species) and *Vanginyssus* (5 species) are associated with Dicruridae and Vangidae (Corvoidea), respectively (MIRONOV & WAUTHY, 2005b, 2006b); *Micropteroherpus* (3 species), the closest genus to *Pteroherpus*, occurs only on cisticolas, Cisticolidae (Sylvioidea) (MIRONOV, 2001).

Taking in consideration the number of recently known *Pteroherpus* species, their monoxenous or oligoxenous host specificity, and the number of species in its main host families (Pycnonotidae, Timaliidae, and Zosteropidae), it is possible to predict that the true number of species of this genus is higher by at least one order of magnitude.

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Table 1. — Host associations and geographic distribution of *Pteroherpus* species.

Mite species	Host species	Host family	Location	Reference
***hoplophorus* group**				
P. africanus	*Pycnonotus barbatus*	Pycnonotidae	South Africa	Mironov & Kopij, 2000
P. africanus	*Pycnonotus nigricans*	Pycnonotidae	South Africa	Mironov & Kopij, 2000
P. chlorocichlae sp. n.	*Chlorocichla simplex*	Pycnonotidae	Cameroon	Present study
P. chlorocichlae sp. n.	*Chlorocichla flavicollis*	Pycnonotidae	Cameroon	Present study
P. doleoplax	*Thescelocichla leucopleura*	Pycnonotidae	Cameroon	Gaud & Mouchet, 1959
P. gabonensis sp. n.	*Pycnonotus barbatus gabonensis*	Pycnonotidae	Cameroon	Present study
P. gabonensis sp. n.	*Pycnonotus barbatus*	Pycnonotidae	Cameroon	Present study
P. gabonensis sp. n.	*Chlorocichla falkensteini*	Pycnonotidae	Cameroon	Present study
P. hoplophorus	*Hypsipetes madagascariensis*	Pycnonotidae	Madagascar	Gaud, 1952
P. hipposathes	*Astrapia nigra*	Pycnonotidae	New Guinea	Trouessart, 1887
P. megathyrus	*Bleda eximius notatus*	Pycnonotidae	Cameroon	Gaud & Mouchet, 1959
P. pycnonoti	*Pycnonotus sinensis*	Pycnonotidae	Vietnam	Mironov, 1992
P. pycnonoti	*Pycnonotus jocosus*	Pycnonotidae	Vietnam	Mironov, 1992
P. pycnonoti	*Pycnonotus aurigaster*	Pycnonotidae	Vietnam	Mironov, 1992
P. pyrrhuri	*Pyrrhurus scandens*	Pycnonotidae	Cameroon	Mironov & Wauthy, 2006a
P. trinoton	*Phyllastrephus terrestris*	Pycnonotidae	South Africa	Mironov & Wauthy, 2006a
***diploplax* group**				
P. dentilobus	*Timalia pileata*	Timaliidae	Vietnam	Mironov, 1992
P. diploplax	*Turdoides plebejus*	Timaliidae	Cameroon	Gaud & Mouchet, 1959
P. turdoides sp.n.	*Turdoides jardineii*	Timaliidae	South Africa	Present study
P. krivolutskii	*Stachyris nigriceps*	Timaliidae	Vietnam	Mironov, 1992
P. pallens	*Acrocephalis arundinaceus*	Sylviidae	Europe, NW Russia	Berlese, 1886; Mironov, 1989
P. pallens	*Acrocephalus rufescens*	Sylviidae	Rwanda	Present study
P. pallens	*Terpsiphone viridis**	Monarchidae	Cameroon	Gaud & Mouchet, 1959
P. zosteropis	*Zosterops japonica*	Zosteropidae	Vietnam	Mironov, 1992
***josephi* group**				
P. josephi	*Muscicapa comitata*	Muscicapidae	Cameroon	Gaud & Mouchet, 1959
***nicator* group**				
P. nicator	*Nicator gularis*	Pycnonotidae	South Africa	Mironov & Wauthy, 2006a
species inquerenda				
P. aciaepigynius	*Cisticola brachyptera**	Cisticolidae	Zaire	Gaud, 1964

* - Questionable host associations.

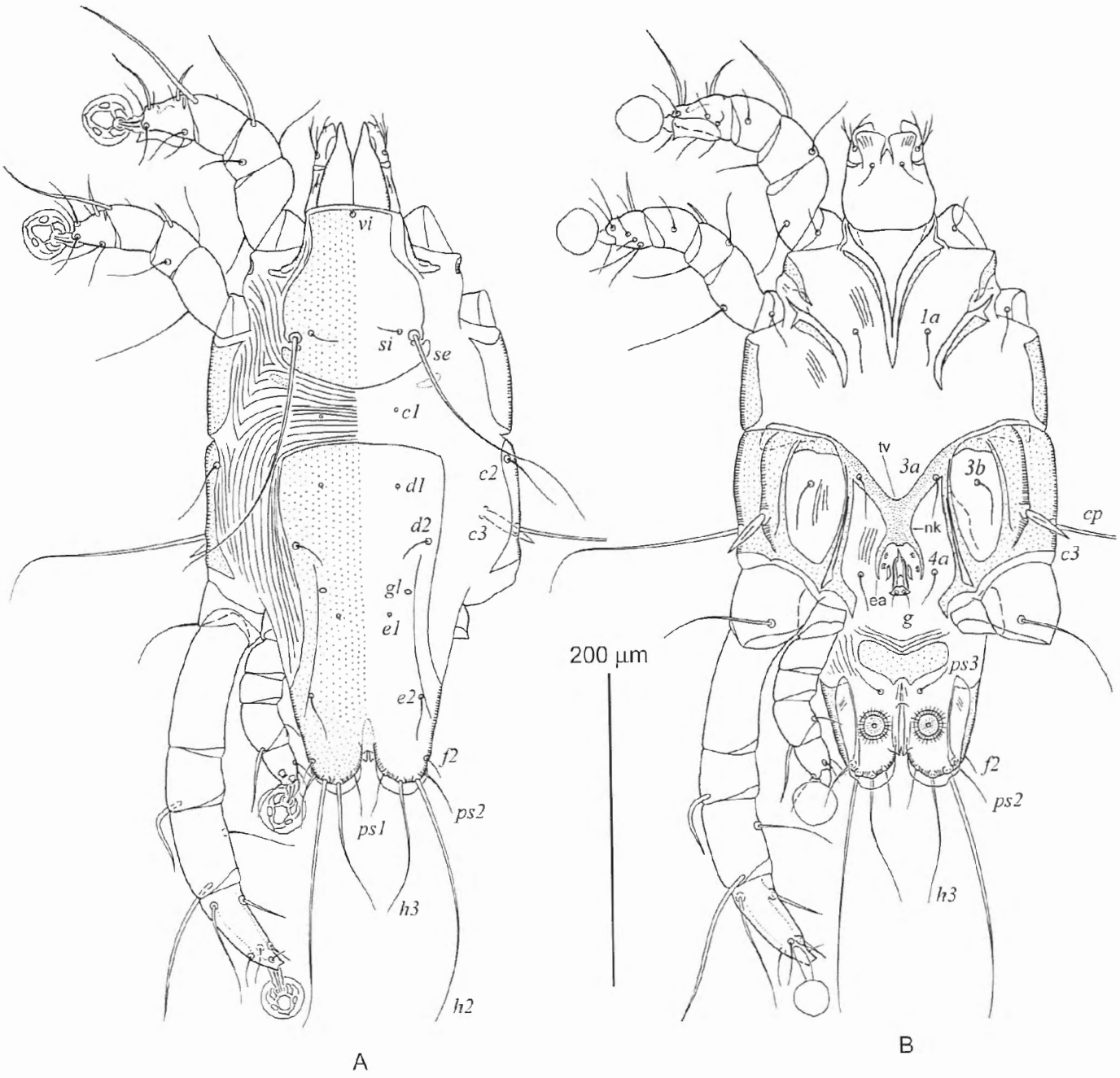

Fig. 1A-B – *Pteroherpus chlorocichlae*, male. **A.** Dorsal view. **B.** Ventral view.
ea – branch of epiandrium, nk – neck of transventral sclerite, tv- transventral sclerite.

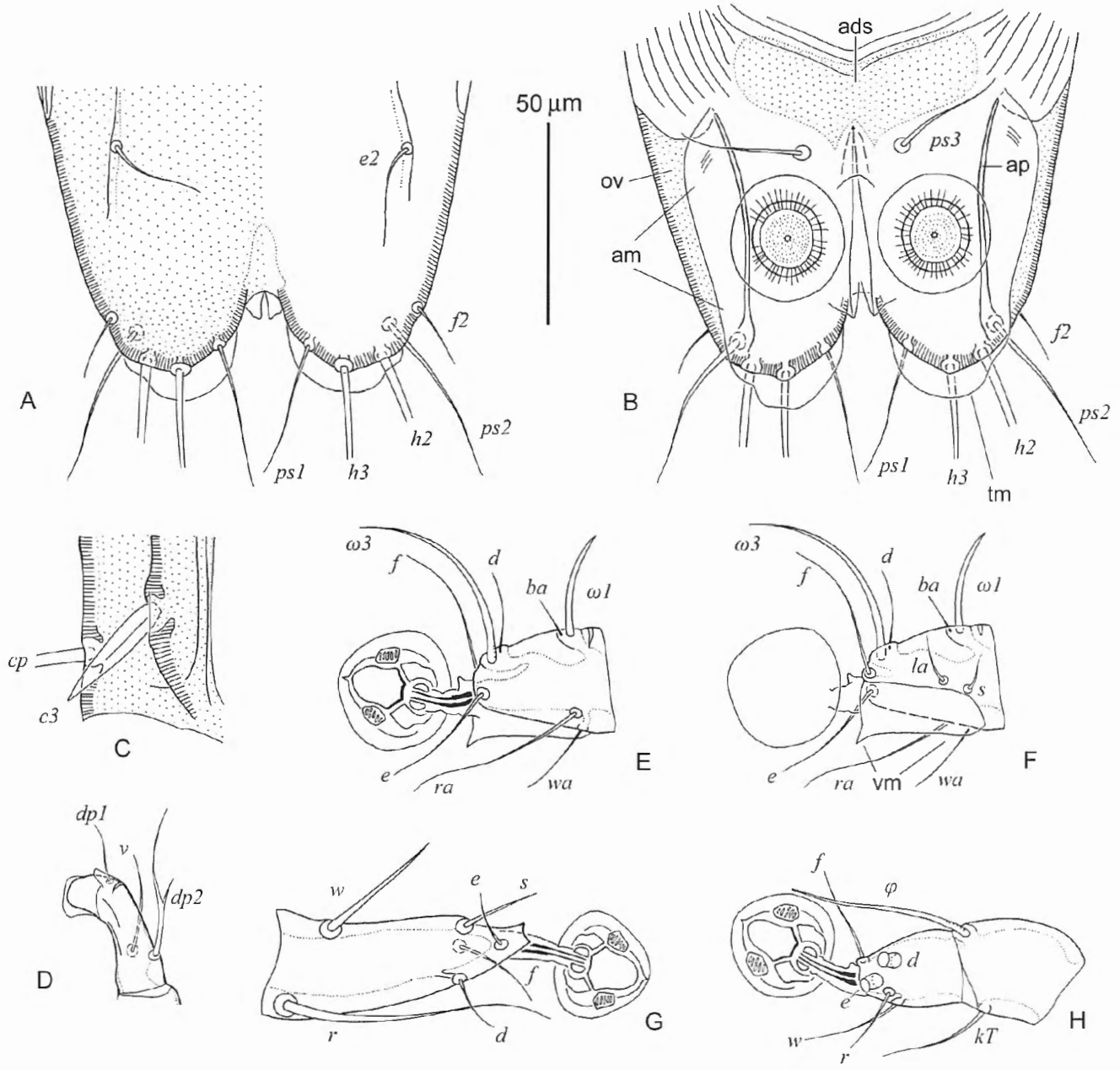

Fig. 2A-H – *Pteroherpus chlorocichlae*, details of male. **A.** Opisthosoma, dorsal view. **B.** opisthosoma, ventral view. **E.** Seta *c3*. **D.** Palp, dorsal view. **E.** Tarsus I, dorsal view. **F.** Tarsus I, ventral view. **G.** Tarsus III, dorsal view. **H.** Tarsus IV, dorsal view.

ads - adanal shield, am – adanal membrane, ap – adanal apodeme, ov – opisthoventral shield, tm - terminal membrane, vm – ventral membrane of tarsus I.

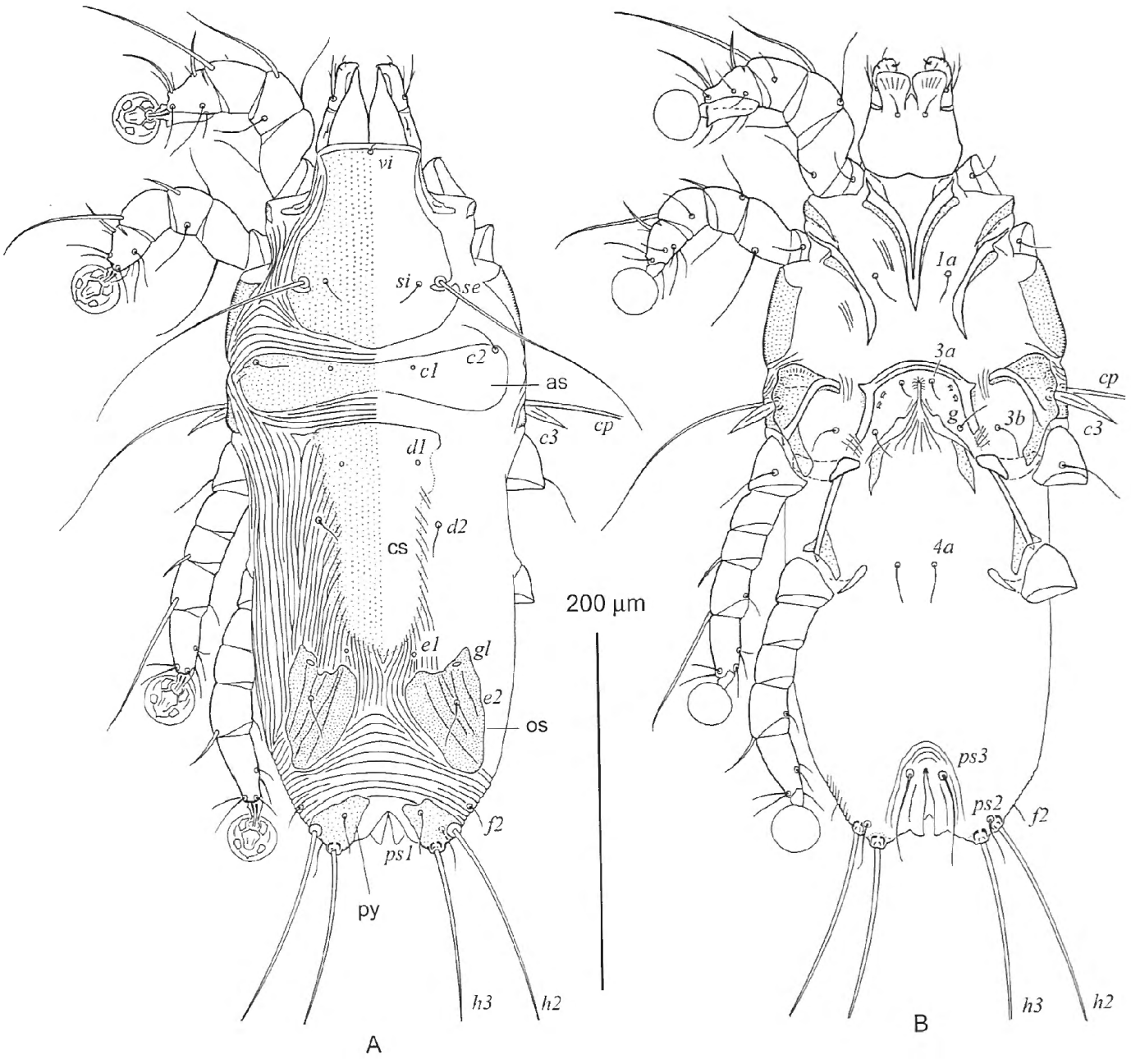

Fig. 3A-B – *Pteroherpus chlorocichlae*, female. **A**. dorsal view. **B**. Dorsal view.
Fragments of hysteronotal shield: as – anterior hysteronotal sclerite, cs – central sclerite, os – opisthosomal sclerite, py – pygidial sclerite.

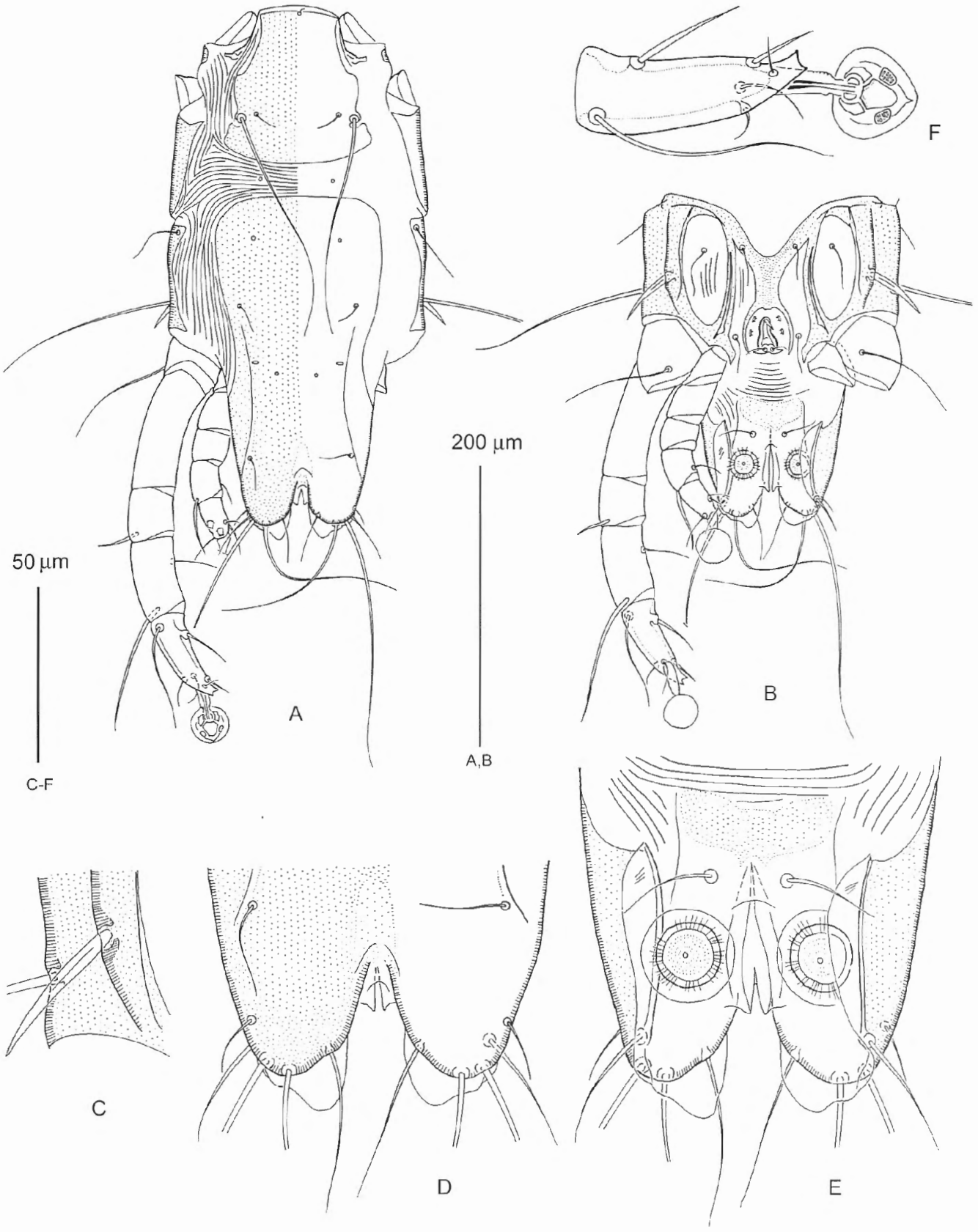

Fig. 4A-E – *Pteroherpus hoplophorus*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

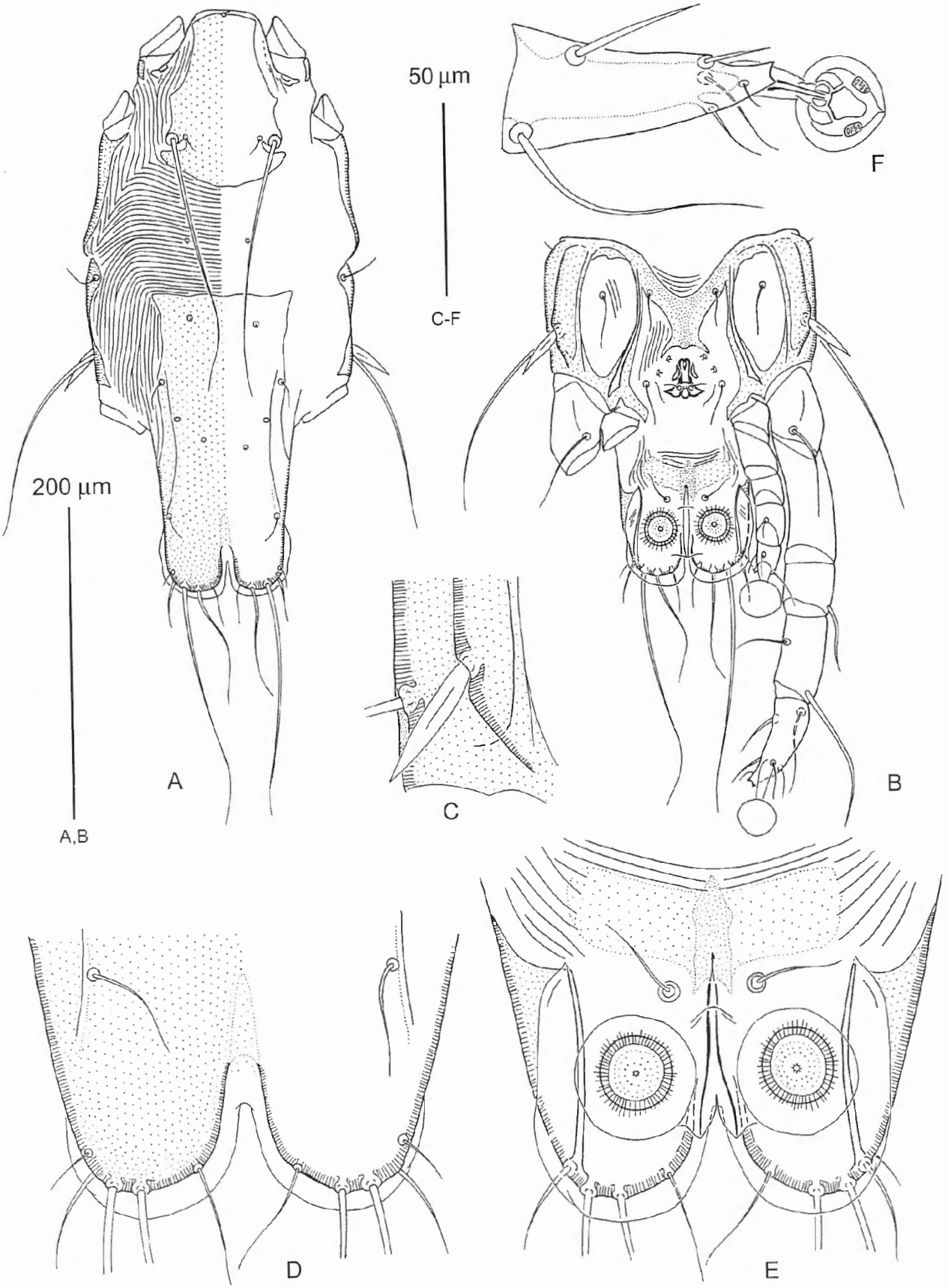

Fig. 5A-F – *Pteroherpus africanus*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

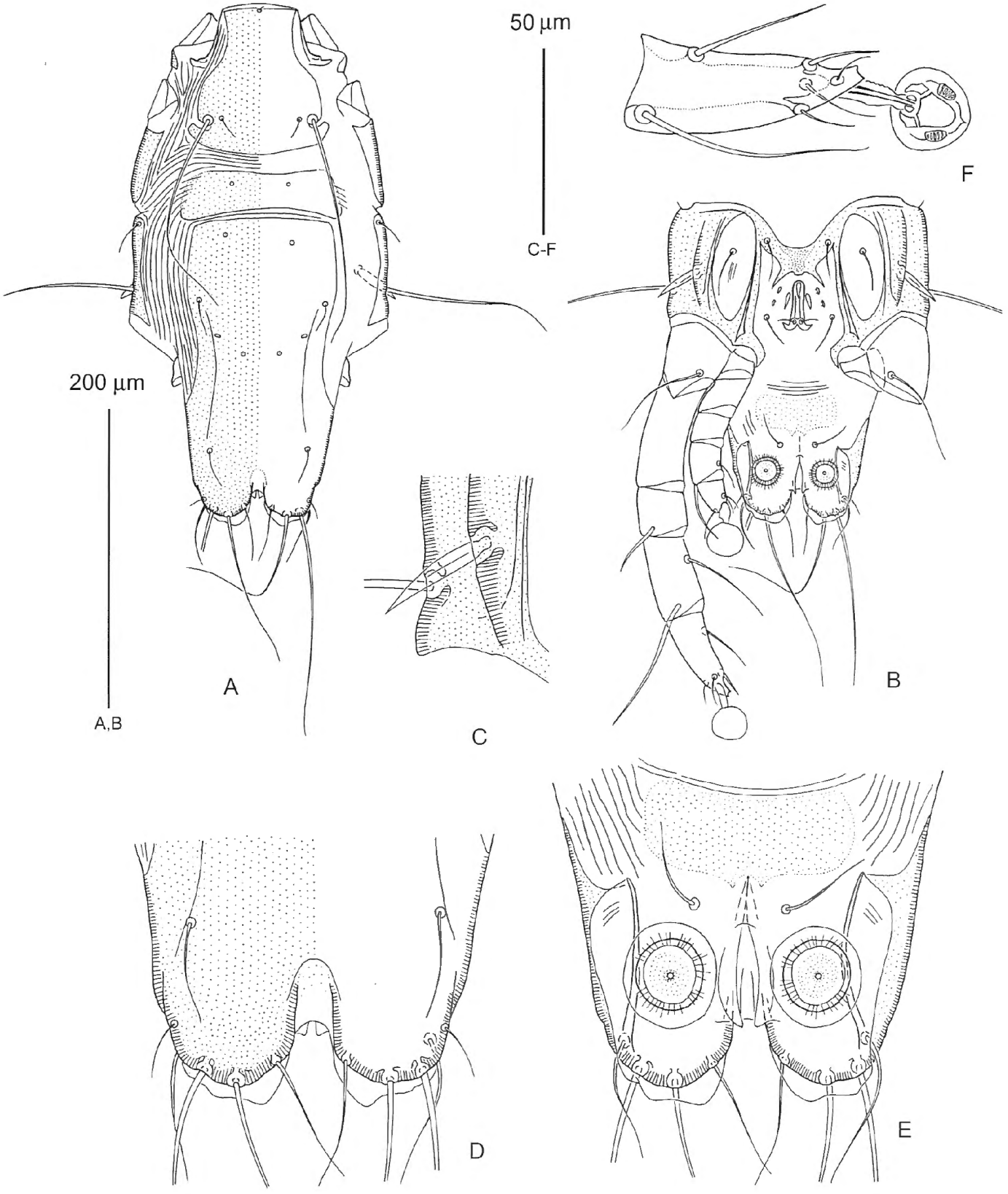

Fig. 6A-F – *Pteroherpus doleoplax*, male. **A.** Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

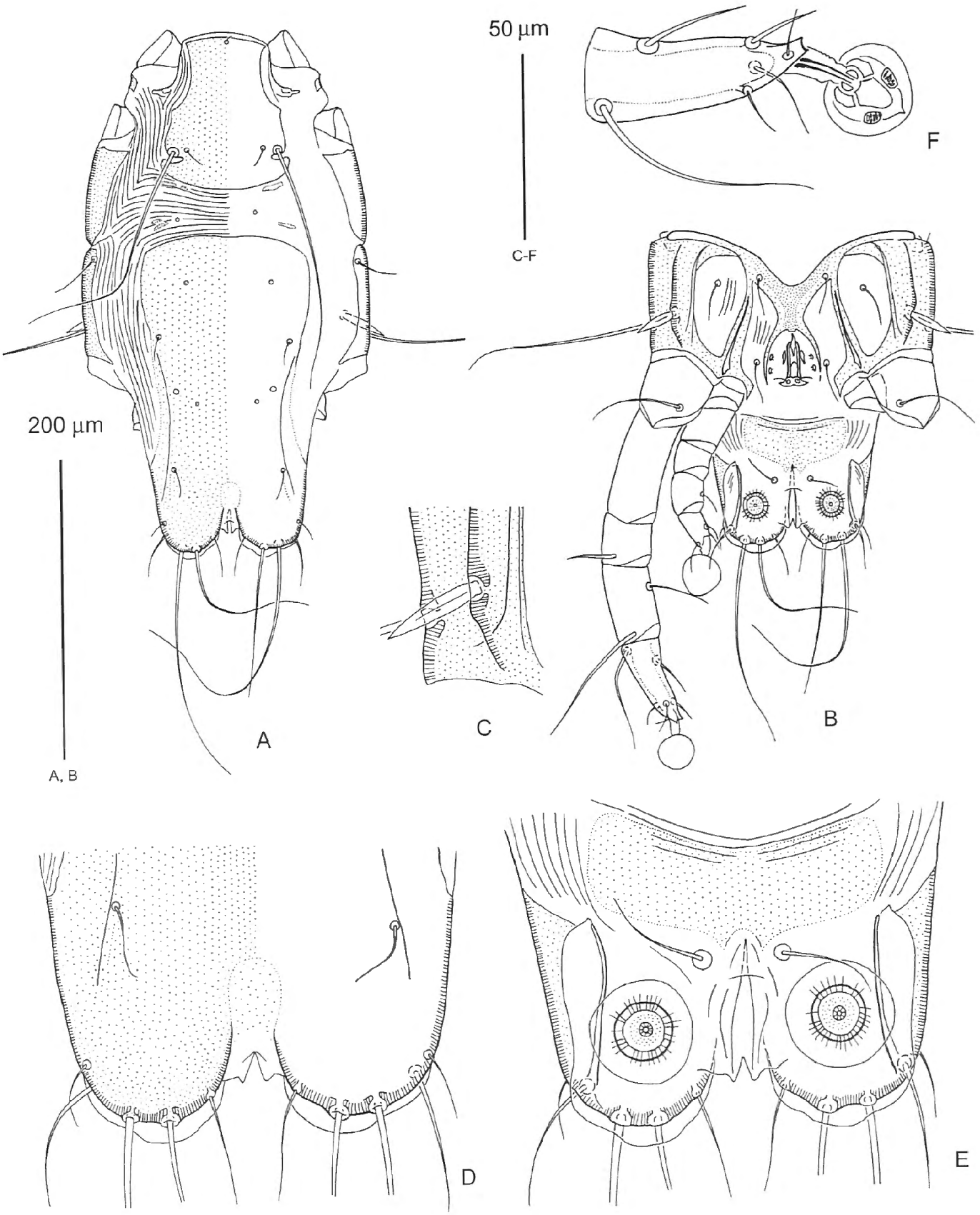

Fig. 7A-F – *Pteroherpus gabonensis*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

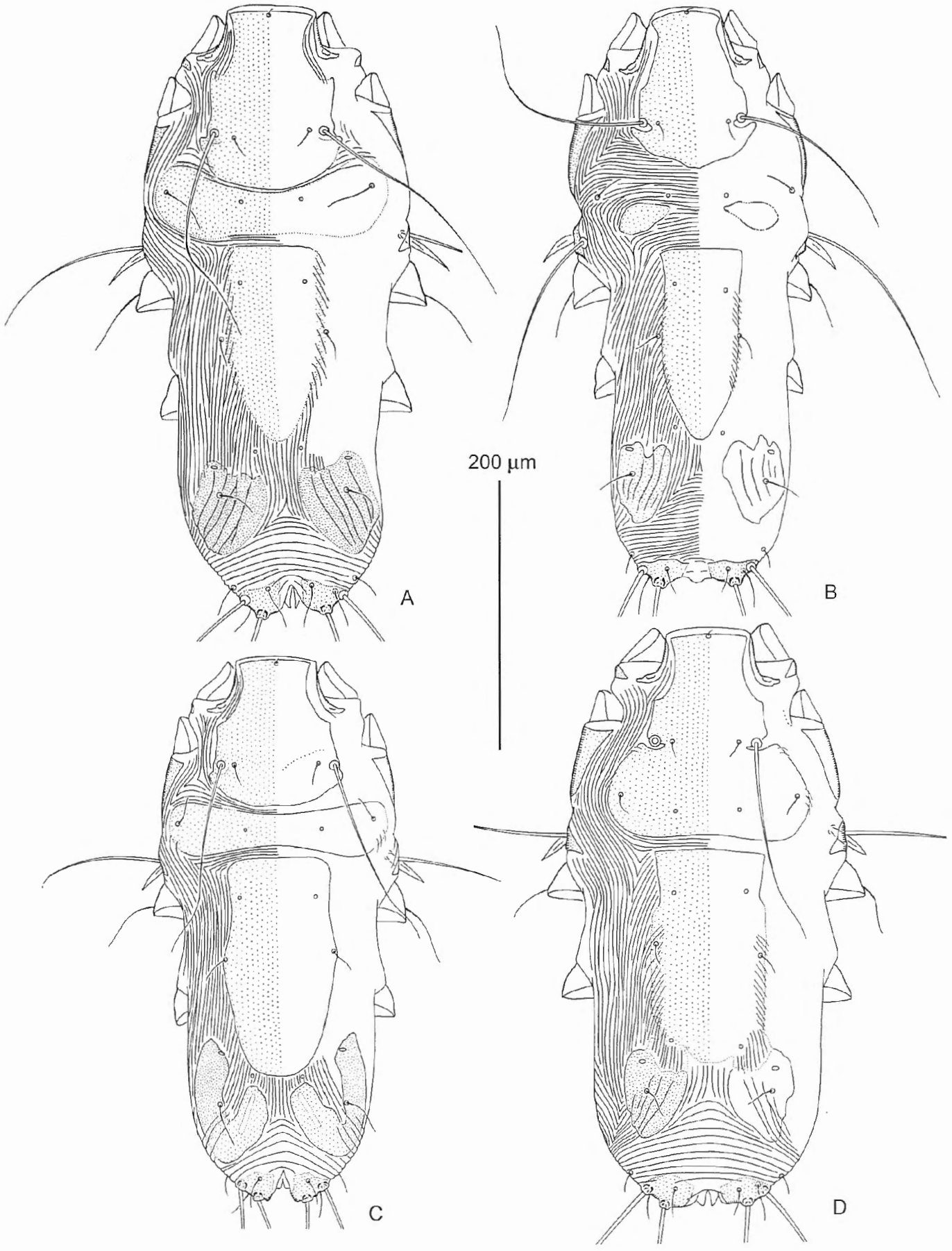

Fig. 8A-D – *Pteroherpus* females, dorsal view of idiosoma. **A.** *Pteroherpus hoplophorus*. **B.** P. *africanus*. **C.** *P. doleoplax*. **D.** *P. gabonensis*.

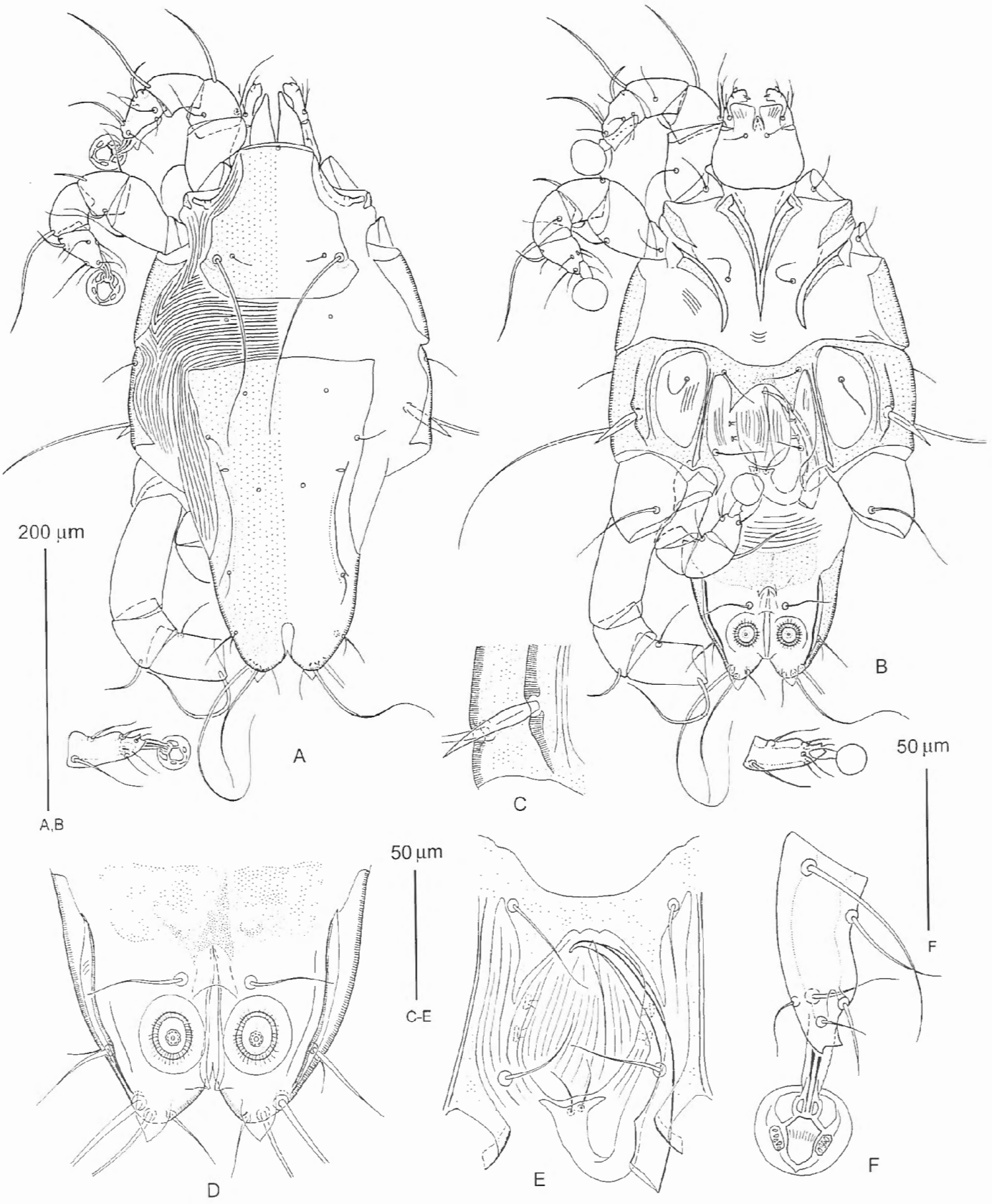

Fig. 9A-F – *Pteroherpus hipposathes*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

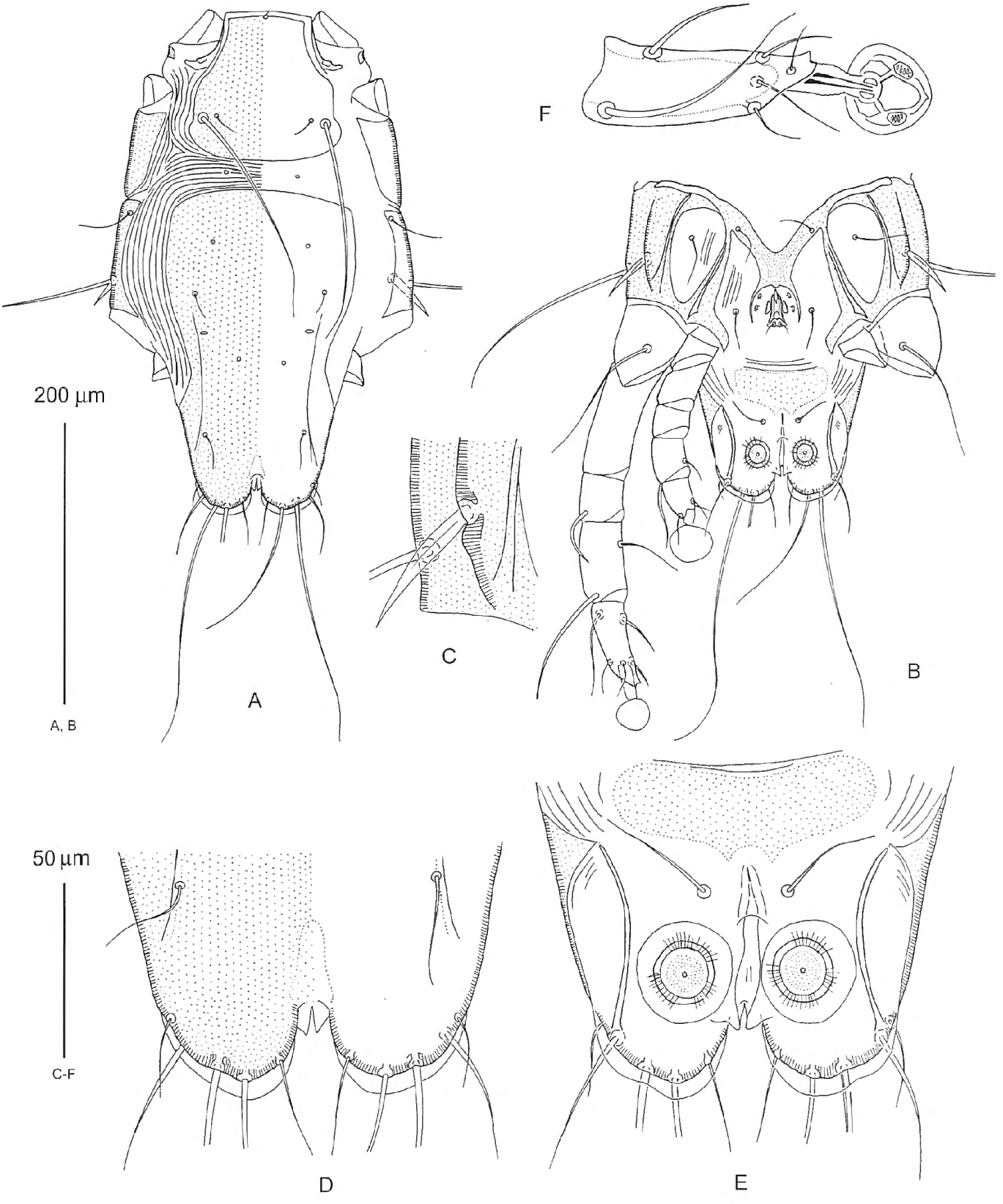

Fig. 10A-F – *Pteroherpus megathyrus*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

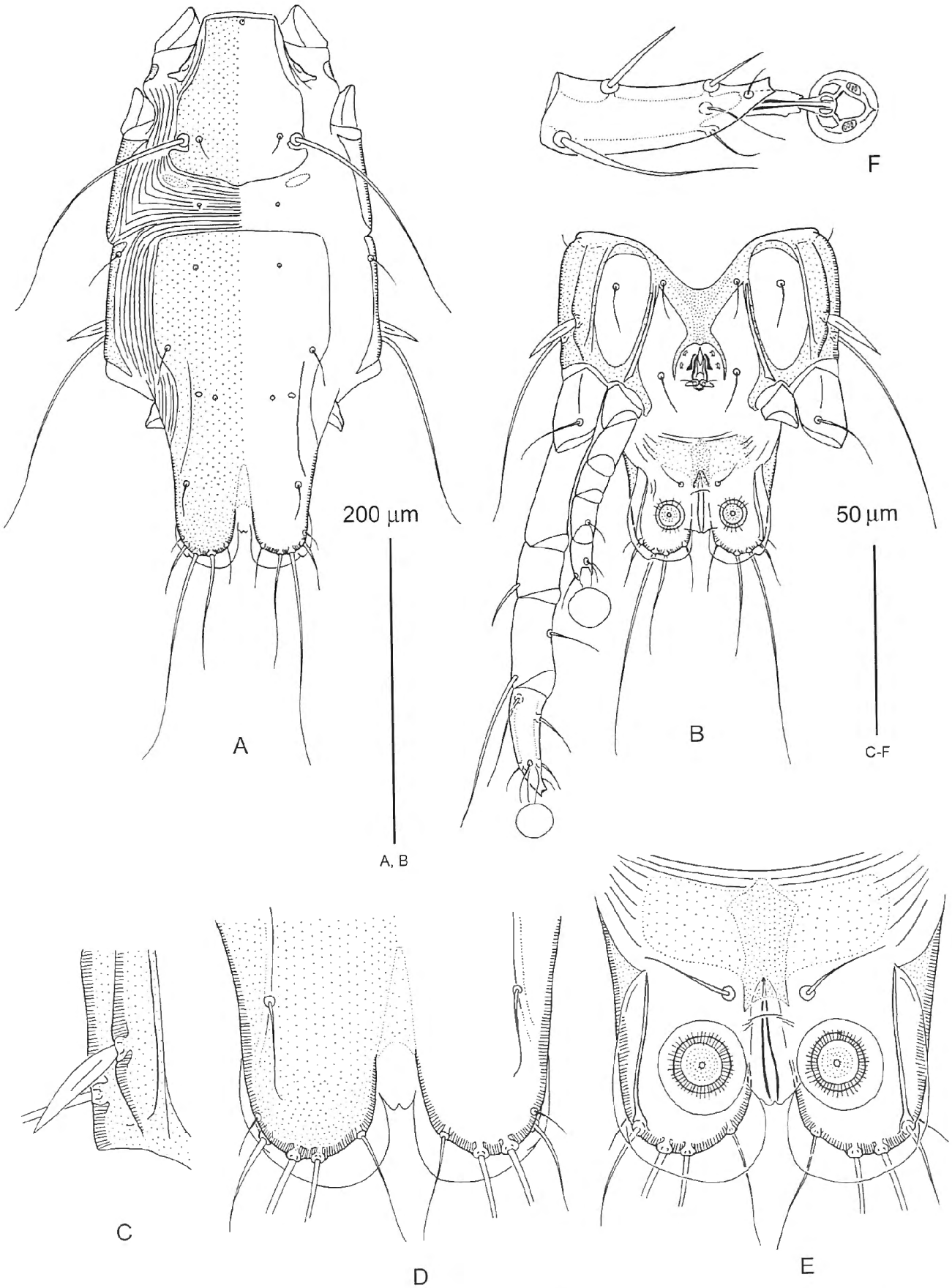

Fig. 11A-F – *Pteroherpus pycnonoti*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

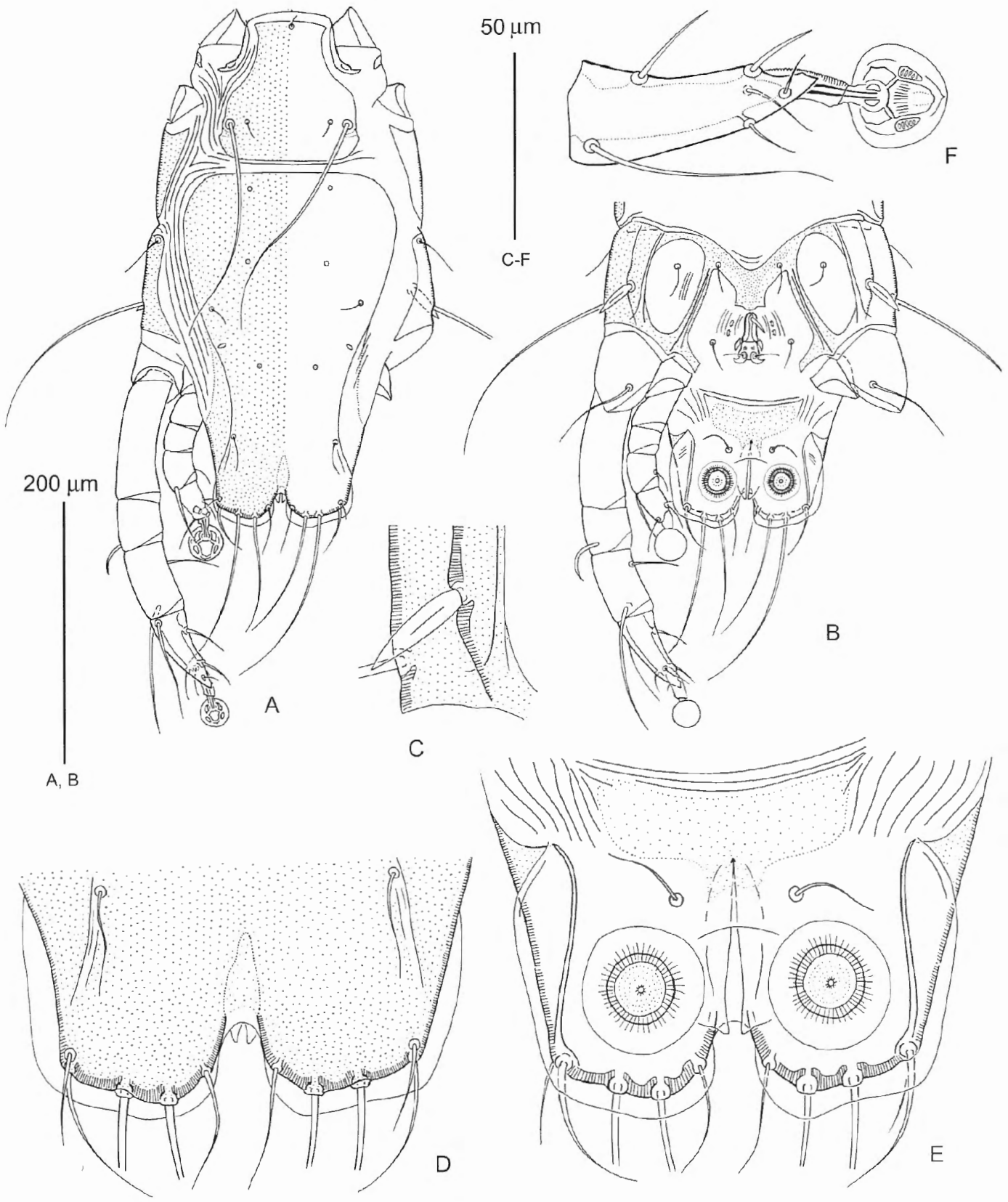

Fig. 12A-F – *Pteroherpus pyrrhuri*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

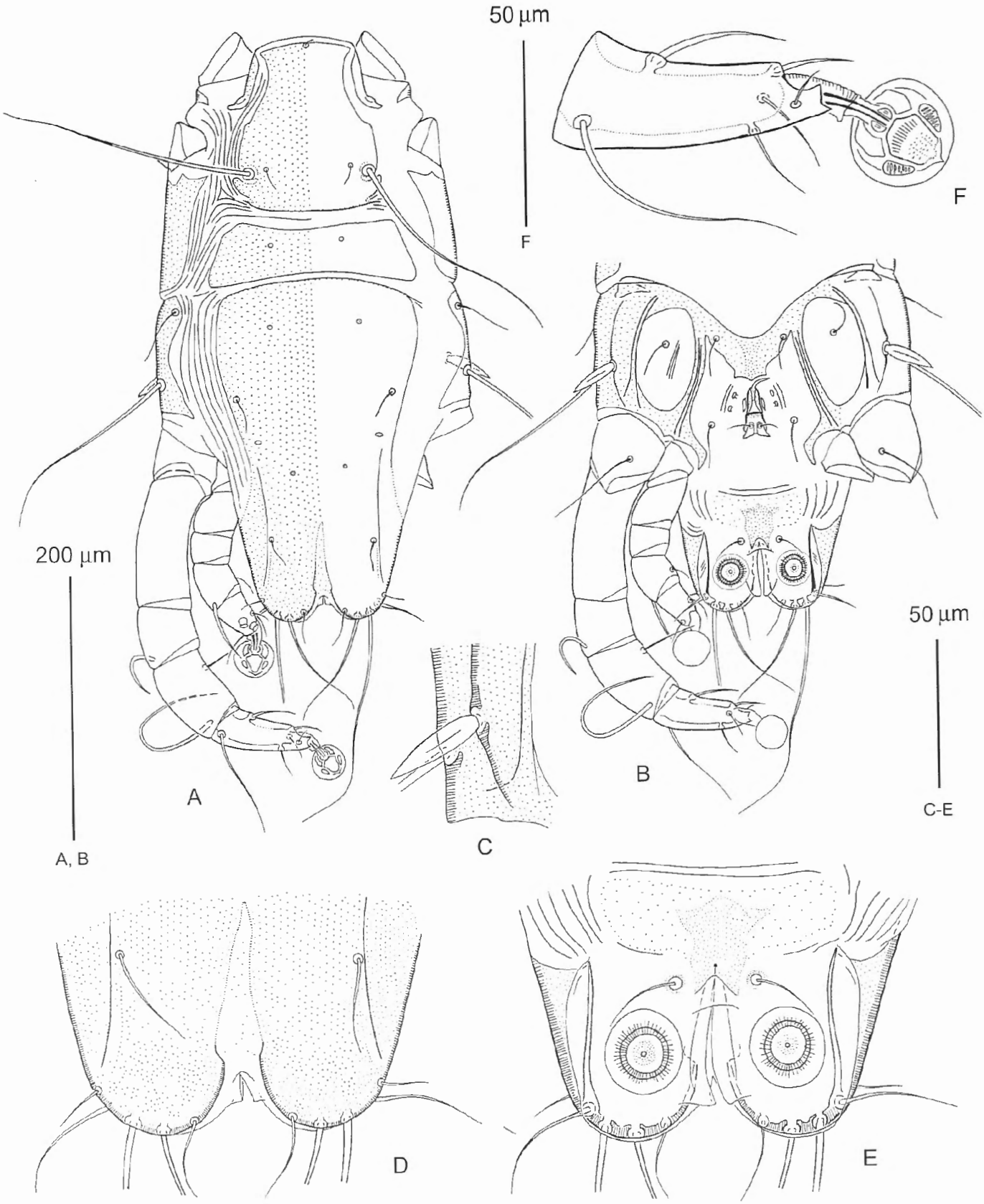

Fig. 13A-F – *Pteroherpus trinoton*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

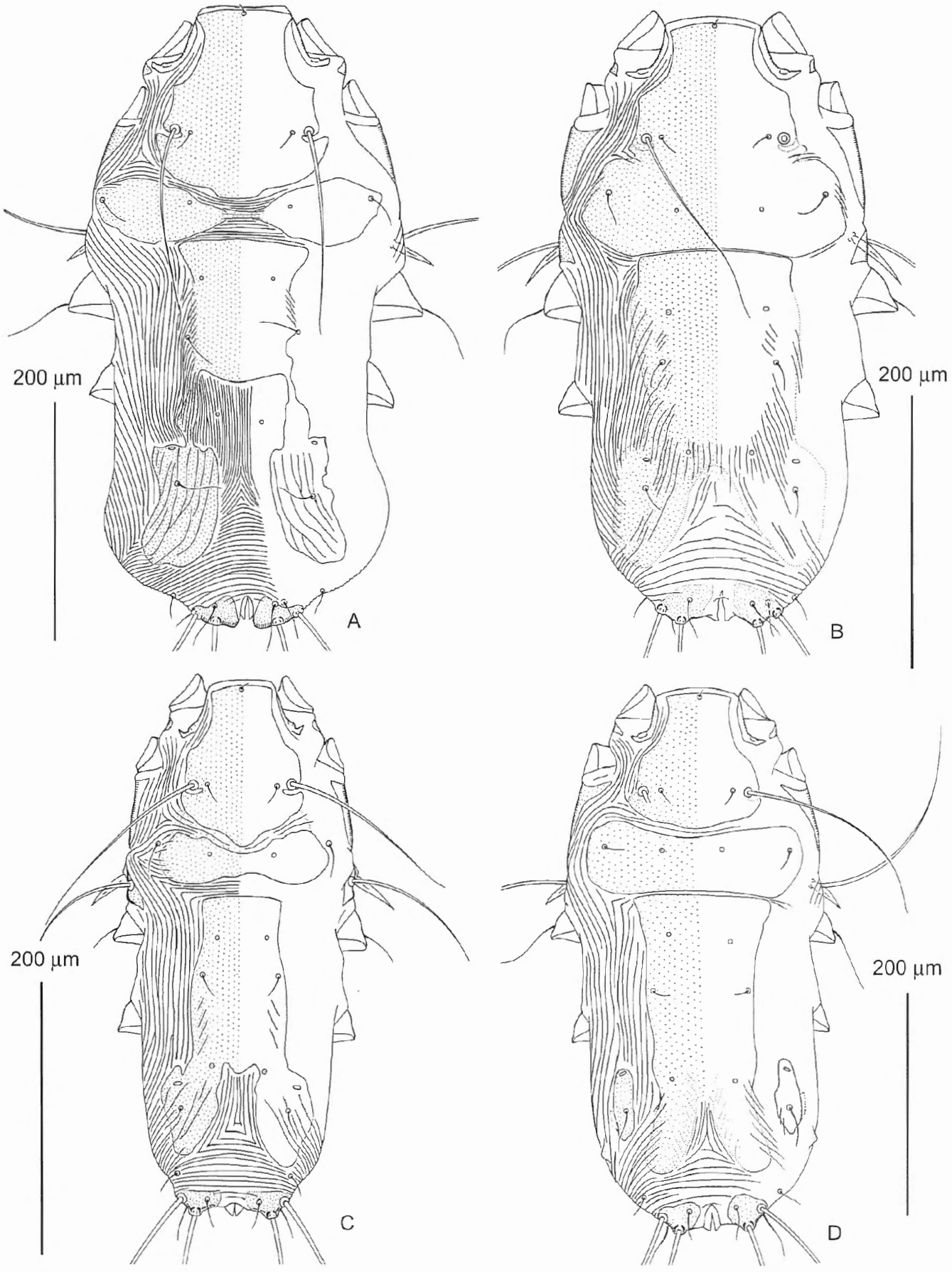

Fig. 14A-D – *Pteroherpus* females, dorsal view of idiosoma. **A**. *Pteroherpus hipposathes*. **B**. *P. megathyrus*. **C**. *P. pycnonoti*. **D**. *P. pyrrhuri*.

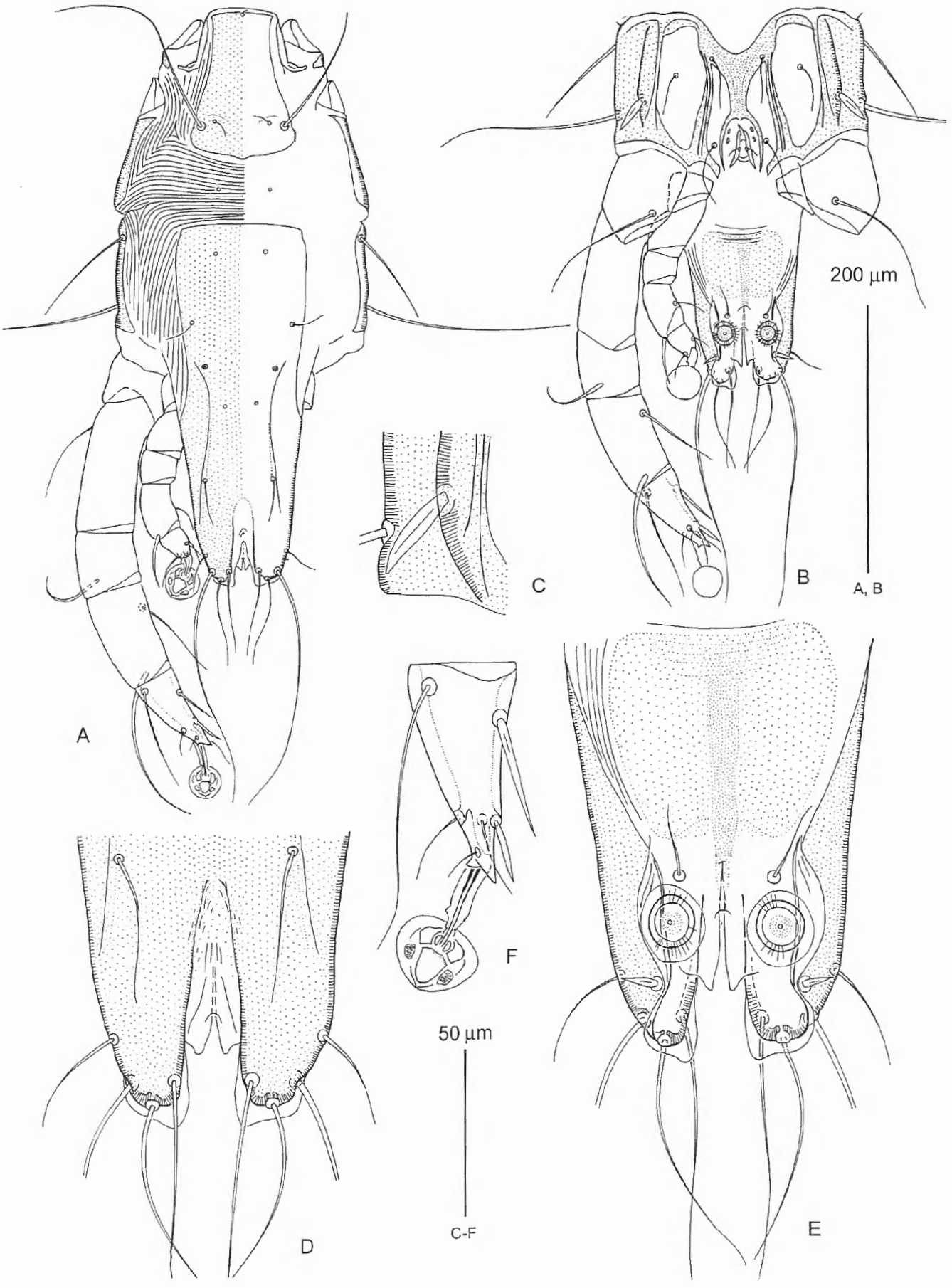

Fig. 15A-G – *Pteroherpus diploplax,* male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

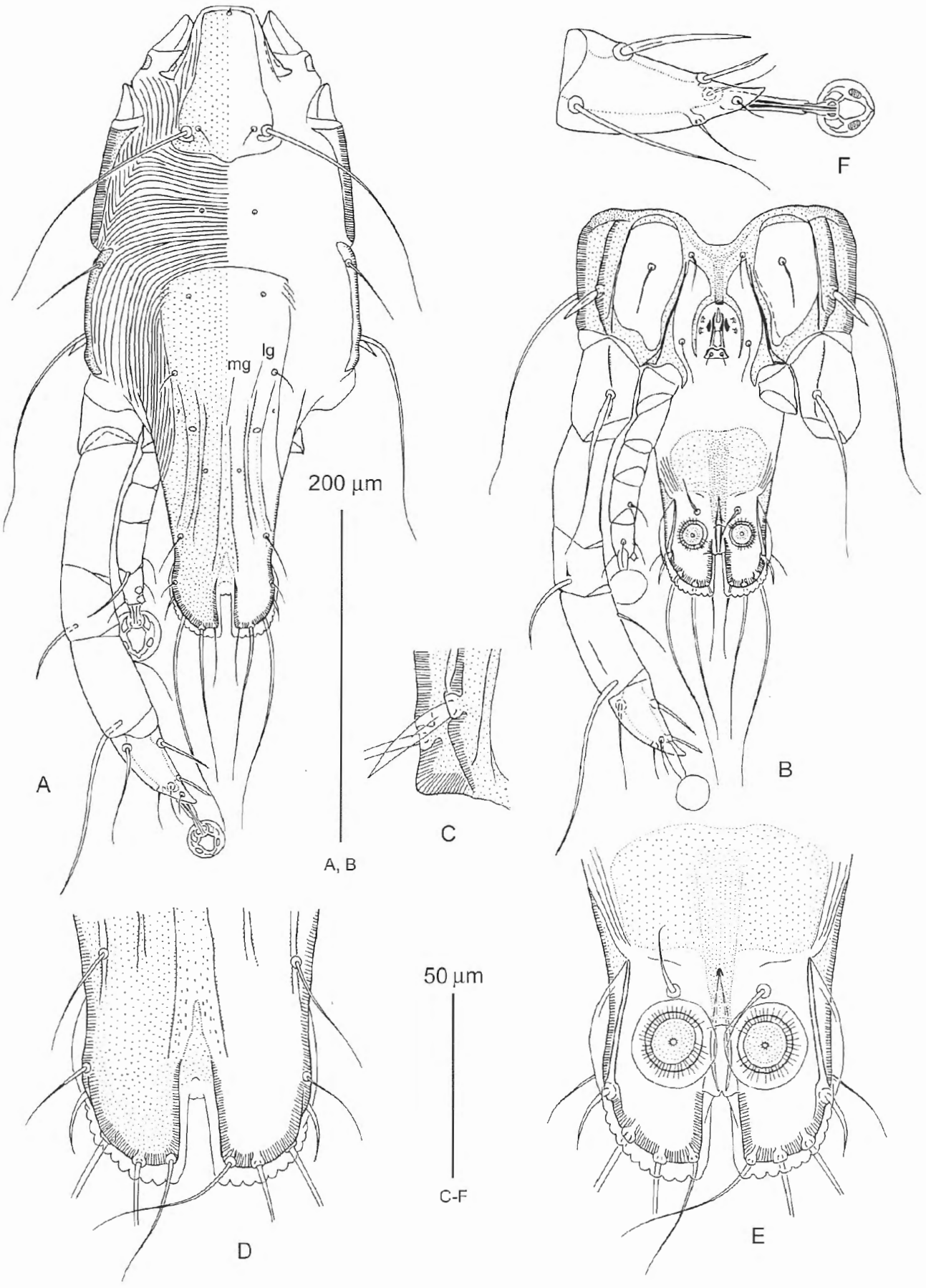

Fig. 16A-F – *Pteroherpus dentilobus*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III. lg – lateral groove, mg – median groove.

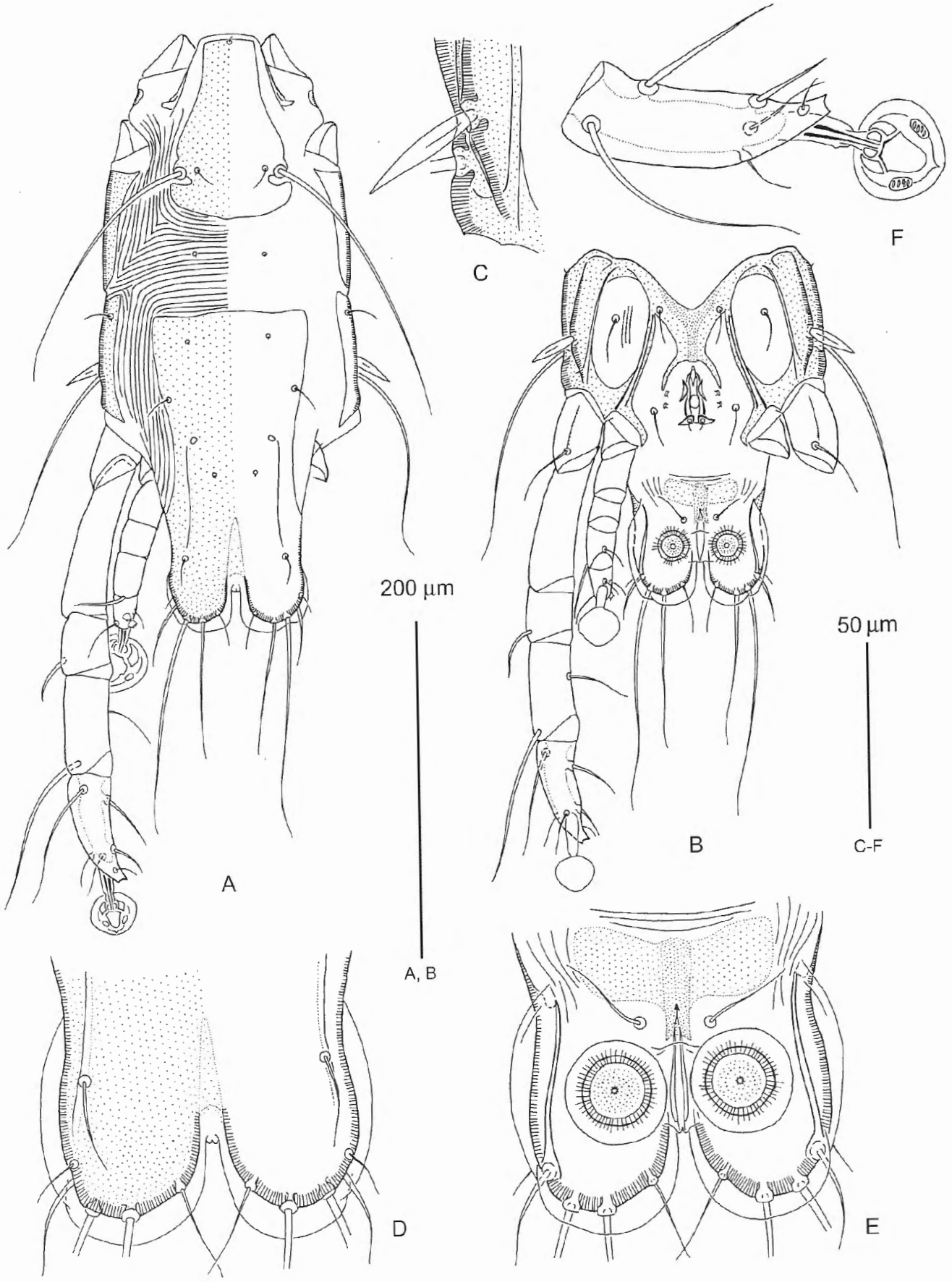

Fig. 17A-F – *Pteroherpus krivolutskii,* male. **A.** Idiosoma, dorsal view. **B.** Hysterosoma, ventral view. **C.** Seta *c3*. **D.** Opisthosoma, dorsal view. **E.** Opisthosoma, ventral view. **F.** Tarsus III.

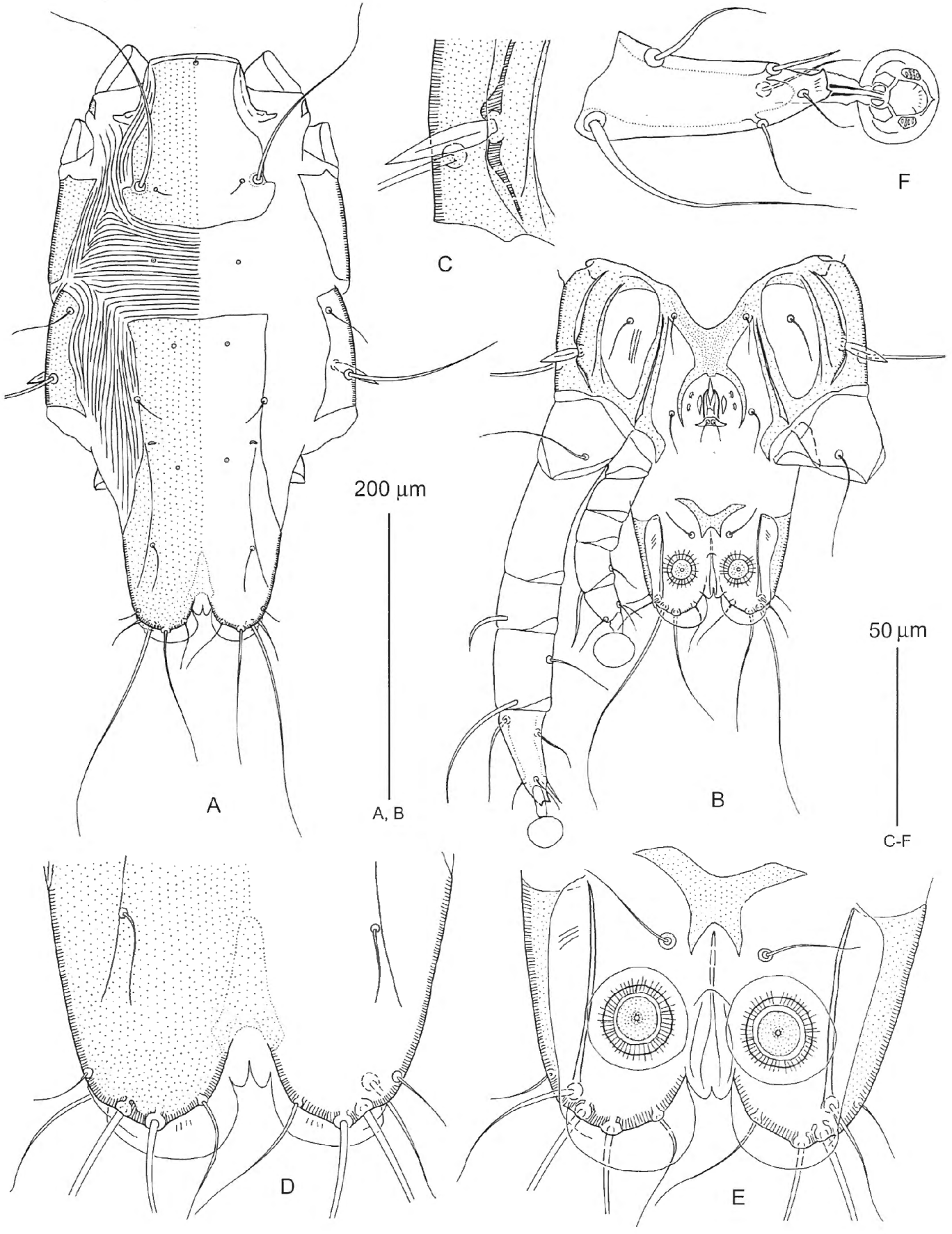

Fig. 18A-F – *Pteroherpus pallens*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

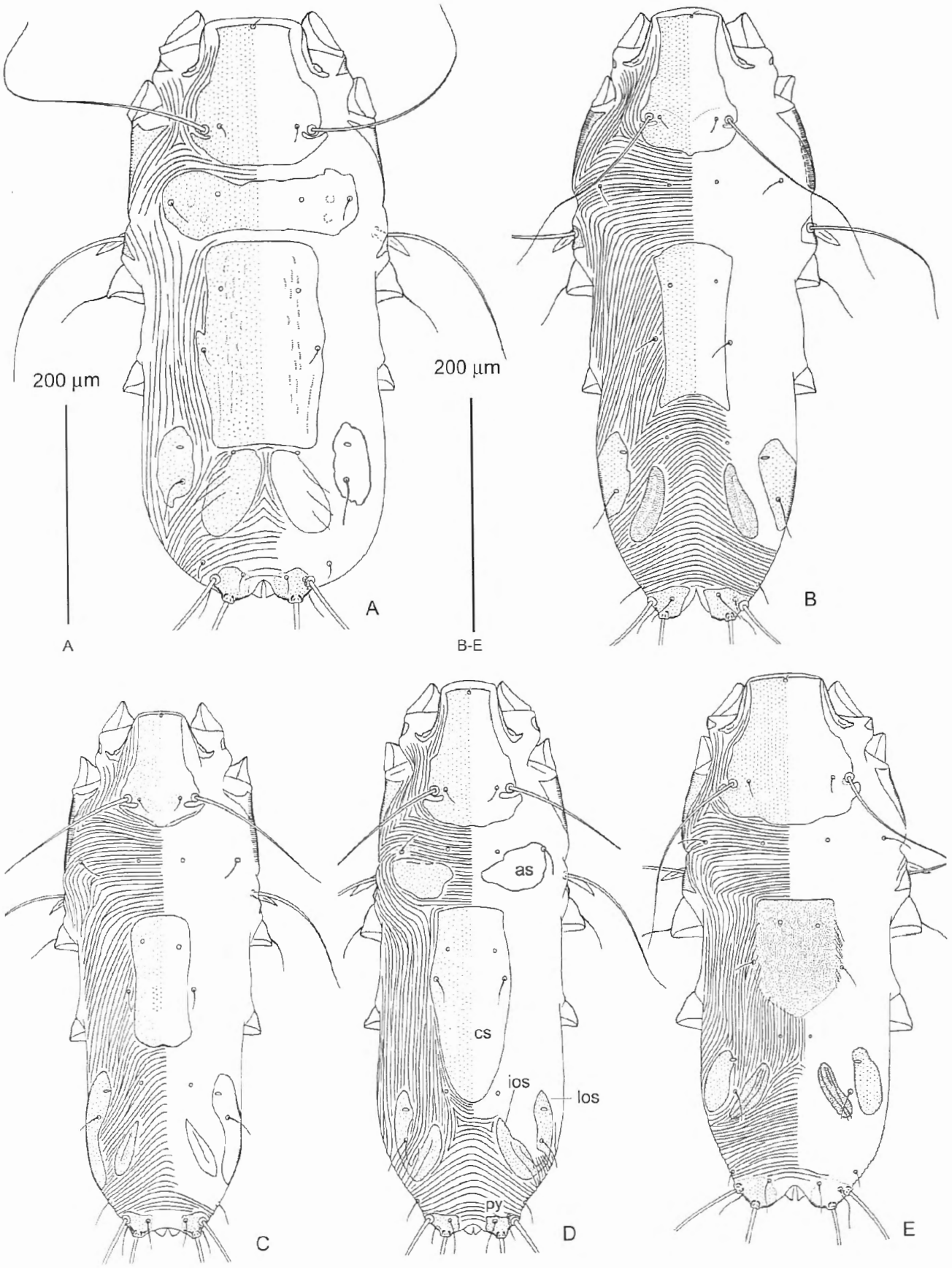

Fig. 19A-E – *Pteroherpus* females, dorsal view of idiosoma. **A**. *Pteroherpu trinoton*. **B**. *P. diploplax*. **C**. *P. dentilovus*. **D**. *P. krivolutskii*. **E**. *P. pallens*. Fragments of hysteronotal shield: as – anterior hysteronotal sclerite, cs –central sclerite, ios – inner fragment of opisthosomal sclerite, los – outer fragment of opisthosomal sclerite, py – pygidial sclerite.

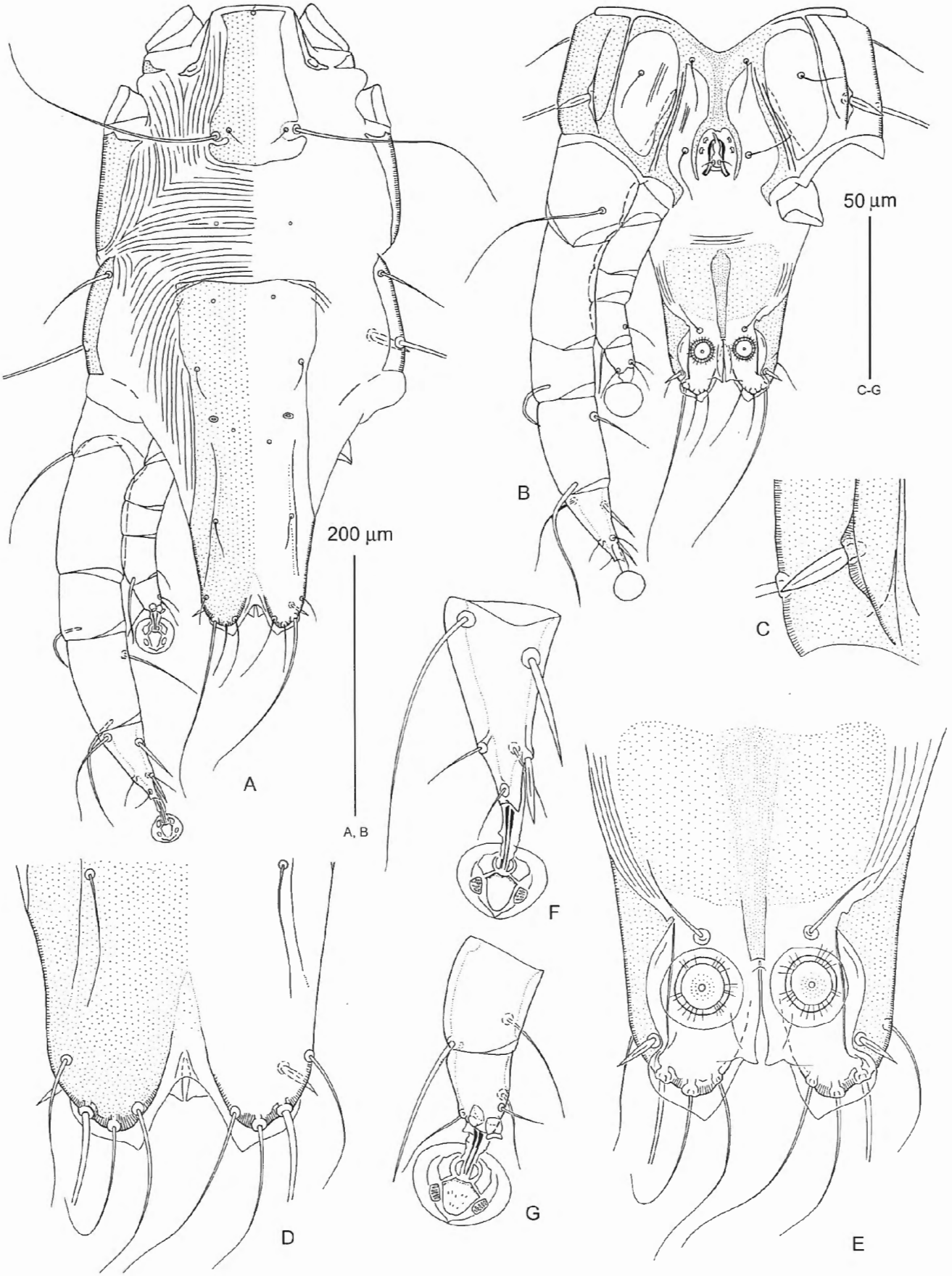

Fig. 20A-G – *Pteroherpus turdoides*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III. **G**. tarsus IV.

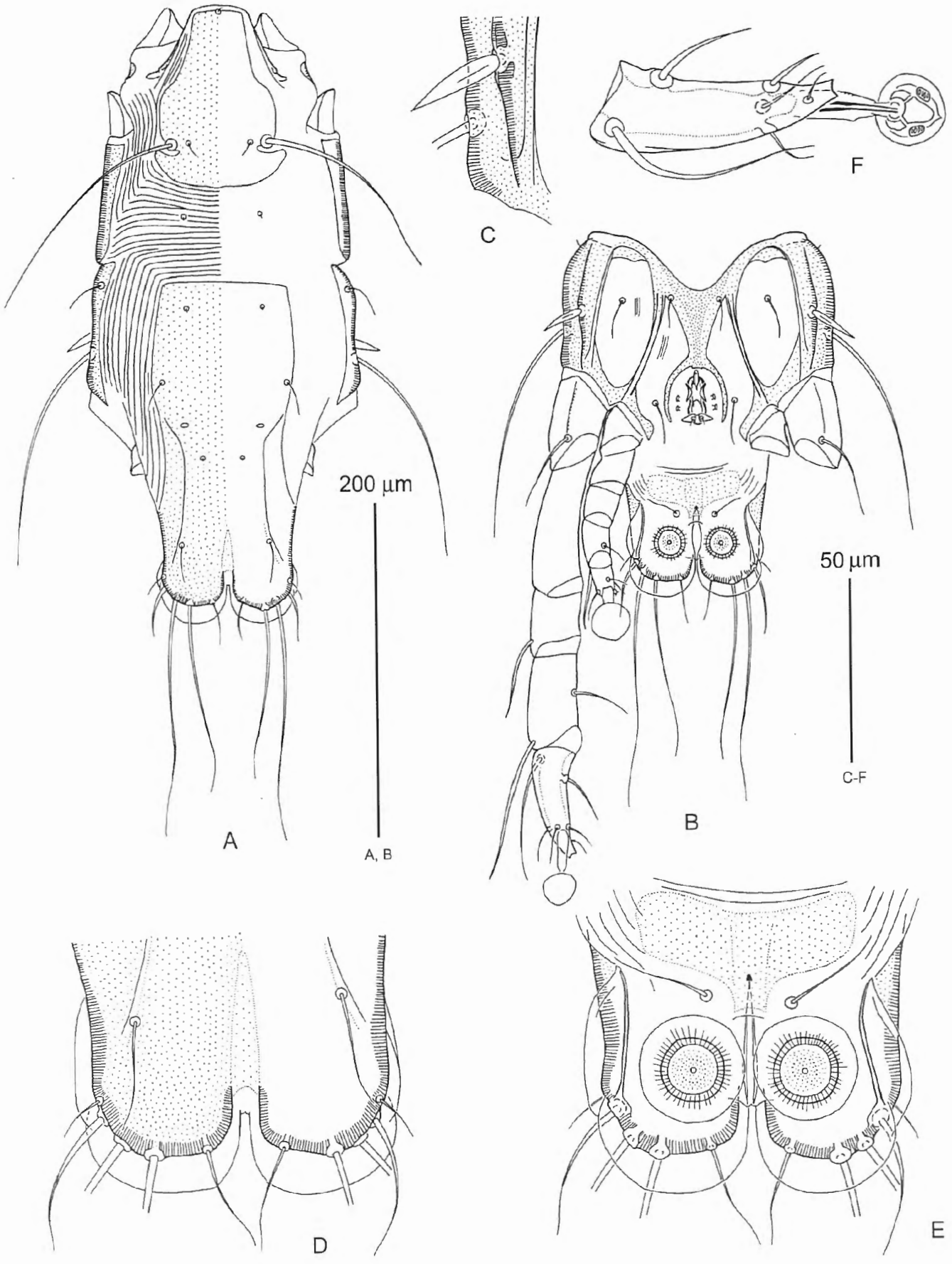

Fig. 21A-F – *Pteroherpus zosteropis*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

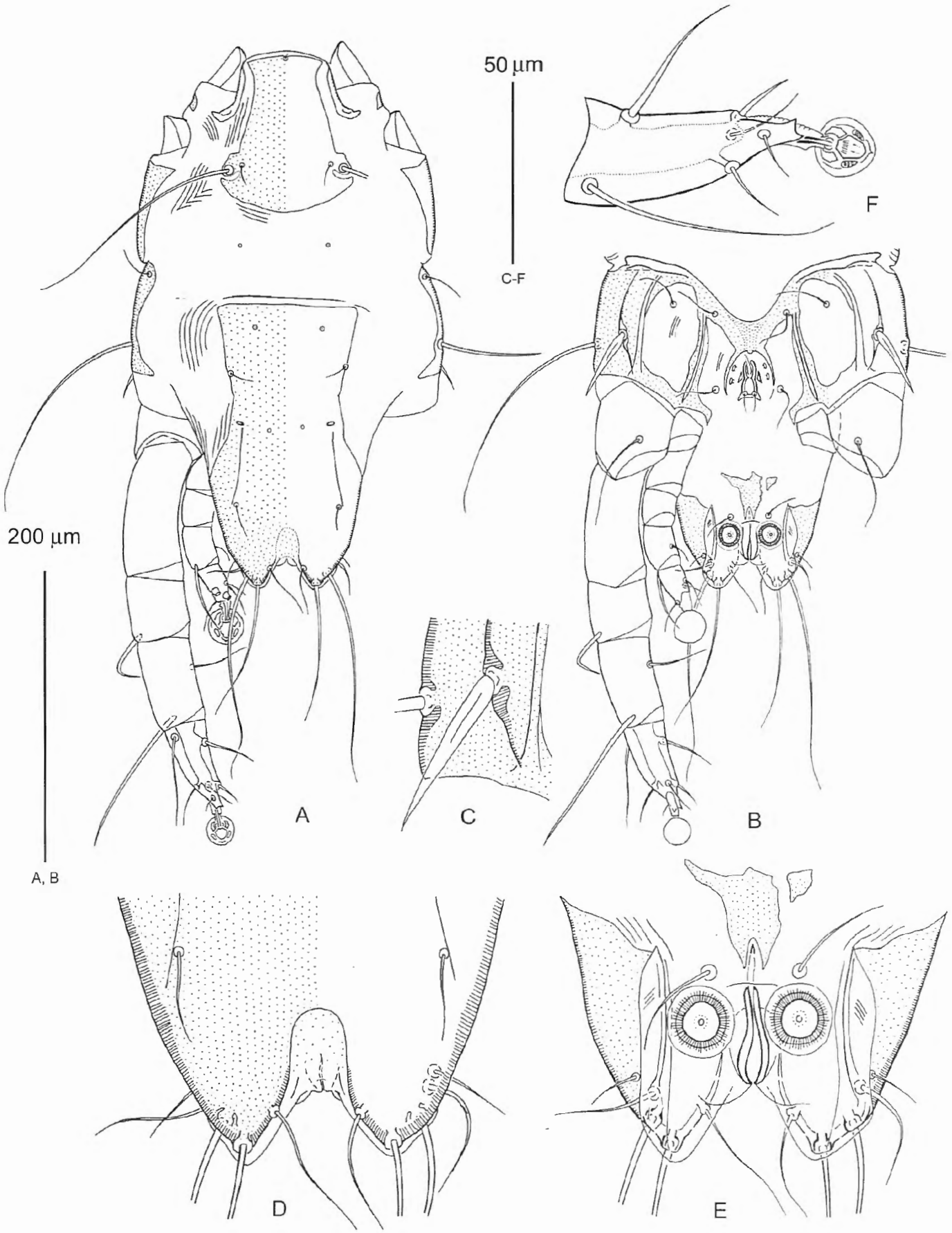

Fig. 22A-F – *Pteroherpus nicator*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III.

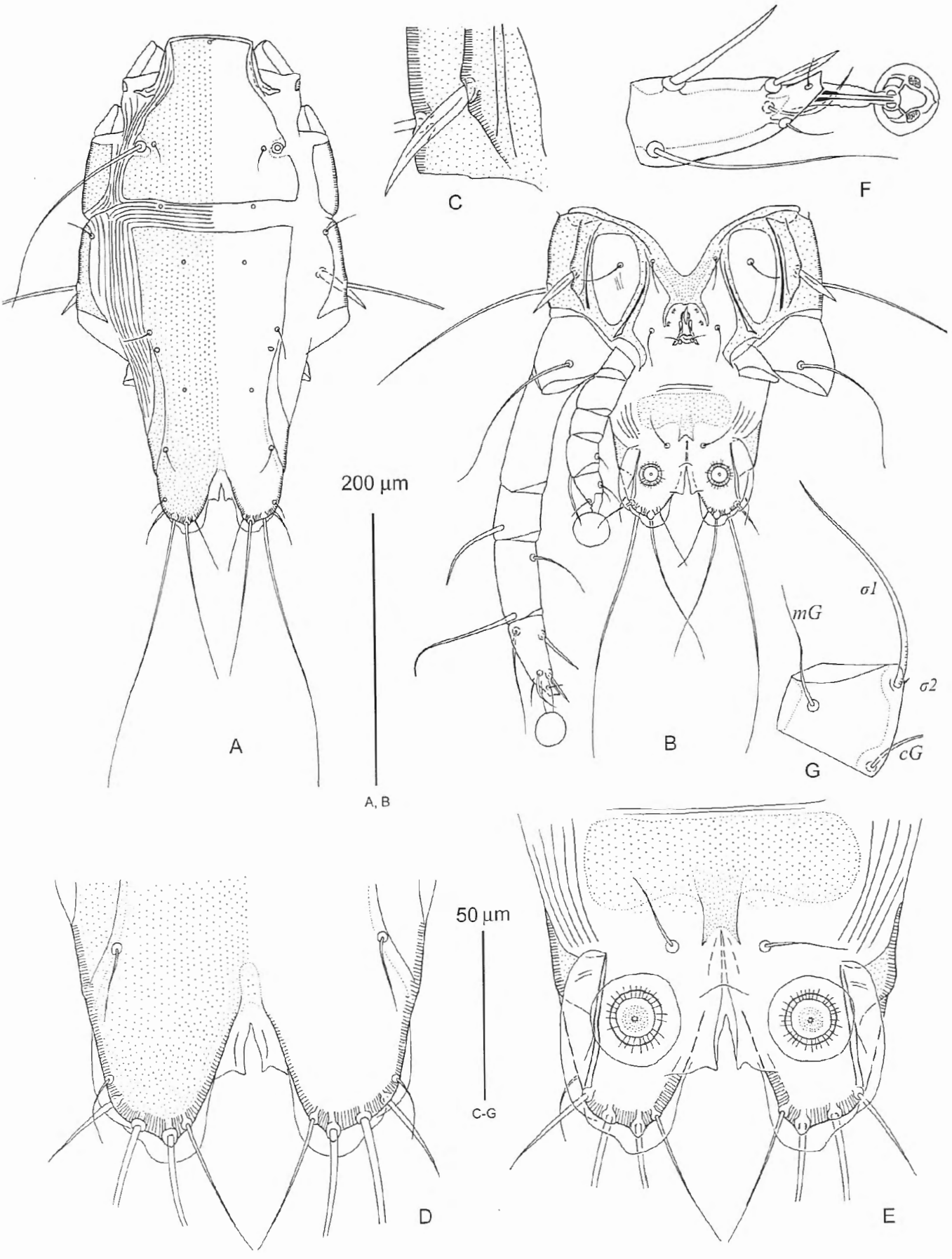

Fig. 23A-G – *Pteroherpus josephi*, male. **A**. Idiosoma, dorsal view. **B**. Hysterosoma, ventral view. **C**. Seta *c3*. **D**. Opisthosoma, dorsal view. **E**. Opisthosoma, ventral view. **F**. Tarsus III. **G**. Genu I.

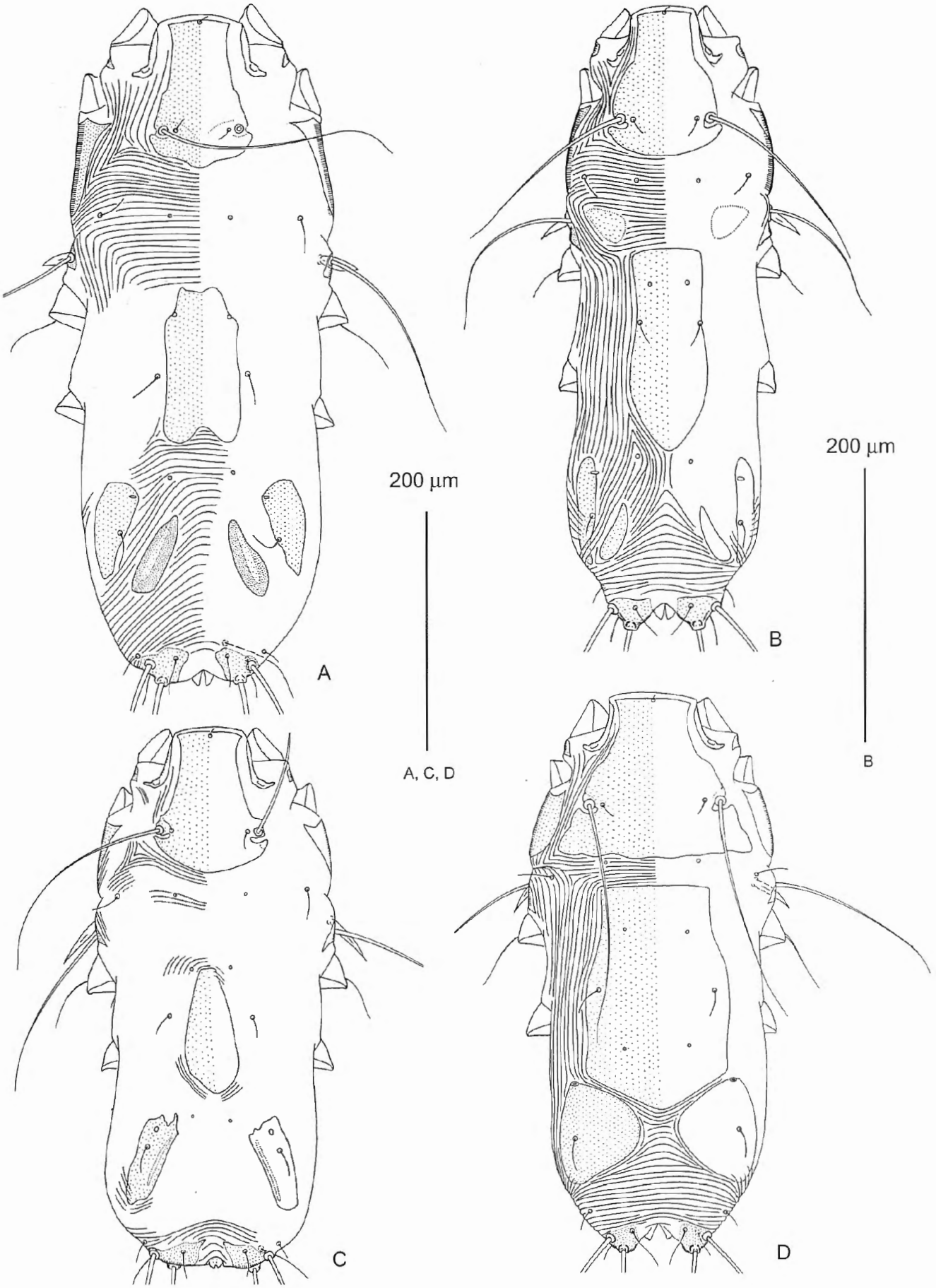

Fig. 24A-D – *Pteroherpus* females, dorsal view of idiosoma. **A**. *Pteroherpus turdoides*. **B**. *P. zosteropis*. **C**. *P. nicator*. **D**. *P. josephi*.