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## Ptyctimous mites (Acari, Oribatida) of Tanzania

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**ABSTRACT** — This monograph sums up the state of knowledge of ptyctimous mites fauna of Tanzania on the basis of literature data. Diagnoses of 61 species known from Tanzania (TAN) are given, 15 species have been redescribed on the basis of types and 22 species have been redescribed in earlier papers. One new species: *A. (H.) onkos* n. sp. is described. For each species a morphological diagnosis and geographic distribution are given. Eight species are new to TAN, including one new to the Afrotropical Region. Keys for identification of species and higher taxa are given. The fauna of ptyctimous mites of Tanzania (TAN) shows some differences and specificities as well as some similarities to the fauna of the nearby hotspot Madagascar with neighbouring islands (MAG), to that of the Afrotropical Region and even to that of distanced faunas of other zoogeographic regions of the southern hemisphere. The fauna of TAN comprises slightly more genera and subgenera (19) than that of MAG (18), although the number of species in MAG is much higher (111) than in TAN (61 species). The specious higher taxa are: *Pocsia*, *Plonaphacarus* and *Notophthiracarus*. *Pocsia* is represented by the highest number (10) of species found in the Afrotropical Region, and it is likely this subgenus originates from Tanzania (7 endemic species). *Plonaphacarus* is relatively rich in species in the Oriental Region. *Notophthiracarus* is even more speciose in the fauna of MAG and the Australasian Region. Over a half of the species known from Tanzania (37) were found in the material collected in 2010 from the Uluguru and Nguru Mts. Both these mountain ranges show some specificity of fauna. Two species occur only in the Nguru range, while as many as 7 species are endemites in the Uluguru.

**KEYWORDS** — oribatids; ptyctimous fauna; taxonomy; zoogeography; Tanzania

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### INTRODUCTION

Tanzania lies entirely in southern hemisphere in the central part of East Africa, as part of the Eastern Arc hotspot. It has mostly subtropical dry climate, while along the ocean and near large lakes — subtropical moist climate. The continental part is taken by the East African Highland laying at the altitudes of 900-1500 m asl. The interior part of the highland is occupied by vast plains. The main vegetation formation are savannahs sometimes transform-

ing into semi deserts, locally tropical forests are met. In the south-eastern part the highland shows mountain ranges, among others the Uluguru and Nguru Mountains in which levels of climate and vegetation depending on altitude occur. Dry savannah reaches up to 1500 m, followed by green tropical forest up to 4 000 m and above this altitude, on the Kilimanjaro and Meru Mts there are alpine meadows.

The new material of ptyctimous mites provided by V. Grebennikov in 2010 comes from the Uluguru and Nguru Mts. Both mountain ranges lie in east-

ern Tanzania and make the largest area of Eastern Afromontane Hotspot. The Uluguru Mts of the area 527 km<sup>2</sup>, reach the height up to 2 600 m, are at a distance of 200 kilometres from the Indian Ocean. The vegetation of the main range of Uluguru and neighbouring rocks shows much diversity. It includes dry forests in the coastal lowlands, transitional rainforests, sub-montane and montane forests. High endemism of the flora and fauna of these habitats is a consequence of their continuous development for the last 30 mln years and long-term isolation from the West and Central African forests for the last 10 mln years (Sloan *et al.* 2014). A few samples from the material studied come from the Nguru Mountains of the area of 34 000 ha and height up to 2 100 m, represented by lowland, submontane and montane forests with domination of rainforest.

A great expert of the Oribatida in Tanzania was Prof. S. Mahunka from Hungarian Natural History Museum of Budapest. He described the first 8 species of ptyctimous mites in 1983 (Mahunka 1983a, b) thereby starting a series of taxonomic studies of the fauna of this region. In subsequent works (1984, 1987, 1988, 1993) he described 15 other species. In 2001 Niedbała described his first species *P. styphelos* and later in 2014 and 2015 together with Dr J. Starý, they described 9 other species (Niedbała and Starý 2014a, b, 2015a, b, c, d). Over one third of the ptyctimous mite species has been described by Niedbała and Starý. Another one third of the species has been described by Mahunka. I tried to redescribe all these species as well as the species described by other authors on the basis of the types or comparative specimens. This monograph is intended to sum up the state of the fauna from this region on the basis of literature data. It is a taxonomic study aimed at determination of the species composition based on the redescription of the species described by different authors. One new species is described *A. (H.) onkos* n. sp. For each species a morphological diagnosis and geographic distribution are given. The fauna of Tanzania has been compared with that of the nearby hotspot of Madagascar with neighbouring islands and the entire fauna of Afrotropical Region.

The term “endemite” refers to the species found

at a single site or at a few sites but in the same locality. However, as the knowledge of ptyctimous mites fauna in the region is poor, the presence of given species only at one site does not have to mean that it is an endemite. Indigenous species occur only in Tanzania, but were found in a few mutually distant localities.

## LIST OF REDESCRIBED SPECIES

Below I give a list redescrived species and the papers in which the redescrptions were made.

**Niedbała 1992:** paratype of *Hoplophthiracarus aokii* Mahunka, 1983; paratype of *Hoplophthiracarus kugohi* Aoki, 1959; specimen from type series of *Steganacarus machadoi* Balogh, 1958; paratype of *Hoplophthiracarus peracutus* Mahunka, 1983 (syn. of *S. (S.) sol*); paratype of *Steganacarus tuberculosissimus* Mahunka, 1978; holotype of *Hoplophorella scapelata* Aoki, 1965 (syn. of *A. (H.) vitrinus*); paratype of *Hoplophorella raychaudhurii* Subías, Sarkar, 1984 paratype (syn. of *A. (H.) vitrinus*);

**Niedbała 1994:** paratype of *Hoplophorella cavernosa* Mahunka, 1987

**Niedbała 1998:** specimen from Seychelles of *Indotritia (Indotritia) heterotricha* Mahunka, 1984 (syn. of *I. krakatauensis*); paratype of *Rhysotritia reticulata* Mahunka, 1988.

**Niedbała 2001:** paratype of *Steganacarus sol* Balogh, 1958; holotype of *Hoplophthiracarus africanus* Mahunka, 1984 (syn. of *P. kugohi*); holotype of *Hoplophthiracarus wallworki* Mahunka, 1984, paratype of *Hoplophthiracarus marginatus* Mahunka, 1984; paratype of *Hoplophthiracarus magnus* Mahunka, 1988 (syn. of *A. sculptilis*); holotype of *Hoplophorella armata* Mahunka, 1986, holotype of *Hoplophorella subciliata* Mahunka, 1983; holotype of *Hoplophorella horrida* Mahunka, 1984 (syn. of *A. (H.) tuberculosissimus*); holotype of *Hoplophorella meszarosi* Mahunka, 1988 (syn. of *A. (H.) tuberculosissimus*); holotype of *Hoplophorella tuberosa* Mahunka, 1988 (syn. of *A. (H.) tuberculosissimus*); holotype of *Hoplophorella verrucosa* Mahunka, 1987 (syn. of *A. (H.) tuberculosissimus*); paratype of *Steganacarus andrei* Balogh, 1958.

Moreover in the years 2013 and 2014 I obtained the subsequent types of species described by Prof. S. Mahunka the courtesy of Dr E. Horváth, L. Forró or L. Dányi, Hungarian Natural History Museum, whose redescription is made in this paper: paratype of *Mesoplophora rostrata* Mahunka, 1988; holotype of *Mesotritia australis* Mahunka, 1984; paratype of *Afrotritia compacta* Mahunka, 1988; paratype of *Pocsia africana* Mahunka, 1983; holotype of *Pocsia heterotricha* Mahunka, 1988; paratype of *Indotritia (Afrotritia) nuda* Mahunka, 1988; paratype of *Pocsia secunda* Mahunka, 1983; holotype of *Pocsia trenta* Mahunka, 1983; paratype of *Rhysotritia reticulata* Mahunka, 1988; paratype of *Rhysotritia clavata spiculifera* Mahunka, 1991; paratype of *Hoplophthiracarus brevisetus* Mahunka, 1984; paratype of *Hoplophthiracarus marginatus* Mahunka, 1984; holotype of *Notophthiracarus lineolatus* Mahunka, 1993; holotype of *Steganacarus sacyae* Mahunka, 1983; holotype of *Hoplophorella armata* Mahunka, 1986; holotype of *Hoplophorella subciliata* Mahunka, 1983.

In 2014 Dr E. Horváth informed me that the types of three species described by Prof. S. Mahunka: *Hoplophthiracarus (Plonaphacarus) tanzicus* Mahunka, 1993; *Rhacaplacarus spiniferus* Mahunka, 1993; *Steganacarus (Rhacaplacarus) zicsii* Mahunka, 1988, unfortunately were not found in the collection.

## MATERIALS AND METHODS

Material of ptyctimous mites listed in review of species comes from 9 regions of Tanzania: 1. Uluguru Mts, 2. Nguru Mts., 3. Kilimanjaro Mt., 4. Tanga Region, 5. Dodoma Region, 6. Arusha Region, 7. Kingoma Region, 8. Morogoro Region, 9. Mt. Meru, 10. Mahale Peninsula (Fig. 1).

The soil and leaf litter samples were collected in 2010 by V. Grebennikov using a sifting method and extracted with a Winkler apparatus. The material was stored in vials in 80 % ethanol. All the measurements in the descriptions are expressed in micrometres.

The morphological terminology is based on Niedbała (2000).

On the basis of the redescrptions I present only the diagnoses of the species supplementing them with full measurements. Also for a few species from the material found in the material collected in 2010 full measurements are given. For the types re-described in the earlier works the measurements are given in shortened version.

In comparative analysis of the fauna of Tanzania I refer to the faunas of the other regions of the world (Niedbała 1998, 2000, 2001, 2004, 2006a, 2011).

In this paper I use sometimes the abbreviation TAN for Tanzania and the abbreviation MAG which refers to Madagascar and neighbouring islands (Comoros, Reunion, Mauritius and Seychelles). I do not give names of the authors of the descriptions of species in the list of references.

## LIST OF SPECIES

### ENARTHRONOTA Grandjean 1947

#### Arthroptyctima Grandjean, 1967

#### Hypochthonioidea Berlese, 1910

#### Mesoplophoridae Ewing, 1917

#### *Mesoplophora* Berlese, 1904

Subgenus *Mesoplophora* Berlese, 1904

*M. (M.) invisitata* Niedbała, 1983

*M. (M.) rostrata* Mahunka, 1988

Subgenus *Parplophora* Niedbała, 1986

*M. (P.) pulchra* Sellnick, 1928

#### MIXONOMATA Grandjean, 1969

#### Euptyctima Grandjean, 1954

#### Euphthiracaroidea Jacot, 1930

#### Oribotritiidae Grandjean, 1954

#### *Oribotritia* Jacot, 1924

*O. africana* Sary, 1993

#### *Mesotritia* Forsslund, 1963

*M. australis* Mahunka, 1984

#### *Indotritia* Jacot, 1929

subgenus *Indotritia* Jacot, 1929

*I. (I.) krakatauensis* (Sellnick, 1923)

*I. (I.) paraconsimilis* Niedbała, 2012

*I. (I.) tropica* Starý, 1993

subgenus *Afrotritia* Mahunka, 1988

*I. (A.) compacta* Mahunka, 1988

*I. (A.) nuda* Mahunka, 1988

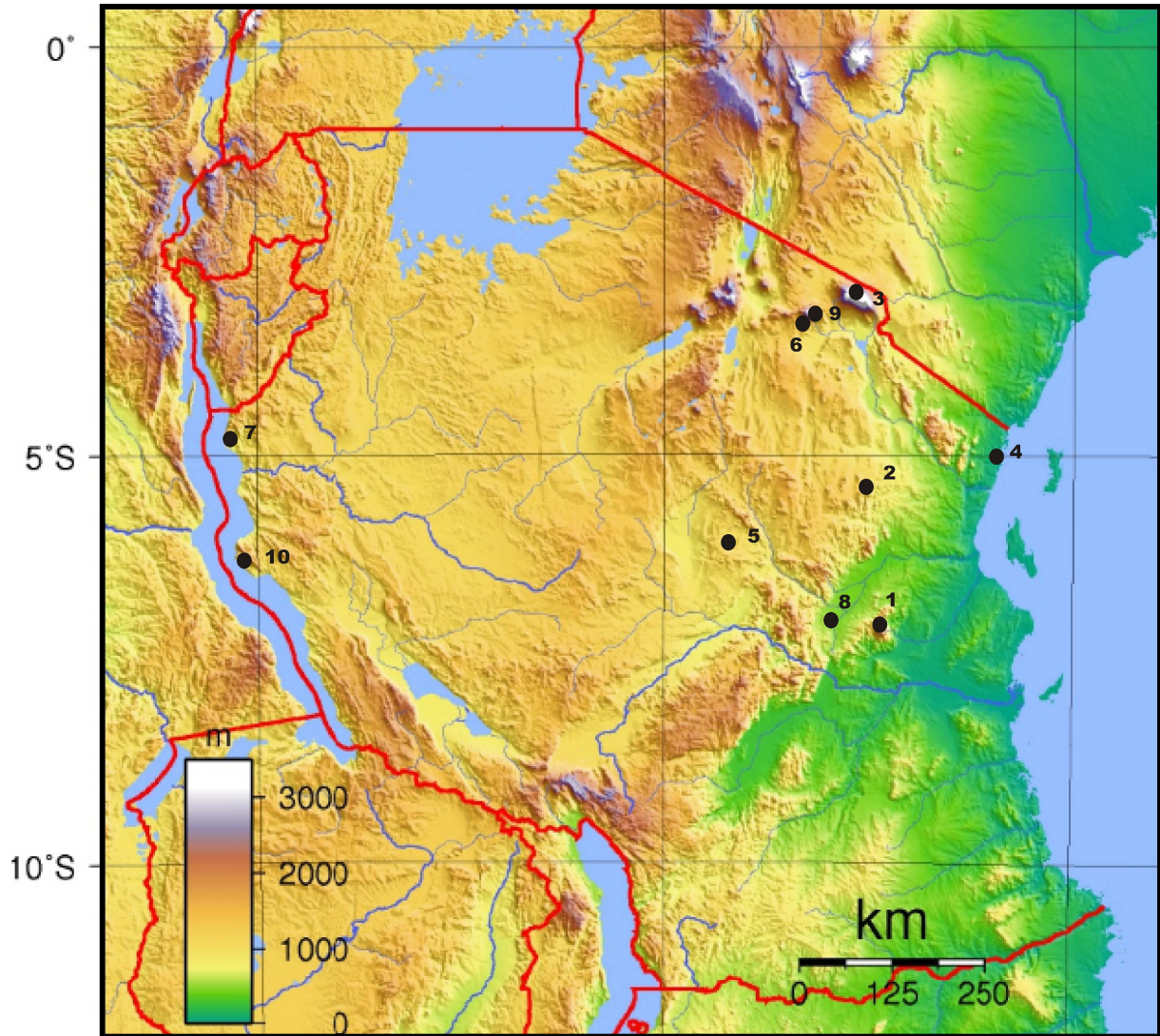


FIGURE 1: Areas (1-10) of collected samples in Tanzania.

**Euphthiracaridae Jacot, 1930****Euphthiracarus Ewing, 1917**Subgenus *Pocsia* Mahunka, 1983

- E. (P.) africanus* (Mahunka, 1983)  
*E. (P.) heterotrichus* (Mahunka, 1988)  
*E. (P.) kunsti* (Stary, 1988)  
*E. (P.) paraafricanus* Niedbała et Starý, 2014  
*E. (P.) parakunsti* Niedbała, 2014  
*E. (P.) secundus* (Mahunka, 1983)  
*E. (P.) trentus* (Mahunka, 1983)  
*E. (P.) uluguruensis* Niedbała et Starý, 2014

**Acrotrititia Jacot, 1923**

- A. ardua* (C.L.Koch, 1841)  
*A. rustica* (Niedbała, 1991)  
*A. reticulata* (Mahunka, 1988)  
*A. spiculifera* (Mahunka, 1991)  
*A. vestita* (Berlese, 1913)

**Microtrititia Märkel, 1964**

- M. diaphoros* Niedbała et Starý, 2014  
*M. parahauseri* Niedbała et Starý, 2014  
*M. tropica* Märkel, 1964

**Phthiracaroida Perty, 1841****Phthiracaridae Perty, 1841****Phthiracarus Perty, 1839**

- P. anonymus* Grandjean, 1933

**Steganacaridae Niedbała 1986****Plonaphacarus Niedbała, 1986**

- P. brevisetus* (Mahunka, 1984)  
*P. ecphylus* Niedbała, 2001  
*P. kugohi* (Aoki, 1959)  
*P. machadoi* (Balogh, 1958)  
*P. ngongi* Niedbała, 2001  
*P. paramachadoi* Niedbała et Starý, 2015  
*P. styphelos* Niedbała, 2001  
*P. tanzicus* (Mahunka, 1993)

**Hoplophthiracarus Jacot, 1933**

- H. ambiguus* Niedbała, 1982

**Steganacarus Ewing, 1917**Subgenus *Rhacaplacarus* Niedbała, 1986

- S. (R.) spiniferus* (Mahunka, 1993)  
*S. (R.) zicsii* Mahunka, 1988

Subgenus *Steganacarus* Ewing, 1917

- S. (S.) sol* Balogh, 1958  
*S. (S.) vestitus* Niedbała, 1983

- S. (S.) wallworki* (Mahunka, 1984)

**Austrophthiracarus Balogh et Mahunka, 1978**

- A. aokii* (Mahunka, 1983)

**Arphthacarus Niedbała, 1994**

- A. marginatus* Mahunka, 1984  
*A. sculptilis* (Niedbała, 1988)

**Protophthiracarus Balogh, 1972**

- P. mayottei* Niedbała, 2001  
*P. turianiensis* Niedbała et Starý, 2015  
*P. venustus* (Niedbała, 1983)

**Notophthiracarus Ramsay, 1966**

- N. armatus* (Mahunka, 1986)  
*N. cavernosus* (Mahunka, 1987)  
*N. lineolatus* Mahunka, 1993  
*N. quasiuluguruensis* Niedbała et Starý, 2015  
*N. sacyae* (Mahunka, 1983)  
*N. subciliatus* (Mahunka, 1983)  
*N. tuberculus* Niedbała et Starý, 2015  
*N. uluguruensis* Niedbała et Starý, 2015

**Atropacarus Ewing, 1917**subgenus *Hoplophorella* Berlese, 1923

- A. (H.) brevipilis* (Balogh, 1958)  
*A. (H.) curtisetosus* Niedbała et Starý, 2014  
*A. (H.) onkos* **n. sp.**  
*A. (H.) stenos* Niedbała et Starý, 2014  
*A. (H.) tuberculosissimus* (Mahunka, 1978)  
*A. (H.) vitrinus* (Berlese, 1913)

## DIGNOSES OF HIGHER TAXA AND REVIEW OF SPECIES

**Arthroptyctima Grandjean, 1967**

(Protoplophoridae, Archoplophoridae, Mesoplophoridae and Apoplophoridae)

The fauna TAN are represented by Mesoplophoridae only.

Diagnosis — Body ptychoid. "Notogaster" divided by transverse sutures and posterior part separated from anterior part by furrow and free or fused with ventral region. If not fused, distinct ventral plate shows genital and anal plates well separated (brachypyline). Larvae and nymphs ptychoid.

This group belong to the supercohort Enarthronota Grandjean, 1947.

### Mesoplophoridae Ewing, 1917

Mesoplophoridae: Aoki 1980c

Type genus: *Mesoplophora* Berlese, 1904

Diagnosis — Cuticle punctuated, smooth. "Notogaster" of adults represented by joined CDE segments with eight pairs of setae, segments FHP joined with adanal segments. Genital and anal plates separated; 7-9 pairs of genital setae, adults with transverse scissure dividing genital plates into two parts, anterior with one to two pairs of setae, posterior with five to eight pairs of setae; seven to 10 pairs of "ventral" setae; two to four pairs of anal setae.

Distribution — Semicosmopolitan.

#### *Mesoplophora* Berlese, 1904

*Mesoplophora*: Aoki 1980c, Subías 2004 *Phthiracarus* Berlese, 1920: Hammen 1959

Type species: *Mesoplophora michaeliana* Berlese, 1904

Diagnosis — Small species. Distance between genital and anal plates equal to half the length of anal plates; nine to 10 pairs of "ventral" setae; two to four pairs of anal setae; seven pairs of genital setae, formula 6+1 or 5+2; setation of palps: 0-2-0-3-12+1.

subgenus – *Mesoplophora* Berlese, 1904

*Mesoplophora* (*Mesoplophora*): Subías 2004

Type species: *Mesoplophora michaeliana* Berlese, 1904

Diagnosis — Two pairs of anal setae present.

Distribution — Semicosmopolitan.

#### *Mesoplophora* (*Mesoplophora*) *invisistata* Niedbała, 1983 (Fig. 2A-F)

*Mesoplophora* (*Mesoplophora*) *invisistata*: Niedbała 2001.

Diagnosis — Measurements of holotype: prodorsum: length 267, width 183, height 126; notogaster: length 364, width 303, height 222. Species

of medium size; colour yellow. Prodorsum with pointed rostrum; lateral carinae present; sensilli (*ss*) long with 8 thin spines; other setae smooth, interlamellar (*in*) setae longer than lamellar (*le*) and rostral (*ro*) setae; exobothridial (*ex*) setae equal to diameter of bothridia. Notogaster with 8 pairs of strong, rough setae, *c*<sub>1-3</sub> remote from anterior margin, setae *e*<sub>1</sub> and *e*<sub>2</sub> thicker than other setae. Ventral region with 9 pairs of ventral setae unequal in length; 7 pairs of genital setae with formula: 5+2; 2 pairs of anal setae present.

Localities in Tanzania: Nguru Mts. Species new for TAN.

Distribution — It is pantropical; oriental and afrotrropical species.

#### *Mesoplophora* (*Mesoplophora*) *rostrata* Mahunka, 1988 (Fig. 3A-G)

*Mesoplophora* (*Mesoplophora*) *rostrata*: Niedbała 2001.

Diagnosis — Measurements of the paratype: prodorsum: length 207, width 154, height 101, setae: *ss* 126, *in* 38, *le* 45, *ex* 23, diameter of bothridium 15; notogaster: length 308, width 257, height 197, setae: *c*<sub>1</sub>, *c*<sub>3</sub> 76, *d*<sub>3</sub> 56; length of genital and anal plates 71, distance between genital and anal plates 25.

Rather small-sized species; colour yellow. Prodorsum with pointed rostrum; lateral carinae present; sensilli long with 8-9 long cilia; other setae (except exobothridial) covered with small setae (invisible in paratype), *in*>*le*>*ro*; exobothridial setae longer than diameter of bothridia (not equal as in Figure 1 of Mahunka). Notogaster with 8 pairs of setae covered with small cilia, setae *c*<sub>1-3</sub> remote from anterior margin. Ventral region with 9 pairs of ventral setae; 7 pairs of genital setae with formula: 6+1; one pair of vestigial *h*<sub>2</sub> setae, and 2 pairs of anal setae present (not 3 pairs as in description and Figure 2 of Mahunka (1988)).

Locality in Tanzania: Tanga Region: Mahunka 1988, Niedbała 2001.

Distribution — Tanzania, perhaps endemic.

subgenus – *Parplophora* Niedbała, 1985 *Mesoplophora* (*Parplophora*): Subías 2004

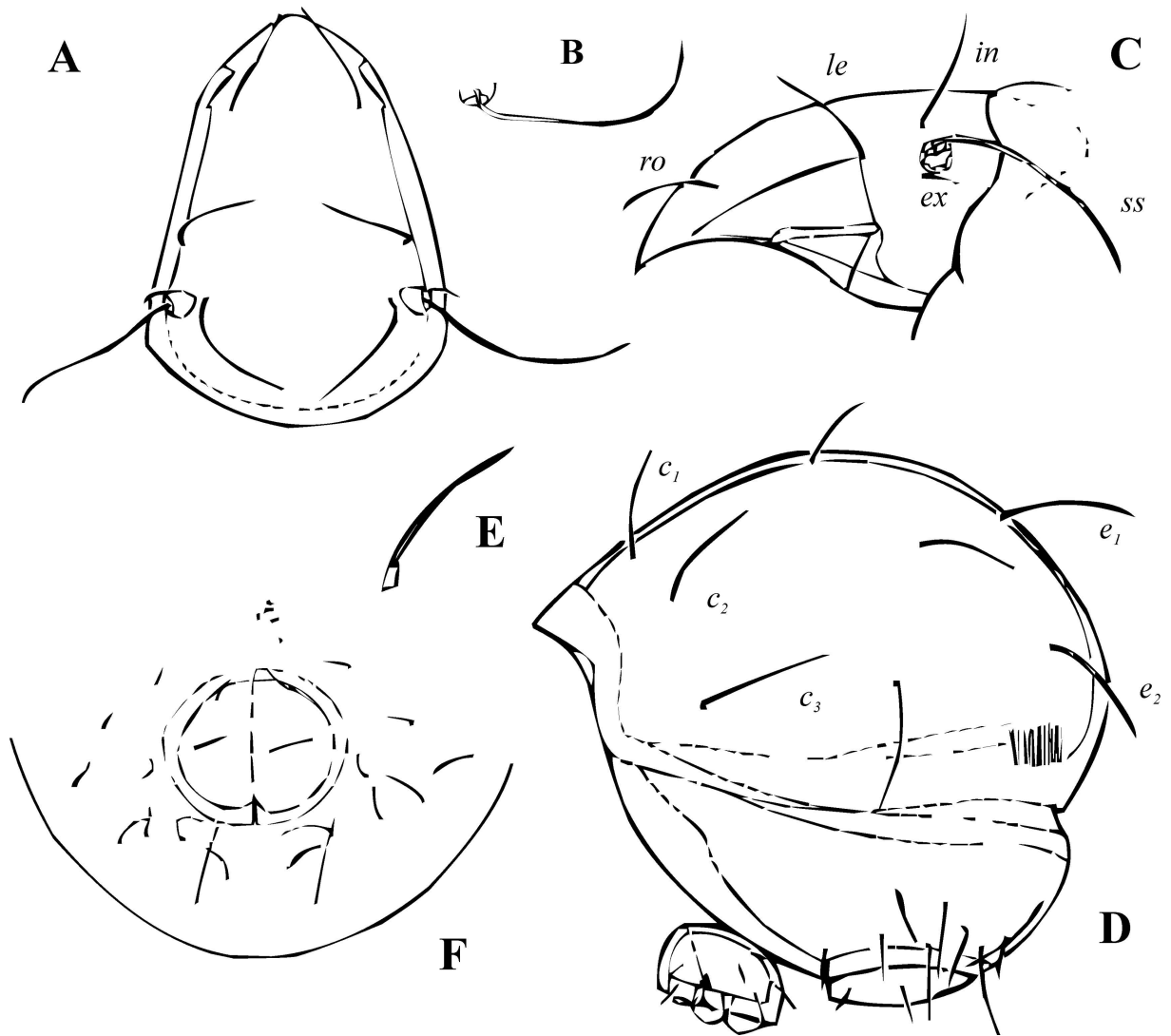


FIGURE 2: *Mesoplophora (Mesoplophora) invisistata* Niedbala, 1983 (holotype): A – prodorsum, dorsal view; B – sensillus; C – prodorsum, lateral view; D – opisthosoma, lateral view; E – seta  $e_2$ ; F – posterior part of ventral side.



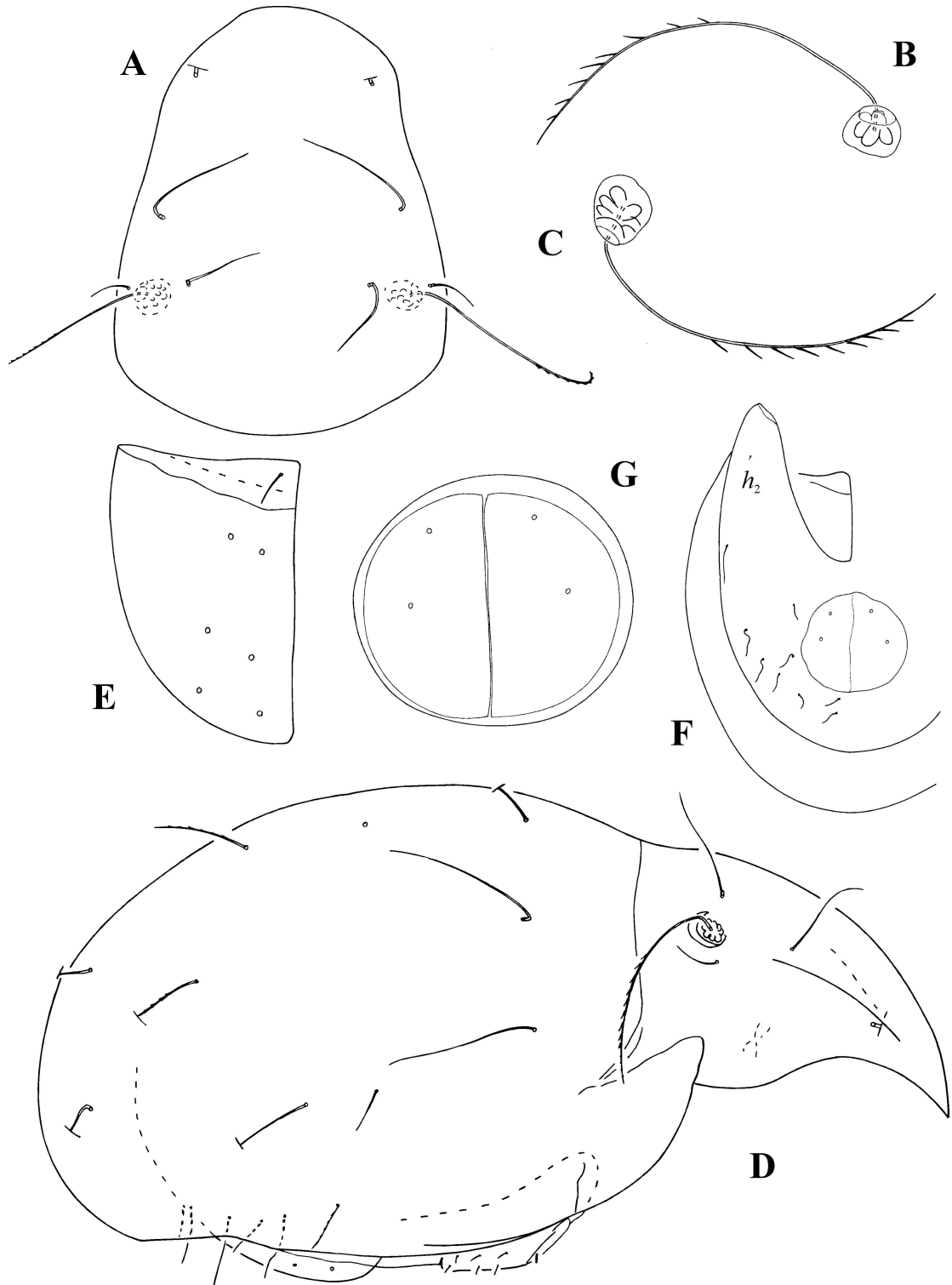


FIGURE 3: *Mesoplophora (Mesoplophora) rostrata* Mahunka, 1988 (paratype): A – prodorsum, dorsal view; B – right sensillus; C – left sensillus; D – lateral view of body; E – right genital plate; F – right fragment of ventral plate; G – anal plates.

Type species: *Mesoplophora pulchra* Sellnick, 1928

Diagnosis — Three or four pairs of anal setae present

Distribution — Semicosmopolitan.

***Mesoplophora (Parplophora) pulchra*  
Sellnick, 1928  
(Fig. 4A-C)**

Diagnosis — Measurements of the specimens from sample TAN-014: Prodorsum: length 182, width and height 144, setae: *ss* 73, *in* 68, *le* and *ro* 63, *ex* 10; notogaster: length 242, width 202, height 156, setae: *c*<sub>1</sub> and *e*<sub>1</sub> 73, *c*<sub>3</sub> 43; genital plate 56×28, anal plate 33×35, distance between genital and anal plates 20.

Small-sized species; colour yellow. Prodorsum with pointed rostrum; sensilli long, filiform with head slightly fusiform; other setae simple; interlamellar setae the longest but thinner than lamellar and rostral setae; exobothridial setae the finest, shorter than diameter of bothridia. Setae of notogaster, except setae *c*<sub>2</sub> and *c*<sub>3</sub> covered with some spines; setae *c*<sub>2</sub> the thinnest and more remote from anterior border than setae *c*<sub>1</sub> and *c*<sub>3</sub>. Ventral region; formula of epimeral region: 3-1-3-1; 10 pairs of ventral setae present; 7 pairs of genital setae with formulae: 5: 2 and 3 pairs of anal setae present. Chaetome of legs: I: 0-3-3(1)-4(1)-16(3), II: 0-4-3(1)-3(1)-13(1), III: 2-2-2(1)-2(1)-10, IV: 2-2-0-8; tarsi monodactylous.

Locality in Tanzania: Uluguru Mts. Species new to TAN and Afrotropical Region.

Remark — All characters of the specimen from TAN-014 are the same as in the description. I found only setae *c*<sub>3</sub> of notogaster finest and shortest than other notogastral setae.

Distribution — Western Palaearctic, distributed in Central Europe, Maghreb countries, Anatolian and Iranian areas. It is surprising to find this Western Palaearctic species in Tanzania.

**Euptyctima Grandjean, 1967**

(Euphthiracaroida and Phthiracaroida)

Neither posterior notogastral furrows nor a brachypyllic ventral plate displaying separated genital and anal plates. Genital and anal plates joined,

large and wide or narrow. Larvae and nymphs not ptychoid.

This group belong the supercohort Mixonomata Grandjean, 1969.

**Euphthiracaroida Jacot, 1930**

Diagnosis — Body considerably compressed laterally, genitoaggenital and anoadanal regions narrow, V-shaped.

**Oribotritiidae Grandjean, 1954**

Oribotritiidae: Grandjean 1954, 1967, Balogh and Mahunka 1983, Aoki 1980a, Mahunka 1990a  
Plesiotritiinae: Walker 1965

Type genus: *Oribotritia* Jacot, 1924

Diagnosis — Cuticular surface of body finely punctate or porose. Bothridia without tracheoles or brachytracheae; ventral region divided by genitoaggenital and/or anoadanal scissures, or fusion of genital and aggenital as well anal and adanal plates only partial; interlocking triangle absent; transversal cleft (*trv*) rarely absent.

***Oribotritia* Jacot, 1924**

*Oribotritia*: Grandjean 1967, Märkel 1964, Aoki 1980a, Balogh and Mahunka 1983, Mahunka 1990a, Niedbała 2008b, Subías 2004

*Tritia* Berlese, 1883 nom preaoc. par Risso 1826

*Plesiotritia* Walker, 1964: Grandjean 1967

*Berndotritia* Mahunka, 1987: Niedbała 2000

*Philotritia* Mahunka, 1988: Niedbała 1998a

Type species: *Hoplophora decumana* Auct. non C.L. Koch, 1836

Diagnosis — Prodorsum without median crista and with one or two pairs of lateral carinae; bothridial scales situated dorsal to bothridia; posterior median apodeme absent; sensilli setiform; interlamellar and rostral setae in median position, lamellar setae situated near bothridia. Notogaster with 14 pairs of setae, setae *ps*<sub>1</sub> dorsal to setae *ps*<sub>2-3</sub>; vestigial setae *f*<sub>1</sub> anteriorly of setae *h*<sub>1</sub>; one pair of lateral opisthonotal gland openings (*gla*) and five pairs of lyrifissures *ia*, *im*, *ip* *ips*, *ih* present. Ventral region;

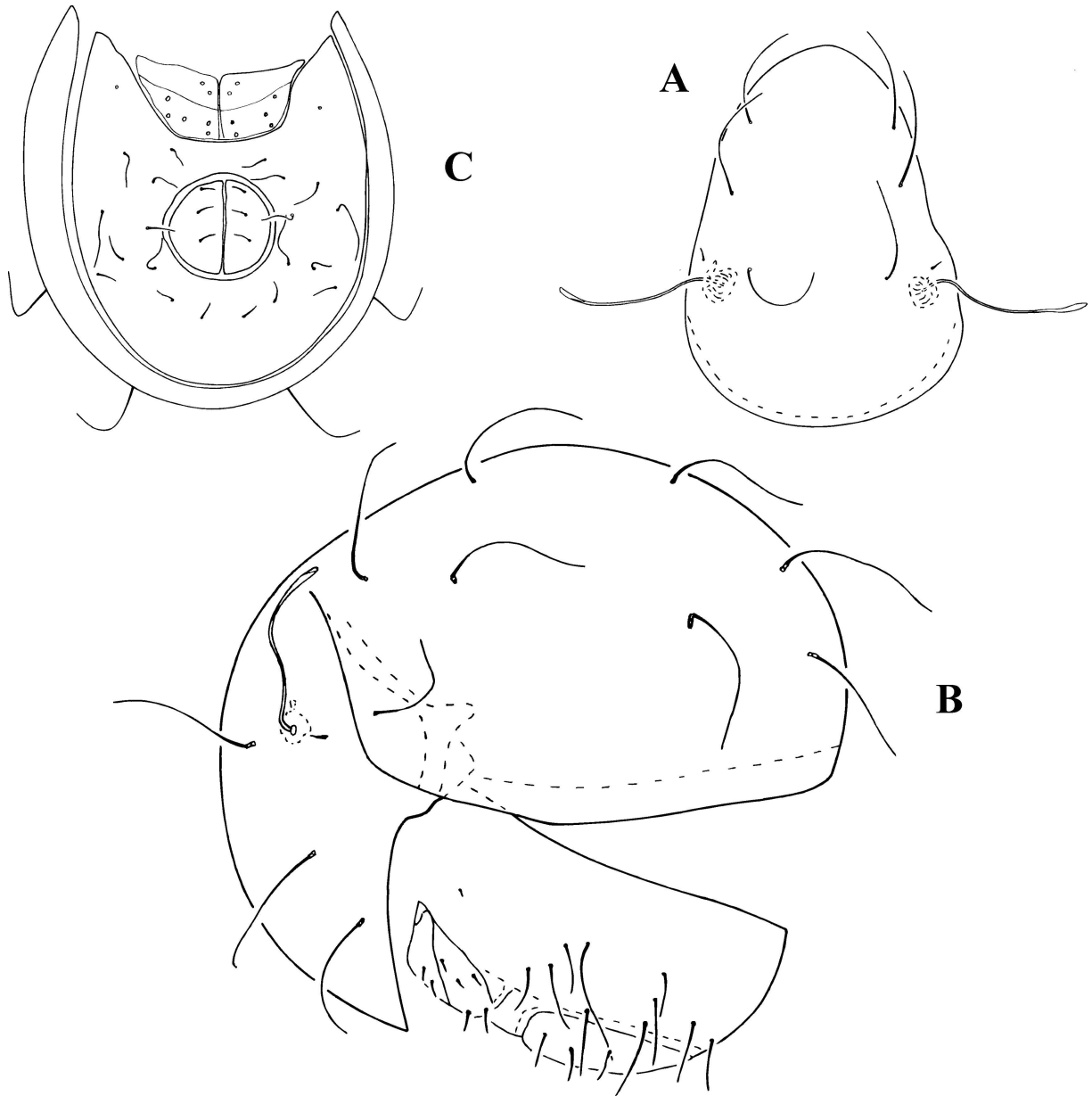


FIGURE 4: *Mesoplophora (Parplophora) pulchra* Selnick, 1928 (specimen from sample TAN-014): A – prodorsum, dorsal view; B – opisthosoma, lateral view; C – ventral side.

genitoaggenital and anoadanal scissures well developed, oblique anogenital cleft visible; infracapitulum of stenarthric type; setae *h* of mentum usually longer than distance between them; normal formula of epimera: 3-0-2-2; genital plates with narrowed, free extension anteriorly; palps 5-segmented with setal formula: 0-(2-4)-0-(2-3)-9 and one solenidion on tarsi. Legs trochanters I and II with one pair of setae, trochanters III and IV with three pairs of setae; femora I with anterodorsal hooked spine; neotrichy on tarsi I and II; solenidia present on genua IV; setae *d* on tibiae IV reduced and coupled with solenidion; tarsi heterotridactylous.

Distribution — Semicosmopolitan.

***Oribotritia africana***  
**Starý, 1993**  
**(Fig. 5A-F)**

*Oribotritia bicarinata* Niedbała, 1993 syn. by Niedbała 1998.

*Oribotritia africana*: Niedbała 2001.

Diagnosis — Measurements: length prodorsum 563-580, length notogaster 1203-1280.

Large-sized species; colour yellow. Prodorsum with two lateral carinae equal in length; sensilli long, smooth, gradually tapering; interlamellar and rostral setae short, erect, robust and barbed; exobothridial setae minute. Notogaster with rather short setae, setae *c*<sub>3</sub> longest and situated near anterior margin, seta *c*<sub>1</sub> and *c*<sub>2</sub> remote from margin. Ventral region with 9 pairs of genital and two pairs of aggenital setae, 2 pairs of anal and 2 pairs of adanal setae present, lyrifissures *iad* posteriad of *ad*<sub>2</sub> setae. Oblique cleft *trv* shorter than distance between setae *g*<sub>8</sub>-*g*<sub>9</sub>. Palps 5-segmented with setal formulae: 0-2-0-2-9 or 0-3-0-3-9 and one solenidion on tarsi. Chaetome of legs: I: 1-4-5(2)-5(1)22(3), II: 1-4-4(1)-3(1)-18(3), III: 3-23(1)-3(1)-14(3), IV: 3-2-2(1)-3(1)-10(3); tarsi heterotridactylous.

Localities in Tanzania: Mt. Meru: Starý 1993, Niedbała 1998; Uluguru and Nguru Mts.

Remark — One specimens from TAN-028 has two aggenital setae *ag*<sub>2</sub> but only on the right side (Fig. 5F).

Distribution — Central part of Afrotropical Region.

***Mesotritia* Forsslund, 1963**

*Mesotritia*: Märkel 1964, Aoki 1980a, Mahunka 1990a, Niedbała 2008b

*Mesotritia* (*Mesotritia*) Märkel, 1964: Balogh and Balogh 1992, Subías 2004

*Mesotritia* (*Entomotritia*) Märkel, 1964: Aoki 1980a

*Mesotritia* (*Peutritia*) Märkel, 1964: Balogh and Balogh 1992

Type species: *Mesotritia testacea* Forsslund, 1963.

Diagnosis — Prodorsum without median crista, lateral carinae present; posterior median apodeme present; bothridial scales situated below bothridia; rostral setae arising medially from rostrum, lamellar and interlamellar setae arising laterally. Notogaster with 14 pairs of setae, terminal sinus or fissure on posterior part; vestigial setae *f*<sub>1</sub> anteriorly of setae *h*<sub>1</sub>; one pair of lateral opisthotal glands openings (*gla*) and 5 pairs of lyrifissures *ia*, *im*, *ip*, *ips*, *ih* present. Ventral region; mentum with setae *h* considerably longer than distance between them; palps 3-segmented, usually with setal formula: 2-2-8 and one solenidion; epimeral formula usually: 3-1-2-2; genitoaggenital and anoadanal scissures well developed; anogenital cleft absent; genital setae never situated anteriorly of *kag* tectum of genitoaggenital plates. Legs heterotridactylous; neotrichy on tarsi I and II; famuli bifurcate; solenidia of tarsi II without coupled setae; genua IV without solenidia; seta *d* on tibiae IV long, not coupled with solenidion.

Distribution — Semicosmopolitan.

***Mesotritia australis***  
**Mahunka, 1984**  
**(Fig. 6A-F)**

Diagnosis — Measurements of the holotype: prodorsum: length 313, width 222, height 101, setae: *ss* 45, *in* 56, *le* 58, *ro* 63, *ex* 43; notogaster: length 586, width 498, height 414, setae: *c*<sub>1</sub> 71, *c*<sub>1</sub>/*c*<sub>1</sub>-*d*<sub>1</sub>=0.4, *h*<sub>1</sub> 40, *ps*<sub>1</sub> 43; genital and aggenital plates 157×48, anal and adanal plates 273×30.

Rather large-sized species; body light brown. Prodorsum with simple lateral carinae; sensilli with

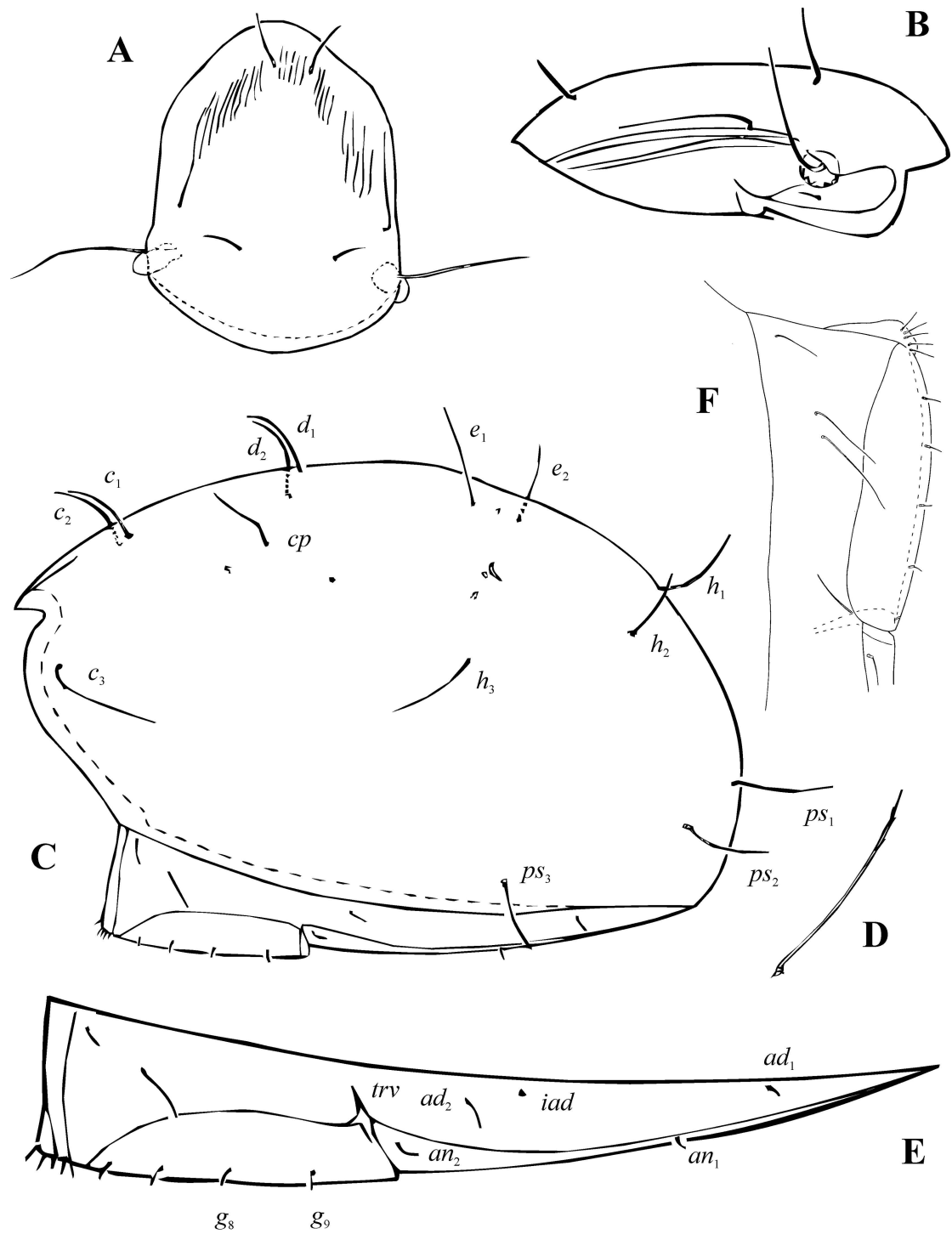


FIGURE 5: *Oribotritia africana* Stary, 1993 (holotype of conspecific *Oribotritia bicarinata* Niedbała, 1993): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – seta  $h_1$ ; E – left side of ventral region; F – right side of genital and aggenital region of specimen from TAN-028.

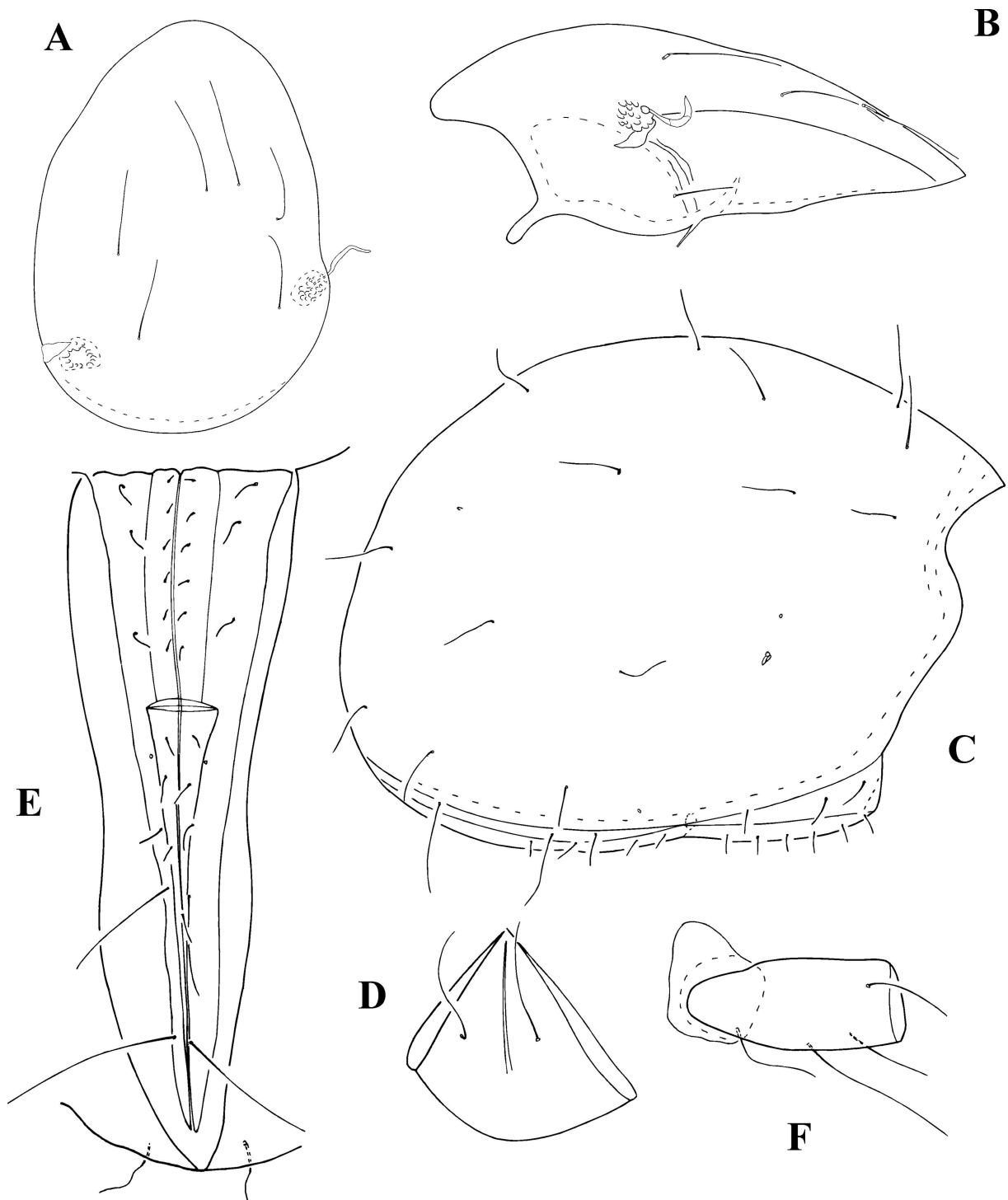


FIGURE 6: *Mesotritia australis* Mahunka, 1984 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – ventral region; F – trochanter and femur of leg I.

narrow stalk and smooth, fusiform head; rostral setae contiguous, anterior of lamellar setae, *le-le>in-in*. Notogastral setae fine and short ( $c_1 < \frac{1}{2}c_1 - d_1$ ); setae of row *c* remote from anterior margin, setae  $c_1$  more, setae  $c_3$  less remote. Ventral region; 6 pairs of genital setae (in the text Mahunka gives 6 pairs but in his Fig. 50 – 5 pairs are marked); 3 pairs of aggenital setae (in the text Mahunka gives 3 pairs but in his Fig. 50 – 4 pairs are marked); 3 pairs of anal and 3 pairs of adanal setae; setae  $ad_1$  and  $ad_2$  longer than  $ad_3$ ; lyrifissures *iad* anterior of  $ad_3$  setae. Tarsi of legs heterotridactylous.

Locality in Tanzania: Dodoma Region: Mahunka 1984, Niedbała 1998.

Distribution — Tanzania, perhaps endemic.

***Indotritia* Jacot, 1929**

*Indotritia*: Märkel 1964, 1968, Walker 1965, Aoki 1980a, Mahunka 1990a

*Indotritia (Indotritia)*: Mahunka 1988, Subías 2004

Type species: *Indotritia krakatauensis* Sellnick, 1923

Diagnosis — Median carina absent; one or two pairs of lateral carinae present; bothridial squamae situated above bothridia; sensilli usually setiform, smooth; lamellar setae arising posteriorly, rostral setae in normal position; posterior median apodeme absent. Notogaster with 14 pairs of setae; a terminal sinus present; vestigial setae  $f_1$  situated anterior to  $h_1$  setae; openings of opisthonal glands (*gla*) and lyrifissures: *ia, im, ip, ips, ih* present. Ventral region; setae *h* of infracapitular mentum usually very long, considerably longer than distance between them; palps 5-segmented, but its genua and femora not hinged, palpal setal formula: 0-2-0-2-9+1; genitoaggenital scissure incomplete, these plates are fused anteriorly; internal transversal apodeme present; anogenital cleft present, but mostly short, genital plates with an extension anteriorly. Legs heterotridactylous, with normal chaetome; solenidia on tarsi II with coupled setae; solenidia on genua IV present; setae *d* on tibiae IV reduced and coupled with the solenidia.

Distribution — Pantropical, relatively uncommon in northern hemisphere: Nearctic and Palaearctic Regions.

subgenus – ***Indotritia* Jacot, 1929**

Anoanal plates separate by complete suture

***Indotritia (Indotritia) krakatauensis*  
(Sellnick, 1923)  
(Fig. 7A-E)**

*Indotritia heterotricha* Mahunka, 1984 syn. by Niedbała 1998.

*Indotritia septentrionalis* Mahunka, 1987 syn. by Niedbała 1998.

non *Indotritia tropica* Sary, 1993 syn. by Niedbała 1998.

*Indotritia (Indotritia) krakatauensis*: Niedbała 2001, Niedbała & Ermilov 2014.

Diagnosis — Measurements of holotype of *I. heterotricha*: prodorsum: length 431, height 158; notogaster: length 846, height 616. Large-sized species; body colour brown. Prodorsum with double lateral carinae; sensilli long, narrow and smooth; other setae relatively short, fine; interlamellar setae bent posteriorly; exobothridial setae vestigial. Gastrotomic setae also relatively short ( $c_1/c_1 - d_1 = 0,42$ ) but covered with small spines. Setal formula of palps: 0-2-0-2-9(1); cleft *trv* shorter than the distance between setae  $g_8$  and  $g_9$ ; 9 pairs of genital; 2 pairs of aggenital setae (rarely 3 or even 4 pairs); 2 pairs of anal and 2 pairs of adanal setae, lyrifissures *iad* anteriorly of setae  $ad_2$ . Chaetome of legs (without tarsi I and II): I: 1-3-5(2)-5(1), II: 1-4-4(1)-3(1), III: 3-2-3(1)-3(1)-14, IV: 3-2-2(1)-3(1)-11; all tarsi heterotridactylous.

Localities in Tanzania: Uluguru Mts. Species not yet recorded from TAN.

Distribution — Pantropical species.

***Indotritia (Indotritia) paraconsimilis*  
Niedbała, 2012  
(Fig. 8A-F)**

*Indotritia paraconsimilis*: Niedbała & Ermilov 2012, Niedbała & Starý, 2015b.

Diagnosis — Measurements of holotype: prodorsum: length 535, width 404, height 202; notogaster: length 1141, width 929, height 808. Large-sized species; colour brown. Prodorsum with double lateral carinae; sensilli long, filiform; other setae fine,

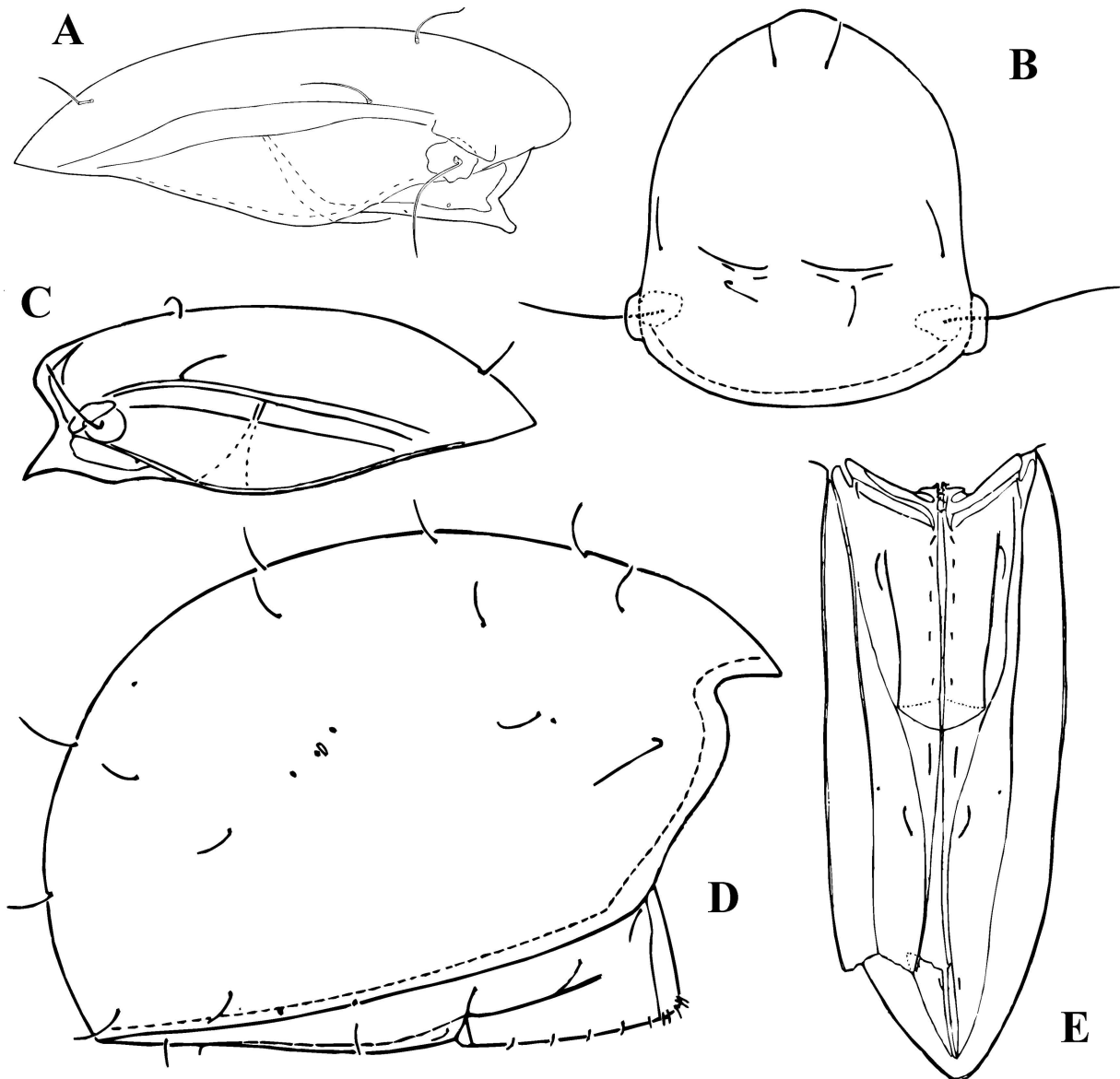


FIGURE 7: *Indotritia* (*Indotritia*) *krakatauensis* (Sellnick, 1923), A (specimen from TAN-003); B-E (specimen from Papua): A – prodorsum, lateral view; B – prodorsum, dorsal view; C – prodorsum, lateral view; D – opisthosoma, lateral view; E – ventral region.



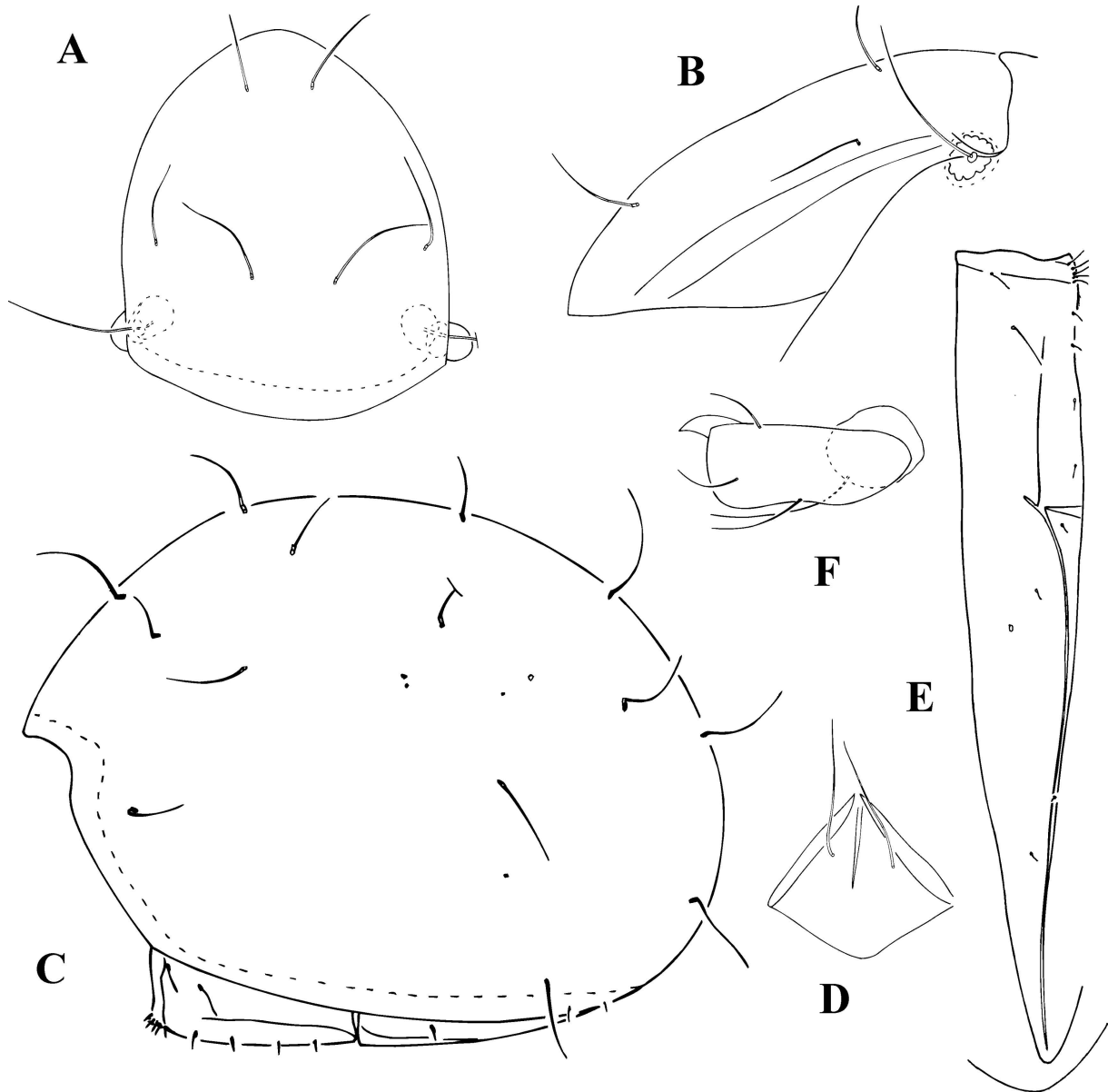


FIGURE 8: *Indotritia (Indotritia) paraconsimilis* Niedbała, 2012 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – right side of ventral region; F – trochanter and femur of leg I.

rather short, rostral and interlamellar erect, rough,  $ss > in > le = ro$ ; exobothridial setae vestigial. Notogaster with rather short ( $c_1/c_1-d_1=0.8$ ), rigid and rough setae; setae  $c_1$  and  $c_2$  remote from anterior margin, setae  $c_3$  near margin. Ventral region; setae  $h$  of mentum very long, considerably longer than distance between them; genital plates each with 9 setae, with formula 4: 5, two pairs of aggenital setae present; 2 pairs of minute anal and 2 pairs of minute adanal setae present, lyrifissures *iad* laterally and posteriorly of  $ad_2$  setae. Legs: tarsi heterotridactylous, femora I with distinct distal spine, chaetome (without tarsi): I: 1-4-5(2)-5(1), II: 1-4-4(1)-5(1), III: 3-2-3(1)-4(1), IV: 3-2-2(1)-3(1).

Remark — I correct the characters of ventral region (Fig. 8E) of the original Figure 1C (Niedbała & Ermilov 2012).

Localities in Tanzania: Uluguru Mts.: Niedbała & Starý (2015b); Uluguru and Nguru Mts.

Distribution — Afrotropical species known only from Ethiopia and Tanzania.

***Indotritia (Indotritia) tropica***  
**Starý, 1993**  
**(Fig. 9A-F)**

*Indotritia tropica* Starý, 1993.

Diagnosis — Measurements of one specimen from sample TAN-028: prodorsum: length 444, height 162, width 358, setae:  $ss$  202,  $in$  139,  $le$  134,  $ro$  101,  $ex$  33; notogaster: length 828, height 687, width 677, setae:  $c_1$  and  $ps_3$  119,  $c_1/c_1-d_1=0.7$ ,  $h_1$  and  $ps_1$  190; genitoaggenital plate  $252 \times 136$ ; anal and adanal plates  $404 \times 101$ . Measurements of one small specimen from sample TAN-019: prodorsum: length 293, height 111; notogaster: length 489, height 409, setae  $c_1$  106,  $c_3$  207,  $c_1/c_1-d_1=0.7$ .

Specimens measured by Starý (1993) are rather similar to my smaller specimens.

Rather large-sized species; colour brown. Prodorsum with fine striation in anterior part; two lateral carinae present, superior carinae slightly shorter than inferior; sensilli long, setiform, smooth similar to lamellar setae; interlamellar and lamellar setae long, erect, spiniform, covered with small

cilia; exobothridial setae short;  $ss > in > le = ro > ex$ . Notogaster with stout, rigid, of medium length setae, similar to interlamellar setae ( $c_1/c_1-d_1=0.7$ ), only setae  $c_3$  and  $ps_3$  more fine; setae  $c_1$  and  $c_2$  remote from anterior margin, setae  $c_3$  situated near anterior border; setae  $ps_3$  situated posteriorly of  $an_1$  and  $ad_1$  setae. Ventral region; setae  $h$  of mentum only slightly longer than distance between them; genitoaggenital plate with 9 setae, 5 setae in progenital position; aggenital setae  $ag_2$  longer (43) than setae  $ag_1$  (23); anal plates with 2 and adanal plates also with 2 setae, setae  $ad_2$  long, considerably longer than minutes other setae of anal and adanal plates, lyrifissures *iad* situated laterally and slightly posteriorly of  $ad_2$  setae. Chaetome of legs without tarsi: I: 1-3-4(2)-5(1), II: 1-4-4(1)-3(1), III: 3-2-3(1)-3(1), IV: 3-2-2(1)-3(1); all tarsi heterotridactylous.

Remark — All (10) specimens from sample TAN-028 has short setae  $c_3$ ; 2 specimens from TAN-019 short setae, 1 specimen long setae; 2 specimens from TAN-018 has short setae, 6 specimens long setae.

I too hastily synonymized *Indotritia tropica* Starý, 1993 with *Indotritia krakatauensis* (Sellnick, 1923) on the basis of the presence of 2 anal and 2 adanal setae (Niedbała 1998). Meanwhile *I. krakatauensis* has small interlamellar setae usually bent posteriorly, shorter setae of notogaster and setae  $ps_3$  situated anteriorly of  $an_1$  and  $ad_1$  setae.

Three similar species has setae  $h$  of mentum considerably longer than distance between them; *I. bellingeri* Niedbała et Schatz, 1996 from Neotropical Region and *I. eksteeni* Niedbała, 2006 from South Africa (Niedbała 2006a) has setae  $ps_3$  situated anteriorly of  $an_1$  and  $ad_1$  setae and setae  $ad_2$  similar in length as other anal and adanal setae; *I. paraconsimilis* Niedbała, 1912 from Ethiopia have setae  $ad_2$  minute.

It is interesting that south American species *I. bellingeri* is found in Zambia (Ermilov and Niedbała 2013).

Localities in Tanzania: Tanga Region: Starý, 1993, Niedbała 1998; Uluguru and Nguru Mts.

Distribution — Afrotropical species known only from Tanzania.

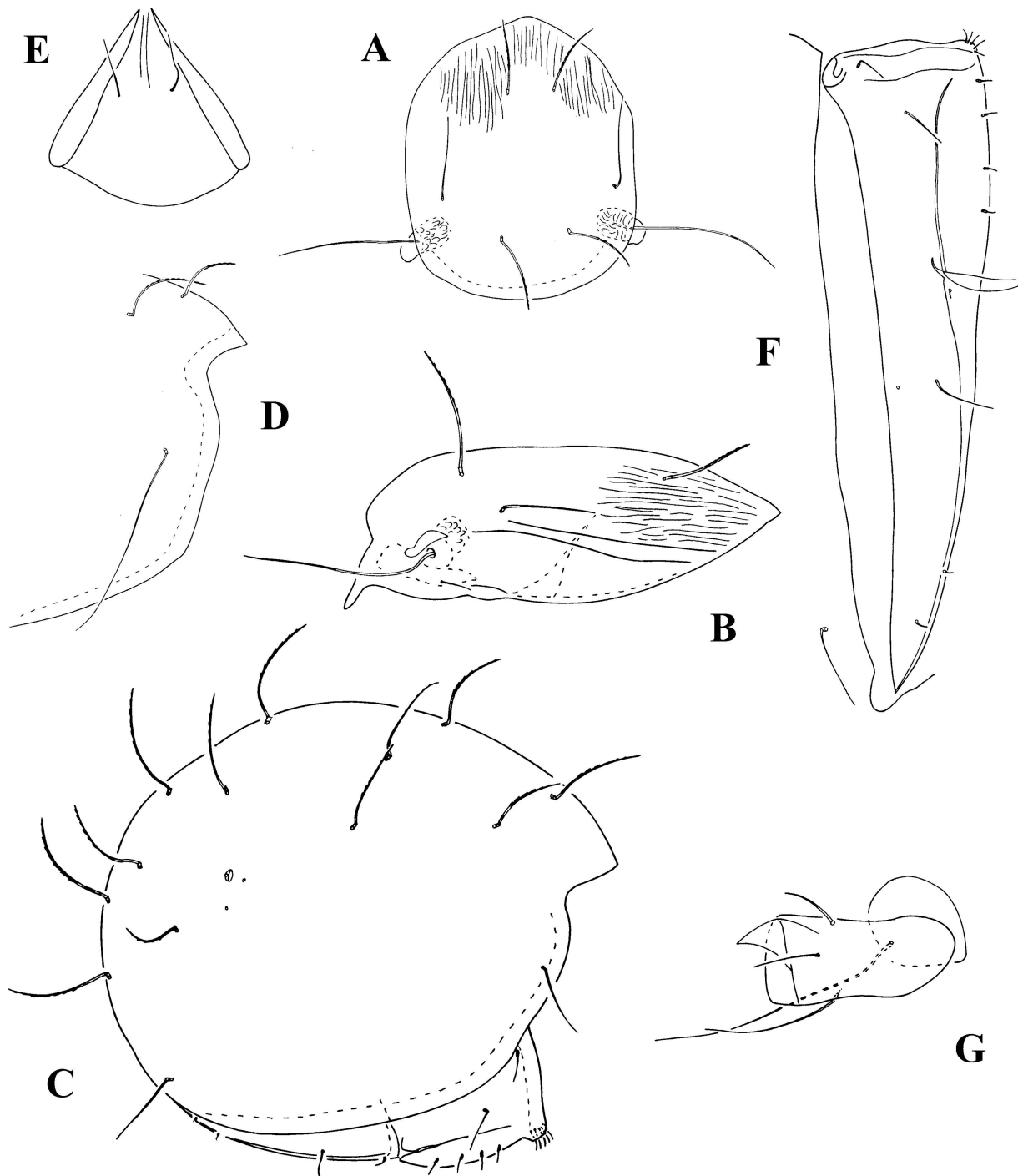


FIGURE 9: *Indotritia (Indotritia) tropica* Starý, 1993 (specimen from sample TAN-028, only D specimen from sample TAN-019): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – anterior part of notogaster, lateral view; E – mentum of subcapitulum; F – right side of ventral region; G – trochanter and femur of leg I.

subgenus – *Afrotritia* Mahunka, 1988

Suture between anal and adanal plates incomplete.

Distribution — Afrotropical Region

***Indotritia (Afrotritia) compacta*  
Mahunka, 1988  
(Fig. 10A-D)**

*Indotritia (Afrotritia) compacta*: Niedbala 2001.

Diagnosis — Measurements of paratype: prodorsum: length 263, height 71, width 207, setae: *ss* 94, *in* 53, *le* 61, *ro* 40; notogaster: length 464, height 353, width 358, setae:  $c_1$  53,  $c_1/c_1-d_1=0.6$ ,  $h_3$  and  $ps_1$  56; genitoaggenital plate  $252 \times 131$ ; anoadanal plate  $475 \times 111$ .

Species of medium size; colour brown. Prodorsum with two parallel lateral carinae, ventral one somewhat longer than dorsal; sensilli long, setiform, smooth; interlamellar and rostral setae erect, strong, rough, lamellar setae fine, procumbent; exobothridial setae minute, comparative length  $ss > le > in > ro > ex$ . Notogaster with rigid, stout, fairly long ( $c_1 < c_1-d_1$ ) setae covered sparsely with small spines along whole length, setae  $c_1$  and  $c_2$  remote from anterior margin, setae  $c_3$  longer and near margin. Ventral region; setae  $h$  of mentum considerably longer than distance between them, formula of five segmented palps: 0-2-0-2-8(1), epimeral formula: 3-0-2-2; genitoaggenital plates with 9 pairs of genital setae (5 in progenital position) and 2 aggenital setae, oblique cleft *trv* very short, shorter than distance between  $g_8$  and  $g_9$  setae, only anterior part of anal plates are separated from adanal plates, 2 distanced setae in anal position and 2 distanced adanal setae present; lyrifissures *iad* situated laterally of  $ad_2$  setae. Legs chaetome (without tarsi): I: 1-4-5(2)-5(1), II: 1-4-4(1)-3(1), III: 3-2-3(1)-3(1), IV: 3-2-2(1)-3(1); all tarsi heterotridactylous.

Locality in Tanzania: Tanga Region: Mahunka 1988, Niedbala 1998.

Distribution — Afrotropical species known from central part.

***Indotritia (Afrotritia) nuda*  
Mahunka, 1988  
(Fig. 11A-G, 12A-F)**

*Indotritia nuda* Mahunka, 1988.

*Indotritia usumbarensis* Starý, 1993 syn. by Niedbala 1998.

Diagnosis — Measurements of paratype: prodorsum: length 444, height 167, width 394, setae: *ss* 152, *in* 30, *le* 56, *ro* 20; notogaster: length 949, height 596, width 606, setae:  $c_1$  25,  $c_1/c_1-d_1=0.2$ ,  $c_3$  56,  $ps_1$  30,  $ps_2$  51,  $ps_3$  48; genitoaggenital plate  $252 \times 131$ ; anoadanal plate  $475 \times 111$ . Measurements of specimen from TAN-016: prodorsum: length 465, width 358, height 146, setae: *ss* 121, *in* 13, *le* 28, *ro* 6; notogaster: length 949, width 606, height 576, setae:  $c_1$  104,  $c_1/c_1-d_1=0.5$ ,  $h_1$  88,  $ps_1$  76; genitoaggenital plate  $177 \times 101$ , anoadanal plate  $444 \times 91$ .

Large-sized species; colour brown. Prodorsum with two closely running carinae; sensilli long, smooth, gradually tapering; all other setae minute; rostral setae do not reach the end of rostrum;  $ss > le > in > ro$ ; exobothridial setae vestigial. Notogastral setae small and smooth, setae  $c_1$  remote from anterior margin more than setae  $c_2$  and  $c_3$ . Ventral region; setae  $h$  of mentum considerably longer than the distance between them, 9 pairs of genital and 2 or 3 pairs of aggenital setae present, setae  $ag_2$  slightly longer than setae  $ag_1$ . Cleft *trv* small, as long as distance between setae  $g_8-g_9$ ; 2 pairs of anal and 2 pairs of adanal setae separated far from each other; lyrifissures *iad* situated antiaxially of  $ad_2$  setae. Palps five segmented with formula: 0-2-0-2-9(1); all tarsi heterotridactylous. Chaetome of legs without tarsi: I: 1-3-5(2)-5(1), II: 1-4-4(1)-3(1), III: 3-3-3(1)-3(1), IV: 3-2-2(1)-3(1); all tarsi heterotridactylous.

Remark — Mahunka (1988) drawing his new species did not observe that the anoadanal suture is incomplete, as demonstrated in the present paratype (Fig. 10A-F). I asked Dr. Starý to check anoadanal plates in *Indotritia usumbarensis* and having examined the holotype he has confirmed that the anoadanal suture was also incomplete (Fig. 11G). The specimens from TAN-016 have longer notogastral setae (Fig. 12C) and 2 specimens 3 pairs of aggenital setae.

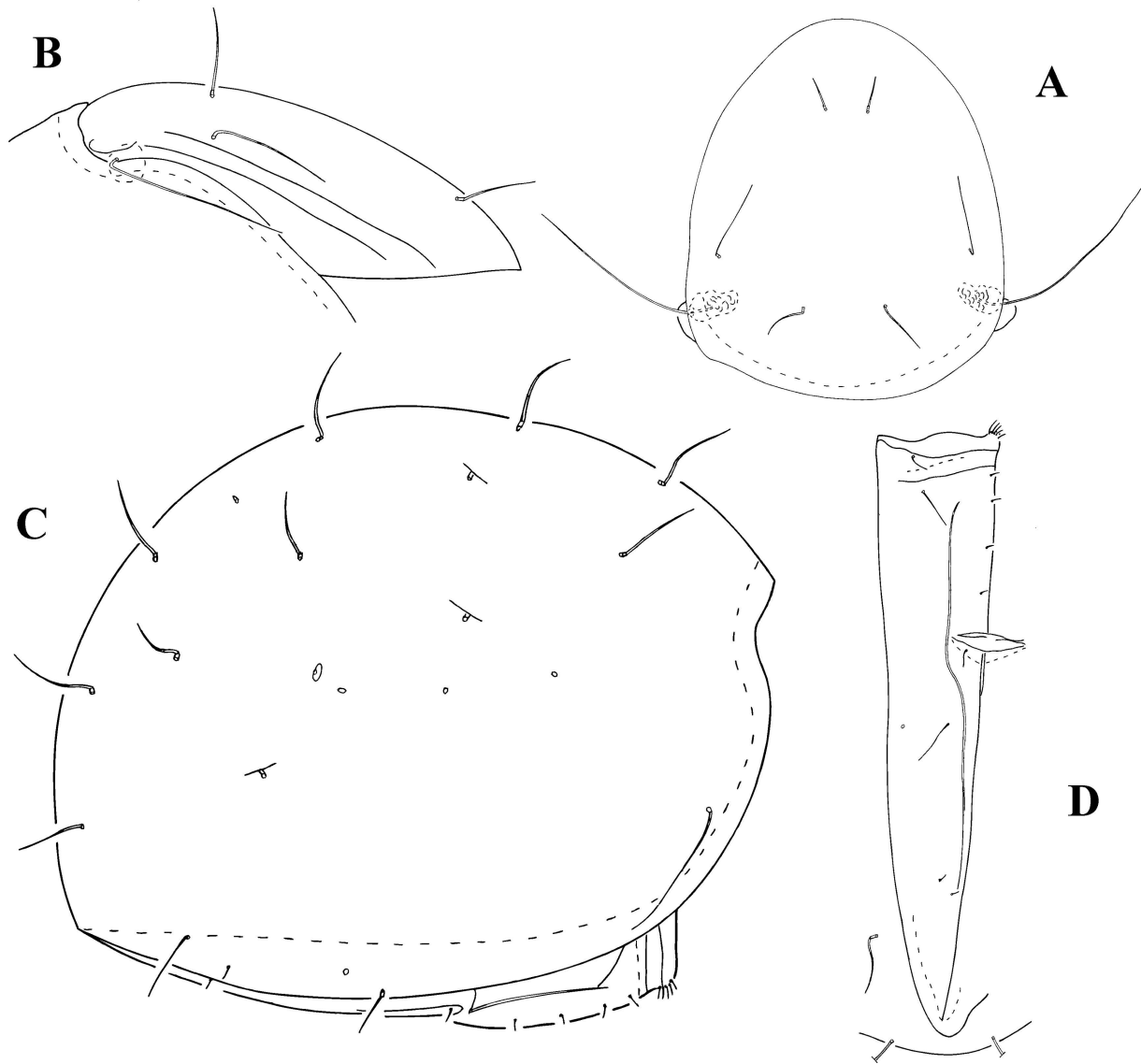


FIGURE 10: *Indotritia (Afrotritia) compacta* Mahunka, 1988 (paratype): A - prodorsum, dorsal view; B - prodorsum, lateral view; C - opisthosoma, lateral view; D - right side of ventral region.

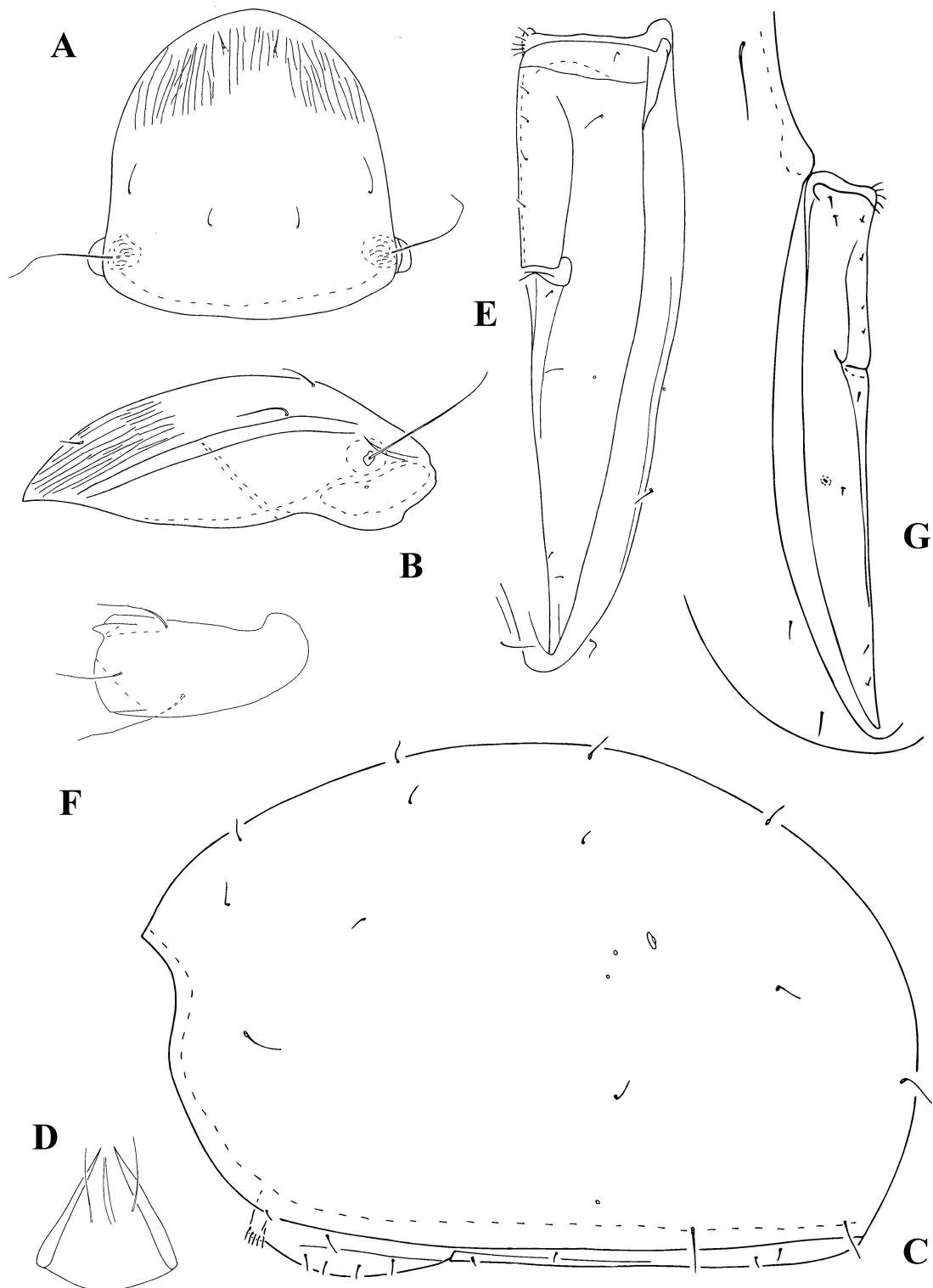


FIGURE 11: *Indotritia (Afrotritia) nuda* Mahunka, 1988. A-F (paratype). G. holotype of *Indotritia usumbarensis* Starý, 1993: A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left side of ventral region; F – femur of leg I; G – right side of ventral region.

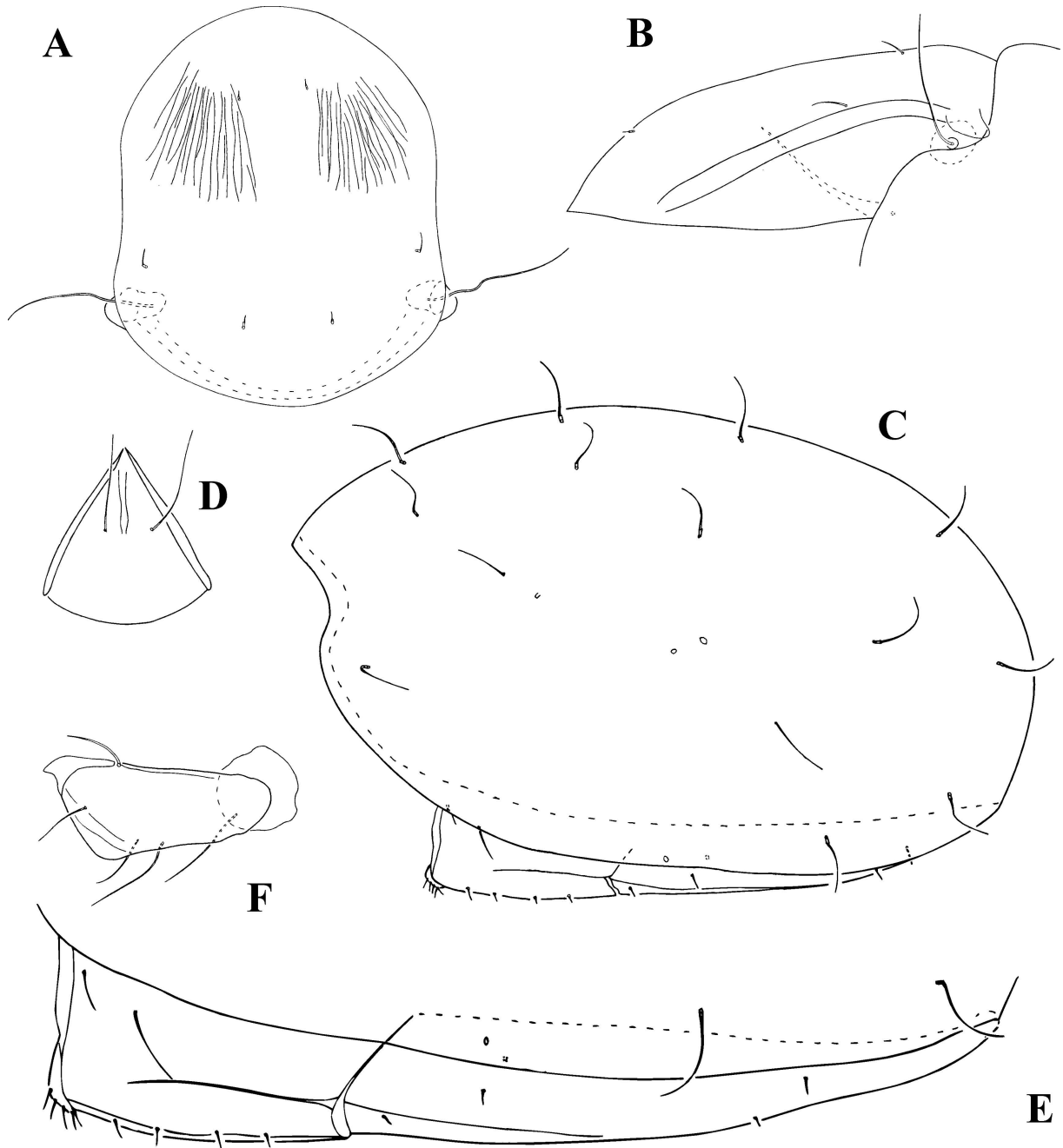


FIGURE 12: *Indotritia (Afrotritia) nuda* Mahunka, 1988 (specimen from TAN-016): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left side of ventral region; F – femur of leg I.

Localities in Tanzania: Tanga Region: Mahunka 1988, Niedbała 1998, Starý 1993; Uluguru and Nguru Mts.

Distribution — Afrotropical species known only from Tanzania.

### **Euphthiracaridae Jacot, 1930**

Euphthiracaridae: Grandjean 1967, Aoki 1980b, Balogh and Mahunka 1983, Mahunka 1990a  
Tritiinae Jacot, 1923: Mahunka 1990a  
Pseudotritiidae Grandjean, 1954: Mahunka 1990a

Type genus: *Euphthiracarus* Ewing, 1917.

Diagnosis — Bothridia with brachytracheae or tracheoles; genitoaggenital and anoadanal regions fused into two holovertral plates (Norton et al. 2003); anogenital cleft rarely present; one or two interlocking triangles present; palps 3-segmented.

### ***Euphthiracarus* Ewing, 1917**

*Hummelia* Oudemans, 1916 “gen. inq.”  
*Pseudotrititia* Willmann, 1919 (subgen.): Mahunka 1990a  
*Niedbalaia* Mahunka, 1999 syn by Niedbała 2001  
*Euphthiracarus*: Märkel 1964, Balogh and Mahunka 1983, Mahunka 1990a, Niedbała 2008b  
*Euphthiracarus* (*Euphthiracarus*): Märkel, 1964, Subías 2004

Type species: *Phthiracarus flavus* Ewing, 1908.

Diagnosis — Prodorsum without median crista; one or two pairs of lateral carinae present; bothridial scales situated below bothridia; posterior median apodeme present; lamellar setae anteriorly of interlamellar setae. Notogaster (with 14 pairs of setae) covered with slightly porose cuticle or strong sculpture and with a terminal fissure; one pair of openings of lateral opisthotal glands (*gla*) and five pairs of lyrifissures: *ia*, *im*, *ip*, *ips*, *ih* present. Ventral region; palps with formula: 2-2-8(1); both anterior and posterior interlocking triangles present; anogenital cleft present or absent; three pairs of anal and three pairs of adanal setae present, lyrifissures *iad* located between *ad*<sub>2</sub> and *ad*<sub>3</sub>. Legs: trochanters III and IV with two setae, genua IV with solenidia, famuli situated far from the solenidia, solenidia  $\omega_1$  and  $\omega_2$  on tarsi II without

coupled setae, seta *d* on tarsi IV comparatively long and not coupled with the solenidium; tarsi mono- or tridactylous.

### subgenus – *Euphthiracarus* Ewing, 1917

Genito-anal cleft absent. Rostral setae situated far anteriorly of lamellar setae. Surface of body punctuated or striated. Species of this subgenus not found so far in TAN.

Distribution — Semicosmopolitan.

### subgenus – *Pocsia* Mahunka, 1983

Genito-anal cleft present. Rostral setae situated far posteriorly between the lamellar setae. Surface of body punctuate.

Distribution — Species of this genus found so far in Afrotropical, Neotropical and Oriental Regions.

### ***Euphthiracarus* (*Pocsia*) *africanus* Mahunka, 1983 (Fig. 13A-H)**

*Pocsia africana* Mahunka, 1983.

Diagnosis — Measurements of paratype: prodorsum: length 353, height 141, width 303, setae: *ss* 126, *le* 119, *ex* 30; notogaster: length 727, seta *c*<sub>3</sub> 56, *ps*<sub>1</sub> 119; genitoaggenital plate 278×53; anoadanal plate 142×23. Paratype is considerably bigger than holotype. Rather large-sized species; colour light brown. Prodorsum with simple lateral carinae; sensilli long, fusiform; interlamellar, lamellar and rostral setae covered with small spines; rostral setae situated slightly posteriorly of lamellar setae; exobothridial setae minute; *in*>*ro*>*le*>*ss*>*ex*. Setae of notogaster covered with small spines, setae *c*<sub>3</sub> and *cp* longer the others, setae *c*<sub>1</sub> and *c*<sub>2</sub> remote from anterior border more than setae *c*<sub>3</sub>. Ventral region; palps three segmented with setal formula: 2-2-8(1); 6-7 pairs of genital setae and 2 pairs of aggenital setae present, posterior genital setae longer than genital setae in progenital position; 3 pairs of anal and 3 pairs of longer adanal setae present; lyrifissures *iad* positioned between and slightly laterally of setae *an*<sub>3</sub> and *ad*<sub>3</sub>.

Localities in Tanzania: Uluguru Mts: Mahunka 1983a, Niedbała 1998.



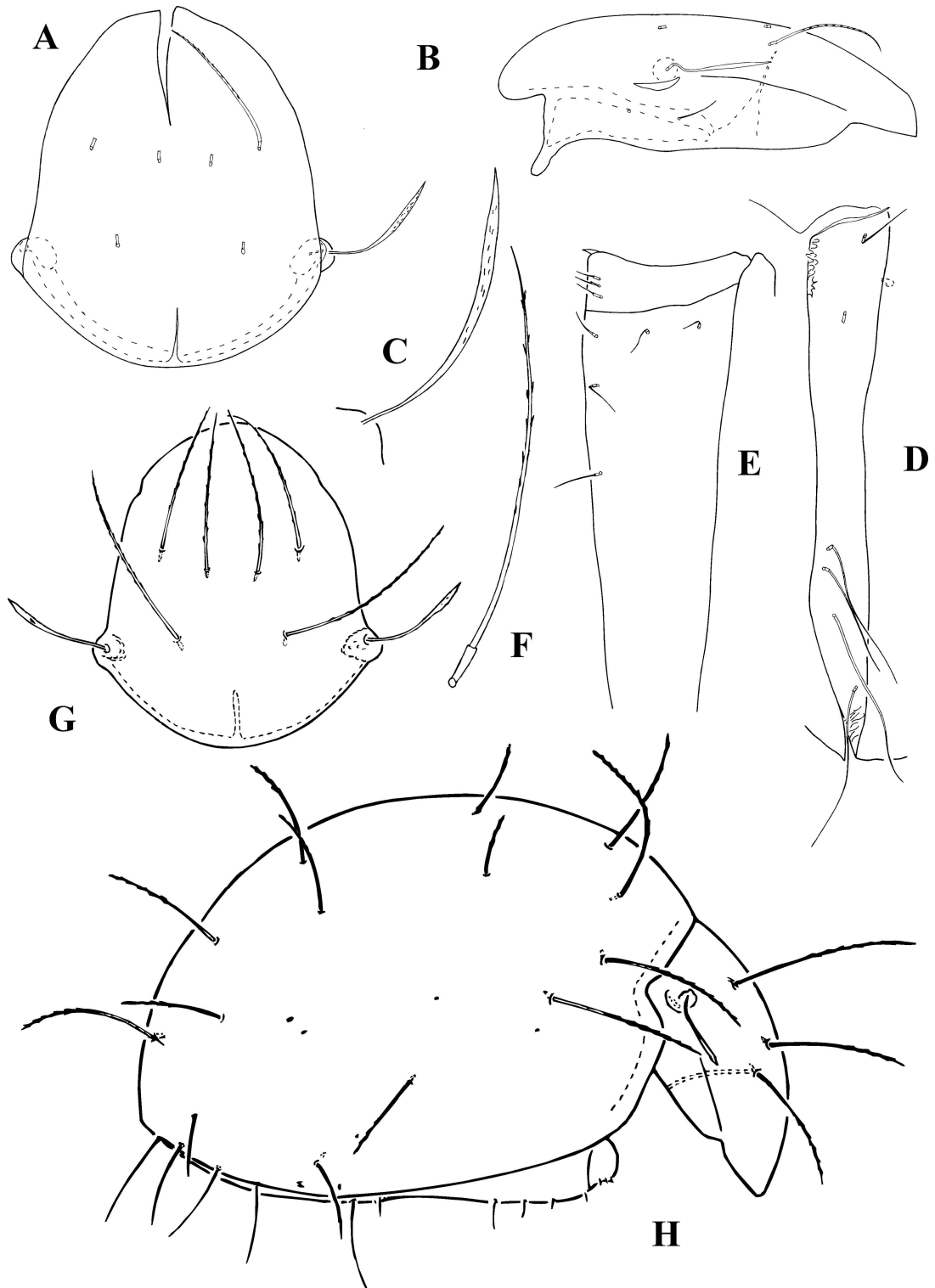


FIGURE 13: *Eupthiracarus (Pocsia) africanus* Mahunka, 1983, A-F. paratype, G, H. after Mahunka 1983a): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – sensillus; D – left anoanal plate; E – left genitoaggenital plate; F – seta  $c_3$ ; G – prodorsum, dorsal view; H – lateral view of body.

Distribution — Afrotropical species known only from Tanzania.

*Euphthiracarus (Pocsia) heterotrichus*  
(Mahunka, 1988)  
(Figs 14A-C, 15A-E)

*Pocsia heterotricha* Mahunka, 1988.

Diagnosis — Measurements of holotype: prodorsum: length 210, height 76, width 152, setae: *ss* 63, *in* 83, *le* 71, *ro* 83, *ex* 20; notogaster: length 394, height 242, width 212, setae: *c*<sub>1</sub> 56,  $c_1/c_1-d_1=0.6$ , *c*<sub>3</sub> 56, *cp* 76, *h*<sub>1</sub> 58, *ps*<sub>1</sub> 53, *h*<sub>3</sub> 61; genitoaggenital plate 137×51, *g*<sub>6</sub> 45, *g*<sub>5</sub> 35, *ag*<sub>2</sub> 23, *ag*<sub>1</sub> 20; anoadanal plate 159×25. Species of medium size; colour brown. Prodorsum with simple lateral carinae; sensilli long, fusiform, finely ciliate; other setae long and barbed; rostral setae shorter than lamellar setae and situated on the same level with lamellar setae or slightly posteriorly;  $ro=in>le>ss>ex$ . From among gastronotic setae, setae *c*<sub>3</sub> the shortest, setae *cp* the longest. Ventral region; 6 pairs of genital setae, 2 posterior genital setae longer than remainder, 2 pairs of aggenital setae; 3 pairs of anal and 3 pairs of adanal setae present, setae *ad*<sub>3</sub> the longest; lyrifissures *iad* situated laterally between *ad*<sub>3</sub> and *an*<sub>3</sub> setae. Chaetome of legs (without tarsi) of the same specimen from Dem. Rep. Congo: I: 1-3-5(2)-5(1), II: 1-4-3(1)-5(1), III: 2-2-2(1)-2(1), IV: 2-1-1(1)-2(1); all tarsi monodactylous.

Localities in Tanzania: Tanga Region: Mahunka 1988, Niedbala 1998.

Distribution — Central part of Afrotropical Region.

*Euphthiracarus (Pocsia) kunsti*  
(Starý, 1988)  
(Fig. 16A-D)

*Pocsia kunsti* Starý, 1988.

Diagnosis — Measurements of holotype (Starý 1988): length of prodorsum 249; notogaster: length 490, height 376. Medium-sized species; colour yellow; integument smooth, punctate. Prodorsum with single lateral carinae; sensilli long, fusiform, with rough head; interlamellar, lamellar and rostral setae covered with small spines; rostral setae situated in the same level with lamellar setae; exobothridial setae minute. Notogaster with relatively short

setae (finely spinose), setae *c*<sub>1</sub> and *c*<sub>2</sub> more remote from anterior margin than setae *c*<sub>3</sub>, setae *c*<sub>3</sub> the shortest, setae *cp* the longest. Ventral region; 7 pairs of genital setae (setae *g*<sub>1</sub> and *g*<sub>2</sub> in progenital position, minute; setae *g*<sub>3</sub>-*g*<sub>7</sub> longer, similar in length) and 2 pairs of aggenital setae present; 3 pairs of anal and 3 pairs of adanal setae present, setae *ad*<sub>3</sub> and *an*<sub>3</sub> the shortest. All tarsi heterotridactylous.

Locality in Tanzania: Tanga Region: Starý 1988, Niedbala 1998.

Distribution — Afrotropical species known only from Tanzania.

*Euphthiracarus (Pocsia) paraafricanus*  
Niedbala et Starý, 2014  
(Fig. 17A-G)

Diagnosis — Measurements of holotype: prodorsum: length 248, width 187, height 88; notogaster: length 454, width 328, height 333. Species of medium size; colour light brown. Prodorsum with rigid, simple lateral carinae; sensilli long, rod-like covered with some spines; other setae rigid, long, ciliate; rostral setae positioned slightly posteriorly of lamellar setae;  $in>ro>le>ss>ex$ . Notogastral setae rigid of medium length,  $c_1<c_1-d_1$ , only setae *cp* considerably (three times) longer than setae *c*<sub>3</sub>, setae of row *c* remote from anterior margin, setae *c*<sub>1</sub> more than setae *c*<sub>2</sub> and *c*<sub>3</sub>. Ventral region; 6 pairs of genital setae, only *g*<sub>1</sub> in progenital position, setae *g*<sub>6</sub> longer than other setae, 2 pairs of aggenital setae present; anal setae slightly shorter than adanal setae; setae *an*<sub>3</sub> and *ad*<sub>3</sub> situated near each other; lyrifissure *iad* situated laterally between setae *ad*<sub>3</sub> and *an*<sub>3</sub>. Setal formula of legs (without tarsi): I:1-3-5(2)-5(1), II:1-4-3(1)-5(1), III: 2-2-2(1)-2(1), IV: 2-1-1(1)-2(1); all tarsi monodactylous.

Localities in Tanzania: Uluguru and Nguru Mts: Niedbala and Starý 2014a.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Euphthiracarus (Pocsia) parakunsti*  
Niedbala, 2014  
(Fig. 18A-F)

Diagnosis — Measurements of holotype: prodorsum: length 252, height 101, width 202, setae: *ss*

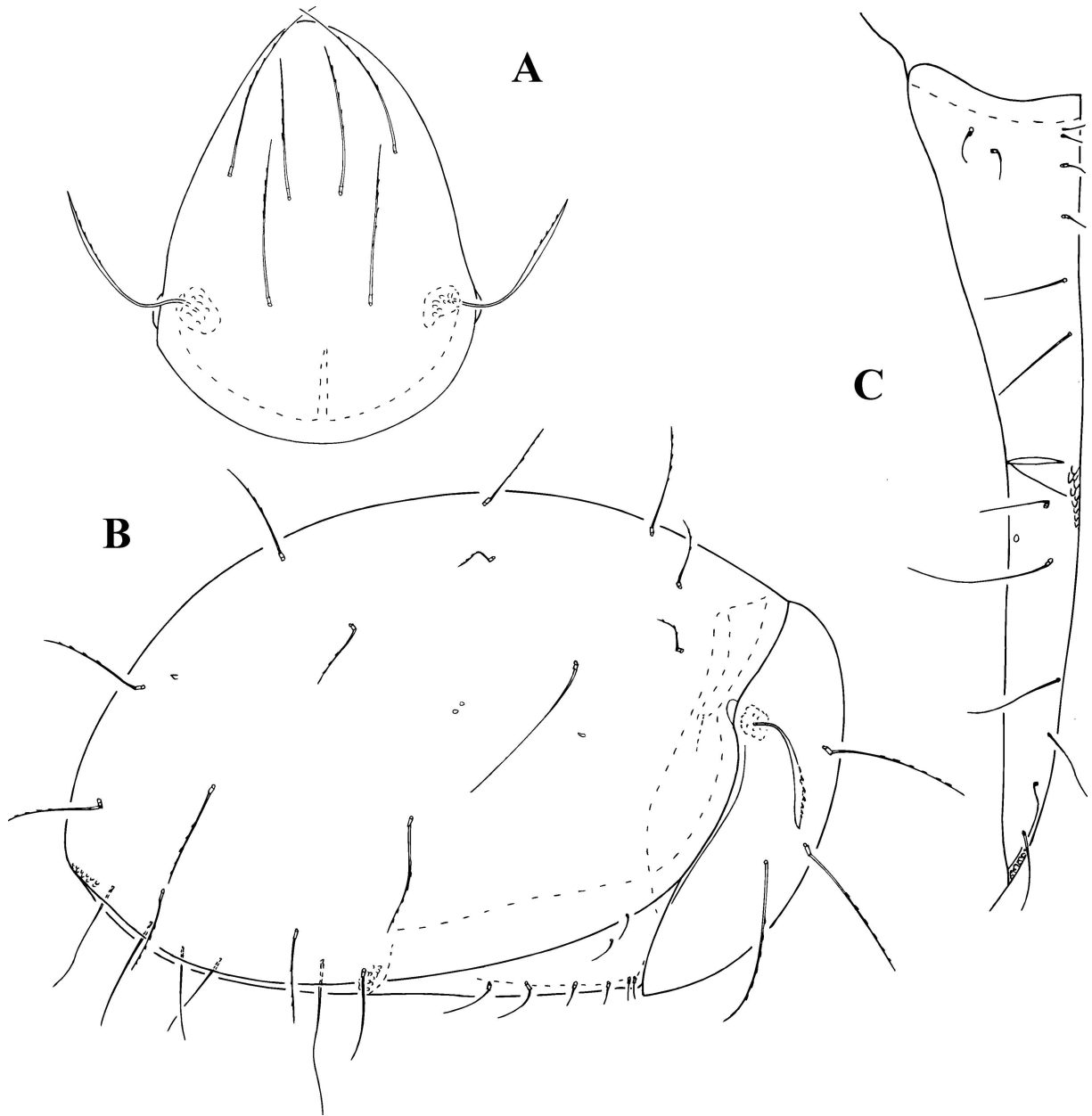


FIGURE 14: *Euphthiracarus (Pocsia) heterotrichus* Mahunka, 1988 (holotype): A – prodorsum, dorsal view; B – lateral view of body; C – right side of ventral region.

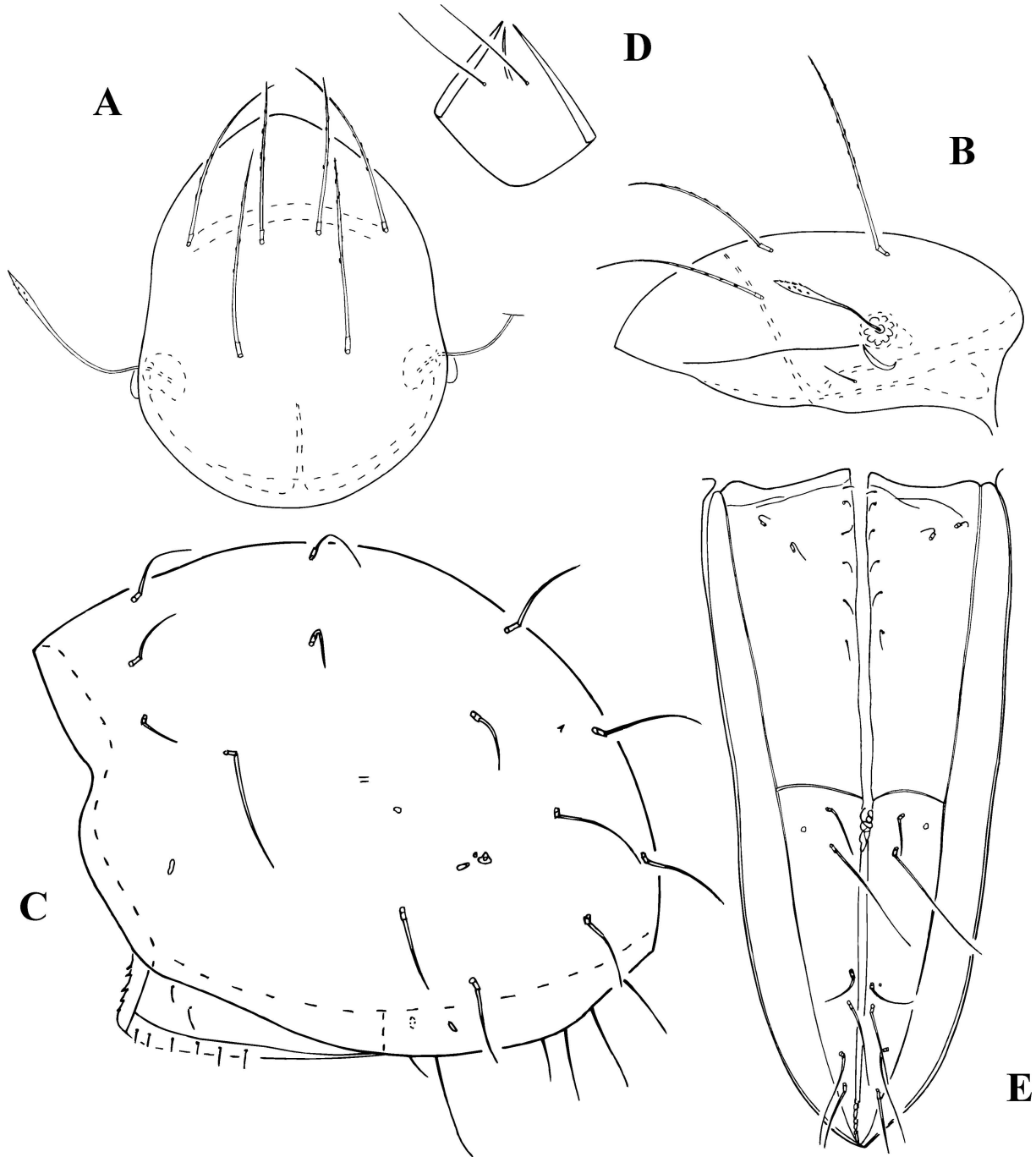


FIGURE 15: *Euphthiracarus (Pocsia) heterotrichus* Mahunka, 1988 (specimen from Dem. Rep. Congo): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – ventral region.

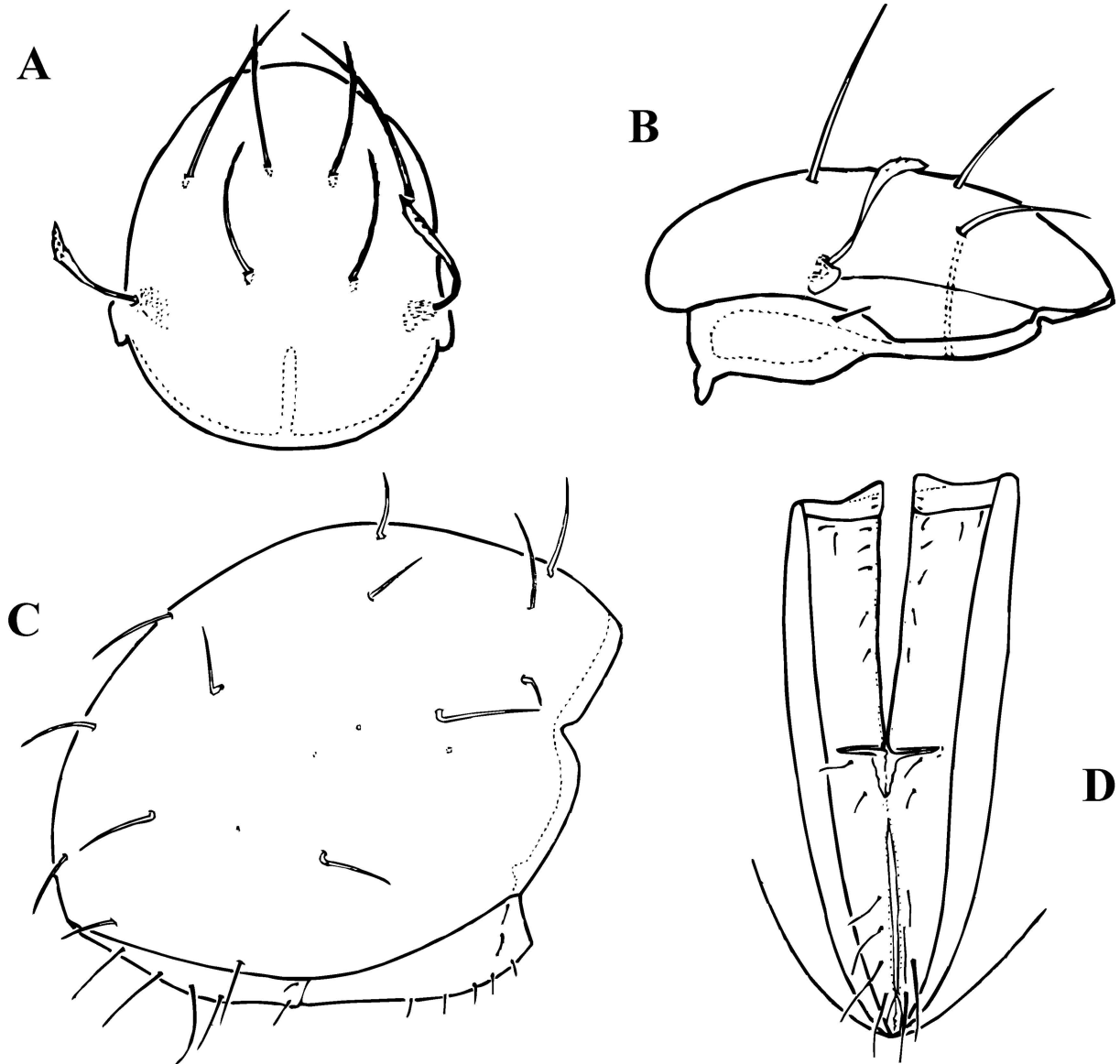


FIGURE 16: *Euphthiracarus (Pocsia) kunsti* Starý, 1988 (after Starý 1988): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – ventral region.

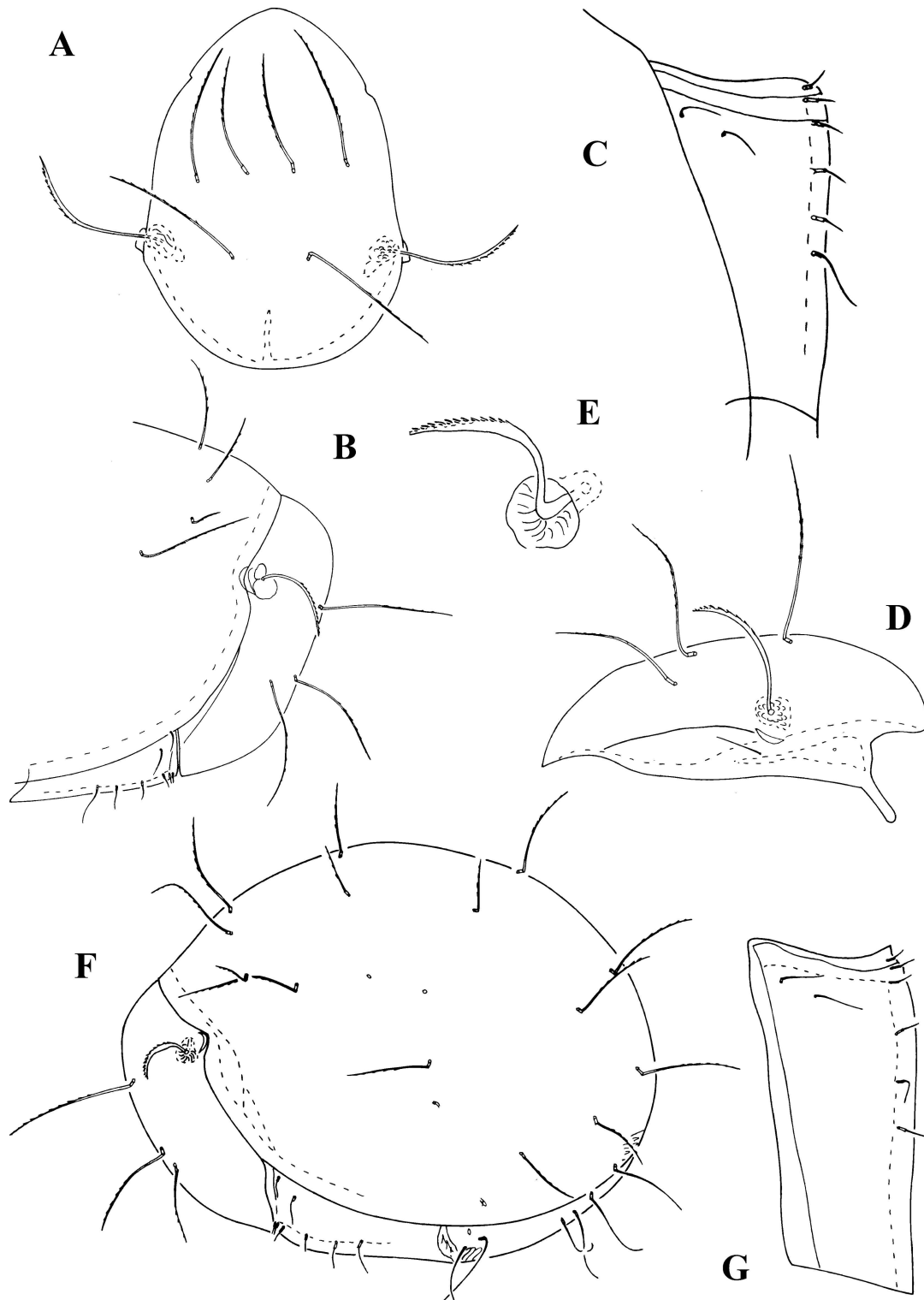


FIGURE 17: *Euphthiracarus (Pocsia) parafricanus* Niedbala et Starý, 2014. A-C (holotype): A – prodorsum, dorsal view; B – prodorsum and anterior part of opisthosoma, lateral view; C – right side of genitoaggenital plate. D, E (paratype I): D – prodorsum, lateral view; E – sensillus; F, G (paratype II): F – lateral view of body; G – right side of genitoaggenital plate.

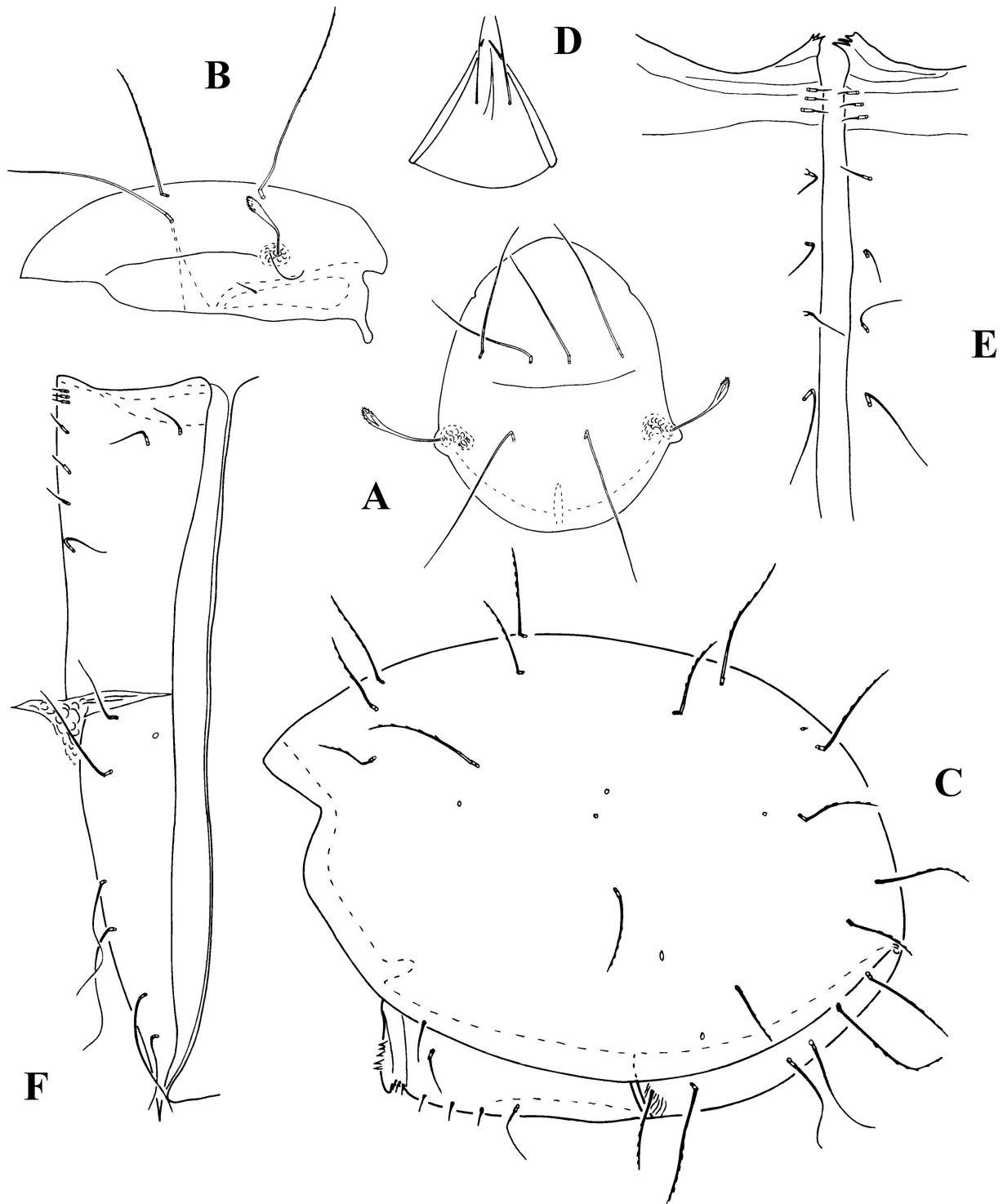


FIGURE 18: *Euphthiracarus (Pocsi) parakunsti* (Niedbała, 2014) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – genital plates, paraxial sides; F – left side of ventral plate.

78, *in* 164, *le* 109, *ro* 126, *ex* 15; notogaster: length 459, height 308, width 333, setae:  $c_1$  78,  $c_1/c_1-d_1=0.77$ ,  $c_3$  91,  $h_1$  and  $ps_1$  71; genitoaggenital plate 157x71, length of seta  $g_7$  43, length of seta  $g_6$  23, ano-adanal plate 207x51. Medium-sized species; colour brown. Prodorsum with one pair of medium length, lateral carinae; sensilli with short, narrow pedicel and fusiform head, covered with tine spines at top; other setae rigid, long; interlamellar and rostral covered sparsely with thin spines, lamellar setae rather smooth; rostral and lamellar setae positioned at the same level; exobothridial setae minute;  $in>ro>le>ss>ex$ . Notogaster with short ( $c_1<c_1-d_1$ ), thick but flexible setae, pointed distally and covered sparsely with thin spines; setae of row *c* remote from anterior margin, setae  $c_1$  more, setae  $c_3$  less, setae *cp* considerably longer than setae  $c_{1-3}$ . Ventral region; setae *h* of mentum considerably longer than distance between them; genital plates dentate in anterior part; 7 pairs of genital setae present, setae  $g_7$  the longest, setae  $g_{4-6}$  shorter, setae  $g_{1-3}$  (in pro-genital position) the shortest, two pairs of aggenital setae present,  $ag_2$  slightly longer than  $ag_1$ ; ano-adanal plates each with 3 pairs of anal and 3 pairs of adanal setae, anal setae shorter than adanal setae, anal setae  $an_1$  and  $an_2$  smooth, flagellate, other setae more rigid and covered sparsely with thin spines, setae  $ad_3$  situated near setae  $an_3$ ; lyrifissures *iad* located laterally and slightly posteriorly of setae  $an_3$ . Chaetome of legs: I: 1-3-5(2)-5(1), II: 1-4-3(1)-5(1), III: 2-2-2(1)-2(1), IV: 2-1-1(1)-2(1); tarsi heterotridactylous.

Localities in Tanzania: Uluguru and Nguru Mts: Niedbała 2014.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Euphthiracarus (Pocsia) secundus***  
(Mahunka, 1983)  
(Fig. 19A-E)

*Pocsia secunda* Mahunka, 1983.

Diagnosis — Measurements of paratype: prodorsum: length 215, height 94, width 177, setae: *ss* 66, *in* 106, *le* and *ro* 86, *ex* 18; notogaster: length 419, height 298, width 308, setae:  $c_1$  45,  $c_1/c_1-d_1=0.45$ ,  $c_2$  83, *cp* 81,  $ps_1$  53; genitoaggenital plate 152x76,  $ag_2$  35,

$ag_1$  20; ano-adanal plate 159x43. Sizes of paratype are higher than the dimensions given by Mahunka (1983a). Species of medium size; colour light brown. Prodorsum with single lateral carinae; sensilli gradually thickening, pointed distally, without well separated head, covered with small spines; interlamellar, lamellar and rostral setae covered with small spines; rostral and lamellar setae nearly equal in length situated in the same level; exobothridial setae minute;  $in>ro=le>ss>ex$ . Notogaster with relatively short setae, setae  $c_2$  and *cp* longer than other setae; setae of row *c* remote from anterior margin, setae  $c_1$  more, setae  $c_3$  less remote. Ventral region; setae *h* of mentum considerably longer than distance between them; 7 or 8 pairs of genital setae, the last posterior pair the longest; 2 pairs of aggenital setae present, setae  $ag_2$  longer than  $ag_1$ . Chaetome of legs (without tarsi): I: 1-3-5(2)-5(1), II: 1-4-3(1)-5(1), III: 2-2-2(1)-2(1), IV: 2-1-1(1)-2(1); all tarsi monodactylous.

Localities in Tanzania: Uluguru Mts: Mahunka 1983a, Niedbała 1998; Nguru Mts.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Euphthiracarus (Pocsia) trentus***  
(Mahunka, 1983)  
(Fig. 20A-F)

*Pocsia trenta* Mahunka, 1983.

Diagnosis — Measurements of holotype: prodorsum: length 255, height 101, width 202, setae: *ss* 73, *in* 169, *le* 126, *ro* 144, *ex* 23; notogaster: length 449, height 343, width 323, setae:  $c_1$  66,  $c_1/c_1-d_1=0.6$ , *cp* 99,  $h_1$  93,  $ps_1$  76; genitoaggenital plate 144x763  $ag_2$  30,  $ag_1$  20; ano-adanal plate 207x51. Species of medium size; colour brown. Lateral carinae of prodorsum present; head of sensilli widely fusiform, covered with small spines; interlamellar, lamellar and rostral setae very long, longer than gastronotic setae, covered with small spines; rostral setae shorter than lamellar setae and all situated on the same level;  $in>ro>le>ss>ex$ . Notogastral setae covered with small spines, setae *cp* and  $h_1$  the longest; setae of row *c* remote from anterior border, setae  $c_1$  more, setae  $c_3$  less remote. Ventral region; 5 or 6 pairs of genital setae (one posterior pair the longest), 2 pairs



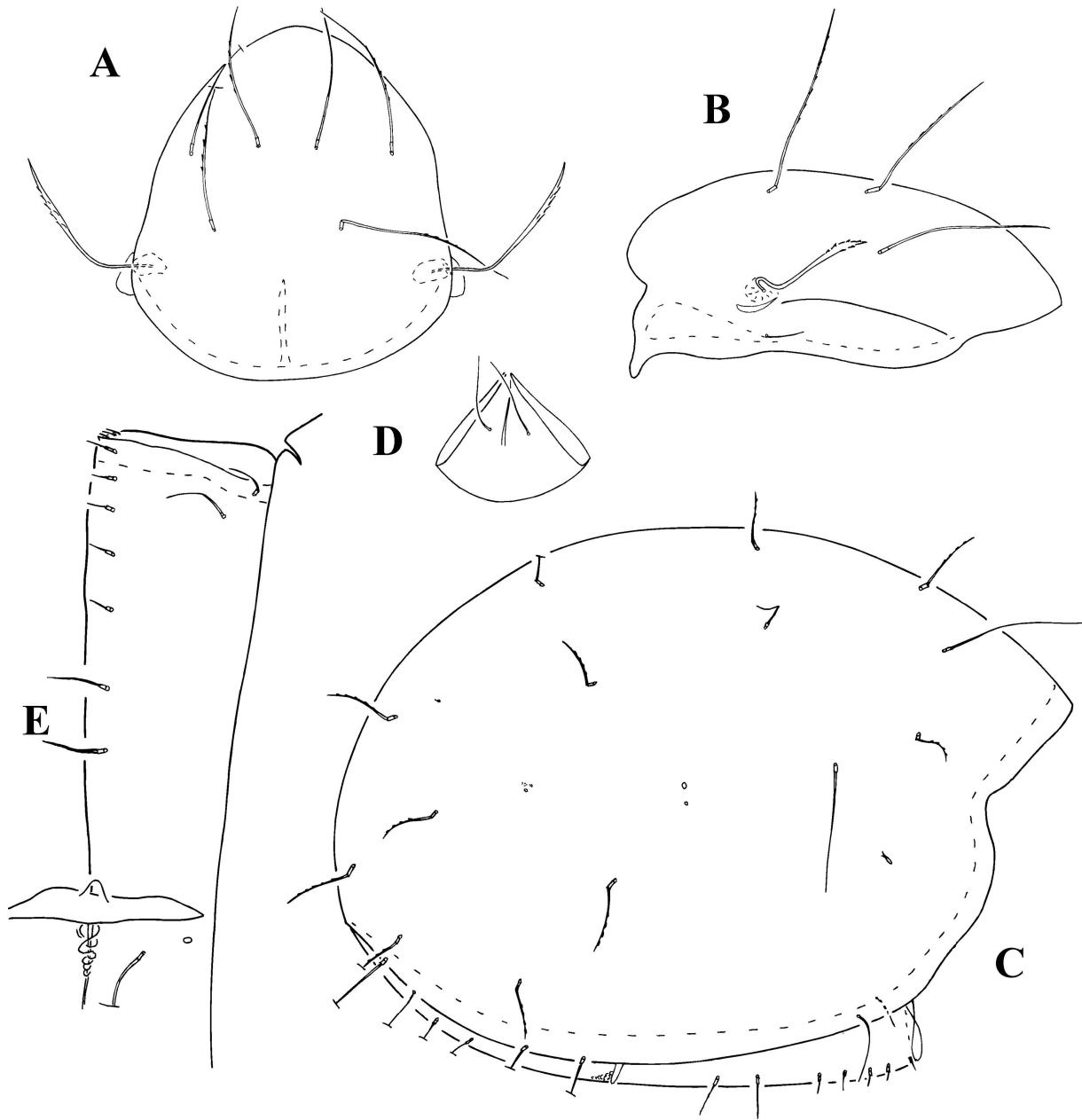


FIGURE 19: *Euphthiracarus (Pocsia) secundus* (Mahunka, 1983) (paratype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left genitoaggenital plate.

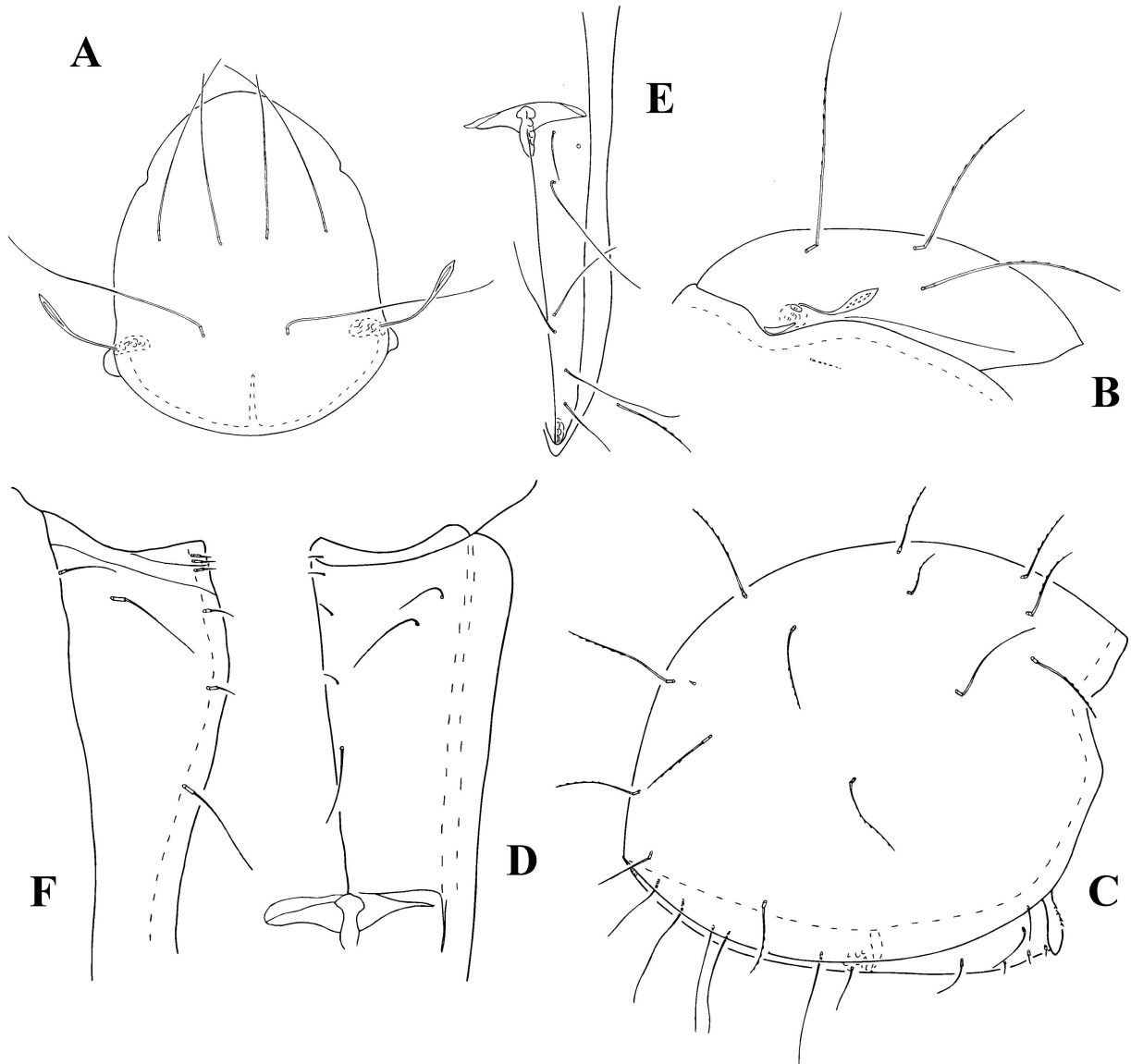


FIGURE 20: *Euphthiracarus (Pocsia) trentus* (Mahunka, 1983) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left anoadanal plate; F – right genitoaggenital plate, specimen from TAN-16.

of aggenital setae present, setae  $ag_2$  longer than setae  $ag_1$ ; 3 pairs of anal and 3 pairs of adanal setae present, setae  $ad_2$  and  $ad_3$  the longest; lyrifissures  $iad$  situated laterally and slightly posteriorly of  $an_3$  setae.

Localities in Tanzania: Kilimanjaro Mts: Mahunka 1983a, Niedbała 1998; Uluguru Mts.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Euphthiracarus (Pocsia) uluguruensis*  
Niedbała et Starý, 2014  
(Figs 21A-F)

Diagnosis — Measurements of holotype: prodorsum: length 328, width 252, height 116; notogaster: length 596, width 434, height 444.

Rather large-sized species; colour light brown. Prodorsum with one pair of distinct long lateral carinae; sensilli rather long, with slightly fusiform head, rough, pointed distally; interlamellar setae longer than similar in length rostral and lamellar setae; rostral setae positioned slightly posteriorly of lamellar setae; exobothridial setae minute;  $in > le > ro > ss > ex$ . Notogastral setae of medium length ( $c_1 < c_1 - d_1$ ), flexible, covered sparsely with cilia; setae  $cp$  the longest, setae  $c_{1-3}$  remote from anterior border, setae  $c_1$  more, setae  $c_3$  less than setae  $c_2$ . Ventral region; setae  $h$  of mentum considerably longer than distance between them; 6 pairs of genital setae, setae  $g_{1-4}$  minute, setae  $g_5$  and  $g_6$  long and attenuate, considerably longer than other genital setae; two pairs of aggenital setae located vertically present, setae  $ag_2$  twice as long than setae  $ag_1$ ; setae of anoanal plates long, 3 pairs of flexible anal and 3 pairs of adanal setae rather straight; setae  $an_3$  situated near setae  $ad_3$ ; lyrifissures  $iad$  located antiaxially from  $ad_3$  setae. Tarsi of legs heterotridactylous.

Localities in Tanzania: Uluguru and Nguru Mts: Niedbała & Starý 2014a.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Acrotritia Jacot, 1923*

*Rhysotritia* Märkel et Meyer, 1959: Subías 2004  
*Rhysotritia*: Märkel 1964, Aoki 1980b, Balogh and

Mahunka 1983, Mahunka 1990a  
*Acrotritia*: Subías 2004, Niedbała 2008b

Type species: *Phthiracarus americanus* Ewing, 1909

Diagnosis — Cuticular surface of body finely generally punctate or porose. Prodorsum without median crista, but with one or two pairs of lateral carinae; bothridial scales situated above the bothridia; posterior median apodeme present; setae in median (paraxial) position. Notogaster with 14 pairs of setae, setae  $c_1$  and  $c_2$  remote from anterior border more than setae  $c_3$ , setae  $ps_1$  situated anterior the  $ps_{2-3}$  setae; one pair of openings of lateral opisthonotal glands openings ( $gla$ ); 5 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ih$ ,  $ips$  and two pairs of vestigial setae  $f$  present; terminal sinus at the posterior end. Ventral region; setae  $h$  of mentum longer than distance between them; palps 3-segmented, with normal formula: 2-2-8(1); anogenital cleft absent; one interlocking triangle present; three pairs of anal setae,  $an_1$  and  $an_2$  rigid, smooth,  $an_3$  minute; three pairs of rigid adanal setae covered with small spines in distal half, longer than anal setae  $an_1$  and  $an_2$ ; lyrifissures  $iad$  located between  $ad_3$  and  $an_3$  setae. Legs: trochanters I and II bearing one setae and III and IV with two setae; genua IV without solenidia; setae  $d$  on tibiae IV relatively long and not coupled with solenidium; solenidia of tarsi II without coupled setae; tarsi mono-, bi- or heterotridactylous.

Distribution — Semicosmopolitan.

*Acrotritia ardua*  
(C.L. Koch, 1841)  
(Figs 22A-E)

*Rhysotritia ardua*: Niedbała 2001, Niedbała & Ermilov 2014.

Diagnosis — Measurements of specimen from TAN-008: length of prodorsum: 261; length of notogaster: length 562. Species of medium size; colour light brown, brown; integument punctuate. Prodorsum with one pair of lateral carinae; sensilli with distinctly dilated head covered with spines; other setae rigid, erect, with small spines in distal half (except minute exobothridial setae);  $in > ss > le > ro > ex$ . Notogastral setae fairly short ( $c_1 < c_1 - d_1$ ) covered

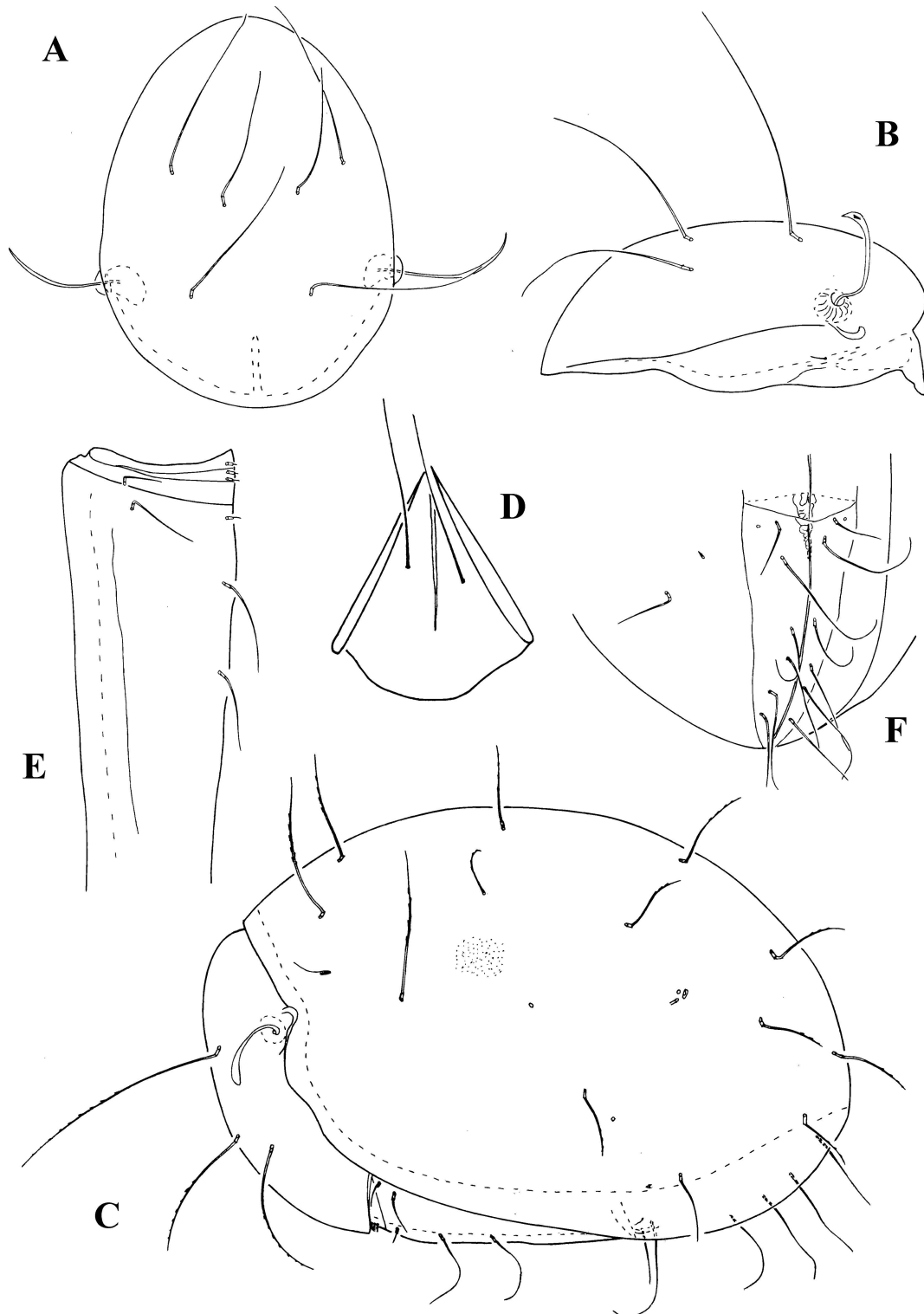


FIGURE 21: *Euphthiracarus (Pocsia) uluguruensis* Niedbala et Starý, 2014 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – lateral view of body; D – mentum of subcapitulum; E – right side of genitoaggenital plate; F – anoadanal plates.

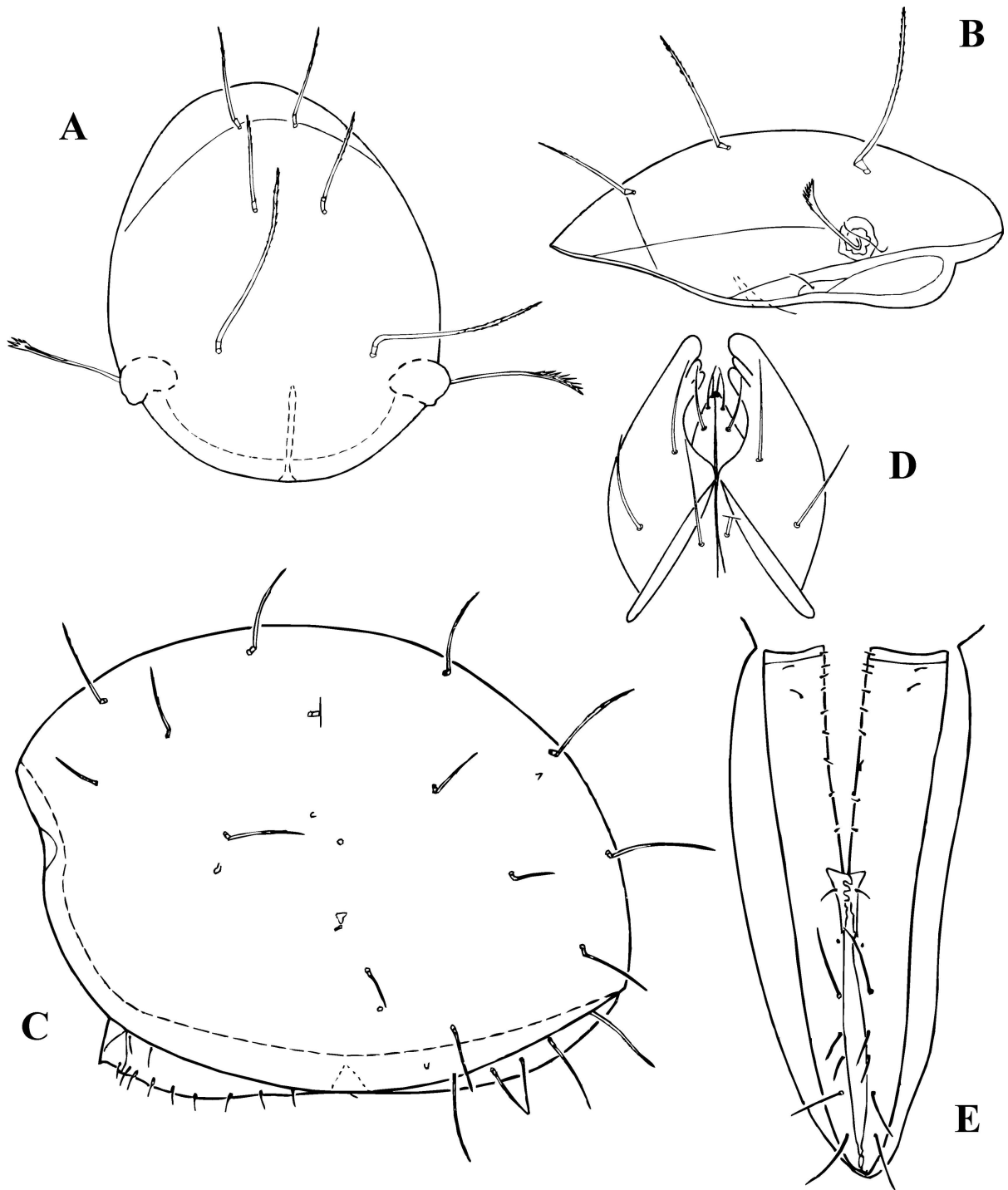


FIGURE 22: *Acrotrititia ardua* (C.L. Koch, 1841) (specimen from Finland): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – subcapitulum; E – ventral region.

with small spines in distal half, setae of row c remote from anterior border, setae  $c_2$  more, setae  $c_3$  less remote. Ventral region; 9 pairs of minute genital setae, 2 pairs of aggenital setae, arranged longitudinally. Chaetome of legs: I: 1-3-5(2)-4(1)-17(3), II: 1-3-3(1)-4(1)-13(2), III: 2-2-2(1)-3(1)-11, IV: 2-1-2-2(1)-10; tarsi of the legs I bidactylous, tarsi II-IV heterotridactylous.

Localities in Tanzania: Nguru Mts. Species not yet recorded from TAN.

Distribution — Semicosmopolitan species.

***Acrotrititia reticulata***  
(Mahunka, 1988)  
(Fig. 23A-E)

*Rhysotrititia reticulata* Mahunka, 1988.

Diagnosis — Measurements of paratype: prodorsum: length 247, height 91, width 192; setae:  $ss$  56,  $in$  91,  $le$  56,  $ro$  51; notogaster: length 520, height 379, width 353, setae:  $c_1$  66,  $c_1/c_1-d_1=0.5$ ,  $h_1$  63,  $ps_1$  56; genitoaggenital plate  $187 \times 81$ ; anoanal plate  $242 \times 61$ . All characters the same as *A. ardua*. Only irregular, probably mineralization patterns as “the ornamentation by secretion granules forming a polygonal reticulation” (Mahunka 1988) distinguish *A. reticulata* (Mahunka 1988) from *A. ardua*.

Locality in Tanzania: Tanga Region: Mahunka 1988, Niedbała 1998.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Acrotrititia rustica***  
(Niedbała, 1991)  
(Fig. 24A-G)

*Rhysotrititia rustica* Niedbała, 1991.

*Rhysotrititia rustica*: Niedbała 2001.

Diagnosis — Measurements of specimen from MAG-083: prodorsum: length 232, height 96, setae:  $ss$  66,  $in$  106,  $le$  66,  $ro$  58,  $ex$  15; notogaster: length 459, height 328, setae:  $c_1$  73,  $c_1/c_1-d_1=0.63$ ,  $h_1$  73,  $ps_1$  68. Specimen from Madagascar are bigger than holotype. Species of medium size; colour yellow; integument punctuate. Prodorsum with one pair of simple, long lateral carinae; sensilli long with oblongly

extended head tapered with small barbs, interlamellar, lamellar, rostral setae erect, interlamellar and lamellar spinose, rostral rough; exobothridial setae minute;  $in > le > ss > ro > ex$ . Notogaster with fairly short ( $c_1/c_1-d_1=0.65$ ) setae, finely barbed at distal half; vestigial setae  $f_1$  a little dorsal of setae  $h_1$ . Ventral region; 9 pairs of genital setae with formula 8: 1 and 2 pairs of aggenital setae present. Chaetome of legs (without tarsi): I: 1-3-5(2)-5(1), II: 1-3-3(1)-4(1) III: 2-2-2(1)-3(1), IV: 2-1-2-2(1); all tarsi monodactylous.

Localities in Tanzania: Uluguru and Nguru Mts. Species new to TAN.

Distribution — Species with very strange distribution; known from western Palaearctic (North Europe, Macaronesia and Holo-Mediterranean areas, disjunctive) Afrotropical Region, central part and South Africa.

***Acrotrititia spiculifera***  
(Mahunka, 1991)  
(Fig. 25A-F)

*Rhysotrititia clavata spiculifera* Mahunka, 1991.

*Rhysotrititia spiculifera*: Niedbała 2001.

Diagnosis — Measurements of paratype: prodorsum: length 205, height 83, width 157; setae:  $ss$  56,  $in$  88,  $le$  63,  $ro$  48,  $ex$  8; notogaster: length 414, height and width 252, setae:  $c_1$  45,  $c_1/c_1-d_1=0.5$ ,  $h_1$  56,  $ps_1$  53; length of genitoaggenital plate 144; length of anoanal plate 182. Medium-sized species: colour yellow; surface of body punctuated. Prodorsum with simple lateral carinae; sensilli with well-separated, claviform head covered with small spines; other setae, with exception of exobothridial, ciliate;  $in > le > ss > ro > ex$ . Notogaster with relatively short setae ( $c_1 < c_1-d_1$ ). Ventral region; 9 pairs of genital and 2 pairs of aggenital setae; anal and adanal setae, except minute  $an_3$ , similar in length. Tarsi of legs monodactylous.

Remark — This species differs from a very similar *A. clavata* (Märkel, 1964) only by the presence of 9 pairs of genital setae (versus 6 pairs of genital setae).

Locality in Tanzania: Nguru Mts. Species new to TAN.

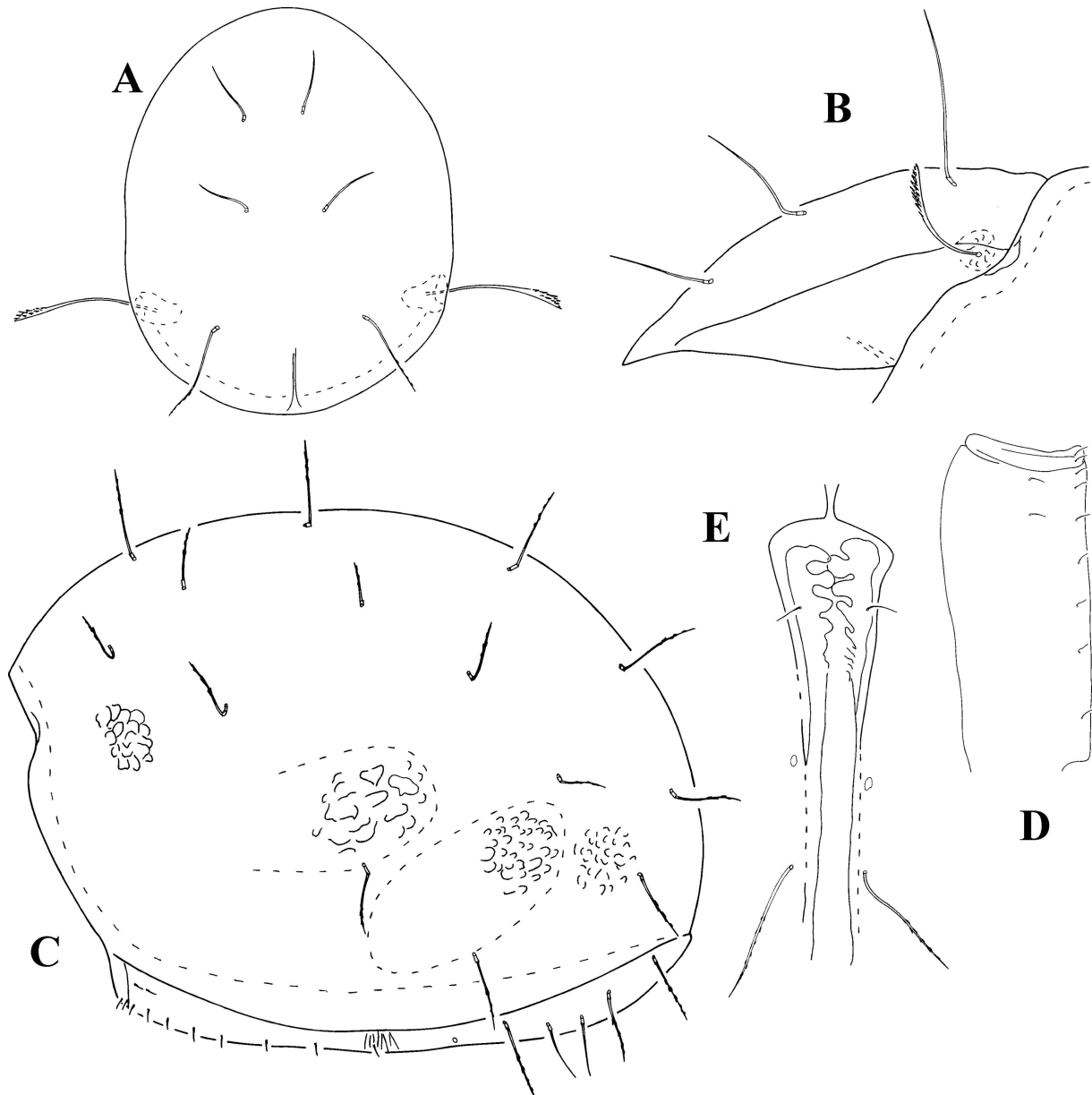


FIGURE 23: *Acrotrititia reticulata* Mahunka, 1988) (paratype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – right genitoaggenital plate; E – anterior part of ano-adanal plates.

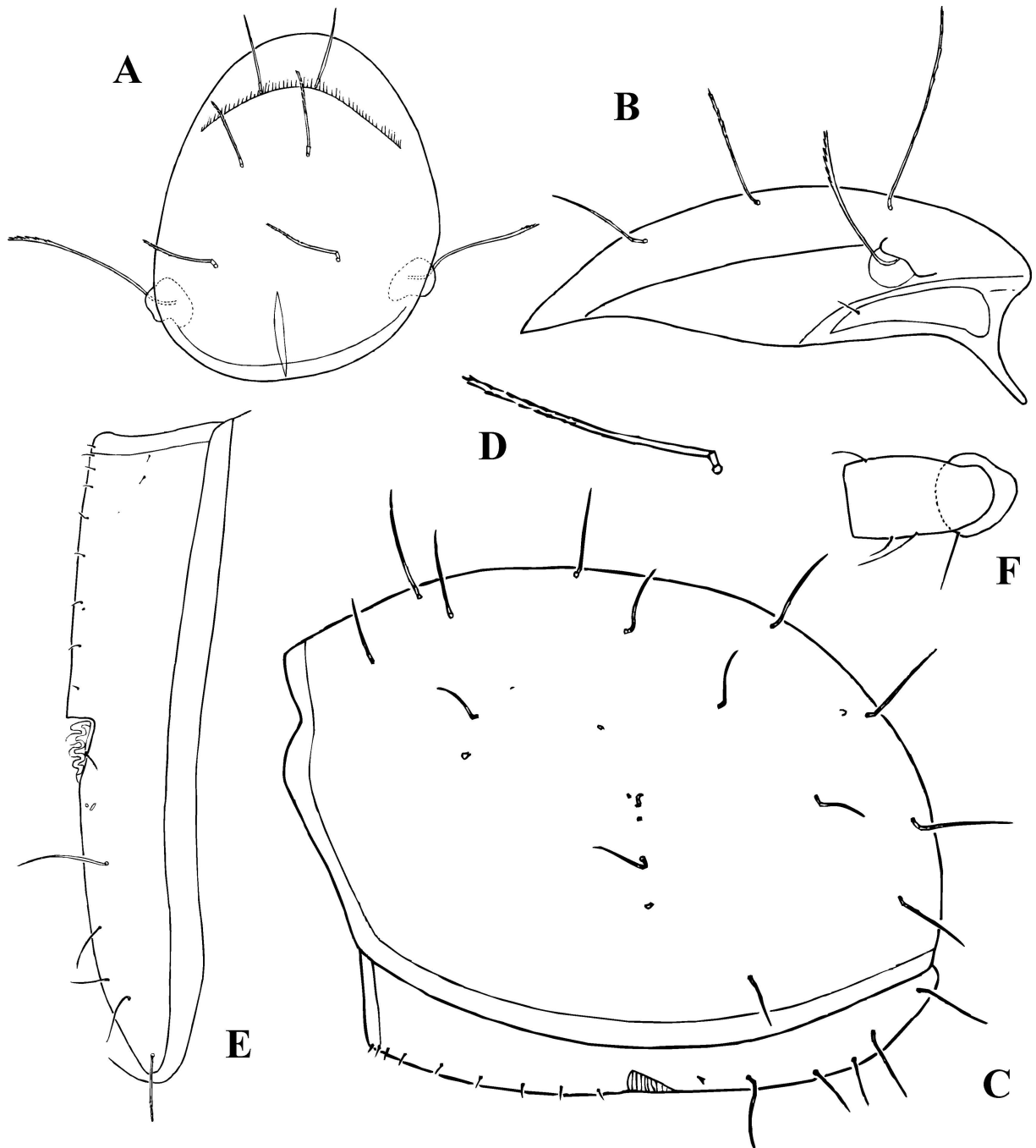


FIGURE 24: *Acrotitia rustica* (Niedbala, 1991) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – seta  $h_1$ ; E – left side of ventral region; F – trochanter and femur of leg I.



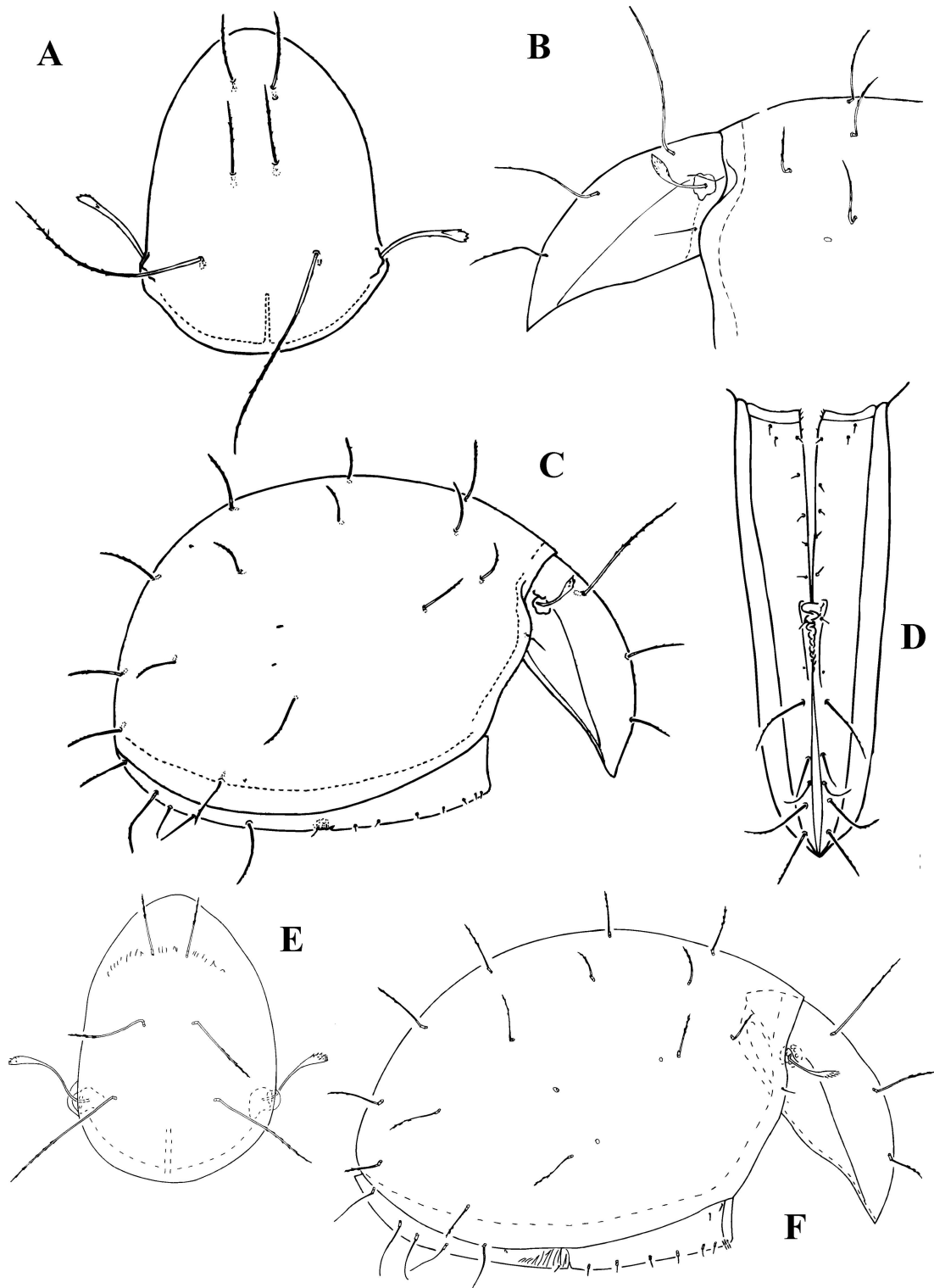


FIGURE 25: *Acrotritia spiculifera* (Mahunka, 1991). A, C, D (after Mahunka 1991), B (specimen from Comores), E, F (paratype): A – prodorsum, dorsal view; B – prodorsum and anterior part of notogaster, lateral view; C – lateral view of body; D – ventral plate; E – prodorsum, dorsal view; F – lateral view of body.

Distribution — Pantropical species.

***Acrotritia vestita***  
(Berlese, 1913)  
(Fig. 26A-C)

*Rhysotritia anchistea* Niedbala, 1998 syn. by Niedbala 2000.

*Rhysotritia bifurcata* Niedbala, 1993 syn. by Niedbala 2000.

*Rhysotritia niedbalai* Balogh et Balogh, 2002 syn. by Niedbala 2006b.

*Rhysotritia comteae* Mahunka, 1983 syn. by Subías 2004

*Rhysotritia comteae*: Niedbala 2001.

*Acrotritia vestita*: Niedbala & Ermilov 2014.

Diagnosis — Measurements: length of prodorsum 220-240; length of notogaster: 440-480. Species of medium size; colour light brown, brown; integument punctate. Prodorsum with one pair of lateral carinae bifurcated at the distal end; sensilli with distinct head covered with numerous small spines; interlamellar, lamellar and rostral setae rigid, erect covered with small spines in distal half; interlamellar setae longer than rostral and lamellar setae; exobothridial setae minute;  $in > ss > le > ro > ex$ ; distance between lamellar setae almost the same as distance between rostral setae. Notogaster with setae covered with small spines in distal half. Ventral region; 9 pairs of genital and 2 pairs of aggenital setae present. Chaetome of legs (without tarsi): I: 1-3-4(2)-5(1), II: 1-4-3(1)-4(1), III: 2-2-2(1)-3(1), IV: 2-1-2-2(1); tarsi of legs I bidactylous, tarsi II-IV heterotridactylous.

Localities in Tanzania: Arusha Region: Niedbala 2008a; Uluguru and Nguru Mts.

Distribution — Pantropical species.

***Microtritia Märkel, 1964***

*Microtritia*: Aoki 1980b, Balogh and Mahunka 1983, Mahunka 1990a, Subías 2004

Type species — *Phthiracarus minimus* Berlese, 1904

Diagnosis — Cuticular surface of body finely porose. Prodorsum without median crista, with one pair of lateral carinae; bothridial scales situated

above the bothridia; posterior median apodeme present; lamellar and rostral setae in median (paraxial) position; interlamellar setae situated near the bothridia. Notogaster with 14 pairs of setae; setae of row *ps* situated almost in one line; terminal sinus or terminal fissure at posterior end present; one pair of openings of lateral opisthonotal glands (*gla*) and 5 pairs of lyrifissures: *ia*, *im*, *ip*, *ips*, *ih* present. Ventral region; palps three-segmented with formula: (1-2)-1-(7-8)(1); genitoaggenital and anoadanal plates completely fused; anogenital cleft present; one median interlocking triangle present. Legs: each trochanter with one seta; genua IV without solenidia; setae *d* on tibiae IV coupled with solenidium; solenidia  $\omega_1$  and  $\omega_2$  without coupled setae; famuli located far from solenidia; all tarsi monodactylous.

Distribution — Semicosmopolitan.

***Microtritia diaphoros***  
Niedbala et Starý, 2015  
(Fig. 27A-C)

Diagnosis — Measurements of holotype: prodorsum: length 215, width 159, height 86; notogaster: length 343, width 263, height 247. Rather small-sized species; colour yellow; posterior part of prodorsum covered with feeble alveoles. Prodorsum with simple, lateral carinae; sensilli narrowly spindle shaped, smooth; other setae fine, short; distance between lamellar setae considerably greater than between rostral setae;  $ss > ro > le > in$ . Notogaster with setae fine, flexible, short ( $c_1 < c_1 - d_1$ ), setae  $c_{1-3}$  remote from anterior margin. Ventral region; 4 pairs of genital setae, no one situated in progenital position, aggenital setae absent; 3 pairs of adanal setae present, setae  $ad_1$  the longest; anal setae  $an_1$  and  $an_2$  shorter than adanal setae, setae  $an_3$  vestigial; lyrifissures *iad* situated anteriorly of setae  $ad_3$ . Chaetome of legs (without tarsi): I: 1-2-3(2)-5(1), II: 1-2-3(1)-2(1); III: 2-2-2(1)-2(1), IV: 2-1-1-2(1).

Localities in Tanzania: Nguru Mts: Niedbala & Starý 2015c.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

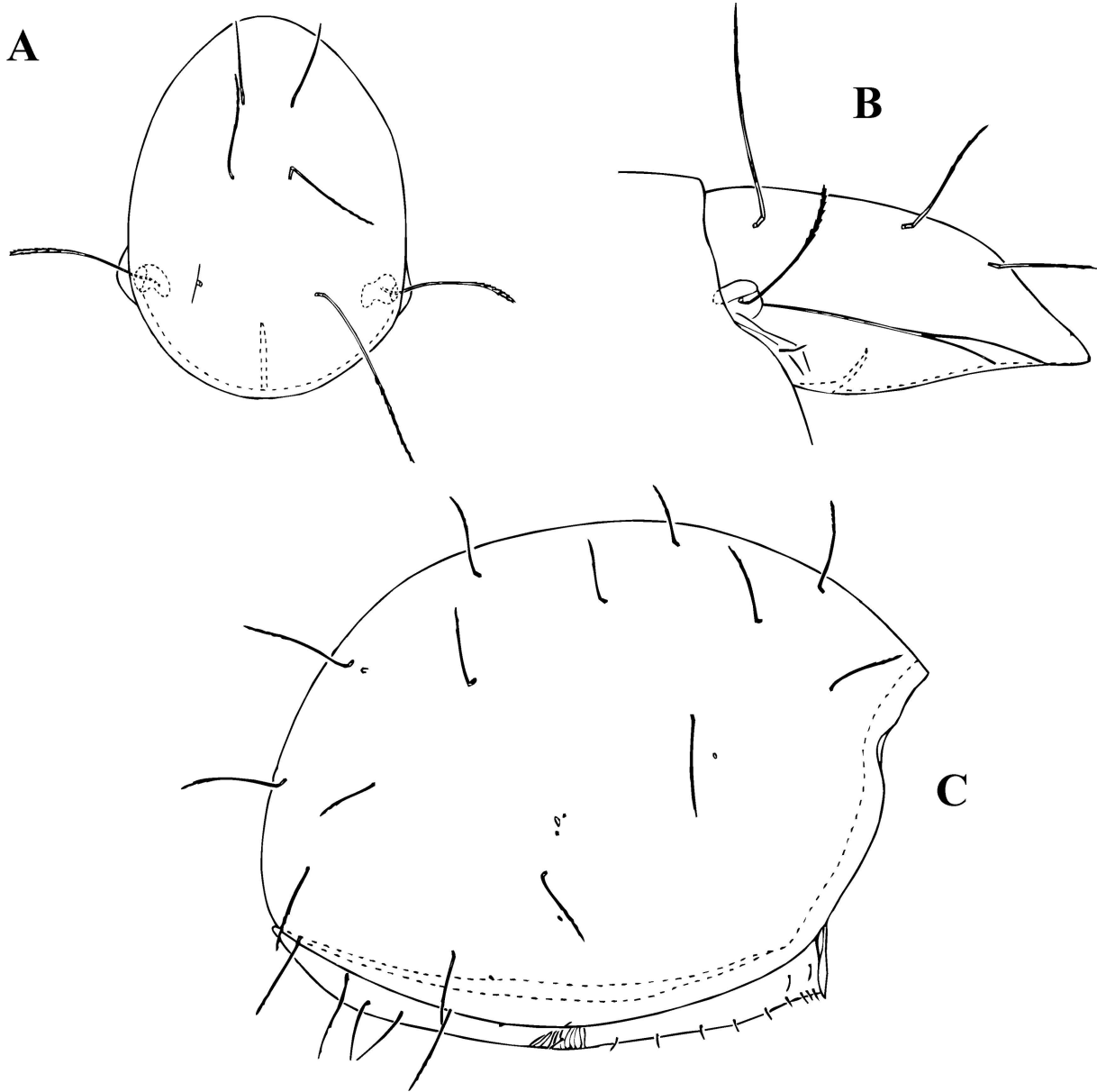


FIGURE 26: *Acrotrititia vestita* (Berlese, 1913) (paratype of *Rhysotrititia comteae* Mahunka, 1983 – synonym of *A. vestita*): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view.

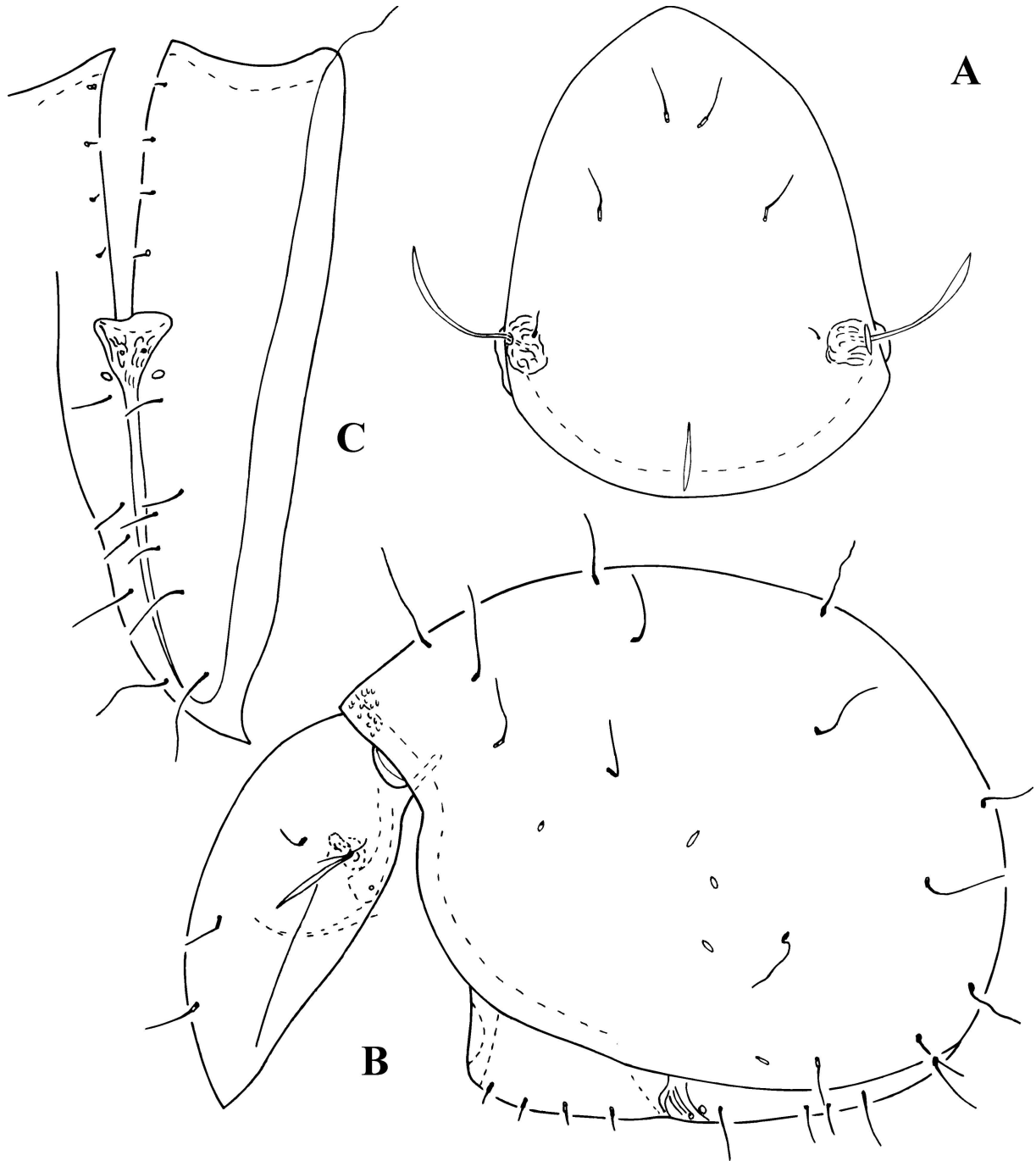


FIGURE 27: *Microtritia diaphoros* Niedbala et Starý, 2014 (holotype): A – prodorsum, dorsal view; B – lateral view of body; C – ventral region.

*Microtritia parahauseri*  
Niedbała et Starý, 2015  
(Fig. 28A-D)

Diagnosis — Measurements of holotype: prodorsum: length 202, width 157, height 76; notogaster: length 338, width 202, height 217. Rather small-sized species; colour yellow; posterior part of prodorsum covered with alveoles. Prodorsum without lateral carinae; sensilli broadly spindle shaped, smooth; other setae fine, short; distance between lamellar setae slightly greater than between rostral setae; rostral setae relatively far from distal end;  $ss > ro > le > in$ . Notogaster with setae fine, flexible, short ( $c_1 < c_1 - d_1$ ), setae  $c_{1-3}$  remote from anterior margin, setae  $c_2$  more than other. Ventral region; 4 pairs of genital setae, no one situated in progenital position, aggenital setae absent; anal setae  $an_2$  and  $an_3$  absent, adanal setae  $ad_1$  and  $ad_2$  the longest; lyrifissures  $iad$  situated anteriorly of setae  $ad_3$ .

Localities in Tanzania: Uluguru Mts: Niedbała & Starý 2015c.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Microtritia tropica*  
Märkel, 1964  
(Fig. 29A-E)

Diagnosis — Measurements of “typus” (Märkel 1964): prodorsum: length 215, width 185, notogaster: length 345, width 270, height 285. Rather small-sized species; colour yellow, surface punctate. Prodorsum with long lateral carinae; sensilli long, narrow, pointed at the distal tip and covered with very small spines; interlamellar setae very small;  $ss > ro > le > in$ ; distance between rostral setae greater than between lamellar setae. Notogastral setae minute; vestigial setae  $f_1$  at the level of  $h_1$  setae. Ventral region; setae  $h$  of mentum considerably longer than distance between them; chaetome of palps: 2-1-7 and one solenidion; 5 pairs of genital setae, aggenital setae absent; 3 pairs of short anal and 3 pairs of longer adanal setae present.

Localities in Tanzania: Nguru Mts. Species not yet recorded from TAN.

Distribution — Pantropical species.

**Phthiracaroidae Perty, 1841**

Diagnosis — Body only slightly compressed laterally, anogenital region relatively wide, almost U-shaped. Legs monodactylous.

**Phthiracaridae Perty, 1841**

Type genus: *Phthiracarus* Perty, 1839.

Monotypic family with the diagnosis as that of the genus.

*Phthiracarus* Perty, 1839

*Hoplophora* C.L. Koch, 1836 (in part); nom. praeoc. par Germar 1833

*Hoploderma* Michael, 1898 (in part)

*Ginglymacarus* Ewing, 1917: Marshall et al. 1987

*Peridromotritia* Jacot, 1923: Marshall et al. 1987

*Phthiracarus*: Jacot 1930 (in part), Hammen 1959 (in part), Parry 1979a, non *Phthiracarus* sensu Michael (1898), Niedbała 2008b

*Neophthiracarus* Balogh et Csiszár, 1963: Niedbała 1986

*Archiphthiracarus* Balogh et Mahunka, 1979: Niedbała 1986

*Phthiracarus* (*Archiphthiracarus*) Balogh et Mahunka, 1979: Subías 2004

*Phthiracarus* (*Phthiracarus*): Subías 2004

*Metaphthiracarus* Aoki, 1980: Niedbała 1986

*Neoprotophthiracarus* Mahunka, 1980: Niedbała 1986

*Microphthiracarus* Mahunka, 1982: Niedbała 1986

*Archiphthiracarella* Mahunka, 1996: Niedbała 2001

*Paraphthiracarus* Aoki, 1980: Niedbała 1986

*Phthiracarus* (*Metaphthiracarus*): Subías 2004 syn. nov.

Type species: *Phthiracarus contractilis* Perty, 1841 (= *Hoplophora laevigata* C.L. Koch, 1841).

Diagnosis — Body integumental surface smooth or punctate (with some exceptions). Median and lateral sigillar fields of prodorsum mostly not fused; lateral carinae of prodorsum either long, extending beyond or reaching sinus, or shorter; no furrows in the back of prodorsum (with some exceptions); sensilli most often smooth, short, fusiform or rounded distally, or long and filiform, without a distinct head; interlamellar setae always parallel to

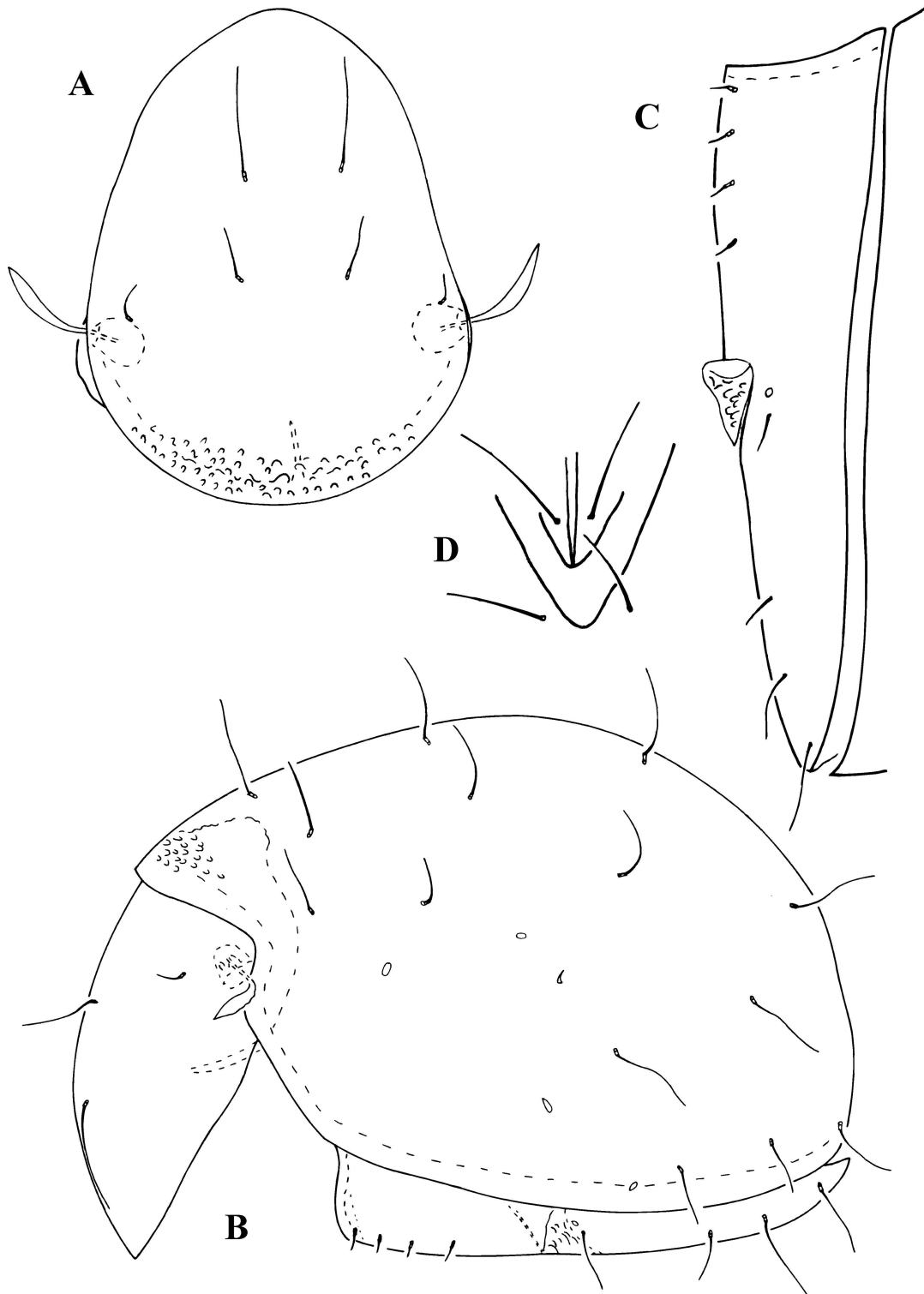


FIGURE 28: *Microtritia parahauseri* Niedbała et Starý, 2014 (holotype): A – prodorsum, dorsal view; B – lateral view of body; C – left side of ventral region; D – posterior end of ventral plates.

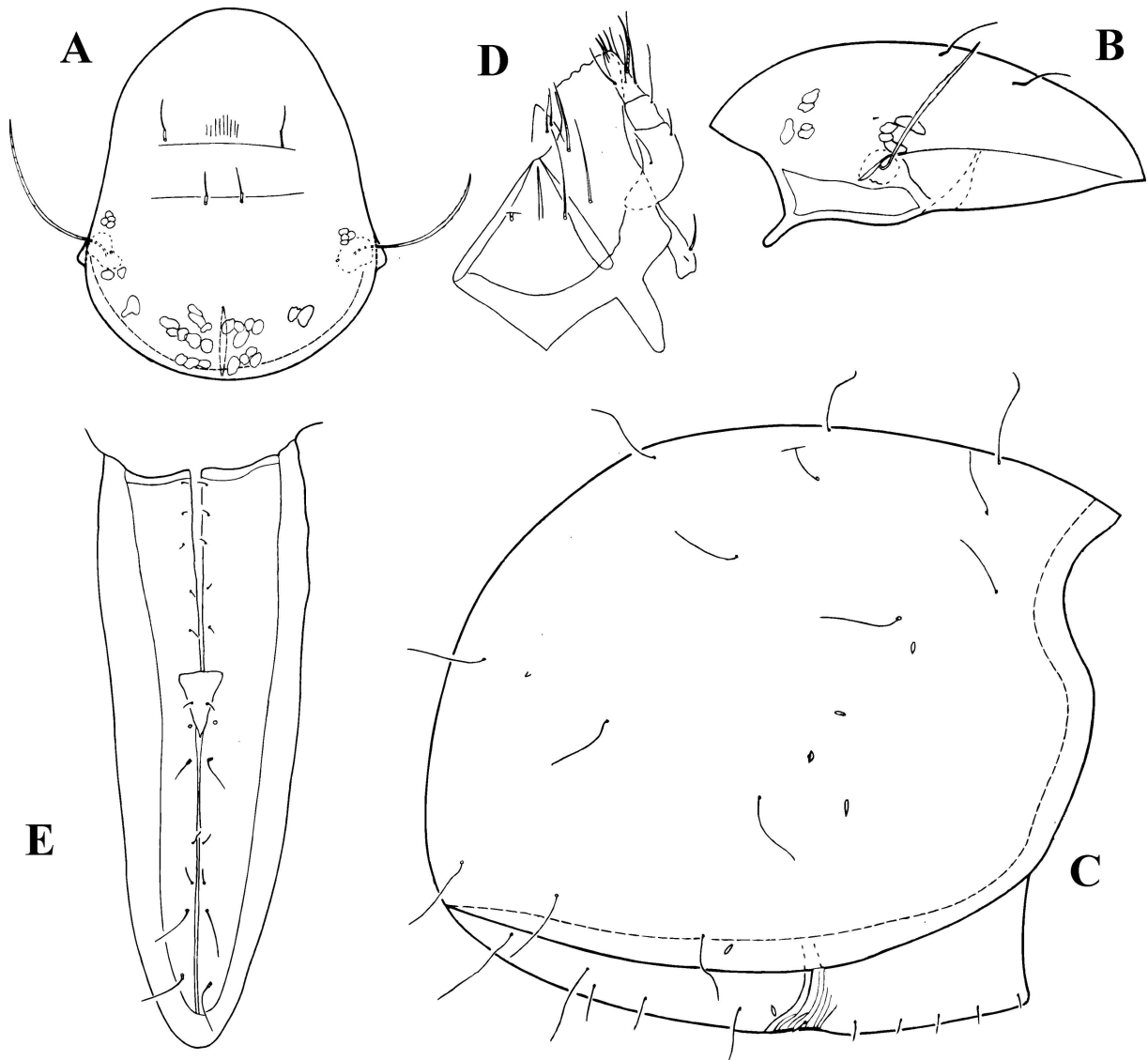


FIGURE 29: *Microtritia tropica* Märkel, 1964 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – subcapitulum with left palp; E – ventral region (specimen from Australia).

surface of prodorsum, setae of prodorsum and notogaster smooth, fine and long, acuminate. Median crista of notogaster absent; 15 pairs of gastronotal setae, rarely more setae present. Ventral region; pedipalps three segmented with formula: 2-2-7(1); epimera I and II are much larger than epimera III and IV with formula: 1-0-1-1; genital setae arranged in two rows, setae  $g_{6-9}$  remote from paraxial margin, setae  $g_6$  usually near or anteriorly of  $g_5$ ; adanal setae always remote from the paraxial margin of plate, setae  $ad_1$  and  $ad_2$  well developed, minute or vestigial, neutrichy involving adanal setae can occur. Legs: setae  $d$  of tibiae IV short, coupled with solenidia; when present, setae  $v'$  on femora I long; setae  $ft''$  of tarsi I normal.

Distribution — Semicosmopolitan.

*Phthiracarus anonymus*  
Grandjean, 1933.  
(Fig 30A-E)

*Archiphthiracarus hauseri* Mahunka, 1988 syn by Niedbała 2001.

*Phthiracarus pocsi* Mahunka, 1983 syn. by Balogh and Balogh 2002.

*Phthiracarus anonymus*: Niedbała 2001.

Diagnosis — Measurements of one of specimens from TAN-007: length of prodorsum: 240, 177; length of notogaster: length 430. Species of medium size; colour yellowish. Prodorsum with median and lateral fields fairly short; lateral carinae long, extending beyond sinus; sensilli short, clavate, rounded distally, slightly curved, covered with few squama; interlamellar setae not reaching the insertion point of rostral setae; rostral and lamellar setae equal in length;  $in > ro > le > ex > ss$ . Notogaster with fairly short setae ( $c_1/c_1-d_1=0.8$ ), filiform setae, dorsal setae slightly longer than laterals, setae  $c_1$  and  $c_3$  located on the anterior margin, setae  $c_2$  further away from the margin; setae  $f_1$  anteriorly of setae  $h_1$ ; among lyrifissures, only  $ia$  and  $im$  present. Ventral region;  $h < h-h$ ; genitoaggenital plate with 9 genital setae: 7(4+3): 2; anoadanal plate with 5 well developed setae, adanal setae longer than anal ones, setae  $ad_1$  and  $ad_3$  located in a nearly the same row with anal setae. Chaetome of legs reduced; missing

setae:  $v'$  on femora I,  $s$  on tarsi I,  $s$  on tarsi II,  $l'$  on genua IV,  $s$  and  $pv'$  on tarsi IV.

Localities in Tanzania: Kilimanjaro Mts., Morogoro Region: Mahunka 1983a, 1993; Uluguru and Nguru Mts.

Distribution — Semicosmopolitan species.

**Steganacaridae Niedbała, 1986**

Type genus: *Steganacarus* Ewing, 1917

Diagnosis — Body integumental surface usually covered with concavities and protuberances; posterior furrows of prodorsum usually present; lateral carinae rarely long, extending beyond sinus; setae of variable form, if smooth, they are spiniform or flagelliform, most commonly covered with spicules or are rod-, club- or leaf-shaped; usually nine pairs of genital setae present.

**Plonaphacarus Niedbała, 1986**

*Hoplophthiracarus* Jacot, 1933 (in part)

*Hoplophthiracarus* (in part): Subías 2004

Type species: *Hoplophthiracarus eximius* Niedbała, 1982

Diagnosis — Median and lateral fields of prodorsum not fused; rostral setae inserted far from the end of rostrum. Notogaster usually with 15 pairs of setae. Ventral region; genital setae arranged in two rows, setae  $g_{7-9}$  always remote from the paraxial margin; adanal setae at a distance from the paraxial margin of anoadanal plate. Legs; setae  $d$  of tibiae IV long and independent of solenidia, setae  $v'$  of femora I present.

Distribution — Pantropical.

***Plonaphacarus brevisetus***  
(Mahunka, 1984)  
(Figs 31A-G; 32A-H)

*Hoplophthiracarus brevisetus* Mahunka, 1984.

*Plonaphacarus brevisetus*: Niedbała 2001.

Diagnosis — Measurements of paratype: prodorsum: length 268, width 202, height 101, setae:  $ss$  71,  $in$  76,  $le$  20,  $ro$  63; notogaster: length 555, width 333, height 303, setae:  $c_1$  88,  $c_1/c_1-d_1=0.6$ ,  $h_1$  76,  $ps_1$  88; genitoaggenital plate  $71 \times 56$ , anoadanal plate



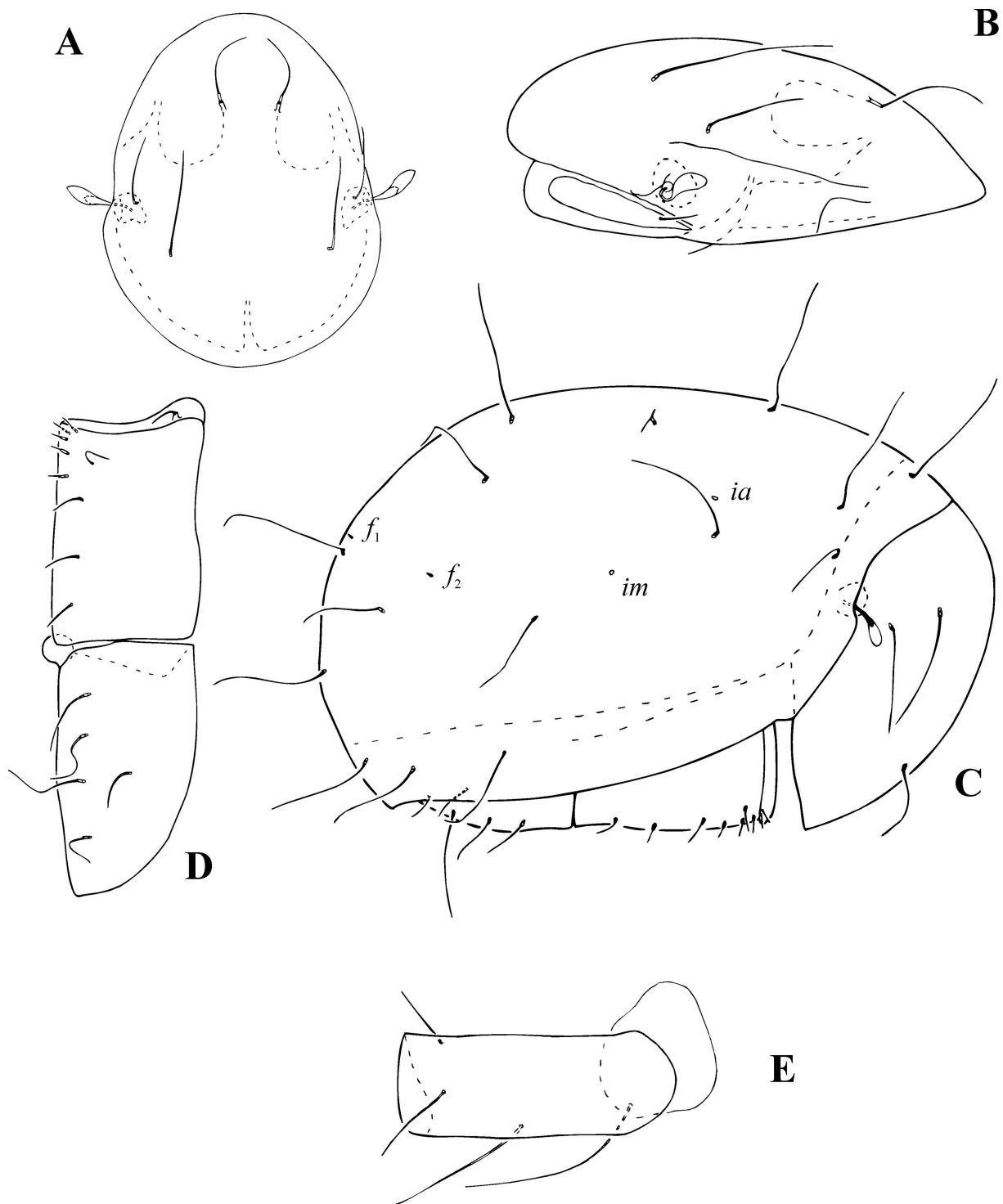


FIGURE 30: *Phthiracarus anonymus* Grandjean, 1933 (specimen from Poland): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – lateral view of body; D – left genitoaggenital and ano-adanal plates; E – trochanter and femur I.

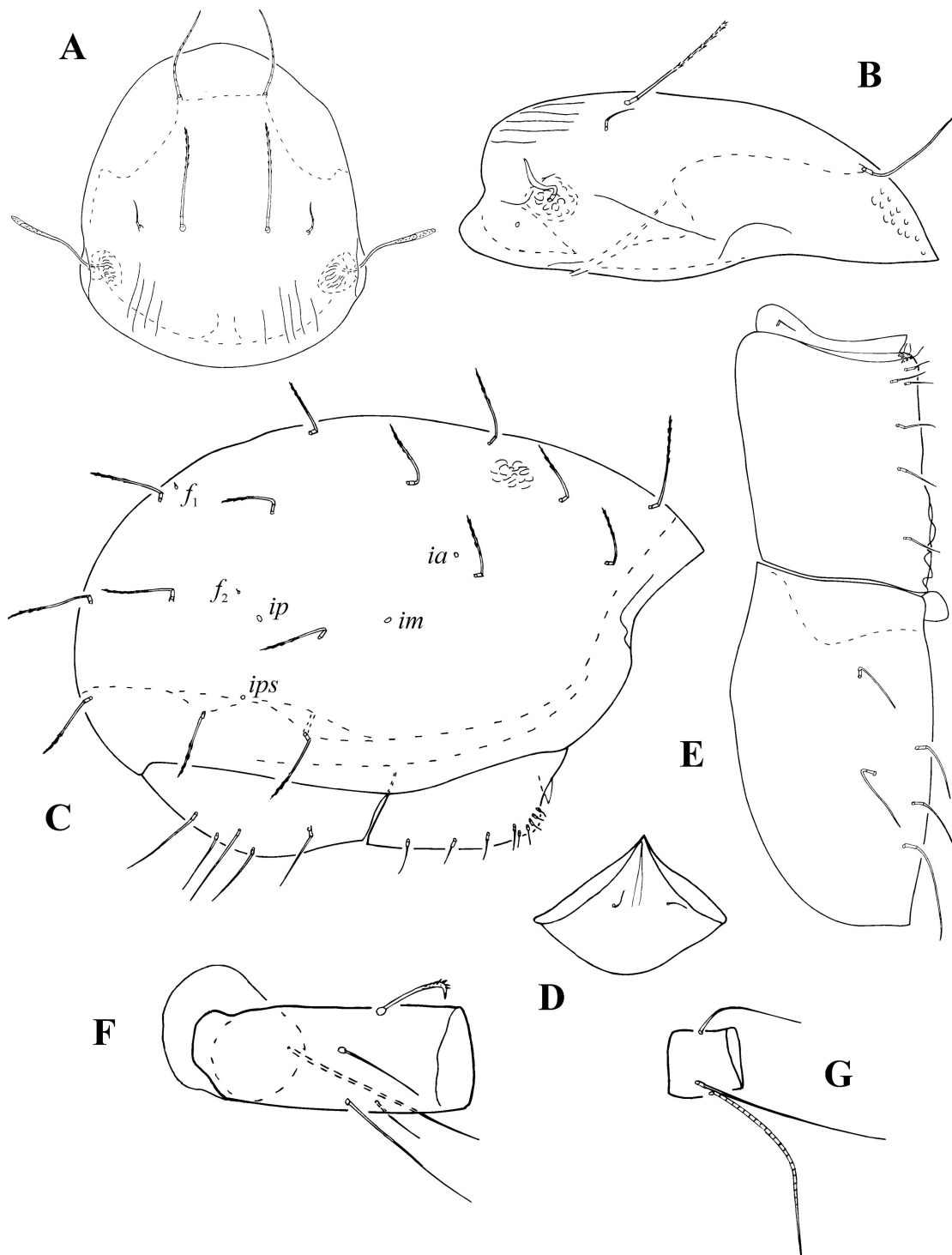


FIGURE 31: *Plonaphacarus brevisetus* (Mahunka, 1984) (paratype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – right genitoaggenital and anoadanal plates; F – trochanter and femur of leg I; G – tibia of leg IV.

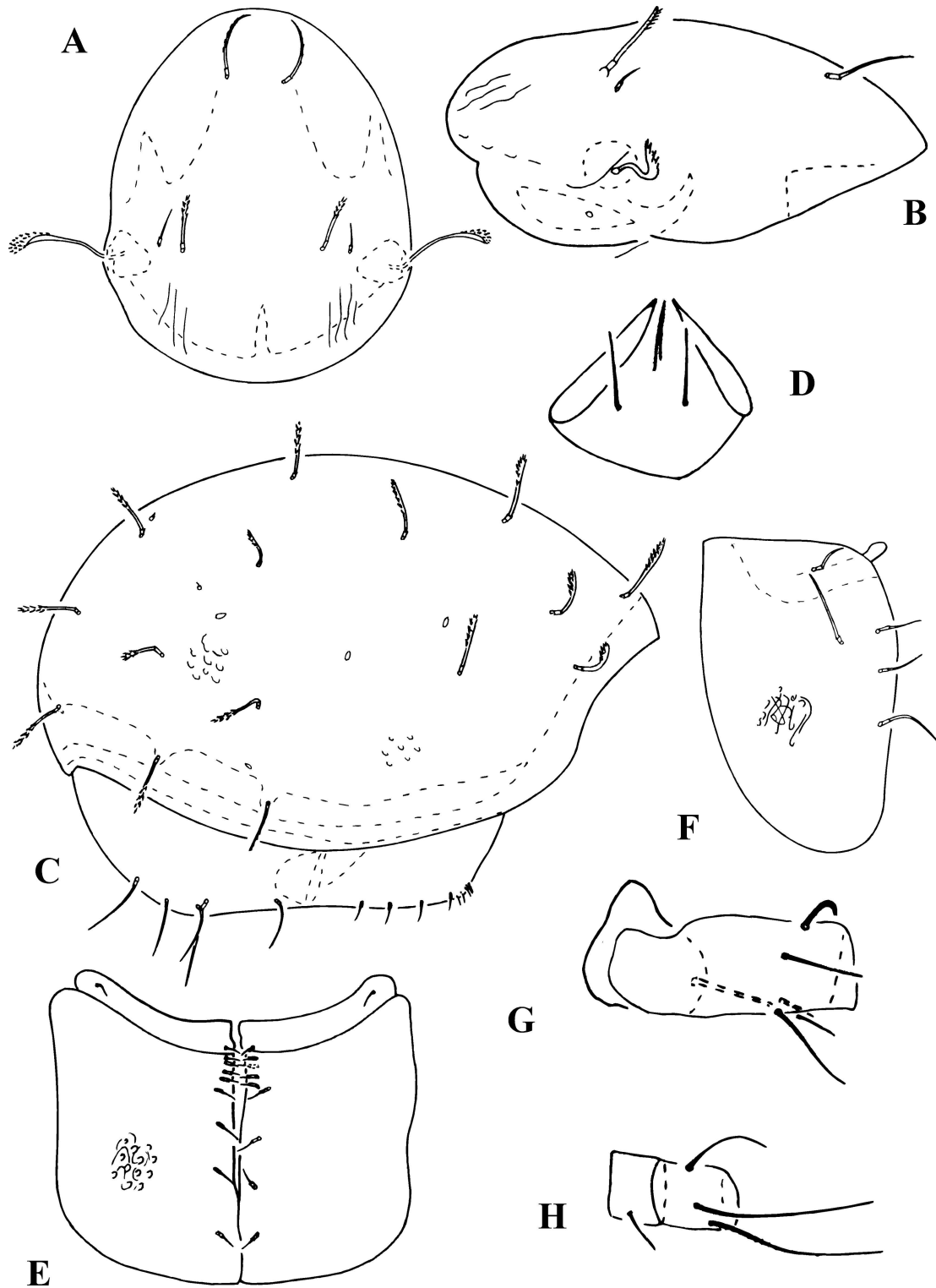


FIGURE 32: *Plonaphacarus brevisetus* (Mahunka, 1984) (specimen from TAN-007): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – genitoaggenital plates; F – right anoadanal plate; G – trochanter and femur of leg I; H – genua and tibia of leg IV.

106×61. Measurements of one specimen from sample TAN-007: prodorsum: length 172  $\mu\text{m}$ , width 134, height 96, setae: *ss* 56, *in* 33, *le* 13, *ro* 28; notogaster: length 343, width 227, height 217, setae:  $c_1$  48,  $c_1/c_1-d_1=0.6$ ,  $h_1$  and  $ps_1$  38; genitoaggenital plate 88×81, anoadanal plate 147×94. Paratype and specimen from TAN-007 are smaller than dimensions given by Mahunka (1984). Medium-sized species; colour light brown to brown; surface of body finely foveolate. Prodorsum with weak lateral carinae; sigillar fields indistinct, median field rather large; posterior furrows present; sensilli comparatively long, narrow, with dilated, lanceolate or oval head covered, with small spines; interlamellar setae semi-erect thick, short, covered with small spines, especially from one side; rostral setae stout, pointed distally, covered with small spines; lamellar setae minute, spiniform, smooth; exobothridial setae vestigial;  $in>ro>le$ . Notogaster with rather short setae ( $c_1<c_1-d_1$ ), stout, thick covered with small spines, especially from one side, setae  $c_1$  and  $c_3$  near anterior border, setae  $c_2$  remote from border; vestigial setae  $f_1$  situated slightly anteriorly of  $h_1$  setae; 4 pairs of lyrifissures present. Ventral region; setae  $h$  of mentum slightly shorter or slightly longer than distance between them; formula of genital setae: 6(4+2): 3; between setae of anoadanal plates setae  $ad_1$  and  $ad_2$  longer than other setae of anoadanal plate, anal setae smaller than  $ad_1$  setae and longer than  $ad_3$  setae, all setae rough. Chaetome of legs of "complete type"; setae  $d$  of femora I distinctly remote from distal end of article.

Localities in Tanzania: Dadoma Region: Mahunka 1984, Niedbała 2001; Uluguru and Nguru Mts.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Plonaphacarus ecphylus*  
Niedbała, 2001  
(Figs 33A-H; 34A-H)

Diagnosis — Measurements of one specimen from sample TAN-006. Prodorsum: length 303, width 227, height 126, setae: *ss* 56, *in* 71, *le* 33, *ro* 61; notogaster: length 596, width 404, height 384, setae:  $c_1$  101,  $c_1/c_1-d_1=0.7$ ,  $h_1$  and  $ps_1$  83; genitoaggenital

plate 156×116, anoadanal plate 227×131. Species of medium size; colour dark brown; surface of body covered with weak concavities. Prodorsum with sigillar fields indistinct; posterior furrows present; lateral carinae feeble reach the sinus; sensilli long, with narrow pedicel and rounded head, rough; interlamellar setae of medium size, covered with small spines in distal half; rostral and lamellar setae spiniform, rough;  $in>ro>ss>le$ ; exobothridial setae vestigial. Notogaster with rigid, fairly short ( $c_1<c_1-d_1$ ), blunt distally setae, covered with small spines in distal half; setae  $c_3$  near anterior border, setae  $c_1$  slightly remote, setae  $c_2$  far from border; vestigial setae  $f_1$  posteriorly of  $h_1$  setae, 4 pairs of lyrifissures *ia*, *im*, *ip* and *ips* present. Ventral region; setae  $h$  of mentum almost equal to distance between them; arrangement of genital setae: 6(4+2): 3; anoadanal plates each with 5 setae, setae  $ad_2$  the longest and the thickest, curved distally,  $ad_1>an>ad_3$ . Chaetome of legs complete, setae  $d$  remote from distal end of article, setae  $v''$  minute.

Localities in Tanzania: Uluguru and Nguru Mts. Species new for TAN.

Distribution — Afrotropical species, found in Kenya and Tanzania only.

*Plonaphacarus kugohi*  
(Aoki, 1959)  
(Fig. 35A-G)

*Hoplophthiracarus kugohi* Aoki, 1959.

*Hoplophthiracarus africanus* Mahunka, 1984 syn. by Niedbała 2001.

*Plonaphacarus kugohi*: Niedbała 2001.

Diagnosis — Measurements after Aoki (1959): length of prodorsum 300-320; length of notogaster 590-630. Species of medium size; colour light brown, brown; surface of body covered with concavities. Prodorsum with lateral carinae very long reach anterior end of rostrum; sigillar fields distinct; posterior furrows present; sensilli long, with long pedicel and fusiform head covered with small spines; interlamellar setae stout, strong covered with small spines in distal half; rostral and lamellar setae spiniform, rough; exobothridial setae minute;  $in>ss>ro>le>ex$ . Notogaster with fairly short ( $c_1<c_1-d_1$ ) setae, robust, covered with small spines in dis-

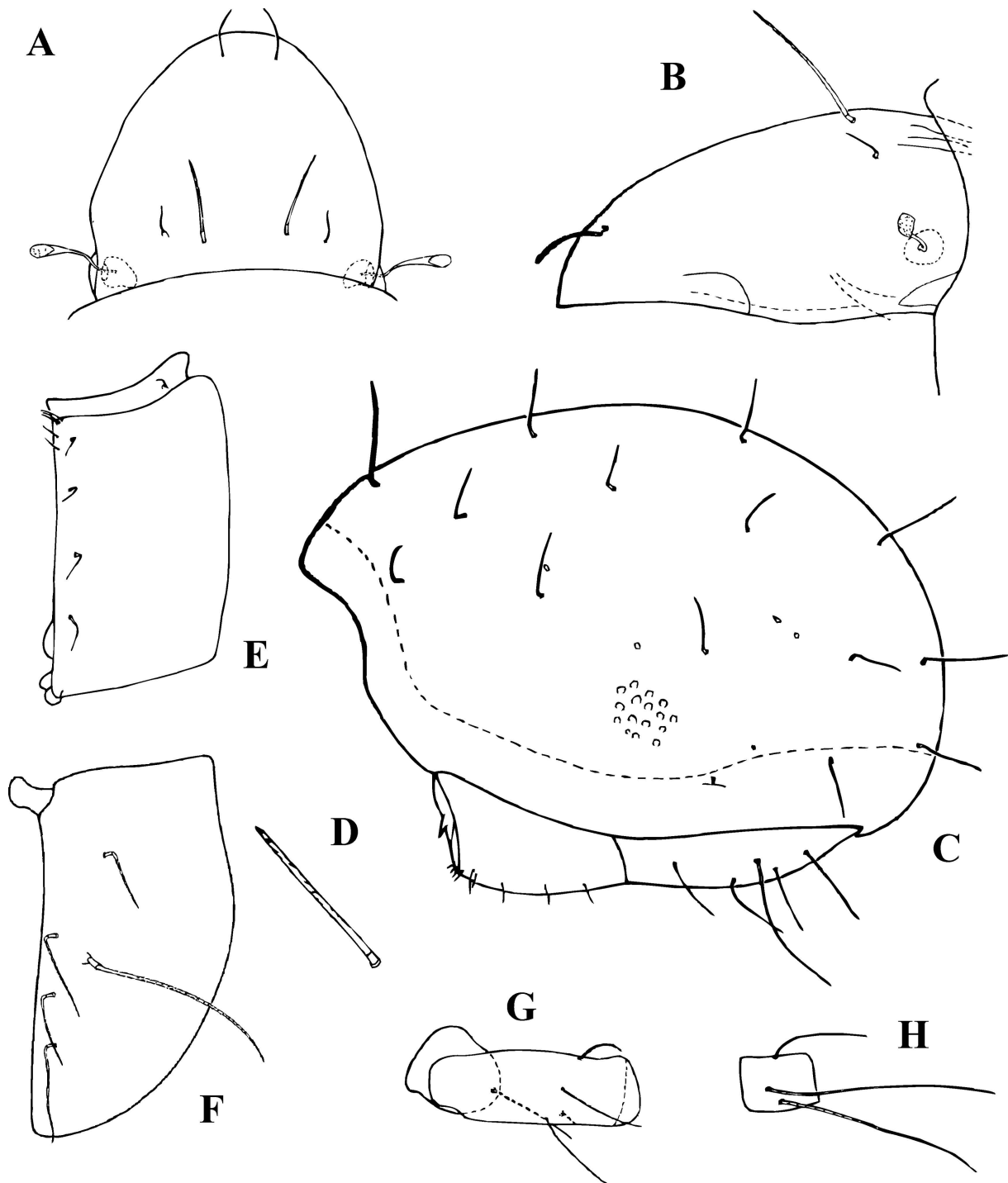


FIGURE 33: *Plonaphacarus ecphylus* Niedbała, 2001 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – seta  $h_1$ ; E – left genitoaggenital plate; F – left anoadanal plate; G – trochanter and femur of leg I; H – tibia of leg IV.

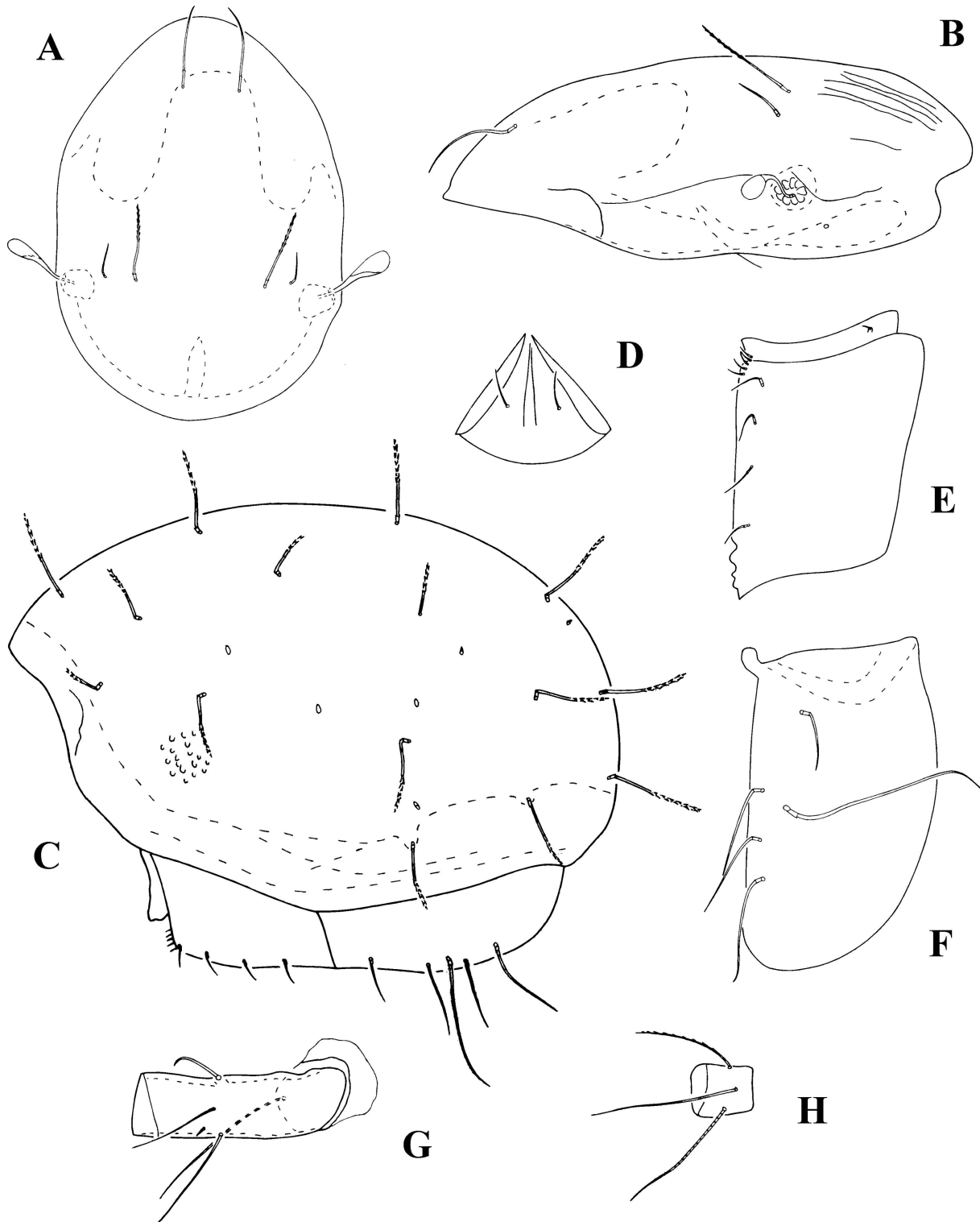


FIGURE 34: *Plonaphacarus ecphylus* Niedbala, 2001 (specimen from TAN-006): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left genitoaggenital plate; F – left anoadanal plate; G – trochanter and femur of leg I; H – tibia of leg IV.

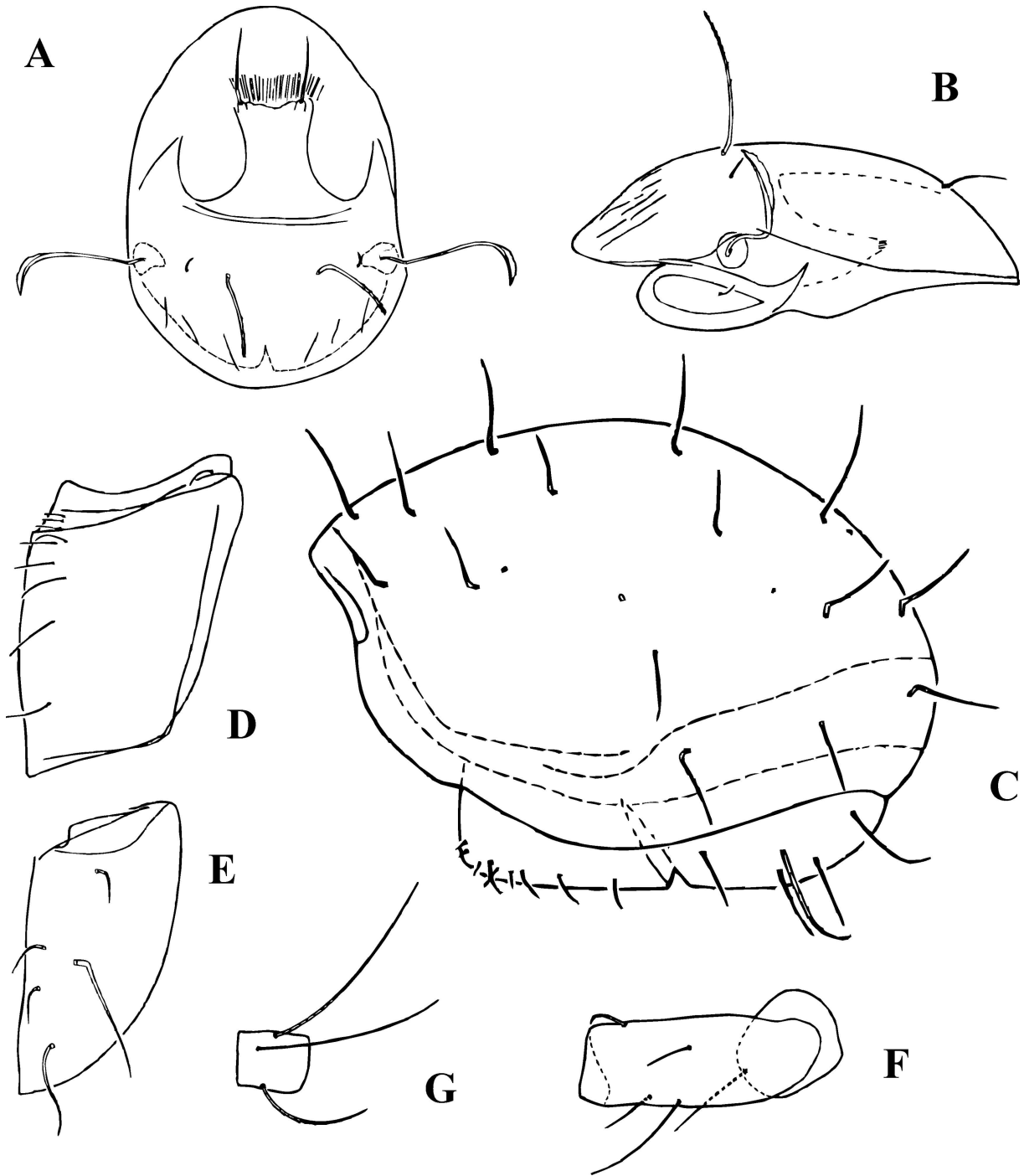


FIGURE 35: *Plonaphacarus kugohi* (Aoki, 1959) (specimen from Australia): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left anoanal plate; F – trochanter and femur of leg I; G – tibia of leg IV.

tal half; setae  $c_1$  and  $c_3$  near anterior border, setae  $c_2$  remote from border; vestigial setae  $f_1$  posteriorly of  $h_1$  setae; 2 pairs of lyrifissures  $ia$  and  $im$  present. Ventral region; setae  $h$  of subcapitulum minute; formula of genital setae: 6(4+2): 3; setae  $ad_2$  of anoadanal plate the longest and the thickest. Leg setation reduced, setae  $a'$  on tarsi I are missing.

Locality in Tanzania: Kilimanjaro Mts: Niedbala 2001.

Distribution — Pantropical species.

***Plonaphacarus machadoi***  
(Balogh, 1958)  
(Fig. 36A-F)

*Steganacarus machadoi* Balogh, 1958.

*Plonaphacarus machadoi*: Niedbala 2001, Niedbala & Ermilov 2014.

Diagnosis — Measurements of specimen from type series: prodorsum: length 283, width 202, height 103; notogaster: length 530, width 348, height 313. Medium-sized species; colour brown; surface of body covered with strong concavities. Prodorsum with broad median field, lateral fields very short, lateral carinae reaching the sinus; posterior furrows present; sensilli long, narrow with round head covered with small spines; interlamellar setae erect, long, thick, covered with small spines in distal half; lamellar setae minute, rostral setae long, directed slightly inwards; exobothridial setae minute;  $in > ss > ro > le = ex$ . Notogaster with robust setae ( $c_1/c_1-d_1=1$ ), spinose in distal half; vestigial setae  $f_1$  anteriorly of  $h_1$  setae; four pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; setae  $h$  of mentum longer than distance between them; formula of genital setae: 6(4+2): 3; setae  $ad_2$  on anoadanal plate erect, the longest and the thickest. Leg setation reduced, setae  $a'$  on tarsi I are missing.

Locality in Tanzania: Mahale Peninsula: Niedbala 2001.

Distribution — Afrotropical, central part.

***Plonaphacarus ngongi***  
Niedbala, 2001  
(Fig. 37A-G)

Diagnosis — Measurements of holotype: prodorsum: length 242, width 192, height 116; notogaster: length 490, width 333, height 313. Species of medium size; colour light-yellow, whitish; integument finely punctate. Prodorsum with posterior furrows; fields and lateral carinae invisible; sensilli long, gradually thickening, with weakly separated head, covered with small spines in distal half; interlamellar setae erect, robust, covered with small spines in distal half, lamellar setae minute, spiniform, smooth; rostral setae moved posteriorly, long, almost procumbent, rough;  $in > ss > ro > le$ ; exobothridial setae vestigial. Notogaster with setae robust, covered with small spines in distal half ( $c_1/c_1-d_1=0,79$ ), setae  $c_1$  close to anterior margin, setae  $c_3$  slightly remote and setae  $c_2$  far from margin; vestigial setae invisible; 4 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; setae  $h$  of mentum longer than their distance between them; arrangement of genital setae: 6(4+2): 3; anoadanal plates with 5 pairs of setae,  $ad_1$  and  $ad_2$  longer than  $ad_3$  setae, anal setae the smallest. Leg setation reduced; setae  $a'$  on tarsi I absent; setae  $d$  on femora I located near the distal end of article.

Locality in Tanzania: Arusha Region: Niedbala 2008a.

Distribution — Afrotropical, central part.

***Plonaphacarus paramachadoi***  
Niedbala et Stary, 2015  
(Fig. 38A-F)

Diagnosis — Measurements of holotype: prodorsum: length 252, width 202, height 91; notogaster: length 485, width 328, height 303. Species of medium size; colour brown; microsculpture of integument slightly rugged with polygonal ornamentation. Prodorsum with distinct, rather short lateral carinae; sigillar fields short; posterior furrows indistinct; sensilli club-like with elongated, dilated head obtuse distally and covered with small spines; interlamellar setae long, thick, erect covered with small spines in distal half similar to notogastral setae; lamellar setae short, spinose, smooth; rostral



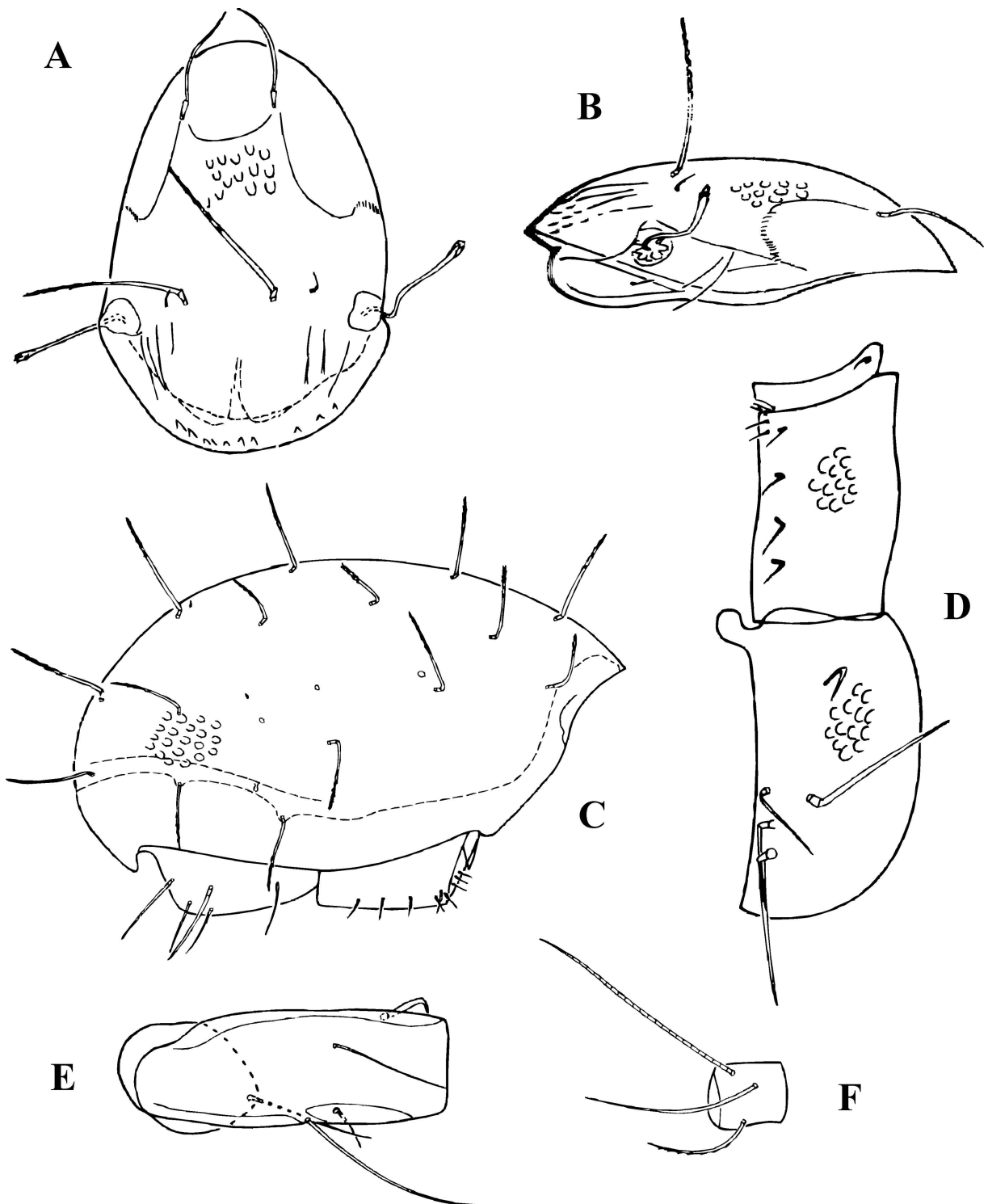


FIGURE 36: *Plonaphacarus machadoi* (Balogh, 1958) (specimen from type serie): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital and anoanal plates; E – trochanter and femur of leg I; F – tibia of leg IV.

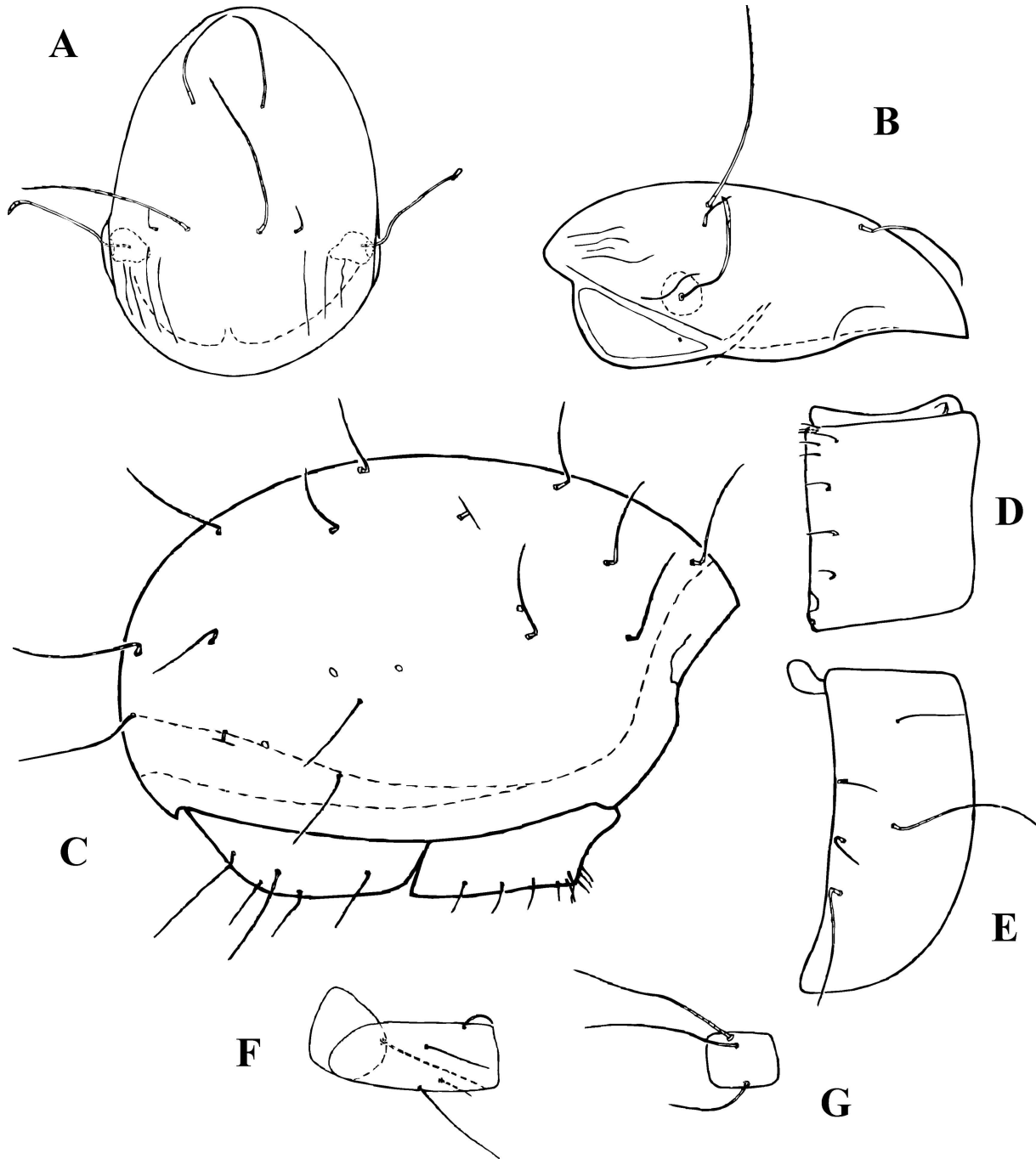


FIGURE 37: *Plonaphacarus ngongi* Niedbala, 2001 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left anoadanal plate; F – trochanter and femur of leg I; G – tibia of leg IV.

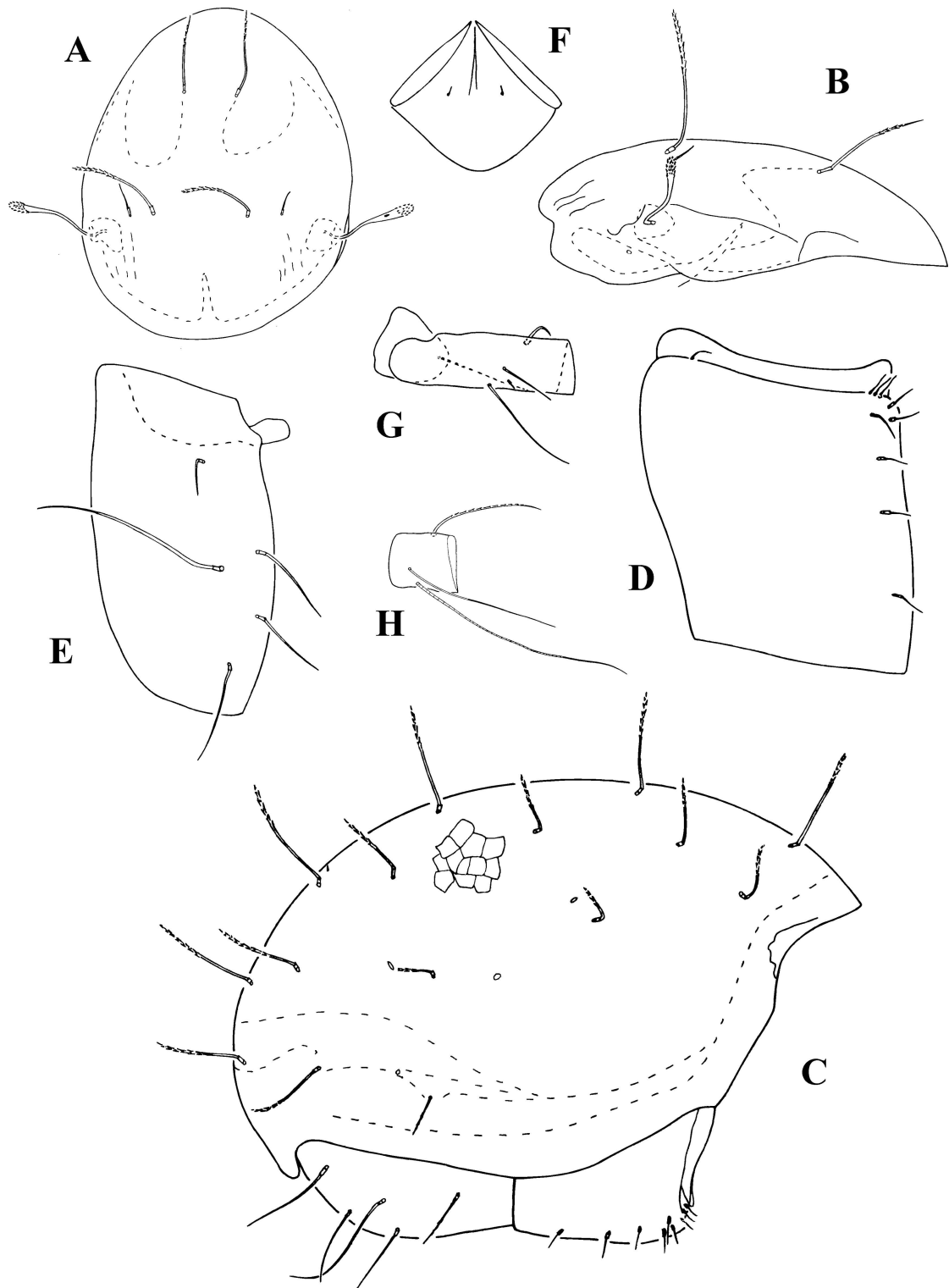


FIGURE 38: *Plonaphacarus paramachadoi* Niedbała et Starý, 2015 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – right genitoaggenital plate; E – right anoanal plate; F – mentum of subcapitulum; G – trochanter and femur of leg I; H – tibia of leg IV.

setae stout, thick, erect, pointed distally and covered with small spines, remote from anterior border;  $in > ro > ss > le$ ; exobothridial setae vestigial. Notogaster with setae of medium length ( $c_1 < c_1 - d_1$ ), thick, covered with spines in distal half, setae  $c_1$  and  $c_3$  slightly remote from anterior margin, setae  $c_2$  far from border; vestigial setae  $f_1$  located slightly anteriorly of  $h_1$  setae; 4 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$  and  $ips$  present. Ventral region; setae  $h$  of mentum minute; formula of genital setae: 6(4+2): 3; anoadanal plates with 5 pairs of well-developed setae, setae  $ad_2$  the longest and bent distally, anal setae shorter than  $ad_1$  and  $ad_2$  setae but longer than  $ad_3$  setae, adanal setae rough, anal setae smooth. Chaetome of legs of "complete type"; setae  $d$  of femora I remote from distal end of article.

Locality in Tanzania: Uluguru and Nguru Mts: Niedbała & Starý, 2015a.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Plonaphacarus styphelos***  
**Niedbała, 2001**  
**(Fig. 39A-G)**

Diagnosis — Measurements of specimen from type serie: prodorsum: length 313, width 227, height 126; notogaster: length 570, width 412, height 380. Species of medium size; colour yellow; integument finely punctate, only the border with regular concavities. Prodorsum with weak and short median and lateral fields; lateral carinae and posterior furrows present; sensilli narrow, setiform, slightly sickle-shaped, covered with small spines; interlamellar setae long, erect, covered with spines; lamellar setae smaller, rough; rostral setae long, hooked, rough;  $in > ro > ss > le$ ; exobothridial setae vestigial. Notogaster with 16 pairs of medium length setae ( $c_1/c_1 - d_1 = 0,85$ ), covered with small spines, additional setae situated in row  $h$ ; setae  $c_2$  remote from anterior margin, setae  $c_1$  and  $c_3$  closer to margin; vestigial setae  $f_1$  anteriorly of  $h_1$  setae; 4 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; arrangement of genital setae: 6(4+2): 3, each anoadanal plate with 5 rough setae,  $ad_2 > ad_1 > an > ad_3$ . Leg setation complete; setae  $d$  on femora I situated near distal end of article.

Locality in Tanzania: Mahale Peninsula: Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Plonaphacarus tanzicus***  
**(Mahunka, 1993)**  
**(Fig. 40A-D)**

*Hoplophthiracarus (Plonaphacarus) tanzicus* Mahunka, 1993.

*Plonaphacarus tanzicus*: Niedbała 2001, Niedbała & Ermilov 2014.

Diagnosis — Measurements after Mahunka (1933): length of prodorsum: 146-170; notogaster: length 230-313, height 126-193. Small-sized species; surface of body with very weak foveolae. Prodorsum with posterior furrows present; lateral carinae absent, fields not observable; sensilli sickle-shaped, distally spinose; interlamellar setae short, thick, spiculate asymmetrically at distal end; lamellar setae close to interlamellar, smaller, slightly dilate; distance between rostral setae (directed inwards) greater than their length;  $ss > ro > in > le$ ; exobothridial setae vestigial. Notogaster with short ( $c_1 < c_1 - d_1$ ), thick setae, generally spinose in their distal half, setae  $c_1$  and  $ps_1$  the longest, setae  $ps_{3-4}$  the thinnest, setae  $d_2$  the smallest; vestigial setae  $f_1$  posteriorly of  $h_1$ ; 4 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; formula of genital setae is 4: 5; adanal setae sword-shaped, setae  $ad_2$  the longest, anal setae the shortest. Chaetome of legs complete; setae  $d$  of femora I thick, bent, slightly remote from anterior bord of article.

Localities in Tanzania: Tanga Region: Mahunka 1993, Niedbała 2001.

Distribution — Afrotropical species, eastern part.

***Hoplophthiracarus Jacot, 1933***

*Hoplophthiracarus*: Jacot 1933 (in part), Niedbała 2008b, Subías 2004 (in part)

*Protrophthiracarus*: Balogh 1972 (in part).

Type species: *Hoplophthiracarus histricinum* Berlese, 1908

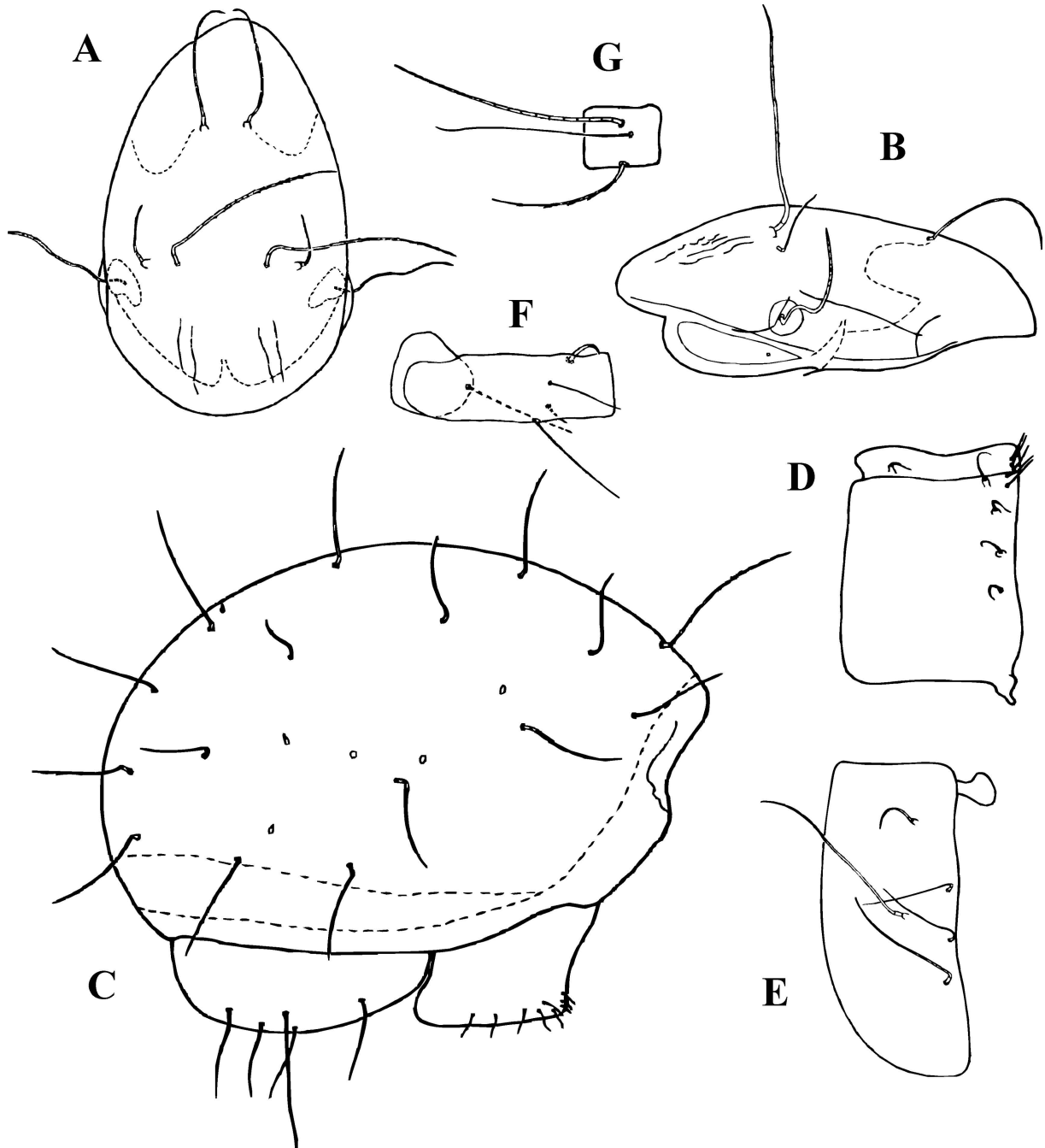


FIGURE 39: *Plonaphacarus styphelos* Niedbała, 2001 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – right genitoaggenital plate; E – right anoanal plate; F – trochanter and femur of leg I; G – tibia of leg IV.

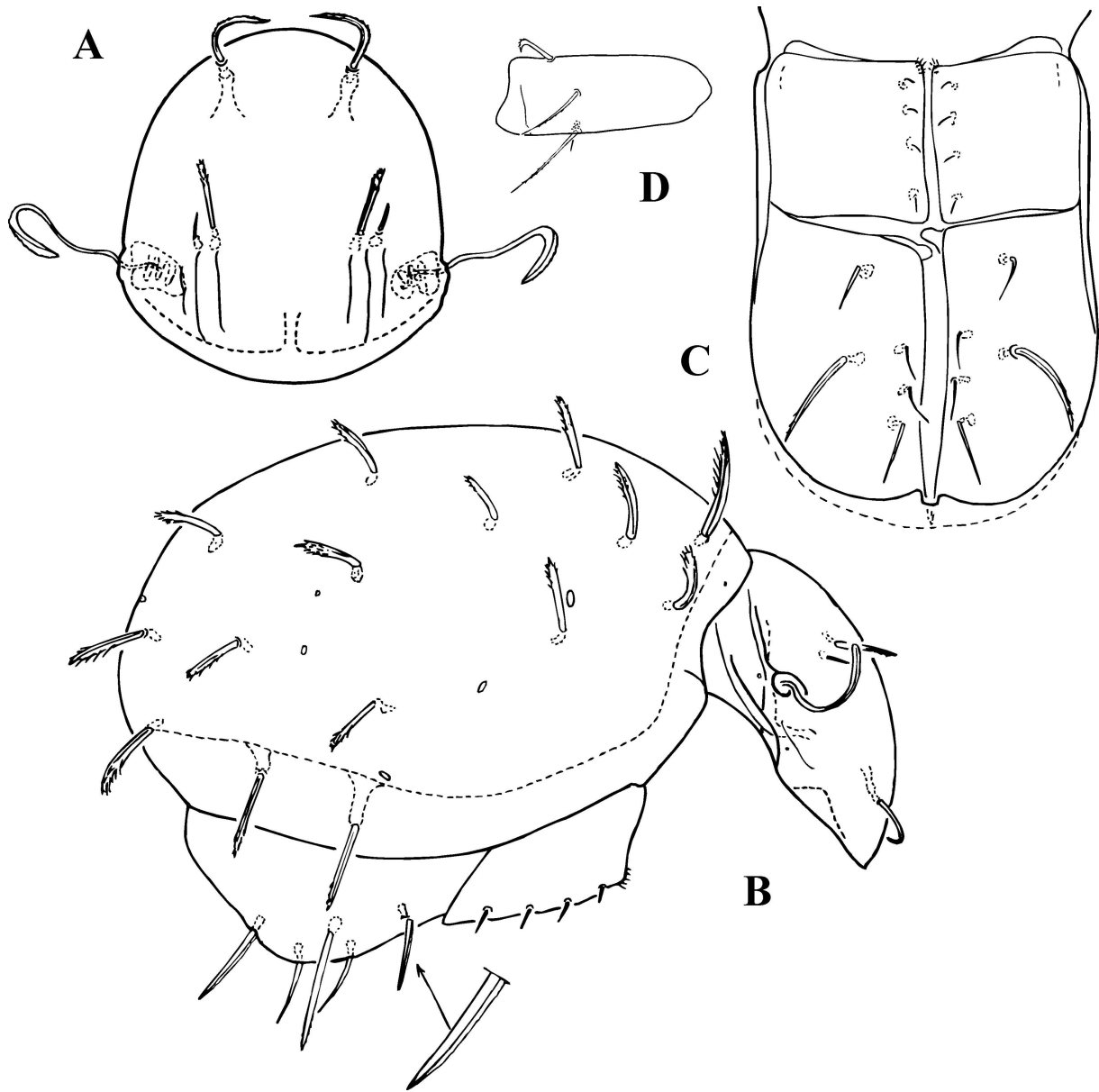


FIGURE 40: *Plonaphacarus tanzicus* (Mahunka, 1993) (after Mahunka 1993): A – prodorsum, dorsal view; B – lateral view of body; C – genital and anal plates; D – femur of leg I.

Diagnosis — Body integumental surface usually covered with concavities. Prodorsum with median sigillar field not fused with lateral fields; furrows usually present on back of prodorsum; interlamellar setae more or less erect; lamellar setae usually very short. Notogaster with 15 pairs of setae, setae  $c_1$  shorter than distance between setae  $c_1$  and  $d_1$ ; 2–4 pairs of lyrifissures present. Ventral region always with nine pairs of genital setae, setae  $g_{6-9}$  or  $g_{7-9}$  located almost in one row with setae  $g_{1-5}$ ; adanal setae remote from paraxial margin of anoadanal plate, setae  $ad_1$  longer than anal setae, all setae on anoadanal plate well developed, neotrichy of adanal setae present. Legs: setae  $d$  on femora I usually at distal end of segment; setae  $d$  of tibiae IV long and independent of solenidion.

Distribution — Semicosmopolitan

*Hoplophthiracarus ambiguus*  
Niedbała, 1982  
(Fig. 41A-G)

*Hoplophthiracarus ambiguus*: Niedbała 2001, Niedbała & Ermilov 2014, Niedbała & Starý, 2015b.

Diagnosis — Measurements of holotype: prodorsum 288, width 197; notogaster: length 586, width 409, height 369. Species of medium size; colour yellowish; integument finely punctuate and covered with concavities. Prodorsum with broad, convergent median and very short lateral sigillar fields; small sinus posterior of rostral setae; lateral carinae and posterior furrows present; sensilli long, with narrow pedicel and enlarged, spinose head; interlamellar setae long, erect, covered with spines; lamellar and exobothridial setae minute; rostral setae also short, spiniform, rough, slightly bent;  $in > ss > ro > le > ex$ . Notogaster with rather short ( $c_1 < \frac{1}{2}c_1 - d_1$ ) setae, covered with small spines, setae  $c_1$  and  $c_3$  slightly remote from anterior margin, setae  $c_2$  far from margin; vestigial setae  $f_1$  posterior of  $h_1$  setae, situated between setae  $h_1$  and  $ps_1$ ; 4 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; setae  $h$  of mentum slightly shorter than distance between them; arrangement of genital setae: 7(4+3): 2, between anoadanal setae,  $ad_1$  and  $ad_2$  rough and longer than other setae. Leg setation reduced, setae

$a'$  on tarsi missing; setae  $d$  on femora I remote from distal end of article.

Locality in Tanzania: Uluguru Mts.

Distribution — Afrotropical species, central part.

*Steganacarus* Ewing, 1917

*Neosteganacarus* Balogh et Mahunka, 1992: Niedbała 2004

*Nortonacarus* Balogh et Mahunka, 1992: Niedbała 2004

*Rafacarus* Niedbała, 1981: Niedbała 1997

Type species: *Hoploderma anomala* Berlese, 1883

Diagnosis — Body integumental surface usually covered with concavities. Prodorsum with lateral carinae of prodorsum do not extend beyond sinus; furrows present on back of prodorsum. Fifteen pairs of notogastral setae present but neotrichy of gastronomic setae exist. Ventral region; 9 pairs of genital setae present, genital setae  $g_{7-9}$  located in paraxial margin of plates and nearly in one row with setae  $g_{1-5}$ , setae  $g_6$  remote from paraxial margin; three or four pairs of setae along paraxial margin of anoadanal plates, three of more setae in adanal position. Legs: setae  $v'$  on femora I and setae  $l'$  on genua IV present; setae  $d$  of tibiae IV long and independent of solenidia, setae  $d$  on femora I usually located at the end of segment.

subgenus – *Rhacaplacarus* Niedbała, 1986

*Rhacaplacarus* (*Rhacaplacarus*) (in part): Subías 2004

*Mantigueracarus* Balogh and Mahunka, 1992: Niedbała 2004

Type species: *Hoplophorella amoena* Niedbała, 1983

Diagnosis — Prodorsum with lamellar and exobothridial setae short ( $ex$  exceptionally vestigial), length ratio of lamellar seta/prodorsum  $< 0.2$ , length ratio of exobothridial seta/prodorsum  $< 0.07$ . Notogaster without median ridge. Ventral region; three setae along paraxial margin of anoadanal plates. Legs: setae  $v'$  on femora short, length ratio  $v''/v' < 2.2$ .

Distribution — Semicosmopolitan.

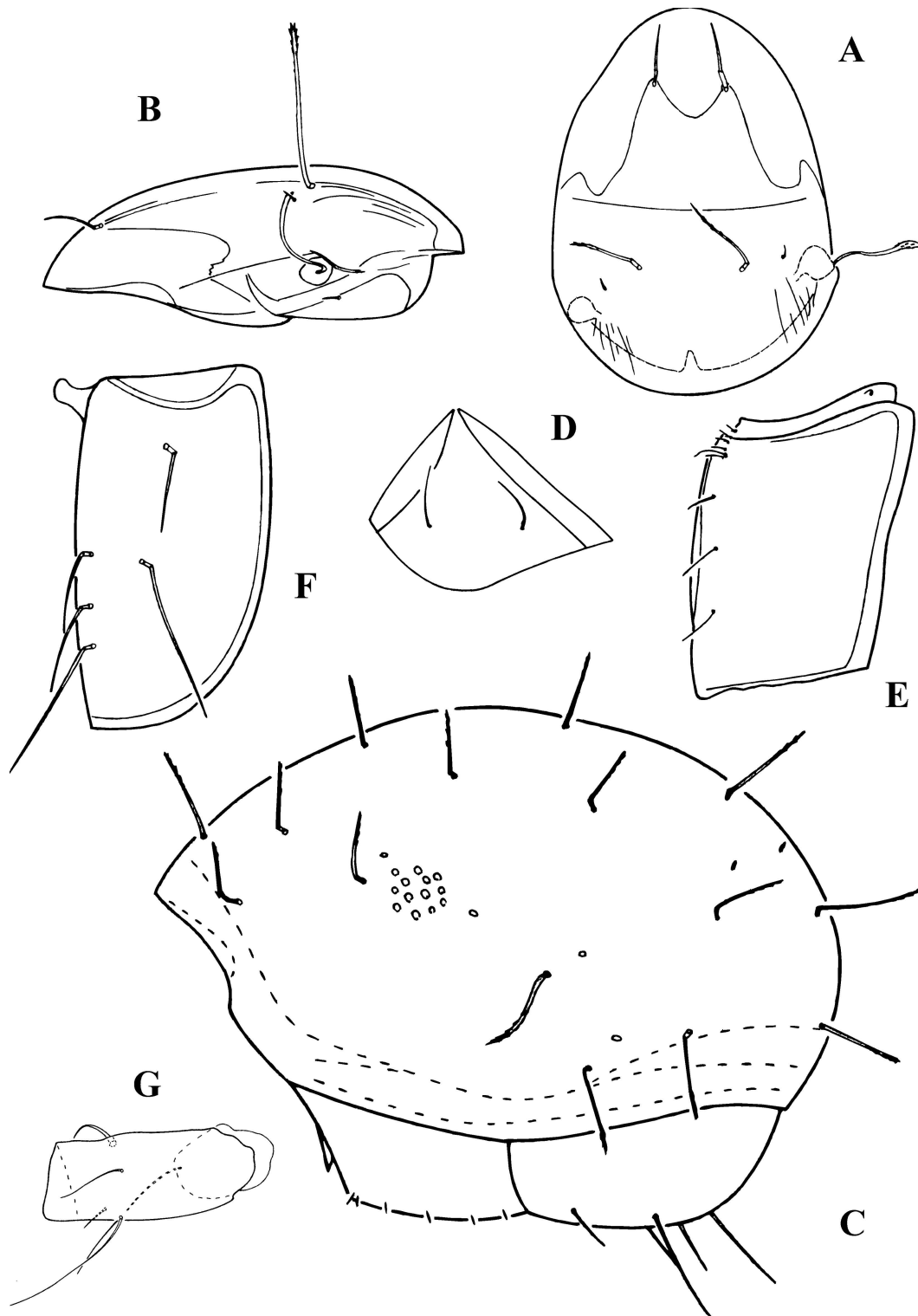


FIGURE 41: *Hoplophthiracarus ambiguus* Niedbala, 1982 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left genitoaggenital plate; F – left ano-adanal plate; G – trochanter and femur of leg I.



***Steganacarus (Rhacaplacarus) spiniferus***  
**(Mahunka, 1993)**  
**(Fig. 42A-G)**

*Rhacaplacarus spiniferus* Mahunka, 1993.

*Steganacarus (Rhacaplacarus) spiniferus*: Niedbała 2001.

Diagnosis — Measurements after Mahunka (1993): length of prodorsum 184-256; notogaster: length 303-483, height 200-344. Medium-sized species; surface of body covered with alveoli. Prodorsum with lateral carinae and posterior furrows present; sensilli long, sickle-shaped, serrate in distal half; dorsal setae spiniform, interlamellar setae the thickest, lamellar setae the smallest,  $ss > in > ro > le$ ; exobothridial setae vestigial. Notogaster with very short, spiniform, rough setae; setae  $c_3$  slightly remote from anterior margin, setae  $c_1$  more remote and setae  $c_2$  far from margin; 4 pairs of lyrifissures *ia*, *im*, *ip*, *ips* present. Ventral region; formula of genital setae: 6(4+2): 3; setae of anoadanal plates sword-shaped, setae *ad*<sub>3</sub> the smallest. Leg setation complete; setae *d* on femora I inserted near distal end of article.

Locality in Tanzania: Morogoro Region: Mahunka 1993, Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Steganacarus (Rhacaplacarus) zicsii***  
**Mahunka, 1988**  
**(Fig. 43A-F)**

*Steganacarus (Rhacaplacarus) zicsii*: Niedbała 2001.

Diagnosis — Measurements after Mahunka (1988): length of prodorsum 128 – 156; notogaster: length 232 – 208, height 124 – 188. Small-sized species; surface of body regularly foveolate. Prodorsum with posterior furrows present; lateral carinae absent; sensilli short with rounded head covered with small spines; other setae very short; interlamellar dilate, phylliform with small spines distally; rostral setae spiniform, rough; lamellar setae minute;  $ss > ro > in > le$ ; exobothridial setae vestigial. Notogaster with very short ( $c_1 < \frac{1}{4}c_1 - d_1$ ), dilate, phylliform setae covered with small spines distally, except spiniform setae *ps*<sub>3</sub> and *ps*<sub>4</sub>; both setae  $c_1$  and  $c_3$

located near anterior margin, setae  $c_2$  far from margin; 4 pairs of lyrifissures *ia*, *im*, *ip* and *ips* present. Ventral region; formula of genital setae: 6(4+2): 3; anoadanal plates each with 5 thin and simple, similar, very short setae.

Locality in Tanzania: Tanga Region: Mahunka 1988, Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

subgenus – ***Steganacarus* Ewing, 1917**

*Steganacarus (Steganacarus)*: Subías 2004

*Trachychoptophora* Berlese, 1923: Subías 2004

*Neosteganacarus* Balogh and Mahunka, 1992: Niedbała 2004

*Nortonacarus* Balogh and Mahunka, 1992: Niedbała 2004

*Rafacarus* Niedbała, 1981: Niedbała 1997

Diagnosis — Notogaster without median ridge. Setae *ad*<sub>2</sub> of anoadanal plates displaced towards paraxial margin, in a row with anal setae and setae *ad*<sub>1</sub>. Legs: setae *d* on femora I displaced towards distal end of segment; setae *v'* on femora short, length ratio  $v''/v' < 2.2$ .

Distribution — Semicosmopolitan.

***Steganacarus (Steganacarus) sol***  
**Balogh, 1958**  
**(Fig. 44A-E)**

*Steganacarus sol* Balogh, 1958.

*Hoplophthiracarus peracutus* Mahunka, 1983 syn. by Niedbała 2001.

*Steganacarus (Steganacarus) sol*: Niedbała 2001.

Diagnosis — Measurements of specimen from Ethiopia (Niedbała and Ermilov 2011): prodorsum: length 429, height 127; notogaster: length 757, height 505. Large-sized species; colour dark brown; surface with concavities. Prodorsum with low median crista, lateral carinae weakly developed; sensilli bacilliform, covered with small spines; interlamellar setae erect, long with spiniform end, covered with small spines in distal half; lamellar and rostral setae very short, spiniform, spinose; exobothridial setae minute;  $in > ss > le > ro > ex$ . Notogaster with long ( $c_1 > c_1 - d_1$ ) setae, setae  $c_2$ ,  $c_3$ , *cp* filiform,

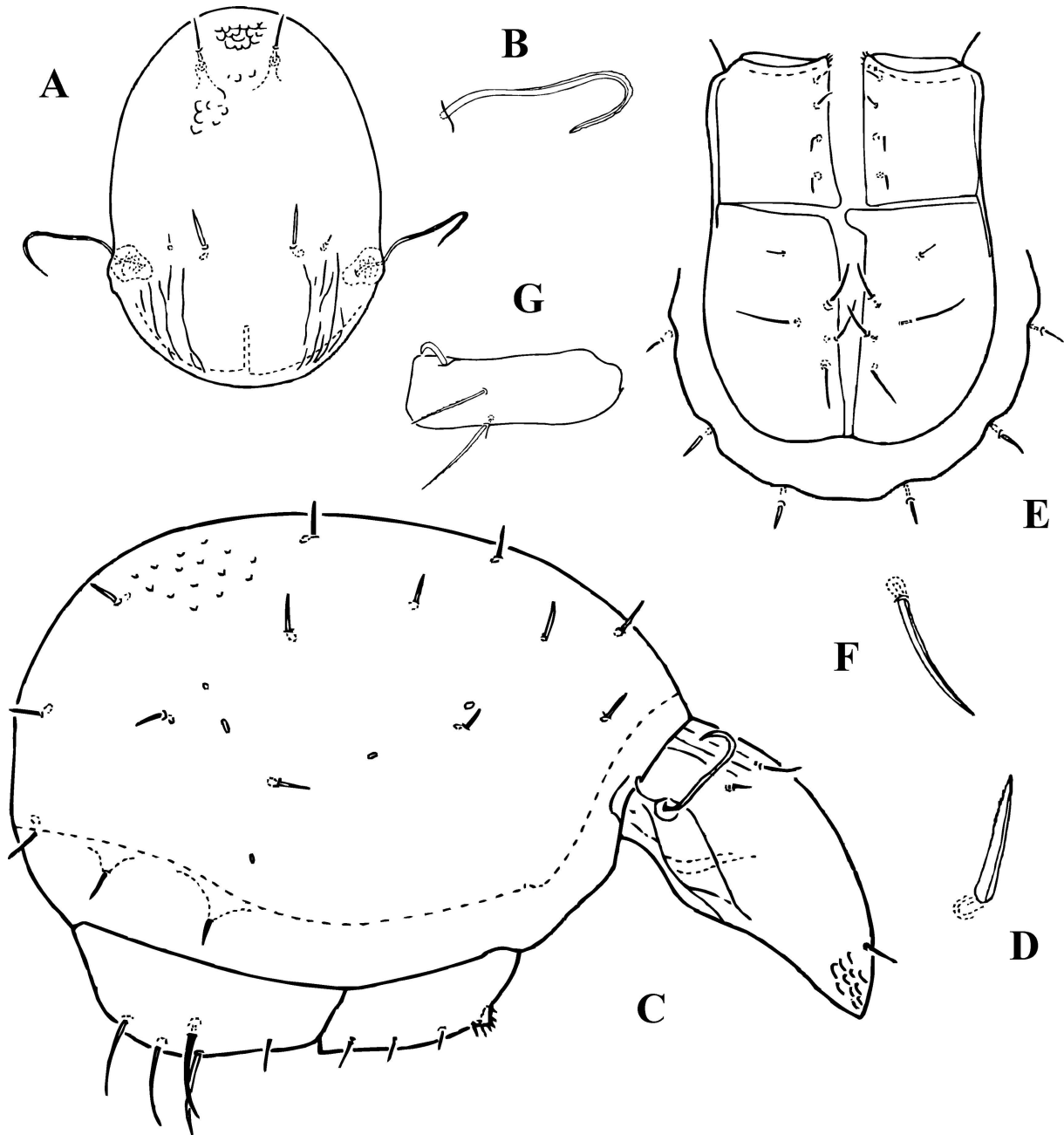


FIGURE 42: *Steganacarus (Rhacaplacarus) spiniferus* (Mahunka, 1993) (after Mahunka 1993): A – prodorsum, dorsal view; B – sensillus; C – lateral view of body; D – seta  $c_1$ ; E – genitoaggenital and anoadanal plates; F – seta  $ad_2$ ; G – femur of leg I.

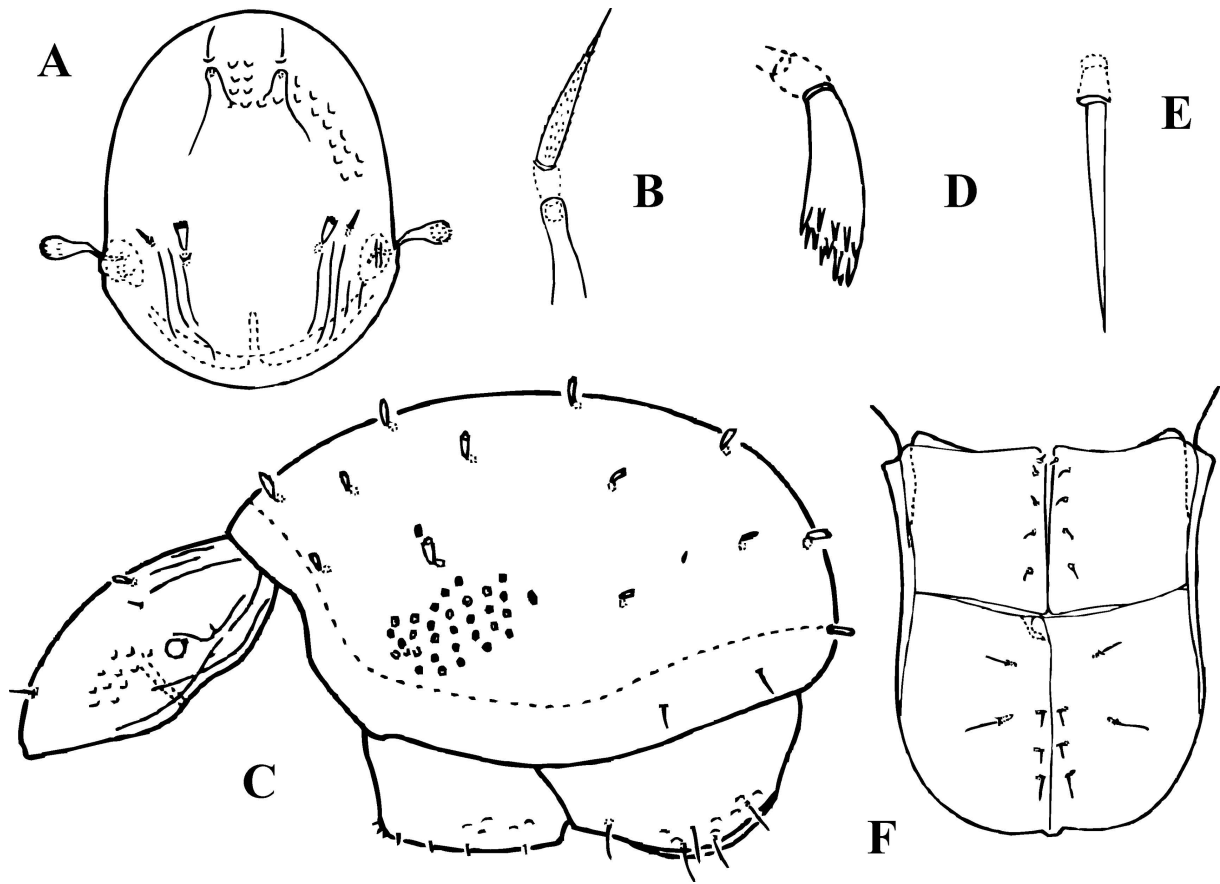


FIGURE 43: *Steganacarus (Rhacaplacarus) zicsii* Mahunka, 1988 (after Mahunka 1988a): A – prodorsum, dorsal view; B – seta *ro*; C – lateral view of body; D – setae *c*<sub>3</sub>; E – seta *ps*<sub>3</sub>; F – genitoaggenital and anoanal plates.

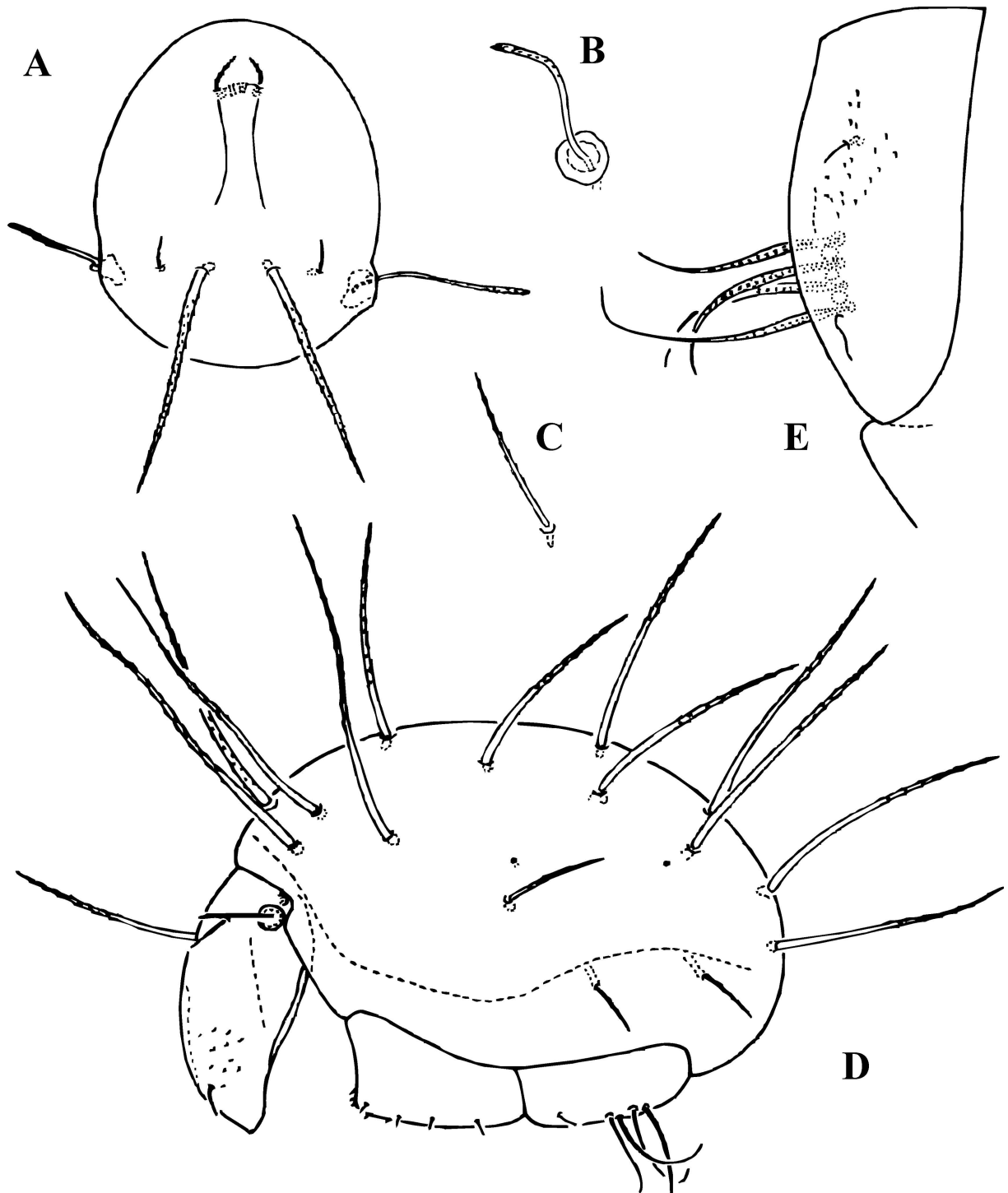


FIGURE 44: *Hoplophthiracarus peracutus* Mahunka, 1983 synonym of *Steganacarus* (*Steganacarus*) *sol* Balogh, 1958 (after Mahunka 1983b): A – prodorsum, dorsal view; B – sensillus; C – lamellar seta; D – lateral view of body; E – left ano-adanal plate.

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remaining setae erect, covered with small spines in distal half, setae  $h_3$ ,  $ps_2$ ,  $ps_3$  considerably shorter, setae  $c_3$  situated near anterior margin, setae  $c_1$  slightly remote, setae  $c_2$  far from margin; 2 pairs of lyrifissures  $ia$  and  $im$  present. Ventral region; formula of genital setae: 6(4+2): 3; 4 setae on paraxial margin of anoadanal plate long and filiform (posterior setae the longest), setae  $ad_3$  the shortest.

Locality in Tanzania: Kilimanjaro Mts: Mahunka 1983b, Niedbała 2001.

Distribution — Afrotropical, central part.

***Steganacarus (Steganacarus) vestitus***  
**Niedbała, 1983**  
**(Fig. 45A-E)**

*Steganacarus (Steganacarus) vestitus*: Niedbała 2001.

Diagnosis — Measurements of holotype: prodorsum: length 434, width 278, height 159; notogaster: length 809, width 523, height 497. Large-sized species; colour brown, integument covered with small concavities. Median and lateral fields of prodorsum long and narrow; lateral carinae absent; sensilli long, smooth, filiform, tapering; interlamellar setae erect, very long, thick at proximal end and tapering towards distal end, flagelliform, covered with spaced scales; lamellar setae rigid, spiniform and smooth; rostral setae short, procumbent, rough; exobothridial setae minute;  $in>ss>le>ro>ex$ . Notogaster with setae  $c_1$ ,  $c_2$ ,  $c_3$ ,  $cp$ ,  $h_1$ ,  $ps_1$ ,  $ps_2$  long and slightly rough in proximal part, flagellate, setae  $d_1$ ,  $d_2$ ,  $e_2$ ,  $h_3$ ,  $ps_3$ ,  $ps_4$  shorter, rigid and rough in distal half; setae  $c_1$  and  $c_3$  situated near anterior margin, setae  $c_2$  slightly remote from margin; vestigial setae  $f_1$  located on level of  $h_1$  setae; 4 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; setae  $h$  of mentum longer than distance between them; formula of genital setae: 6(4+2): 3; setae  $ad_1$ , the longest, setae  $ad_3$  the shortest. Leg setation complete.

Locality in Tanzania: Kilimanjaro Mts: Niedbała 2001.

Distribution — Afrotropical, central part.

***Steganacarus (Steganacarus) wallworki***  
**(Mahunka, 1984)**  
**(Fig. 46A-E)**

*Hoplophthiracarus wallworki* Mahunka, 1984.

*Steganacarus (Steganacarus) wallworki*: Niedbała 2001.

Diagnosis — Measurements of holotype: prodorsum: length 288, width 196, height 126; notogaster: length 513, width 355, height 368. Species of medium size; colour brown; surface of body smooth, only anterior part of prodorsum and genital plate as well posterior part of notogaster covered with concavities. Prodorsum with long median and lateral fields; lateral carinae absent; posterior furrows distinct; sensilli long, smooth, narrow, tapering; interlamellar setae long, thick, erect, covered with small spines; lamellar and rostral setae spiniform, procumbent, rough,  $ss>in>ro>le>ex$ . Notogaster with setae, strong, thick, but not long ( $c_1/c_1-d_1=0,79$ ) densely covered with small spines; setae  $c_1$  and  $c_2$  near the anterior margin than setae  $c_3$ , setae  $c_2$  longer than  $c_1$  and  $c_3$ , setae  $ps_4$  the shortest; vestigial setae  $f_1$  posteriorly of  $h_1$  setae; only 2 pairs of lyrifissures  $ia$  and  $im$  present. Ventral region; setae  $h$  of mentum longer than distance between them; formula of genital setae: 7(4+3): 2; formula of anoadanal setae is 4:1, setae  $ad_1$  the longest, setae  $ad_3$  the smallest. Leg setation complete; setae  $d$  on femora I situated on the distal end.

Locality in Tanzania: Dodoma Region: Mahunka 1984, Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Austrophthiracarus* Balogh et Mahunka, 1978**

*Hoplophthiracarus* Jacot, 1933 (in part)

*Antarctoplophora* Mahunka, 1980: Niedbała 1986

*Fuegoplophora* Mahunka, 1980: Niedbała 1986

*Hauserophtiracarus* Mahunka, 1982: Niedbała 1986

*Phthirarica* Mahunka, 1982: Niedbała 1986

*Sturmacarus* Balogh, 1984: Niedbała 1986

*Notophthiracarus (Calypthophthiracarus)* (in part): Subías 2004 syn. nov.

*Notophthiracarus (Notophthiracarus)* (in part): Subías 2004 syn. nov.

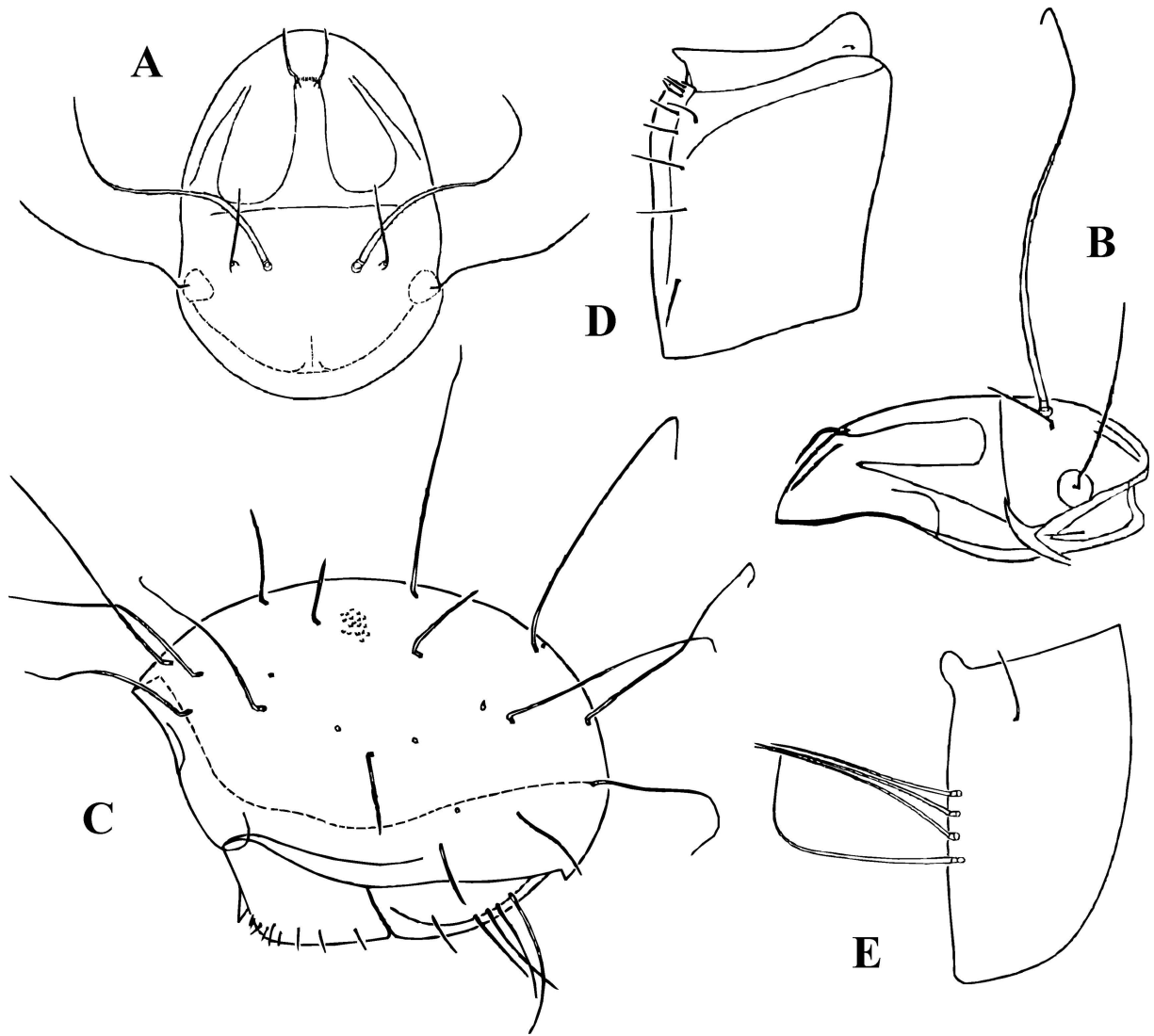


FIGURE 45: *Steganacarus (Steganacarus) vestitus* Niedbała, 1983 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left anoanal plate.

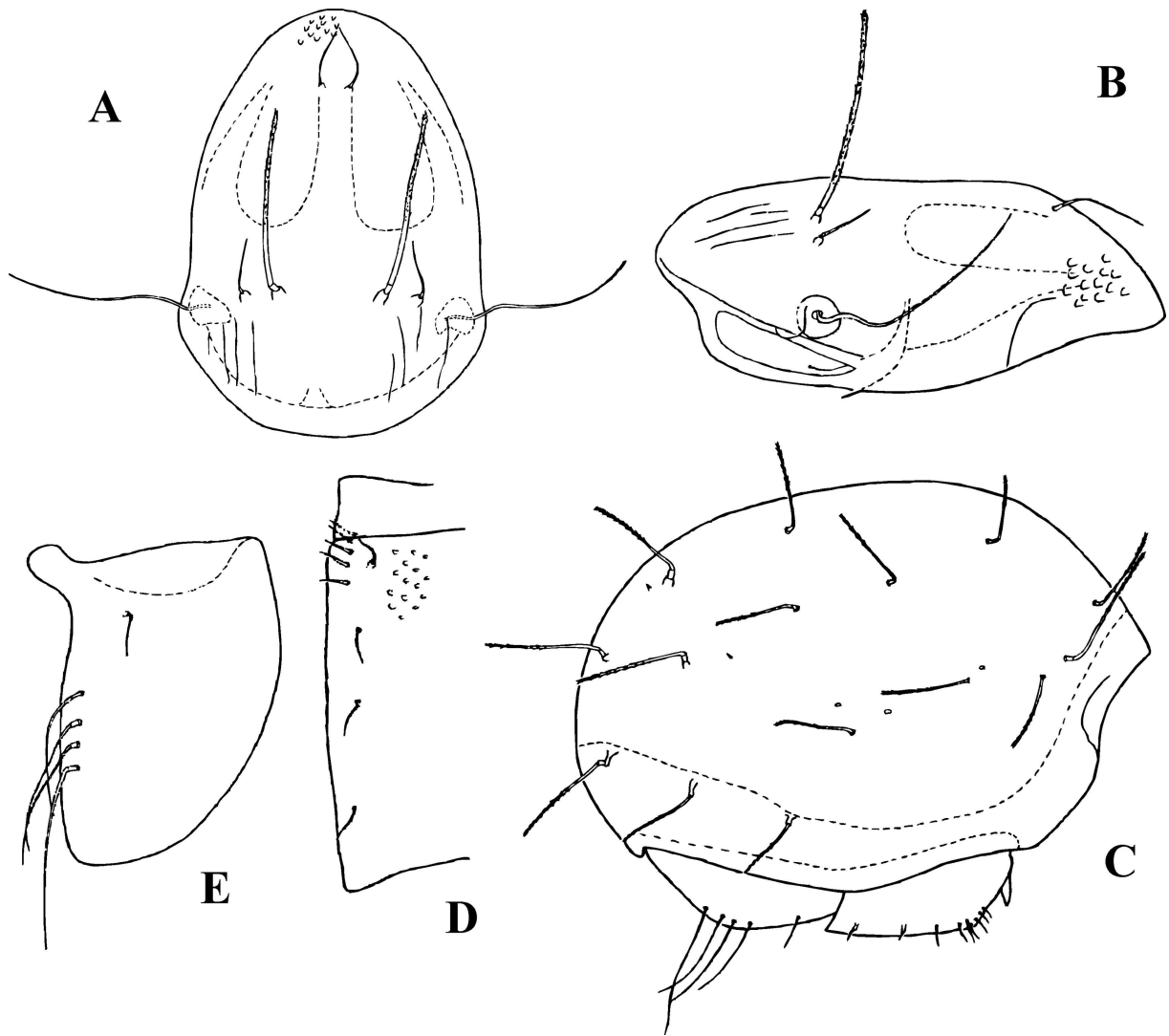


FIGURE 46: *Steganacarus (Steganacarus) wallworki* (Mahunka, 1984) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left anoanal plate.

Type species: *Austrophthiracarus radiatus* Balogh et Mahunka, 1978

Diagnosis — Body integumental surface punctate or pitted, exceptionally covered with concavities. Median and lateral fields of prodorsum not fused, rostral setae inserted at distance from the end of rostrum. Notogaster with 15 pairs of setae but often neotrichous. Ventral region; nine pairs of genital setae present, genital setae arranged in two rows, setae  $g_6$  close to, or even anteriorly of  $g_4$ , at least setae  $g_6$  and  $g_7$  remote from paraxial region; adanal setae well developed, remote from paraxial margin of plate.

**Remark.** The species of this genus have been found mostly in the southern hemisphere. However, the ranges of individual species have reached further to the North, namely to the Palearctic Region especially in its eastern margins, more specifically to the islands of Japan (Aoki 1980a) and northern India (Niedbała 2000).

Distribution — Semicosmopolitan

*Austrophthiracarus aokii*  
(Mahunka, 1983)  
(Fig. 47A-F)

*Hoplophthiracarus aokii* Mahunka, 1983.

*Austrophthiracarus akii*: Niedbała 2001.

*Austrophthiracarus akii*: Niedbała 2001.

Diagnosis — Measurements of paratype: prodorsum: length 414, width 303, height 177; notogaster: length 902, width 539, height 549. Large-sized species; colour brown; surface of body margin covered with concavities. Prodorsum with median field longer than laterals; lateral carinae distinct; sensilli long, narrow without head, covered with small spines on distal end; interlamellar setae long, erect, covered with spines in distal half, rostral setae relatively long, distant from each other, covered with small spines, procumbent and directed inwards in distal half, lamellar and exobothridial setae minute;  $in > ro > ss > ex > le$ . Notogaster with setae strong, covered with small spines in distal half, setae  $cp$ ,  $d_2$ ,  $h_3$ ,  $ps_3$  and  $ps_4$  shorter than others; setae  $c_1$  and  $c_2$  near anterior margin, setae  $c_2$  remote from margin; vestigial setae absent, 4 pairs of lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; formula

of genital setae: 6(4+2): 3; 5 pairs of ano-adanal setae, rough,  $ad_2 > ad_1 > an = ad_3$ . Leg setation reduced, setae  $a'$  on tarsi I absent.

Locality in Tanzania: the Uluguru Mts: Mahunka 1983a, Niedbała 2001.

Distribution — Afrotropical, eastern part.

*Arphthiracarus* Niedbała, 1994

*Austrophthiracarus* Balogh and Mahunka, 1978 (in part)

*Notophthiracarus* (*Notophthiracarus*) (in part): Subías 2004 syn. nov.

Type species: *Hoplophthiracarus latebrosus* Niedbała, 1982

Diagnosis — Median and lateral sigillar fields of prodorsum not fused; lamellar setae short, length ratio of lamellar setae/prodorsum  $< 0.2$ . Notogaster with 15 pairs of setae, rarely neotrichous; setae  $c_1$  usually shorter than distance between setae  $c_1$  and  $d_1$ . Ventral region; setae  $g_{7-9}$  displaced towards the paraxial margin of ano-adanal plate, almost in row with setae  $g_{1-5}$ , setae  $g_6$  remote from the margin and located anteriorly of  $g_5$ , when it is placed posteriorly these setae, the distance between  $g_6$  and  $g_5$  is shorter than that between  $g_5$  and  $g_4$ ; adanal setae well developed, setae  $ad_1$  remote from paraxial margin and longer than anal setae; setae  $ad_2$  also remote from margin.

Distribution — Pantropical.

*Arphthiracarus marginatus*  
(Mahunka, 1984)  
(Fig. 48A-E)

*Hoplophthiracarus marginatus* Mahunka, 1984.

*Arphthiracarus marginatus*: Niedbała 2001.

I examined once again the paratype in alcohol.

Diagnosis — Measurements of paratype: prodorsum: length 404, width 308, height 151; notogaster: length 810, width 545, height 444. Large-sized species; colour brown, light; concavities only on borders of prodorsum and notogaster, ventral plates smooth. Prodorsum with median field trapezoidal, longer than lateral ones; anterior end of prodorsum convex in lateral view; lateral carinae distinct; posterior furrows well visible; sensilli relatively long,



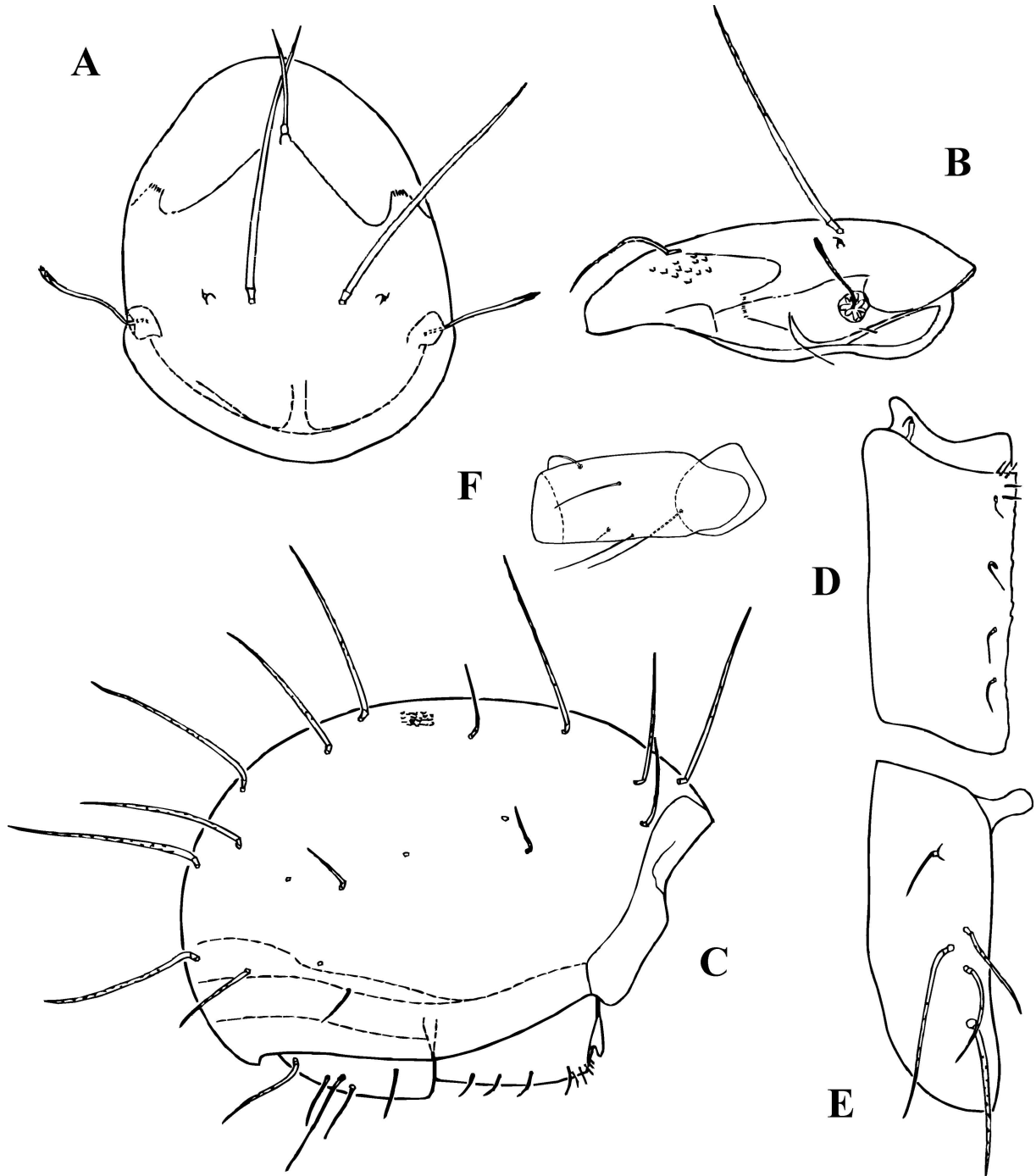


FIGURE 47: *Austrophthiracarus aokii* (Mahunka, 1983) (paratype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – right genitoaggenital plate; E – right anoanal plate; F – trochanter and femur of leg I.

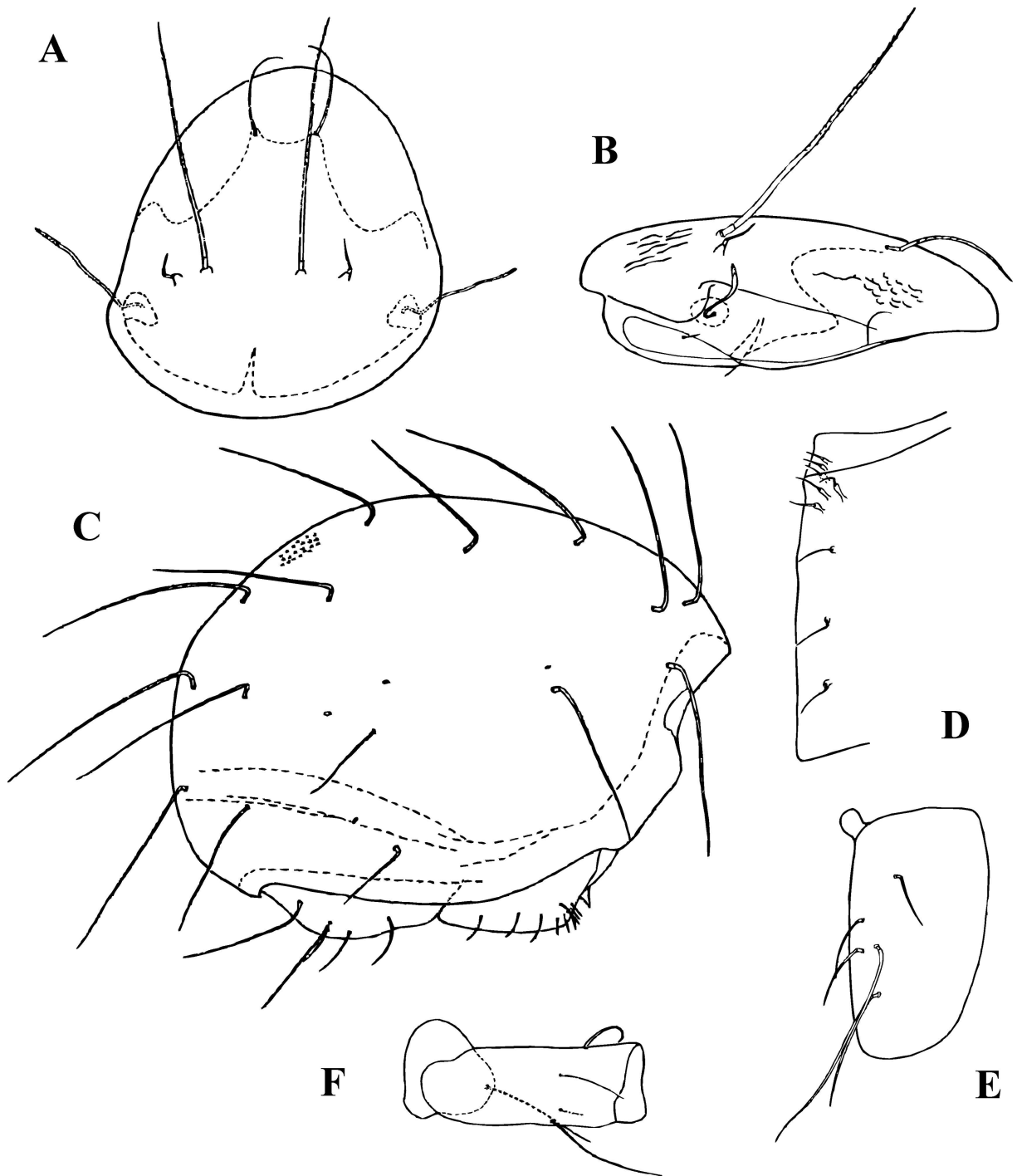


FIGURE 48: *Arpthiracarus marginatus* (Mahunka,1984) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – paraxial side of left genitoaggenital plate; E – left ano-adanal plate; F – trochanter and femur of leg I.

lanceolate end of head covered with small spines; interlamellar setae very long, strong, erect, covered with small spines in distal half; rostral setae long, thick, rough, directed inwards; lamellar setae spiniform; exobothridial setae minute; *in>ro>ss>le>ex*. Notogaster with long ( $c_1/c_1-d_1=1.4$ ) setae, thick, rough, with conical distal end; setae  $c_3$  near anterior margin, setae  $c_1$  and  $c_2$  remote from margin, setae  $h_3$  and  $ps_4$  the shortest, setae  $h_1$  and  $ps_1$  the longest; vestigial setae invisible; 4 pairs of lyrifissures: *ia, im, ip, ips* present. Ventral region; formula of genital setae: 6(4+2): 3; anal and adanal setae rough, setae  $ad_1$  and  $ad_2$  considerably longer than anal and  $ad_3$  setae. Leg setation complete; setae  $d$  on femora I remote from distal end.

Localities in Tanzania: Dodona Region: Mahunka 1984, Niedbała 2001; the Uluguru and Nguru Mts.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Arphthycarus sculptilis*  
(Niedbała, 1988)  
(Figs.49A-F; 50A-F)**

*Hoplophthiracarus sculptilis* Niedbała, 1988.

*Hoplophthiracarus magnus* Mahunka, 1988 syn. by Niedbała 2001.

*Arphthycarus sculptilis*: Niedbała 2001, Niedbała & Starý, 2015b.

Diagnosis — Measurements of specimen from sample TAN-016. Prodorsum: length 465, width 328, height 151, setae: *ss* 96, *in* 271, *le* 25, *ro* 198, *ex* 6; notogaster: length 1000, width 707, height 687,  $c_1$  238,  $c_1/c_1-d_1=1.0$ ,  $h_1$  409,  $ps_1$  368; genitoaggenital plate  $273 \times 182$ , anoadanal plate  $333 \times 192$ . Large-sized species; colour brown; integument with deep concavities. Fields of prodorsum feeble, posterior furrow and lateral carinae absent; sensilli with rounded, ciliate head; interlamellar setae long, erect, obtuse distally, covered with small spines in distal half, similar to notogastral setae; lamellar and exobothridial setae minute; rostral setae erect or semi-erect, rough; *in>ro>ss>le>ex*. Notogaster with rather short ( $c_1 < c_1-d_1$ ) stout, setae covered with small spines in distal half; setae  $c_3$  situated near anterior margin, setae  $c_1$  remote and setae  $c_2$  far from

margin, vestigial setae  $f_1$  anterior or posterior of  $h_1$  setae. Ventral region; setae  $h$  of mentum longer than distance between them; formula of genital setae: 6(4+2): 3; adanal setae located near paraxial border, setae  $ad_1$  and  $ad_2$  rough and longer than other setae. Chaetome of legs reduced, setae  $a'$  on tarsi I absent; setae  $d$  remote from anterior border.

**Remarks.** Specimen from sample TAN-016 has some characters different from holotype: setae  $h_1$  and  $ps_1$  are longer than the other setae; the distance between setae  $ps_3$  and  $ps_4$  considerably longer than that between  $ps_2$ - $ps_3$ ; vestigial setae  $f_1$  slightly anteriorly of setae  $h_1$ ; setae  $ad_1$  similar to notogastral setae, they are covered with small cilia, obtuse; the remaining setae of anoadanal plates spiniform.

Localities in Tanzania: the Uluguru Mts.

Distribution — Afrotropical, central and eastern part and eastern islands.

***Protophthiracarus* Balogh, 1972**

Type species: *Neophthiracarus chilensis* Balogh and Mahunka, 1967

Diagnosis — Body surface covered with concavities. Prodorsal posterior furrows present; median and lateral sigillar fields of prodorsum fused or not; exobothridial setae short or vestigial. Neotrichy of notogastral and anoadanal setae present. Ventral region; genital plates with 9 pairs of genital setae present; setae  $g_{7-9}$  displaced towards the paraxial margin, form a row with setae  $g_{1-5}$  (sometimes one of these setae not displaced), setae  $g_6$  remote from the margin and situated on the side or anteriorly of  $g_5$ ; setae of anoadanal plates well developed, setae  $ad_1$  displaced towards the paraxial margin in a row with anal setae, setae  $ad_2$  at a distance from the margin. Legs: setae  $v'$  on femora I short (length ratio  $v''/v' > 2.25$ ); setae  $ft''$  on tarsus I well developed; setae  $l'$  of genua IV present.

Distribution — Not found in Palaearctic and eastern part of southern hemisphere.

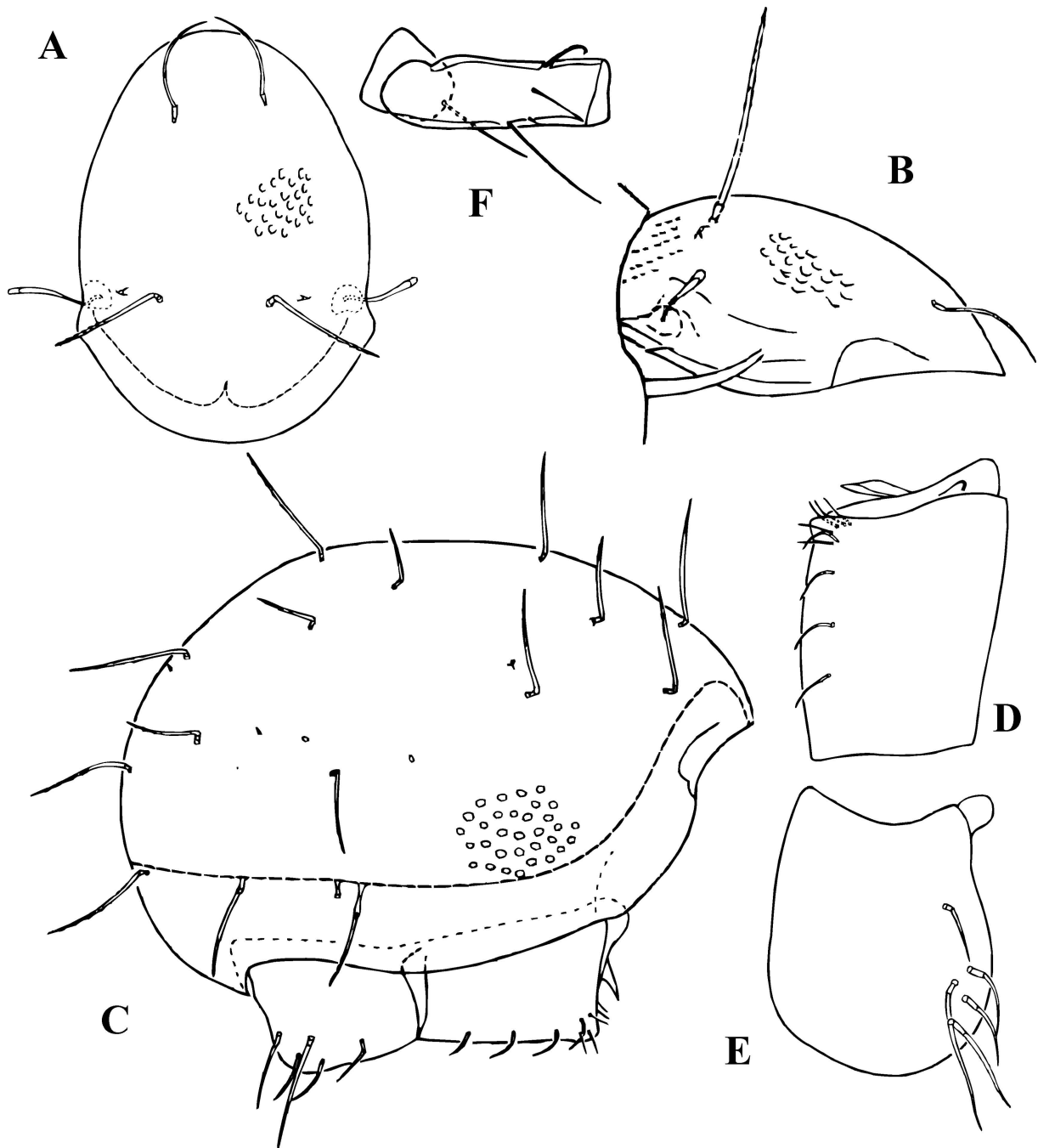


FIGURE 49: *Arphthycarus sculptilis* (Niedbała, 1988) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – right anoanal plate; F – trochanter and femur of leg I.

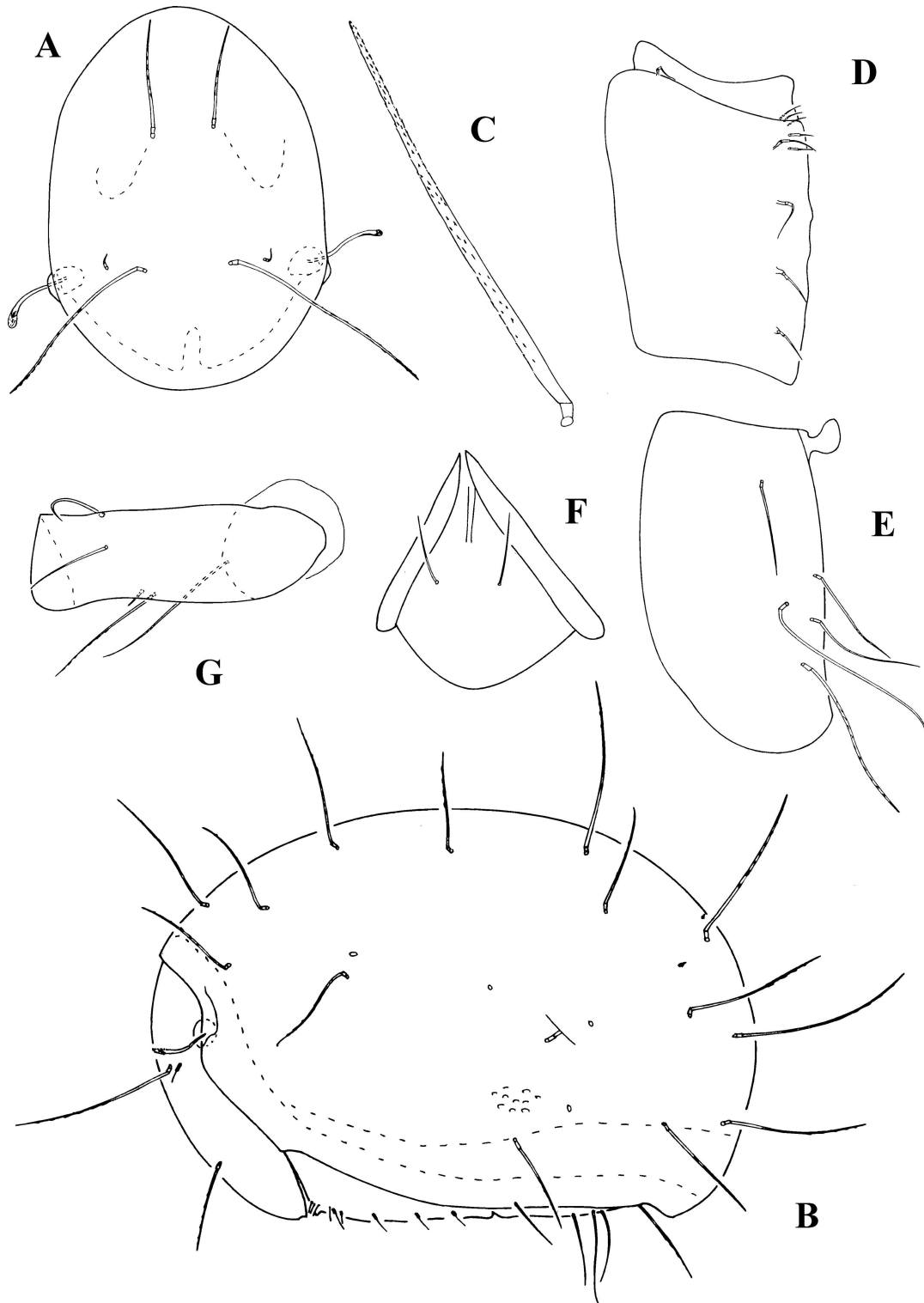


FIGURE 50: *Arphthycarus sculptilis* (Niedbała, 1988) (specimen from TAN-016): A – prodorsum, dorsal view; B – lateral view of body; C – seta  $c_1$ ; D – right genitoaggenital plate; E – right anoadanal plate; F – mentum of subcapitulum; G – trochanter and femur of leg I.

*Protophthiracarus mayottei*

Niedbała, 2001

(Fig. 51A-F)

Diagnosis — Measurements of holotype: prodorsum: length 404, width 283, height 156; notogaster: length 780, height 507. Large-sized species; colour light brown; prodorsum covered with weak concavities, notogaster and ventral plates with strong concavities. Integument of dorsal side of notogaster with irregular lines. Fields of prodorsum and posterior furrows invisible; lateral carinae absent; sensilli elongate, gradually thickening, without well separated head; rostral setae strong, thick, rough, similar to gastronotic setae, directed inwards; interlamellar and lamellar setae fine, attenuate;  $ro > ss > in > le$ ; exobothridial setae vestigial. Notogaster with relatively short setae ( $c_1/c_1-d_1=0,77$ ), thick, spiniform, rough; dorsal setae longer than lateral ones; setae  $c_3$  close to anterior margin, setae  $c_1$  remote, setae  $c_2$  far from anterior margin; vestigial setae and lyrifissures invisible because of the strong cerotegument. Ventral region; setae  $h$  of mentum longer than distance between them; arrangement of genital plate: 7(4+3): 2; anoadanal plates each with 5 setae; setae  $ad_2$  thick, the longest close to  $an_1$  setae;  $ad_2 > an_2 > ad_1 > ad_3 = an_1$ . Leg setation complete; setae  $d$  on femora I strong, bent, remote from distal end of article.

Locality in Tanzania: Mahale Peninsula: Niedbała 2001.

Distribution — Afrotropical, eastern part.

*Protophthiracarus turianiensis*

Niedbała et Starý, 2015

(Fig. 52A-H)

Diagnosis — Measurements of holotype: prodorsum: length 480, width 328, height 247; notogaster: length 949, width 687, height 646. Large-sized species; colour light brown; surface of body alveolate and covered with strong sculpture. Prodorsum with distinct median crista; above the bothridium strong roller present and continued in lateral carinae; posterior furrows feeble; sigillar fields not visible because strong integument; sensilli long, narrow without head with feeble spines at tip; interlamellar setae fairly long, thick covered with small

spines in distal end; lamellar setae spiniform, rough; rostral setae thick, obtuse, rough curved inwards;  $ss > in > ro > le$ ; exobothridial setae vestigial. Notogaster with setae fairly long ( $c_1 < c_1-d_1$ ), thick covered with small spines in distal end, some setae from one side, some setae from both sides; setae of row  $c$  remote from anterior margin,  $c_2$  and  $c_3$  remote more than setae  $c_1$ ; vestigial setae  $f_1$  and all lyrifissures not visible because strong sculpture. Ventral region; setae  $h$  of mentum shorter than distance between them; genitoaggenital plates with 9 pairs of setae with formula: 5(4+1): 4; anoadanal plates each with 5 short, rough setae, setae  $ad_2$  the longest and thick, setae  $an_2$  longer than setae  $ad_1$  and  $an_1$ , setae  $ad_3$  the shortest. Legs: formulae of setae and solenidia of "complete type"; setae  $d$  on femora I slightly remote from distal end of article.

Localities in Tanzania: The Nguru Mts: Niedbała et Starý, 2015a.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Protophthiracarus venustus*

(Niedbała, 1983)

(Fig. 53A-E)

*Hoplophorella venusta* Niedbała, 1983.*Protophthiracarus venustus*: Niedbała 2001, 2008a.

Diagnosis — Measurements of holotype: prodorsum: length 241, width 167, height 88; notogaster: length 449, width 288, height 293. Species of medium size; colour brown, surface covered with small concavities. Prodorsum with median and lateral fields narrow; lateral carinae reach the sinus; posterior furrows present; sensilli long, sickle-shaped, enlarged towards distal end, covered with spines; interlamellar setae long, thick, covered with spines in distal half, rostral and lamellar setae smooth, spiniform;  $in > ss > ro > le$ ; exobothridial setae vestigial. Notogaster with thick, relatively short ( $c_1 < c_1-d_1$ ) setae, covered with spines in distal half; vestigial setae absent; 2 pairs of lyrifissures  $ia$  and  $im$  present. Ventral region, setae  $h$  of mentum longer than distance between them; formula of genital setae: 6(4+2): 3; among anal and adanal setae  $ad_2$  the longest and the thickest. Leg setation reduced, setae  $a'$  on tarsi I missing.

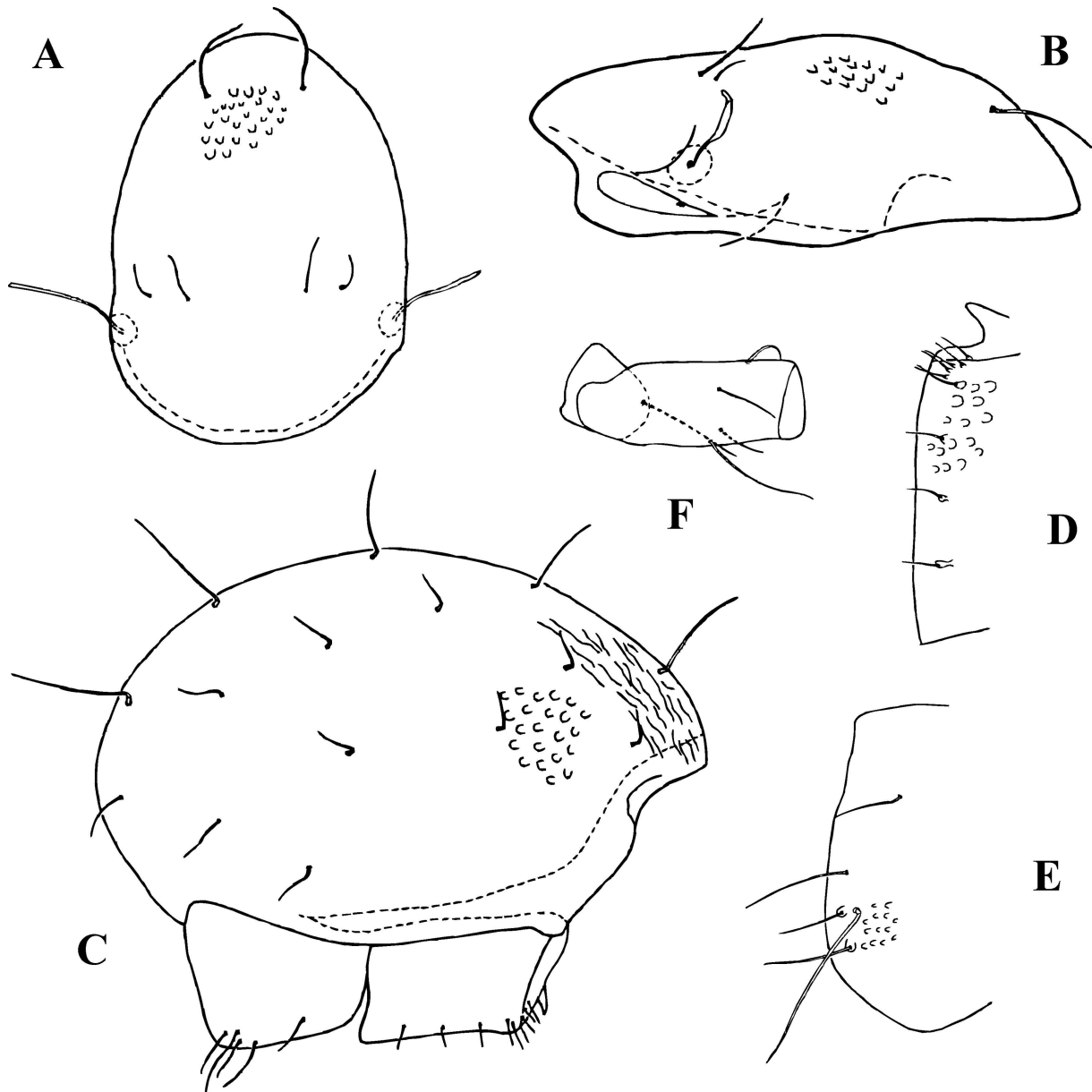


FIGURE 51: *Protophthiracarus mayottei* Niedbała, 2001 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – paraxial margin of left genitoaggenital plate; E – paraxial margin of left ano-adanal plate; F – trochanter and femur of leg I.

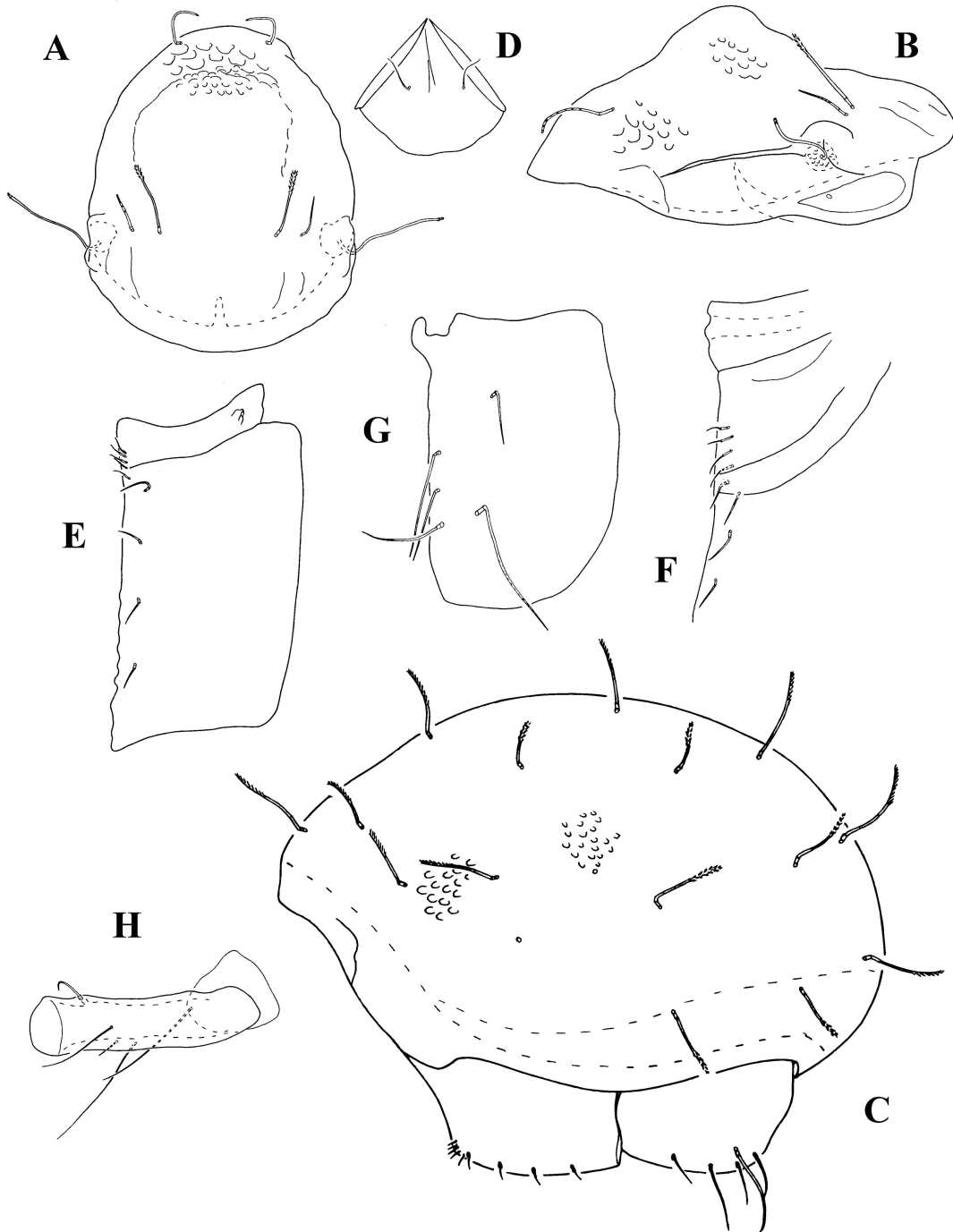


FIGURE 52: *Protophthiracarus turianiensis* Niedbala et Starý, 2015 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left genitoaggenital plate; F – fragment of paraxial margin of left genitoaggenital plate; G – left ano-adanal plate; H – trochanter and femur of leg I.



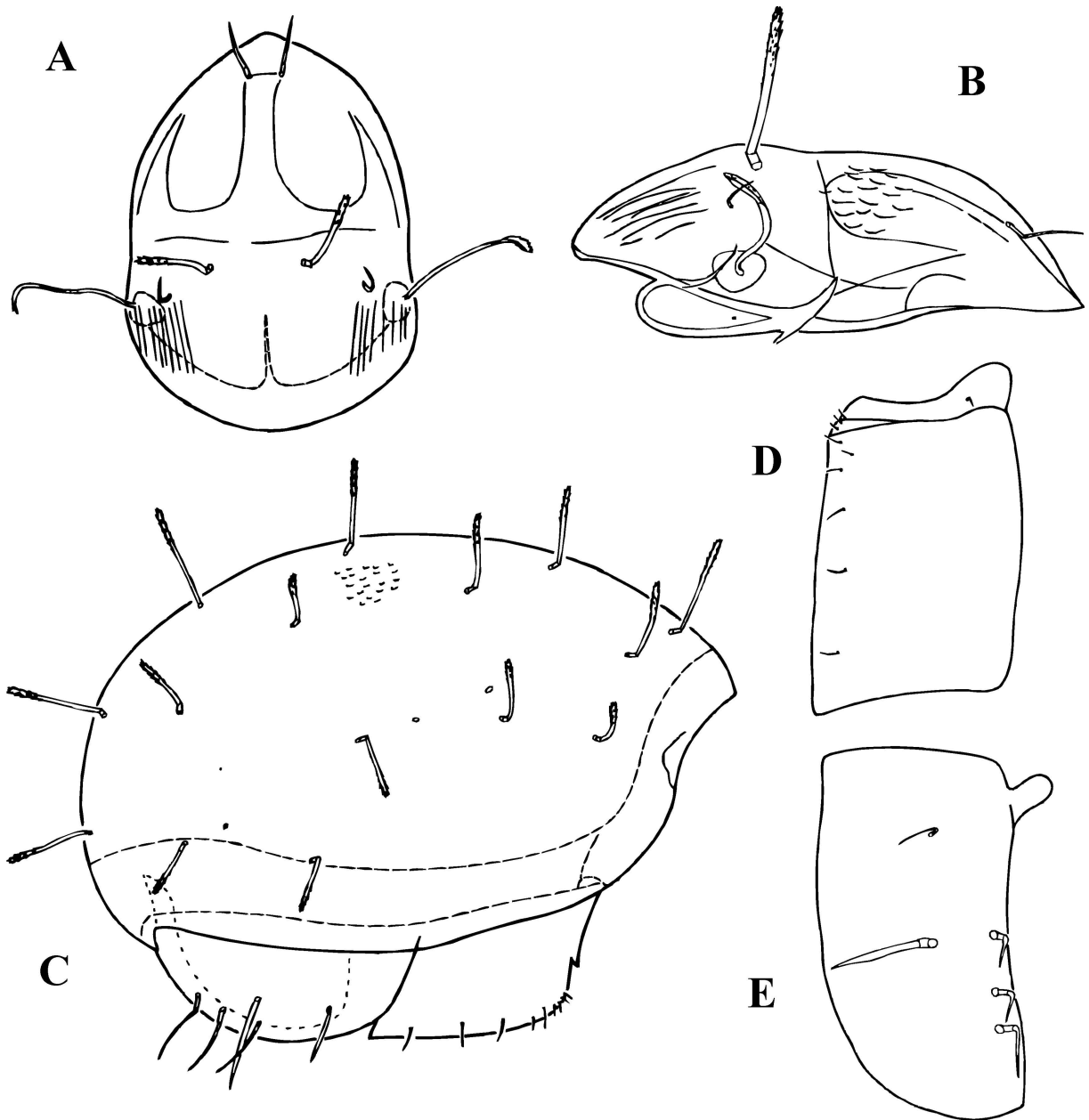


FIGURE 53: *Protophthiracarus venustus* (Niedbała, 1983) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – right ano-adanal plate.

Locality in Tanzania: Mt. Meru: Niedbała 2008a.

Distribution — Afrotropical, central part.

***Notophthiracarus Ramsay, 1966***

*Steganacarellus* Mahunka, 1986: Mahunka 1992

*Notophthiracarus* (*Notophthiracarus*): Mahunka 1990c, Subías 2004

*Afrophthiracarus* Els, 1966: Niedbała 2006a

Type species: *Phthiracarus maculatus* Trägårdh, 1931

Diagnosis — Notogaster with 15 pairs of setae, rarely neotrichous. Ventral region; 9 pairs of genital setae arranged in a single row, distance between setae  $g_6$  and  $g_9$  longer than between  $g_5$  and  $g_4$  or  $g_3$  and  $g_4$ ; five pairs of setae on anoadanal plates present, setae  $ad_1$  and  $ad_2$  remote from paraxial margin, well developed, minute or vestigial. Legs: setae  $v'$  on femora I (if present) minute (length ratio  $v''/v' < 2.2$ ); setae  $l'$  on genua IV always present.

Distribution — Pantropical.

***Notophthiracarus armatus*  
(Mahunka, 1986)  
(Fig. 54A-F)**

*Hoplophorella armata* Mahunka, 1986.

*Notophthiracarus armatus*: Niedbała 2001.

I examined once again the holotype in alcohol.

Diagnosis — Measurements of holotype: prodorsum: length 191, width 151, height 81; notogaster: length 348, width 249, height 227. Species of medium size; colour brown, prodorsum covered with concavities, surface of notogaster with polygonal reticulation, ventral plates with weak concavities. Prodorsum with very diversified design of anterior part of median field; lateral fields joined with median; lateral carinae distinct; posterior furrows well visible; sensilli bulbous in proximal part and very narrow and tapering in distal part; other setae short, spiniform;  $ss > ro > in > le$ ; exobothridial setae vestigial. Notogaster with short ( $c_1/c_1-d_1=0.29$ ) setae, simple, spiniform, slightly curved; setae  $c$  remote from anterior margin, setae  $c_2$  far from margin; vestigial setae absent; only 2 pairs of lyrifissures:  $ia$  and  $im$  present. Ventral region; setae  $h$  of mentum

shorter than distance between them; formula of genital setae: 6(4+2): 3; setae on anoadanal plates short, rough, setae  $ad_1$  slightly remote from proximal margin. Chaetome of legs complete; setae  $d$  on femur I slightly remote from distal end.

Localities in Tanzania: Tanga Region, Usumbara Mts, Mt. Meru Krofer: Mahunka 1986, Niedbała 2001; the Uluguru Mts.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Notophthiracarus cavernosus*  
(Mahunka, 1987)  
(Fig. 55A-F)**

*Hoplophorella cavernosa* Mahunka, 1987.

*Notophthiracarus cavernosus*: Niedbała 2001.

Diagnosis — Measurements of paratype: prodorsum: length 394, width 273, height 247; notogaster: length 681, width 442, height 437. Large-sized species; colour brown; body surface covered by tubercles and short ribs. Prodorsum with very high median crista; lateral carinae absent; posterior furrows strong, dorsal and lateral fields narrow and joined; sensilli short, clavate, slightly serrate distally; other setae thin, short, smooth, similar in length. Notogaster with minute setae; vestigial setae  $f_1$  posterior of  $h_1$  setae; all lyrifissures  $ia$ ,  $im$ ,  $ip$ ,  $ips$  present. Ventral region; setae  $h$  of mentum longer than distance between them; formula of genital setae: 5(4+1): 4; anoadanal setae minute. Chaetome of legs complete, setae  $d$  on femora I remote from distal end of segment, setae  $v''$  remote from setae  $v'$ . Locality in Tanzania: The Kilimanjaro Mts: Mahunka 1987, Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Notophthiracarus lineolatus*  
Mahunka, 1993  
(Fig. 56A-G)**

*Notophthiracarus lineolatus*: Niedbała 2001.

Diagnosis — Measurements of holotype: prodorsum: length 434, width 308, height 162, setae:  $ss$  43,  $in$  159,  $le$  131,  $ro$  51,  $ex$  61; notogaster: length 858, width 606, height 575, setae:  $c_1$  303,  $c_1/c_1-d_1=1.6$ ,  $d_2$

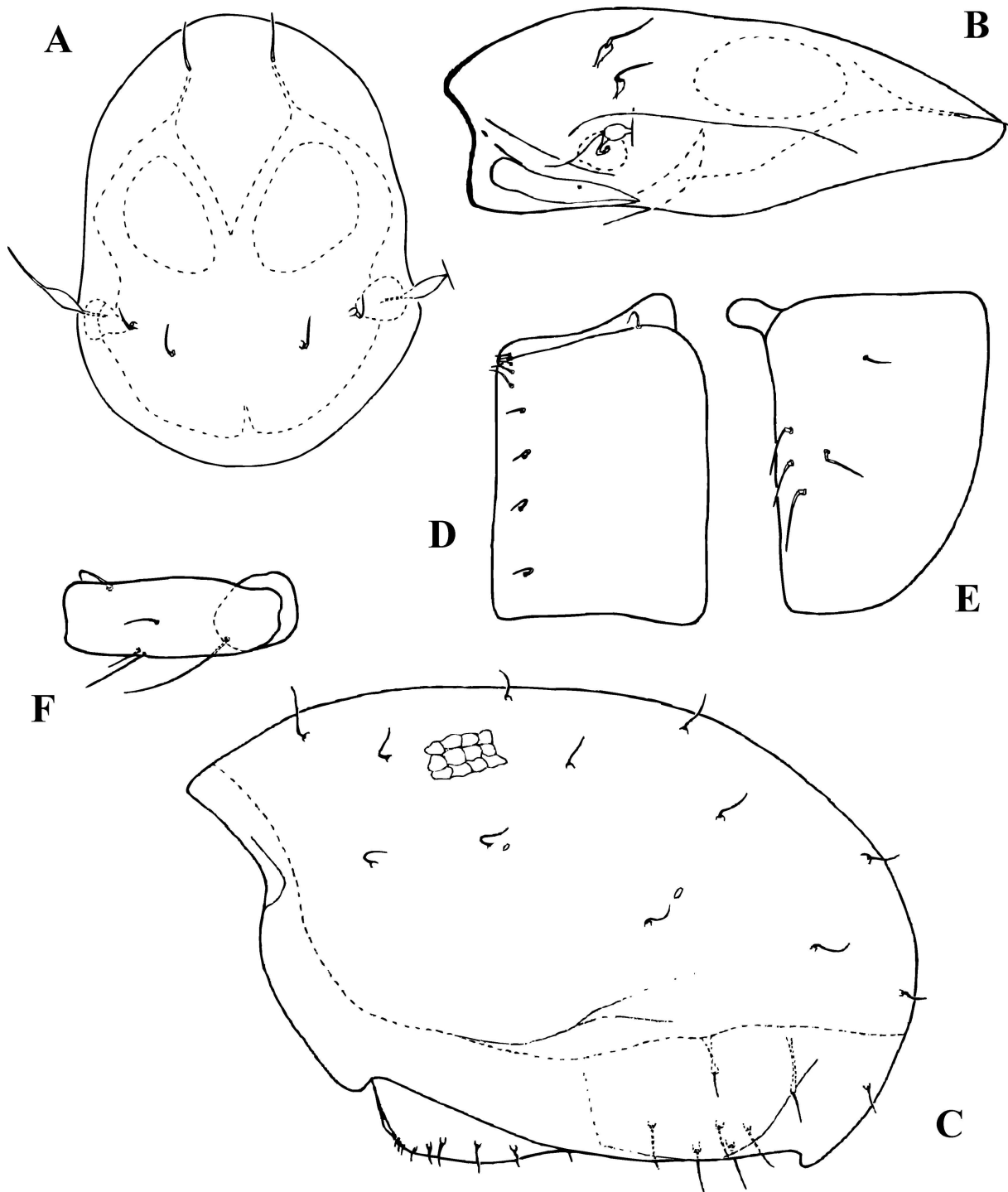


FIGURE 54: *Notophthiracarus armatus* (Mahunka, 1986) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left anoadanal plate; F – trochanter and femur of leg I.

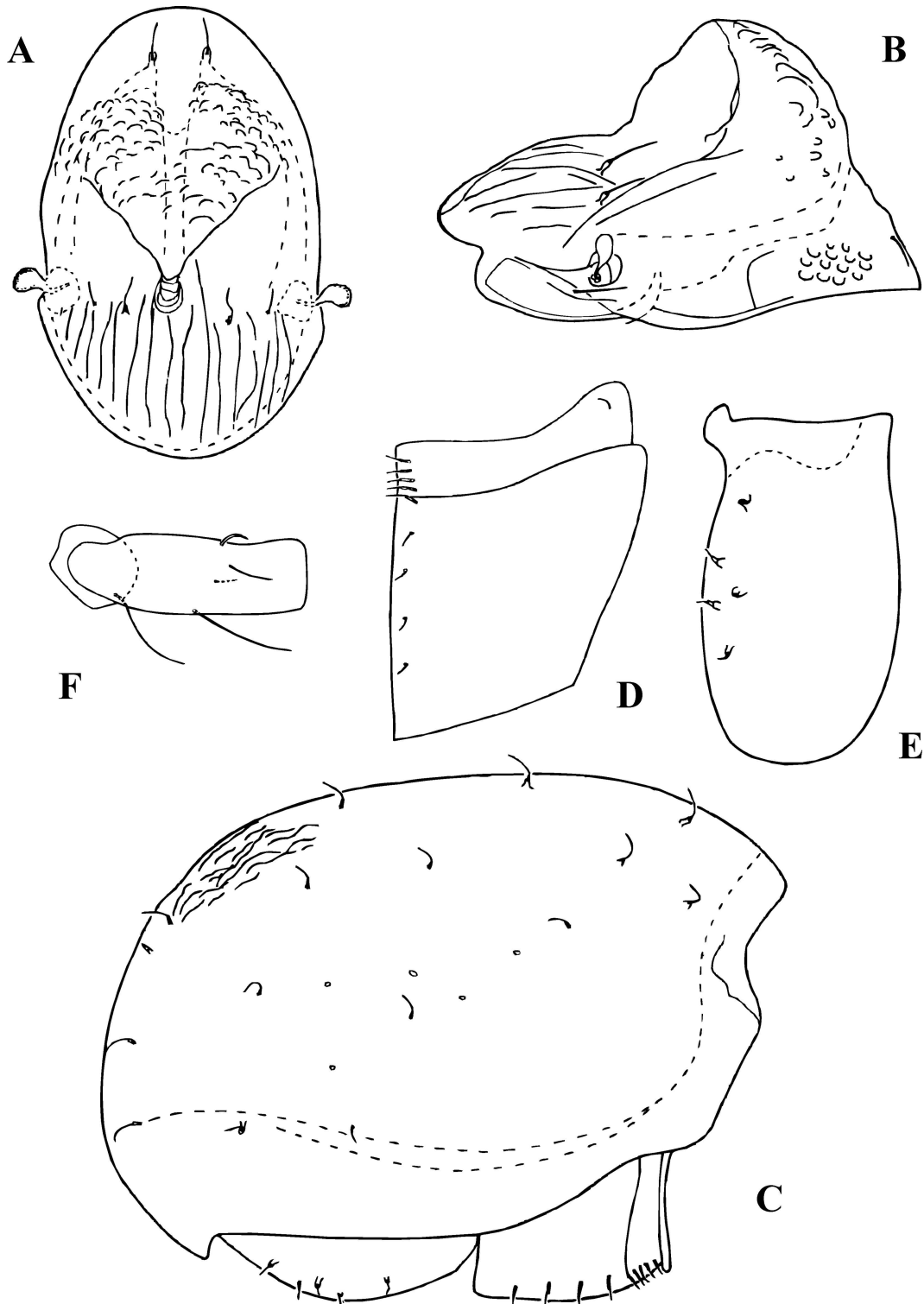


FIGURE 55: *Notophthiracarus cavernosus* (Mahunka, 1987) (paratype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left anoanal plate; F – trochanter and femur of leg I.

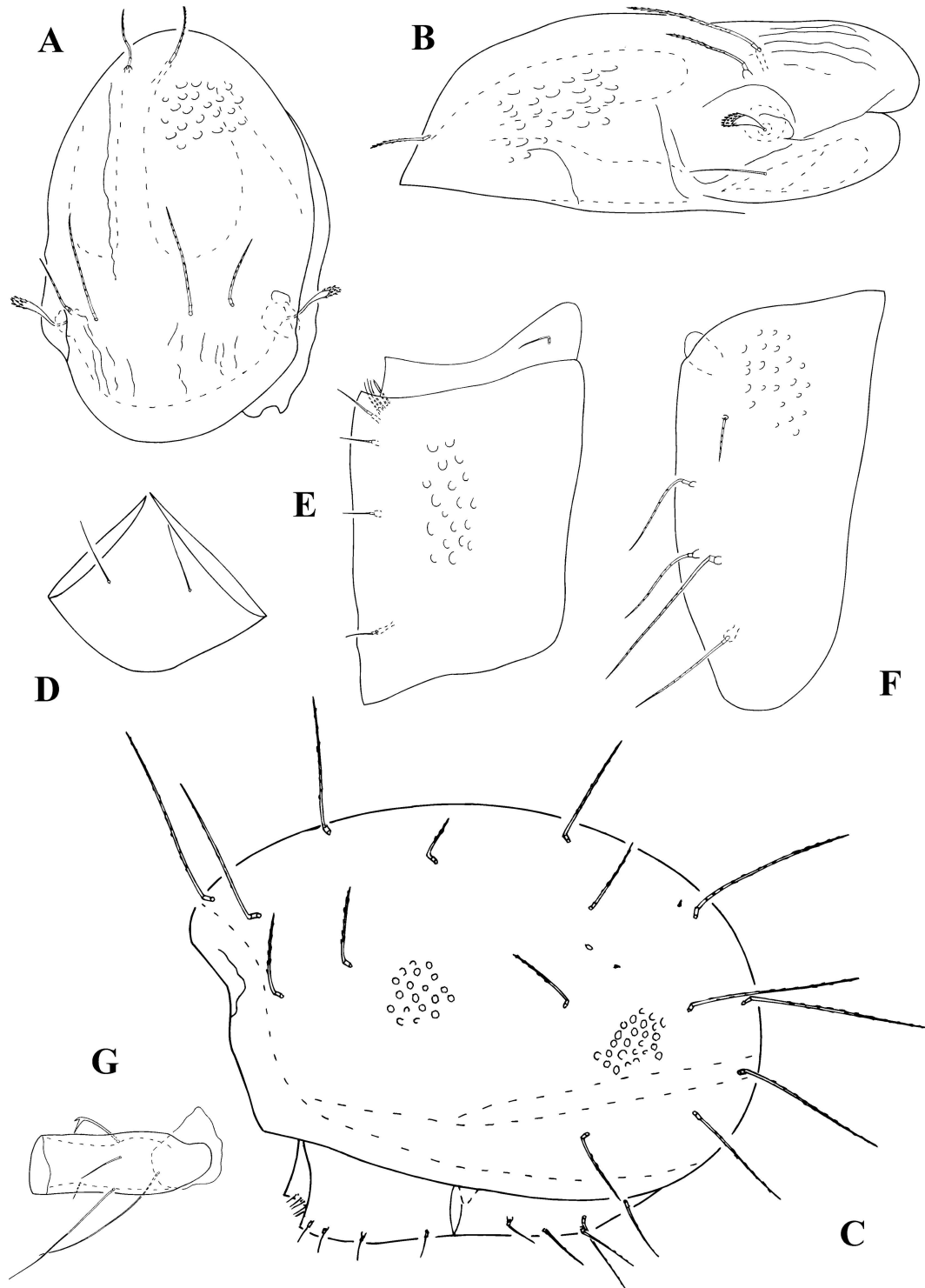


FIGURE 56: *Notophthiracarus lineolatus* Mahunka, 1993 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left genitoaggenital plate; F – left anoadanal plate; G – trochanter and femur of leg I.

96,  $h_1$  273,  $ps_1$  293; genitoaggenital plate  $242 \times 162$ , anoadanal plate  $303 \times 136$ . Large-sized species; colour brown; integument covered with deep concavities, especially notogaster covered with heavy sculpture. Prodorsum with weak median crista; lateral carinae absent; sigillar fields long, narrow, median longer than laterals; sensilli short, with rounded head, spinose distally; interlamellar, lamellar and rostral setae bacilliform, spinose; rostral setae semi-erect;  $in > le > ex > ss > ro$ . Notogaster with varying in length setae ( $c_1 > c_1 - d_1$ ), generally dorsal setae longer than lateral, all barbed in their distal half; setae  $c_1$  situated at anterior margin, setae  $c_2$  and  $c_3$  slightly remote from anterior margin; vestigial setae  $f_1$  anterior of setae  $h_1$ ; only one pair of lyrifissures  $ip$  are observable. Ventral region; setae  $h$  of mentum shorter than distance between them; formula of genital setae: 4: 5; setae of anoadanal plates spiniform, rough;  $ad_2 > ad_1 > an > ad_3$ . Chaetome of legs complete, setae  $d$  on femora I bifurcate, located at middle of article.

Locality in Tanzania: Morogoro Region: Mahunka 1993, Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Notophthiracarus quasiuluguruensis*  
Niedbała et Starý, 2015  
(Fig. 57A-H)

Diagnosis — Measurements of holotype: prodorsum: length 243, width 197, height 96; notogaster: length 465, width 343, height 313. Species of medium size; colour light brown; surface of body porose and with well-developed sculpture. Prodorsum with well-developed, joined sigillar fields and with deep sinus between rostral setae; lateral carinae absent, posterior furrows feeble; Sensilli long, with pedicel narrow proximally, slightly dilated in the middle and again narrow with small dilated head, obtuse distally, covered with minute spines; other setae needleform, rough ( $ss > ro > in > le$ ), except vestigial exobothridial setae. Notogaster with setae needleform, short ( $c_1/c_1 - d_1 = 0.5$ ), setae of row  $c$  remote from anterior border, setae  $c_2$  more than setae  $c_1$  and  $c_3$ ; vestigial setae  $f_1$  and  $f_2$  not observable; 2 pairs of lyrifissures  $ia$  and  $im$  present.

Ventral region; setae  $h$  of mentum shorter than distance between them; formula of genital setae: 5: 4; setae  $g_{1-4}$  smaller than setae  $g_{5-9}$ ; anoadanal plates with 5 pairs of unequal length of setae,  $ad_2 > an_2 > ad_3 > an_1 > ad_1$ , adanal setae  $ad_1$  and  $ad_2$  in unusual position, posteriorly of anal setae. Chaetome of legs of “incomplete type”; setae  $v'$  of femora I absent; setae  $d$  of femora I slightly remote from distal end of the article.

Locality in Tanzania: The Uluguru Mts: Niedbała & Starý 2015d

Distribution — Afrotropical species known only from Tanzania, probably endemic.

*Notophthiracarus sacyae*  
(Mahunka, 1983)  
(Fig. 58A-F)

*Steganacarus sacyae* Mahunka, 1983.

*Notophthiracarus sacyae*: Niedbała 2001.

Diagnosis — Measurements of holotype: prodorsum: length 228, width 167, height 81, setae:  $in$  30,  $le$  23,  $ro$  28; notogaster: length 429, width 293, height 288, setae:  $h_1$  and  $ps_1$  48; genitoaggenital plate  $126 \times 109$ , anoadanal plate  $147 \times 116$ . Medium-sized species; colour brown; anterior part of prodorsum foveolated; integument of notogaster ornamented with large foveolae which are flower-shaped, consisting of 4-5 little and round parts. Prodorsum without lateral carinae; posterior furrows present; sigillar fields narrow, joined, median field with deep sinus between rostral setae; sensilli long, narrow, s-shaped, tapering; other setae short ( $ss > in > ro > le$ ), spiniform and rough, except vestigial exobothridial setae; distance between rostral setae longer than between lamellar and interlamellar setae. Notogaster with short ( $c_1 < c_1 - d_1$ ), rough setae; 2 pairs of lyrifissures  $ia$  and  $im$  present. Ventral region; setae  $h$  of mentum longer than distance between them; formula of genital setae: 4: 5; anal setae shorter than adanal, all setae rough, setae  $ad_1$  situated near paraxial margin. Leg chaetome complete; setae  $d$  of femora I bifurcate distal end.

Locality in Tanzania: The Kilimanjaro Mts: Mahunka 1983a, Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

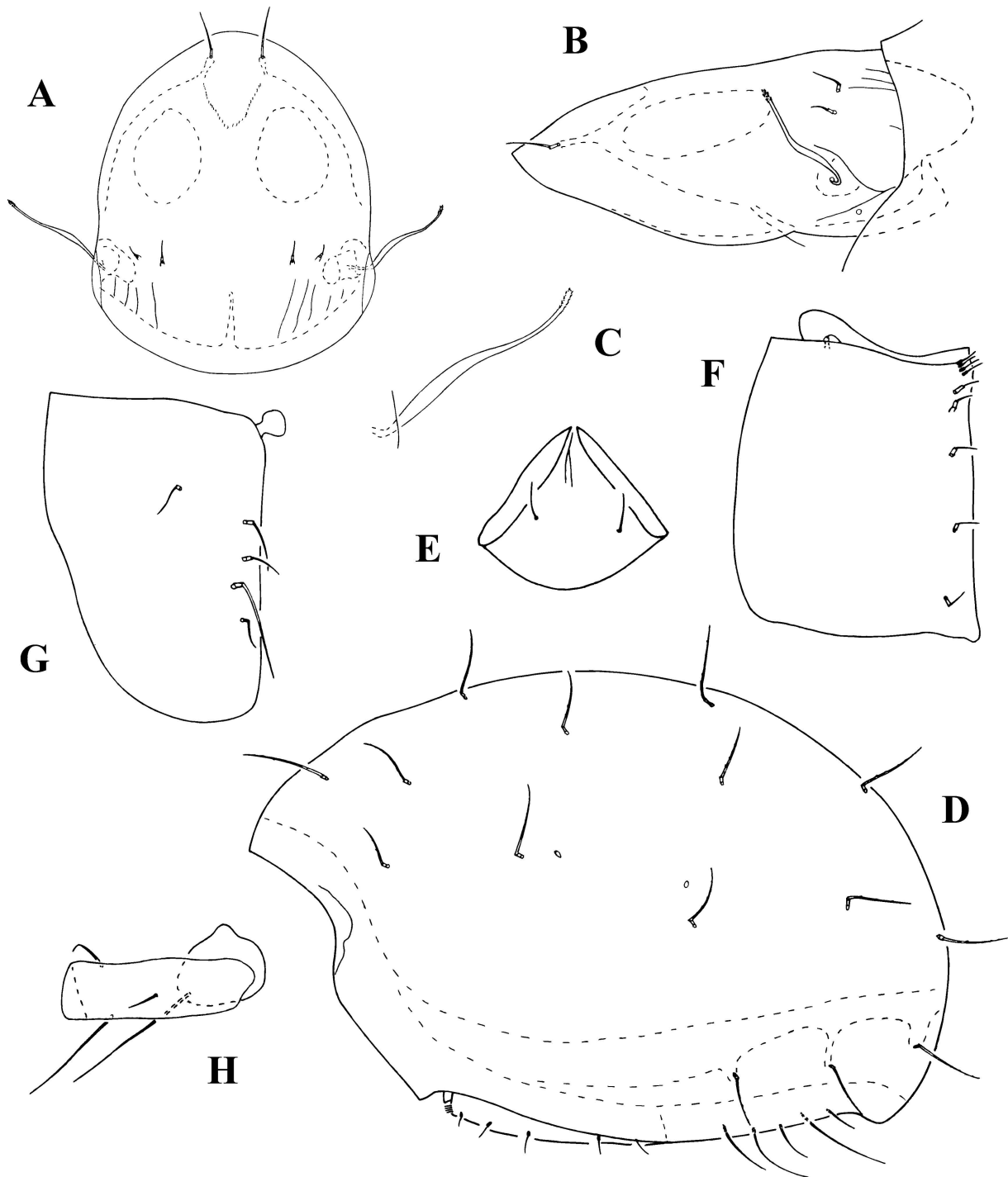


FIGURE 57: *Notophthiracarus quasiuluguruensis* Niedbała et Starý, 2015 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – sensillus; D – opisthosoma, lateral view; E – mentum of subcapitulum; F – right genitoaggenital plate; G – right anoadanal plate; H – trochanter and femur of leg I.

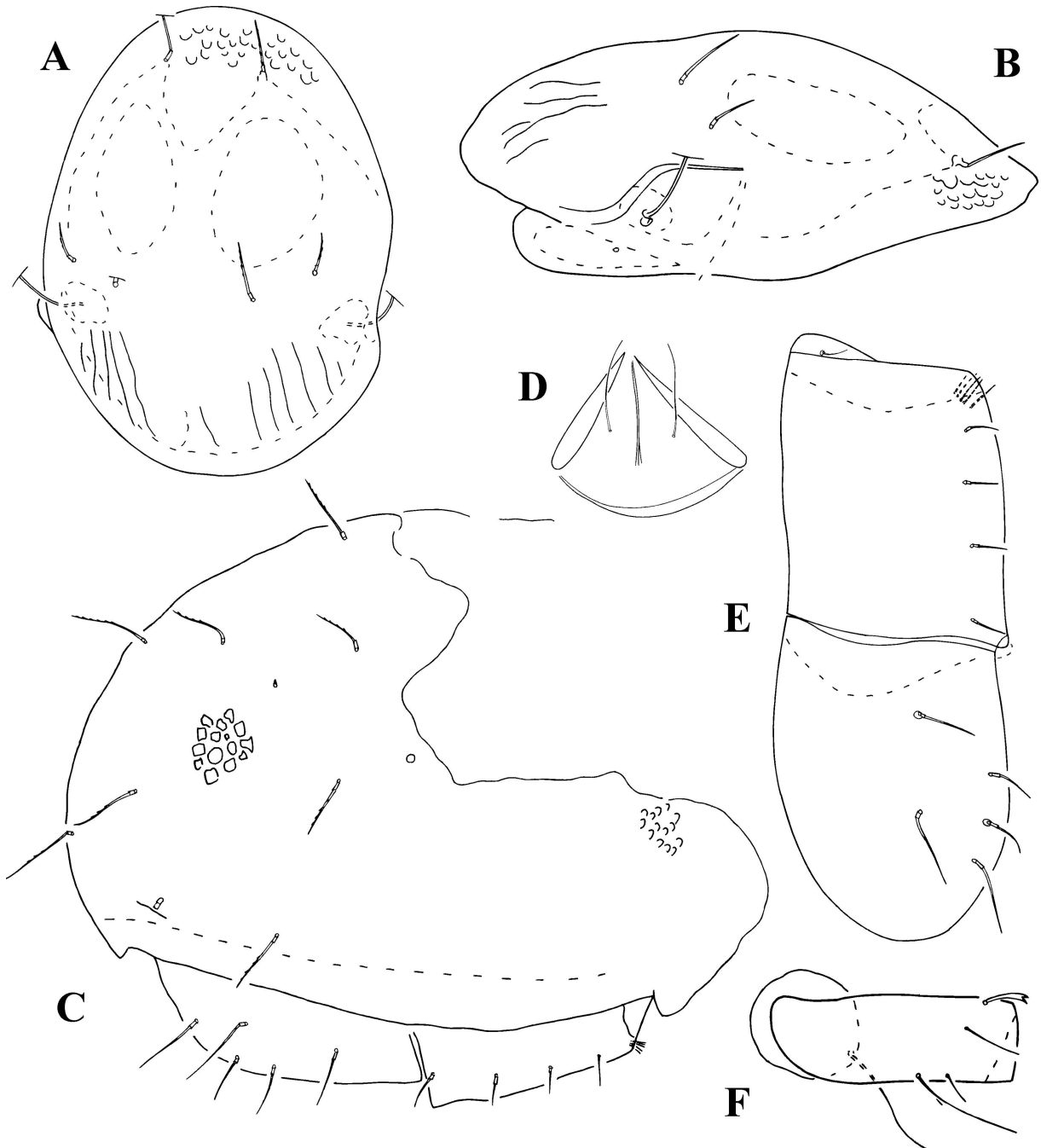


FIGURE 58: *Notophthiracarus sacyae* (Mahunka, 1983) (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – right genitoaggenital and anoadanale plates; F – trochanter and femur of leg I.



***Notophthiracarus subciliatus* (Mahunka, 1983)  
(Figs 59A-F; 60A-H)**

*Hoplophorella subciliata* Mahunka, 1983.

*Atropacarus (Hoplophorella) subciliatus*: Niedbała 2001.

I examined once again the holotype in alcohol.

Diagnosis — Measurements of holotype: prodorsum: length 358, width 267, height 136; notogaster: length 656, width 485, height 454. Rather large-sized species; colour light yellow; surface of body weakly foveolate only on border of notogaster. Prodorsum with dorsal field longer than lateral ones; distinct lateral carinae and posterior furrows present; sensilli short, weakly dilated, pointed distally, slightly rough; other setae short ( $ss=in>le=ro$ ), spiniform, rough, except vestigial exobothridial ones. Notogaster with small, spiniform, rough setae, setae *c* far from anterior margin, setae  $c_1$  and  $c_2$  more than setae  $c_3$ , setae *ps* almost in one row; vestigial setae  $f_1$  posteriorly of  $h_1$  setae, 3 pairs of lyrifissures *ia*, *im* and *ip* present. Ventral region; setae *h* of mentum very short; arrangement of genital setae is 4: 5; setae  $ad_2$  slightly longer than other setae of anoadanal plates, situated near paraxial margin, right plate with additional setae on paraxial margin. Chaetome of legs complete, setae *d* on femora remote from distal end of its segment.

Locality in Tanzania: The Kilimanjaro Mts: Mahunka 1983b, Niedbała 2001.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Notophthiracarus tuberculus*  
Niedbała et Starý, 2015  
(Figs 61A-F; 62A-F)**

Diagnosis — Measurements of holotype: prodorsum: length 258, width 195, height 137; notogaster: length 586, width 374, height 303. Species of medium size; colour brown; surface of body, especially of notogaster covered with numerous tubercles. Prodorsum with powerful median carina; lateral carinae short; sigillar fields not well observable; posterior furrows present; sensilli in holotype and one paratype (sample TAN-018) long, narrow, flagellate, smooth, however in nine paratypes

(TAN-018) sensilli are baciliform covered with small cilia in distal end (Figs 62B, C); other setae short, spiniform, smooth ( $ss>in>le=ro$ ), except vestigial exobothridial setae. Notogaster with strong anterior collar; setae short, rather smooth, spiniform setae, dilated proximally and whiplike distally; setae of row  $c_{1-3}$  situated at collar; only lyrifissures *im* visible; vestigial setae not observable. Ventral region; setae *h* of mentum longer than distance between them; formula of genital setae: 5: 4, setae  $g_{1-4}$  shorter than setae  $g_{5-9}$ ; adanal setae  $ad_1$  and  $ad_2$  situated closely to paraxial border, near of anal setae, all setae of anoadanal plates short, similar in length, smooth. Chaetome of legs of “complete type”; setae *d* of femora I slightly remote from distal end of article; setae *l*” very short.

Localities in Tanzania: The Uluguru Mts: Niedbała & Starý 2015d.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Notophthiracarus uluguruensis*  
Niedbała et Starý, 2015  
(Fig.63A-G)**

Diagnosis — Measurements of holotype: prodorsum: length 328, width 257, height 116; notogaster: length 667, width 465, height 444. Medium-sized species; colour brown; well sclerotized; integument covered with feeble mosaic and punctate. Prodorsum with distinct, joined together sigillar fields, deep sinus situated anteriorly of median field; posterior furrows present; lateral carinae distinct, not so long; sensilli with fusiform head, smooth, rounded distally; other setae needleform, rough, rostral setae erect, situated near rostrum;  $ro>in>ss>le>ex$ . Notogaster with rather short ( $c_1/c_1-d_1=0.6$ ) rigid, needleform setae, covered with very short cilia, in shape as prodorsal setae; setae  $c_1$  and  $c_2$  situated remote from anterior border, setae  $c_3$  near the border; between lyrifissures only *ia* and *im* present; vestigial setae not observable. Ventral region; setae *h* of mentum slightly longer than distance between them; arrangement of genital setae: 6: 3, setae  $g_{1-5}$  considerably smaller than setae  $g_{6-9}$ ; anoadanal plates with unusual arrangement of adanal setae, setae  $ad_1$  and  $ad_2$  situated close to each

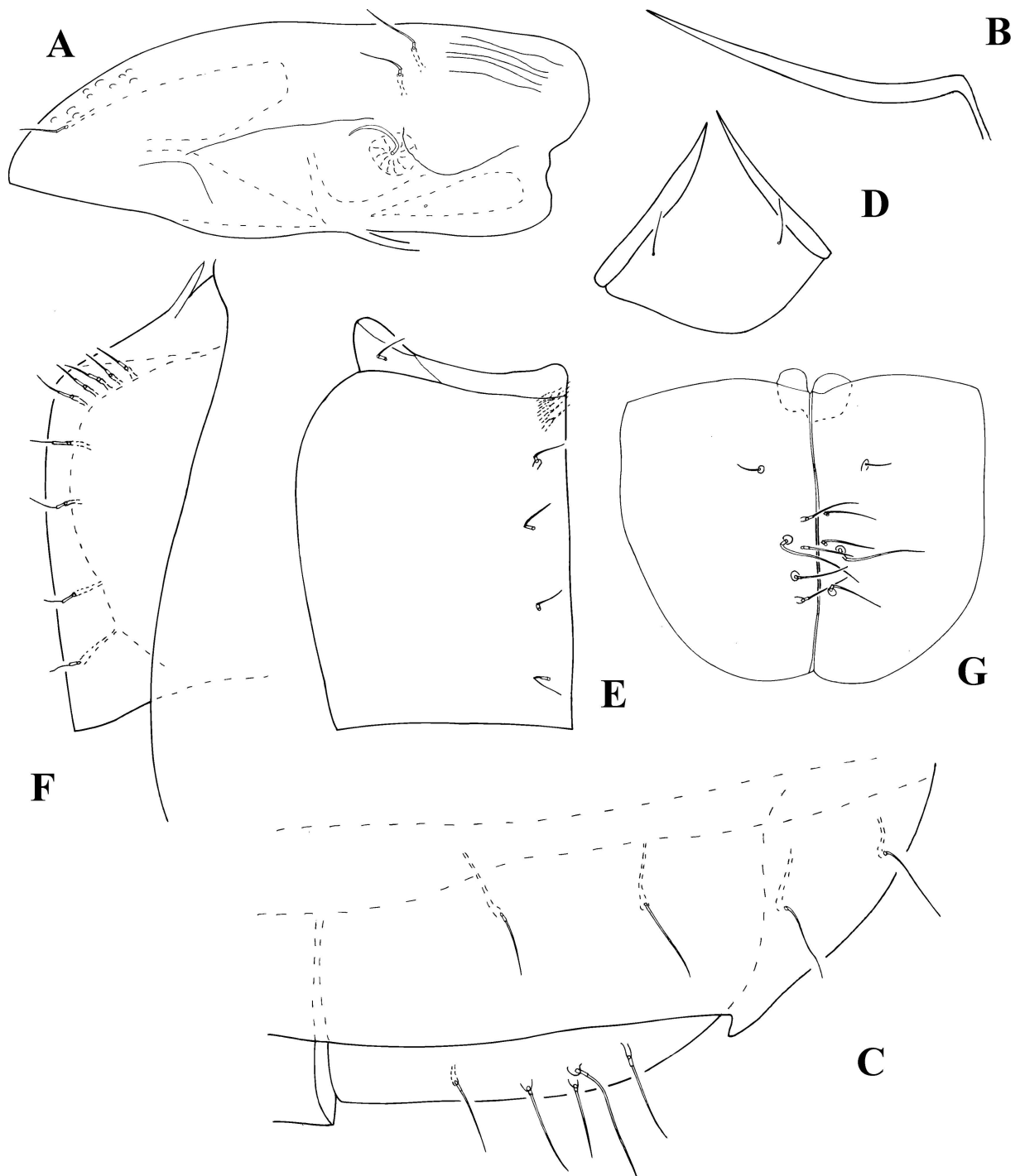


FIGURE 59: *Notophtiracarus subciliatus* (Mahunka, 1983) (holotype): A – prodorsum, lateral view; B – sensillus, dorsal view; C – posterior fragment of opisthosoma with setae of row *ps* and ano-adanal plate; D – mentum of subcapitulum; E – right genitoaggenital plate; F – left genitoaggenital plate; G – ano-adanal plates.

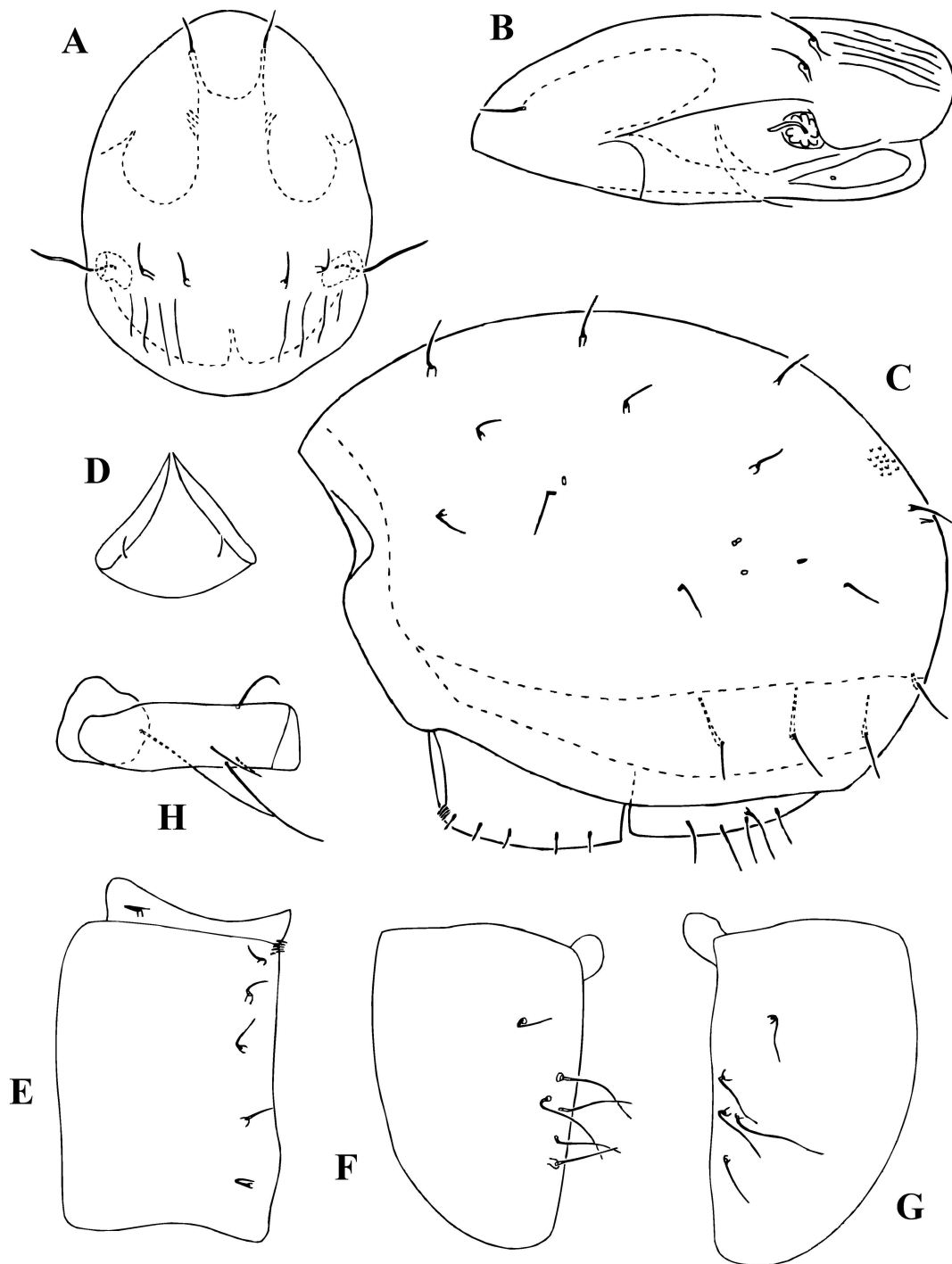


FIGURE 60: *Notophthiracarus subciliatus* (Mahunka, 1983) (specimen from Tanzania after Niedbała 2001): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – right genitoaggenital plate; F – right anoadanal plate; G – left anoadanal plate; H – trochanter and femur of leg I.

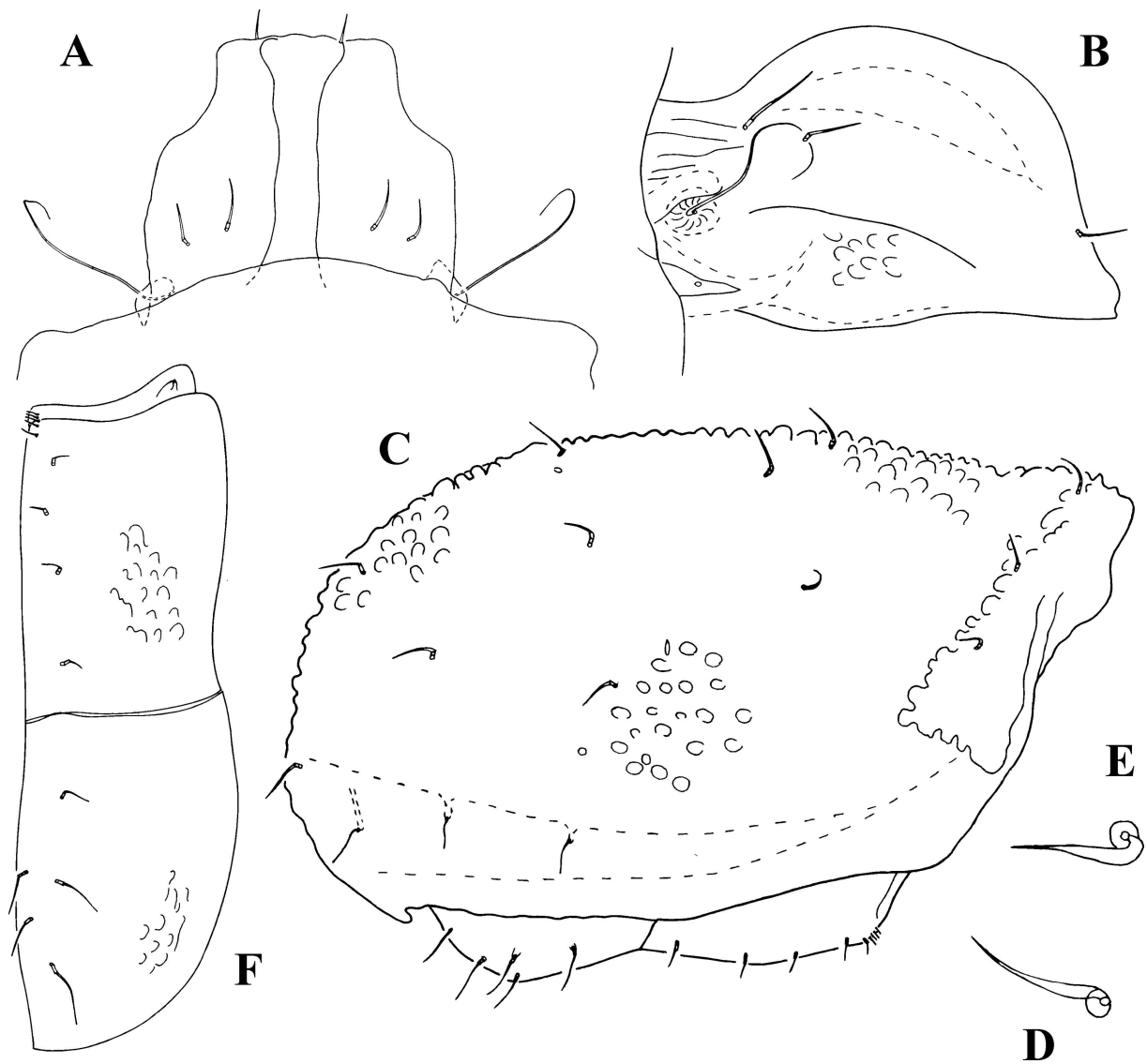


FIGURE 61: *Notophthiracarus tuberculus* Niedbała et Starý, 2014 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – seta  $h_1$ ; E – seta  $h_2$ ; F – left genitoaggenital and anoadanale plates.

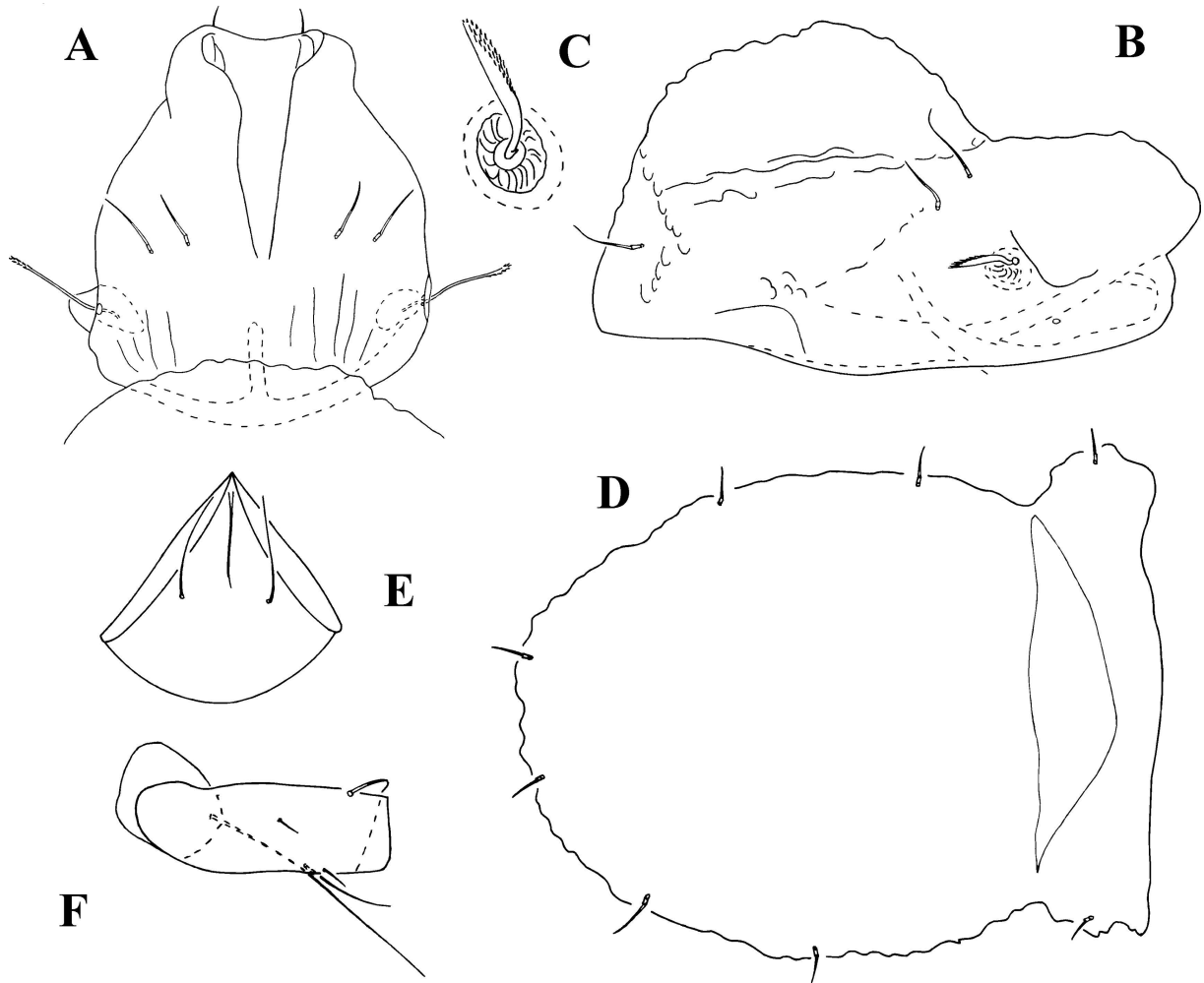


FIGURE 62: *Notophthiracarus tuberculus* Niedbała et Starý, 2015 (holotype and paratype). A-C (paratype). D-F (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – sensillus; D – notogaster, dorsal view; E – mentum of subcapitulum; F – trochanter and femur of leg I.

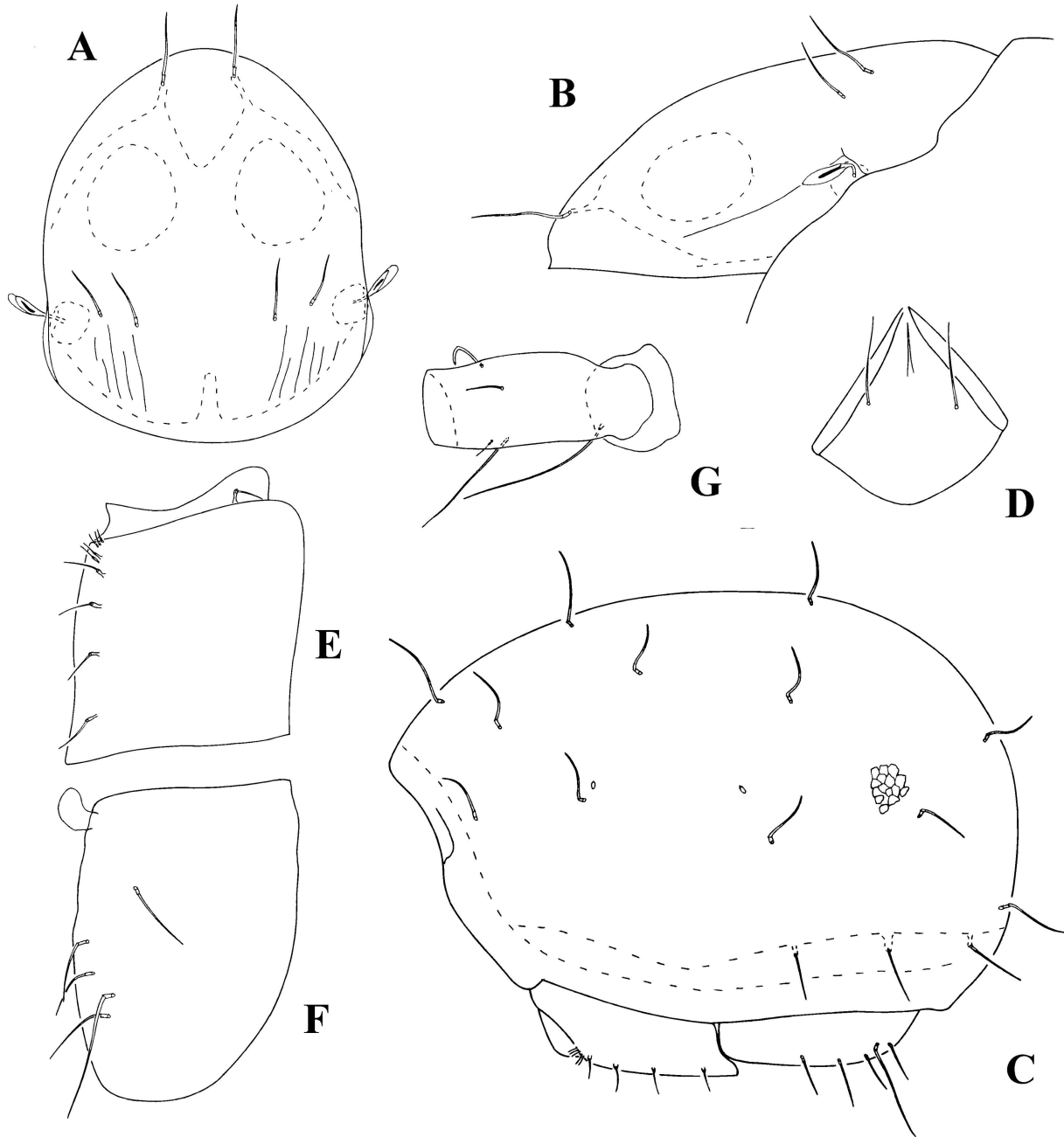


FIGURE 63: *Notophthiracarus uluguruensis* Niedbala et Starý, 2015 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – mentum of subcapitulum; E – left genitoaggenital plate; F – left ano-adanal plate; G – trochanter and femur of leg I.

other, both posteriorly of anal setae, setae  $ad_2$  the longest and thickest, all setae rough. Legs setation of "complete type"; seta  $d$  on femora I distinctly remote from distal end of segment.

Localities in Tanzania: the Uluguru Mts: Niedbała & Starý 2015d.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

#### *Atropacarus* Ewing, 1917

*Helvetacarus* Mahunka, 1993: Subías 2004

Type species: *Hoplophora stricula* C.L. Koch, 1936.

Diagnosis — Body integumental surface covered with concavities. Posterior furrows of prodorsum present, lamellar setae minute (length ratio of lamellar setae/prodorsum < 0.2). Ventral region; genital setae in a row or nearly so, distance between setae  $g_6$  and  $g_5$  longer than that between  $g_5$  and  $g_4$ ; setae  $ad_1$  always close to paraxial margin, in a row with anal setae; setae  $ad_2$  remote from the paraxial margin or close to it. Legs: setae  $v'$  on femora I minute, length ratio  $v''/v' < 2.2$ .

Distribution — Semicosmopolitan

#### subgenus – *Hoplophorella* Berlese, 1923

*Hoplophorella* (*Hoplophorella*): Subías 2004 syn. nov.

Type species: *Hoplophorella cucullatum* Ewing, 1909.

Diagnosis — Fifteen pairs of notogastral setae, as a rule only two pairs of lyrifissures,  $ia$  and  $im$  present. Ventral region; nine pairs of genital setae arranged in a single row and five pairs of anal and adanal setae present; setae  $ad_2$  remote from the paraxial margin.

Distribution — Rather pantropical, uncommon in northern hemisphere.

#### *Atropacarus* (*Hoplophorella*) *brevipilis* (Balogh, 1958) (Fig. 64A-F)

*Steganacarus brevipilis* Balogh, 1958.

*Atropacarus* (*Hoplophorella*) *brevipilis*: Niedbała 2001.

Diagnosis — Measurements of a specimen from Kenya (Niedbała 1992): prodorsum: length 432, width 308; notogaster: length 846, width 614, height 595. Large-sized species; colour light brown, surface covered with small concavities. Prodorsum with strong median crista, median sigillar field, narrow at the base and enlarging trapezoidally towards rostral setae, longer than laterals; lateral carinae extend beyond sinus; sensilli fusiform, with short pedicel and oval, smooth head; other setae short, smooth, spiniform;  $in > ro > ss > le$ ; exobothridial vestigial. Notogaster with small ( $c_1 < \frac{1}{4}c_1 - d_1$ ), smooth, spiniform setae; setae  $c_{1-3}$  remote from anterior border, setae  $c_1$  and  $c_2$  more than setae  $c_3$ ; vestigial setae  $f_1$  on the level of  $h_1$  setae. Ventral region; setae  $h$  of mentum shorter than distance between them; formula of genital setae: 6: 3; setae  $ad_2$  the longest and the thickest of all on anoadanal plates, situated near paraxial border, very close  $ad_1$  setae. Chaetome of legs complete; setae  $d$  of femora I remote from distal end of article.

Locality in Tanzania: "Tanganika": Balogh, 1958, Niedbała 2001.

Distribution — Afrotropical, central and eastern parts.

#### *Atropacarus* (*Hoplophorella*) *curtisetosus* Niedbała et Starý, 2014 (Fig. 65A-D)

Diagnosis — Measurements of holotype: prodorsum: length 167, width 121, height 51; notogaster: length 296, width 195, height 177. Small-sized species; colour brown; surface of body covered with cerotegument and with small concavities. Prodorsum without lateral carinae; posterior furrows present; sigillar fields indistinct because strong cerotegument; sensilli long, rod-like without head covered with cilia in distal half; other setae short, rodlike, stout, obtuse, rough;  $ss > ro > in > le$ ; exobothridial setae vestigial. Notogaster with setae short ( $c_1 < \frac{1}{2}c_1 - d_1$ ), rigid, stout, obtuse, rough, setae  $c_1$  and  $c_3$  remote from anterior margin, setae  $c_3$  more than  $c_1$ , setae  $c_2$  considerably further; only lyrifissures  $ip$  visible. Ventral region; Formula of genital setae: 5: 4; anoadanal plates with rough setae, setae  $ad_2$  the thickest and longest. Legs: formulae of setae

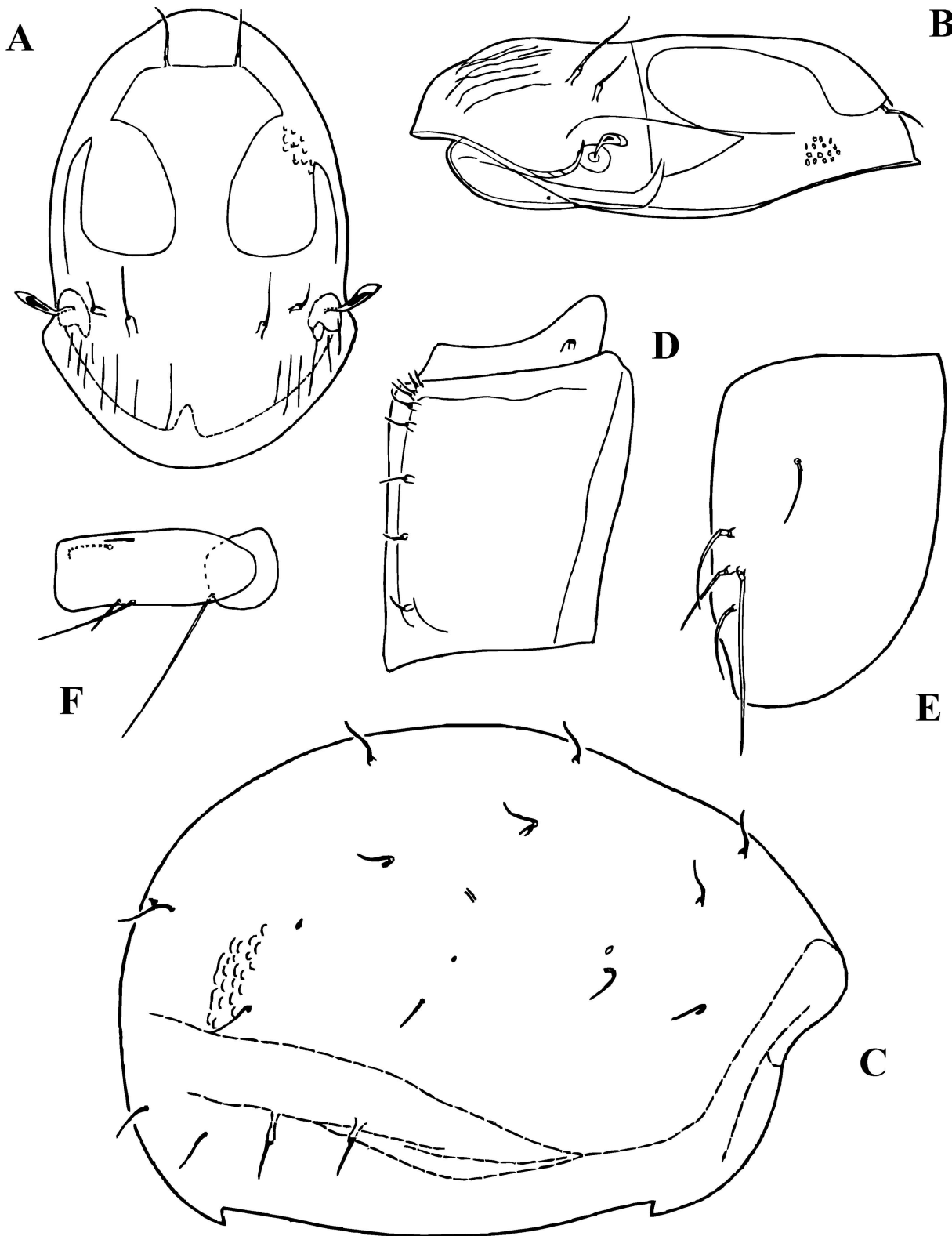


FIGURE 64: *Atropacarus (Hoplophorella) brevipilis* (Balogh, 1958) (specimen from Kenya): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – left ano-adanal plate; G – trochanter and femur of leg I.



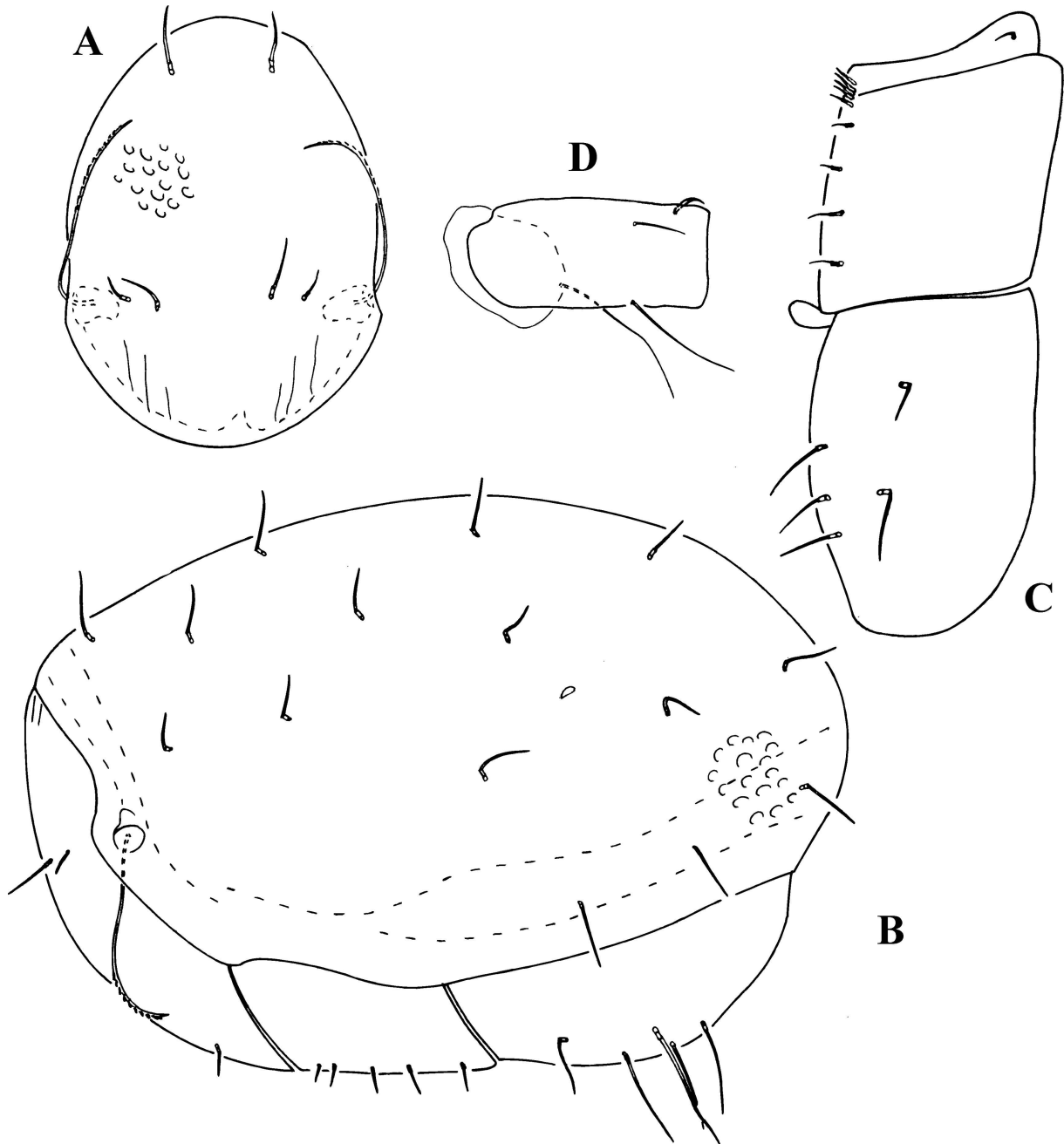


FIGURE 65: *Atropacarus (Hoplophorella) curtisetosus* Niedbała et Starý, 2014 (holotype): A – prodorsum, dorsal view; B – lateral view of body; C – left genitoaggenital and ano-adanal plates; D – trochanter and femur of leg I.

and solenidia of “incomplete type”, setae *v'* absent; setae *d* on femora I slightly remote from distal end of article.

Locality in Tanzania: The Uluguru Mts: Niedbala & Starý 2014b.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Atropacarus (Hoplophorella) onkos* n. sp.**  
(Fig. 66A-H)

Zoobank: DBDE4696-8C65-4999-8B3D-A6D3CF158F4D

Description — Measurements of holotype: prodorsum: length 303, width 202, height 156, setae: *ss* 76, *in* 45, *le* 35, *ro* 23; notogaster: length 636, width 429, height 384, setae: *c*<sub>1</sub> and *ps*<sub>1</sub> 40, *h*<sub>1</sub> 45; genitoaggenital plate 172×131, anoadanal plate 217×152. Species of medium size; colour dark brown. Body covered with strong cerotegument. Surface of prodorsum and ventral plates covered with concavities or small reticulation, surface of notogaster covered with small protuberances. Prodorsum with powerful median crista. Lateral carinae absent. Sigillar fields invisible. Posterior furrows well developed. Sensilli fairly long, with narrowly fusiform head finely barbed. Other setae (except vestigial exobothridial) spiniform, fine, smooth, similar to notogastral setae; *ss* > *in* > *le* > *ro*. Notogaster with developed anterior collar. Setae spiniform, fine, smooth, very short ( $c_1/c_1-d_1=0.2$ ); setae *c*<sub>1</sub> situated at collar, setae *c*<sub>3</sub> near collar, setae *c*<sub>2</sub> far away from collar. Vestigial setae and lyrifissures invisible. Ventral region. Setae *h* of subcapitular mentum are shorter than distance between them. Formula of genital setae: 4: 5. Anoadanal plates with 5 pairs of very short spiniform setae, setae *ad*<sub>2</sub> situated at the level between anal setae, both setae *ad*<sub>2</sub> and *ad*<sub>3</sub> positioned rather near paraxial border of plate. Chaetome of legs complete. Setae *d* on femora I slightly remote from distal end of article, setae *l''* minuscule.

Holotype TAN-003 (deposited in Department of Animal Taxonomy and Ecology, Poznań).

Etymology — The name *onkos* is Latinised Greek for „a protuberance, tubercle“ and refers to the covering of surface of notogaster.

Comparison — The new species is similar to *A. (H.) subitus* (Niedbala, 1983) from Kenya in the shape of setae and sensilli but is distinguishable especially by the presence of protuberances on surface of notogaster and anterior collar of notogaster, and furthermore setae *h* of subcapitular mentum are shorter than distance between them (versus slightly longer), arrangement of genital setae is 4: 5 (versus (4+2): 3, setae *ad*<sub>3</sub> on anoadanal plates are located rather near paraxial border (versus remote from border). Legs, minute setae *l''* of femora I.

Locality in Tanzania: The Uluguru Mts.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

***Atropacarus (Hoplophorella) stenos***  
**Niedbala et Starý, 2014**  
(Fig. 67A-G)

Diagnosis — Measurements of holotype: prodorsum: length 210, width 139, height 96; notogaster: length 404, width 222, height 247. Species of medium size; colour dark brown; surface of body covered with strong cerotegument, and with small concavities. Prodorsum with powerful median crista but without lateral carinae and posterior furrows; sigillar fields invisible; sensilli short, club-shaped, smooth; other setae short, needleform, similar in length, exobothridial setae vestigial. Notogaster with strong anterior cowl; setae short ( $c_1 < \frac{1}{2}c_1-d_1$ ), needleform; setae *c*<sub>1-3</sub> situated on cowl, slightly remote from anterior margin, *c*<sub>2</sub> distinctly further; vestigial setae not visible. Ventral region; setae *h* of mentum considerably shorter than distance between them; formula of genital setae: 6: 3; anoadanal plates with minute, needleform, similar in length setae. Legs: formulae of setae and solenidia of “complete type”; big setae *d* on femora I distinctly remote from distal end of article.

Localities in Tanzania: The Uluguru and Nguru Mts: Niedbala & Starý 2014b.

Distribution — Afrotropical species known only from Tanzania, probably endemic.

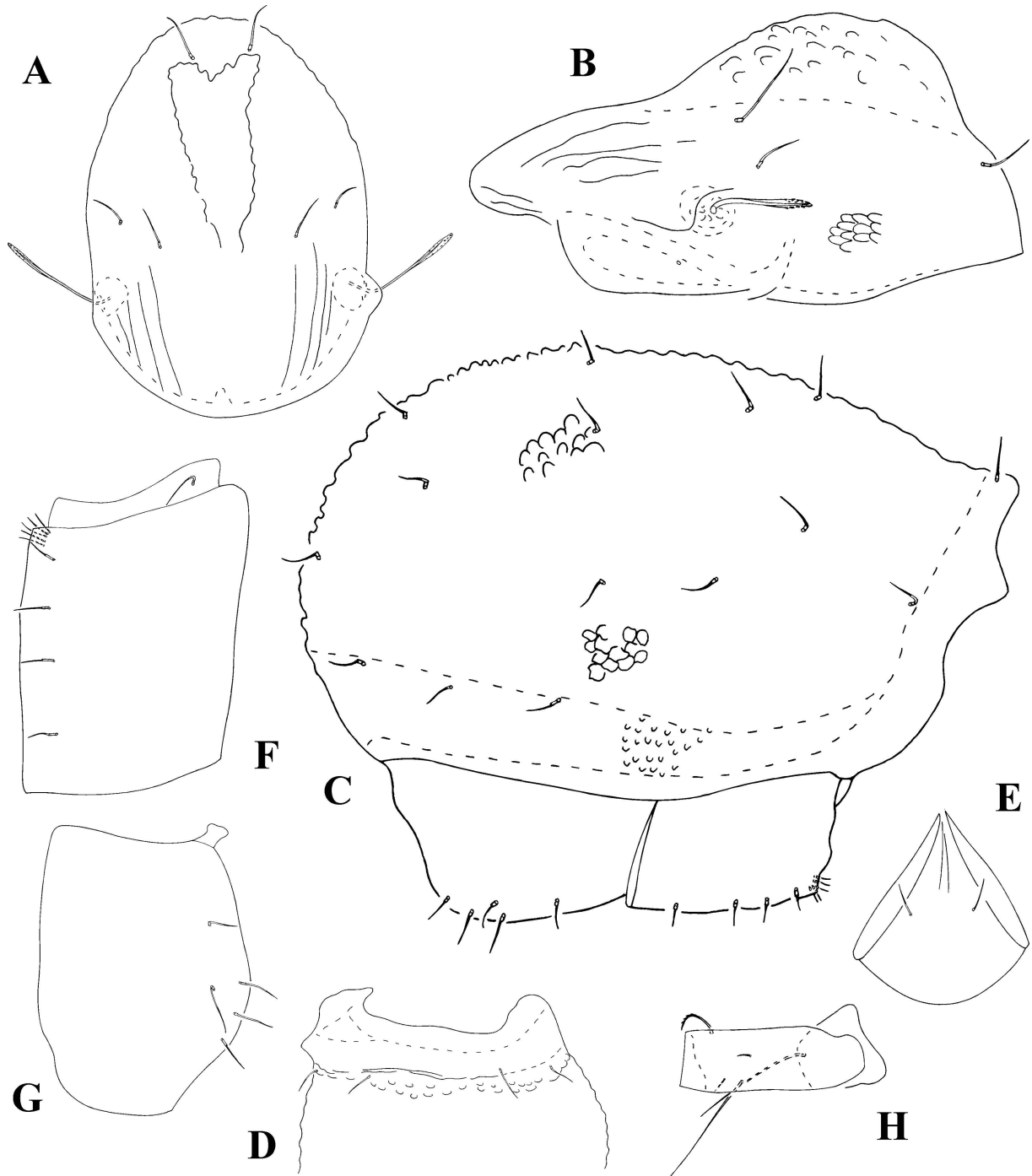


FIGURE 66: *Atropacarus (Hoplophorella) onkos* n. sp. (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – opisthosoma, dorsal of anterior part of notogaster; E – mentum of subcapitulum; F, left genitoaggenital plate; G – right anoadanal plate; H – trochanter and femur of leg I.

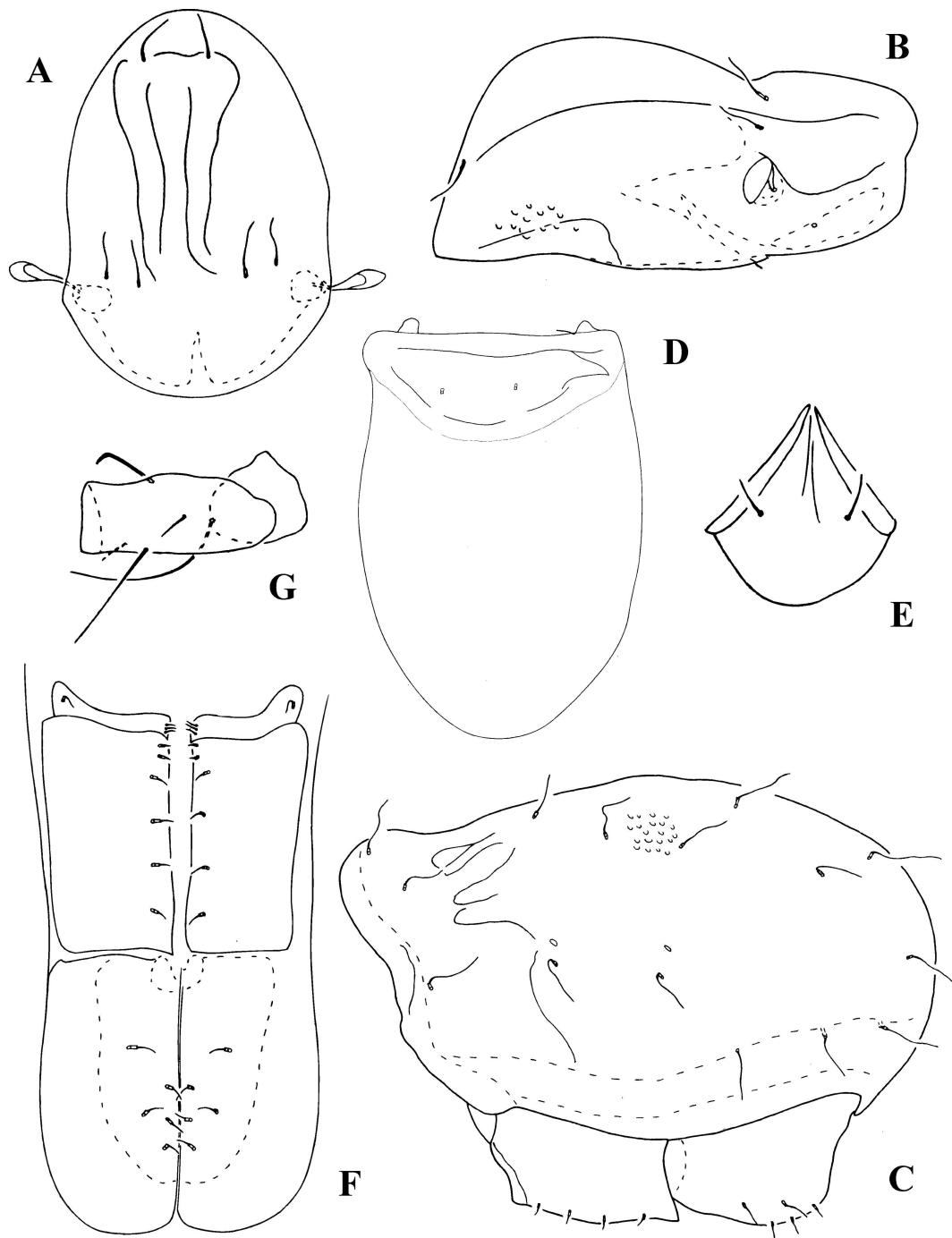


FIGURE 67: *Atropacarus (Hoplophorella) stenos* Niedbała et Starý, 2014 (holotype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – opisthosoma, dorsal view; E – mentum of subcapitulum; F – genitoaggenital and anoanal plates; G – trochanter and femur of leg I.

***Atropacarus (Hoplophorella) tuberculosissimus***  
**(Mahunka, 1978)**  
**(Fig. 68A-F)**

*Steganacarus tuberculosissimus* Mahunka, 1978.  
*Hoplophorella horrida* Mahunka, 1984 syn. by Niedbała 2001.  
*Hoplophorella meszarosi* Mahunka, 1988 syn. by Niedbała 2001.  
*Hoplophorella tuberosa* Mahunka, 1988 syn. by Niedbała 2001.  
*Hoplophorella verrucosa* Mahunka, 1987 syn. by Niedbała 2001.  
*Atropacarus (Hoplophorella) tuberculosissimus*: Niedbała 2001.

Diagnosis — Measurements (Niedbała 2001): prodorsum: length 298-429, width 207-273, height 126-187; notogaster: length 716-948, width 363-505, height 406-511. Large-sized species; colour light brown, body strongly sculptured, covered with some ribs, foveoles and rugae. Prodorsum with powerful quadrangular median crista with three anterior projections well visible in dorsal aspect; lateral carinae and posterior furrows present; median sigillar field trapezoidal, lateral fields short; sensilli rather long, smooth, blade-shaped, tapering, flagellate at distal end; other setae needle-shaped; lamellar setae situated anteriorly of interlamellar ones, distance between interlamellar setae is large;  $ss > in > ro > le$ ; exobothridial setae vestigial. Notogaster with well-developed anterior hood; setae thin, fine, short and curved ( $c_1/c_1-d_1=0,16-0,21$ ), majority of setae inserted on tubercles; setae of row *c* remote from anterior margin,  $c_1$  situated in the middle of the hood,  $c_3$  near anterior margin, setae  $c_2$  far from margin; vestigial setae not visible. Ventral region; setae *h* of mentum shorter than distance between them; formula of genital setae: 4: 5; anal and adanal setae minute. Chaetome of legs complete; setae *d* on femora I situated on distal end of article.

Localities in Tanzania: Tanga Region: Mahunka 1988, Niedbała 2001; the Uluguru and Nguru Mts.

Distribution — Afrotropical and southafrican, disjunctive.

***Atropacarus (Hoplophorella) vitrinus***  
**(Berlese, 1913)**  
**(Fig. 69A-F)**

*Hoploderma vitrinum* Berlese, 1913.  
*Hoplophorella scapellata* Aoki, 1965 syn. by Niedbała 2000.  
*Hoplophorella africana* Wallwork, 1967 syn. by Niedbała 1986.  
*Hoplophorella raychaudhurii* Subías et Sarkar, 1984 syn. by Niedbała 1986.  
*Hoplophorella lienhardi* Mahunka, 1987 syn. by Niedbała 2000.  
*Atropacarus (Hoplophorella) nigeriensis* Badejo et al. 2001 syn. by Niedbała 2008a.  
*Atropacarus (Hoplophorella) vitrinus*: Niedbała 2001.

Diagnosis — Measurements (Niedbała 2011): length of prodorsum: 168-253; length of notogaster: 383-483. Medium-sized species; colour brown, surface covered with small concavities. Prodorsum with distinct median crista; median sigillar field bifurcate with deep incision, longer than laterals; lateral carinae reaching the sinus; sensilli sickle-shaped, long, narrow, inflated in the middle covered with thin spines; interlamellar setae lanceolate, rough; lamellar and exobothridial setae spiniform, minute; rostral setae thick, directed inwards, rough;  $ro > ss > in > ex > le$ . Notogaster with setae foliate, short ( $c_1 < c_1-d_1$ ) covered with small spines; vestigial setae  $f_1$  posteriorly to  $h_1$  setae. Ventral region; setae *h* of mentum shorter than distance between them; formula of genital setae: 6: 3; anoadanal plate with setae  $ad_2$  foliate covered with small spines, remaining setae short, spiniform, setae  $ad_3$  somewhat shorter than others. Chaetome of legs reduced; setae *a'* on tarsi I absent.

Locality in Tanzania: The Nguru Mts. Species not yet recorded from TAN.

Distribution — Semicosmopolitan species.

**subgenus – *Atropacarus* Ewing, 1917**

*Atropacarus*: Subías 2004  
*Helvetacarus* Mahunka 1993: Subías 2004

Diagnosis — Cerotegument usually present. Lateral carinae of prodorsum usually absent; sensilli

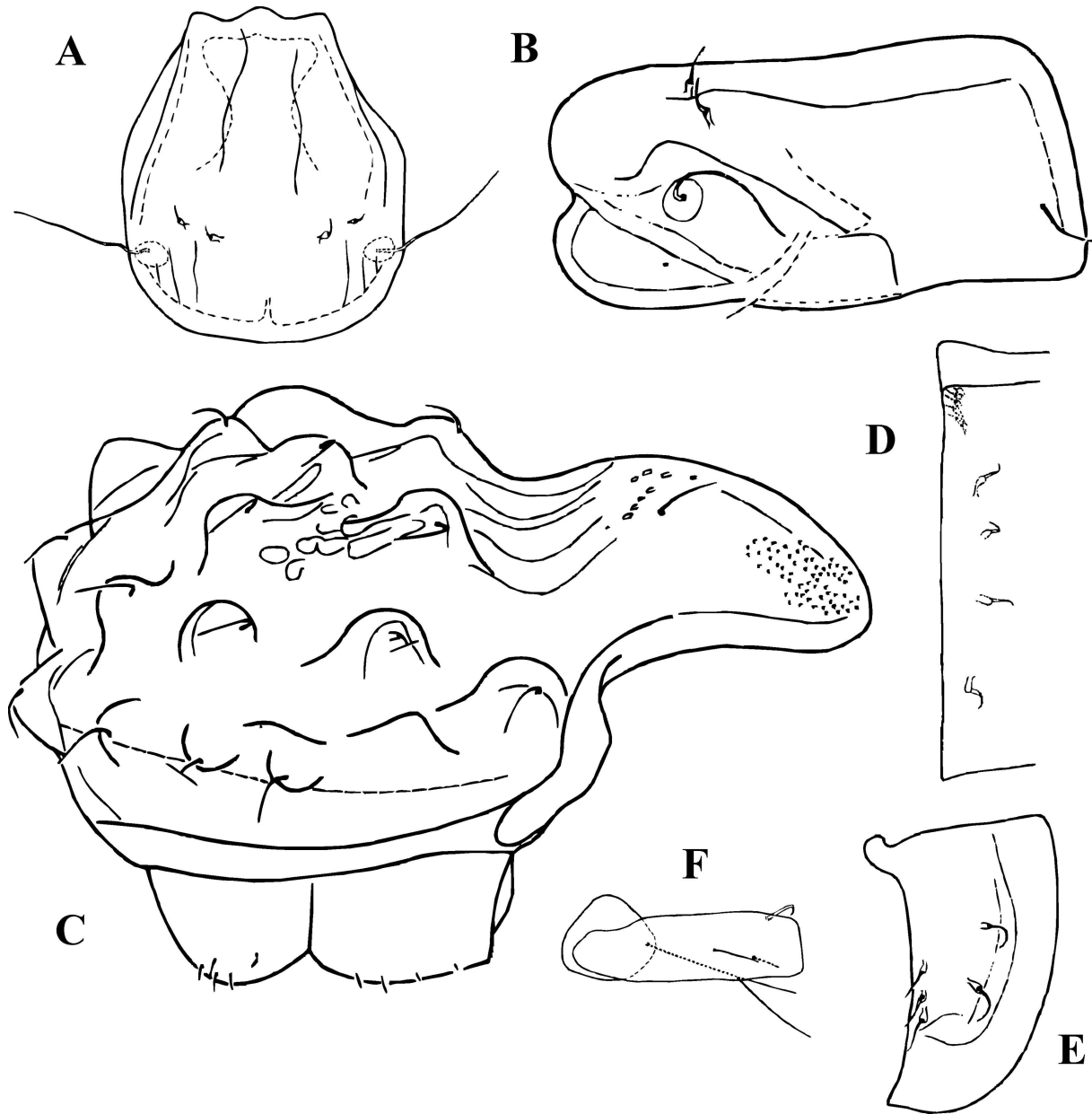


FIGURE 68: *Atropacarus (Hoplophorella) tuberculosissimus* (Mahunka, 1978) (paratype): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – paraxial margin of left genitoaggenital plate; E – left anoanal plate; F – trochanter and femur of leg I.

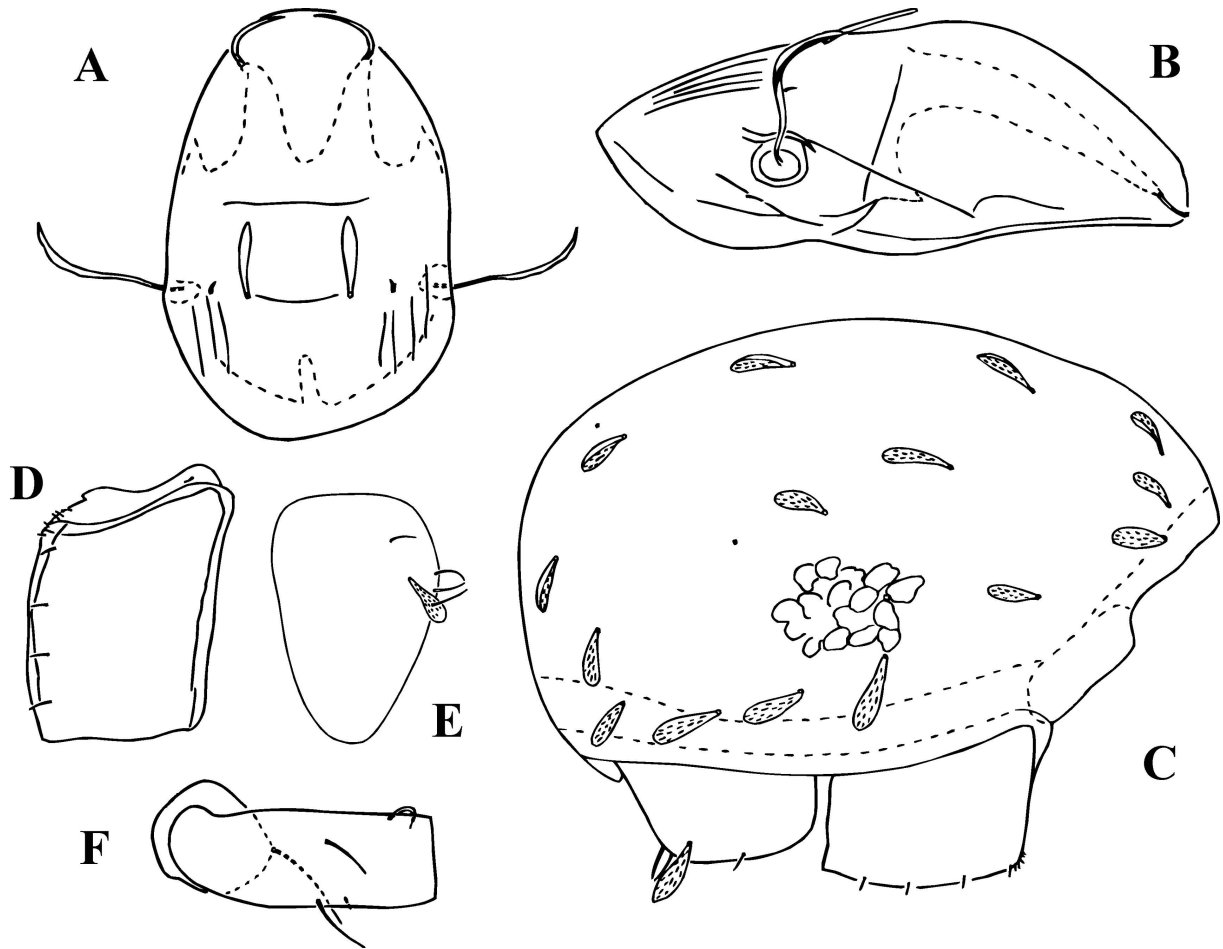


FIGURE 69: *Atropacarus (Hoplophorella) vitrinus* (Berlese, 1913) (specimen from Brazil): A – prodorsum, dorsal view; B – prodorsum, lateral view; C – opisthosoma, lateral view; D – left genitoaggenital plate; E – right anoanal plate; F – trochanter and femur of leg I.

long; rostral setae usually positioned at end of rostrum. Notogaster with 16 or more pairs of setae (exceptionally 15 pairs), vestigial setae  $f_1$  always posteriorly of  $h_1$  setae; lyrifissures  $im$  below the line  $cp-h_3$ . Ventral region; genitoaggenital plates with nine pairs of genital setae (exceptionally with seven pairs with formula: 6: 1), with formula: 6: 3 (exceptionally with formula: 7: 2); four setae ( $ad_1, an_1, an_2, ad_2$ ) on paraxial margin of anoadanal plates, all setae on anoadanal plates well developed, adanal setae neutrichous occasionally. Legs: setae  $d$  on femora I located at distal end of the segment.

Distribution — Semicosmopolitan.

Species of this subgenus not found so far in TAN.

#### KEYS FOR DETERMINATION

##### Key for determination of cohorts

1. Either notogaster with well discernible furrows on posterior half of body or ventral side with distinct ventral plate showing genital and anal openings well separated by brachypily ..... **Arthroptyctima**  
— Neither posterior notogastral furrows nor a brachypylic ventral plate displaying separate genital and anal openings present. Genital and anal openings joined, large and wide or narrow ..... **Euptyctima**

##### Key for determination of species in genus

###### *Mesoplophora*

1. Sensilli smooth with slightly swollen head, three pairs of anal setae present ..... *M. (P.) pulchra*  
— Sensilli setiform covered with cilia, two pairs of anal setae present ..... 2
2. Sensilli with weak discernible cilia, exobothridial setae as long as diameter of bothridia, formula of genital setae: 5+2 ..... *M. (M.) invisitata*  
— Sensilli covered with long cilia, exobothridial setae longer than diameter of bothridia, formula of

genital setae: 6: 1 ..... *M. (M.) rostrata*

##### Key for determination of superfamilies in Euptyctima

1. Body considerably compressed laterally, genitoaggenital and anoadanal regions narrow, V-shaped ..... **Euphthiracaroidae**  
— Body less compressed laterally, genitoaggenital and anoadanal regions relatively wide, U-shaped . . . . . **Phthiracaroidae**

##### Key for determination of families in superfamily Euphthiracaroidae

1. Genital setae situated in anterior part of genitoaggenital plates ..... **Synichotriidae**, *Synichotritia spinulosa*  
— Genital setae situated in paraxial position of genitoaggenital plates ..... 2
2. Ventral plates not completely fused, at least anal plates separated, anogenital region without interlocking triangle ..... **Oribotritiidae**  
— Ventral plates completely fused, at least one interlocking triangle present in anogenital region . . . . . **Euphthiracaridae**

##### Key for determination of genera and species in family Oribotritiidae

1. Genitoaggenital scissure incomplete, two plates well delineated from each other only posteriorly . . . . . **Indotritia**  
— Genitoaggenital scissure complete ..... 2
2. Bothridial scale situated above bothridium; two pairs of lateral carinae; suture between genital and anal plates present ..... *Oribotritia africana*  
— Bothridial scale situated below bothridium; one pair of simple lateral carinae; suture between genital and anal plates absent . . . . . *Mesotritia australis*



**Key for determination of subgenera in genus  
*Indotritia***

1. Anoadanal plates separate by complete suture . . . . . *Indotritia (Indotritia)*  
— Suture between anal and adanal plates incomplete . . . . . *Indotritia (Afrotritia)*

**Key for determination of species in subgenus  
*Indotritia (Indotritia)***

1. Lyrifissures *iad* located laterally and anteriorly of *ad*<sub>2</sub> setae . . . . . *I. (I.) krakatauensis*  
— Lyrifissures *iad* located laterally and posteriorly of *ad*<sub>2</sub> . . . . . 2
2. Setae *ps*<sub>3</sub> posteriorly of *an*<sub>1</sub> and *ad*<sub>1</sub> setae; setae *ad*<sub>2</sub> considerably longer than other anal and adanal setae . . . . . *I. (I.) tropica*  
— Setae *ps*<sub>3</sub> anteriorly of *an*<sub>1</sub> and *ad*<sub>1</sub> setae; setae *ad*<sub>2</sub> minute as other anal and adanal setae . . . . . *I. (I.) paraconsimilis*

**Key for determination of species in subgenus  
*Indotritia (Afrotritia)***

1. Notogastral setae longer ( $c_1/c_1-d_1=0.7$ ); setae *ps*<sub>3</sub> posteriorly of *an*<sub>1</sub> and *ad*<sub>1</sub> setae . . . . . *I. (A.) compacta*  
— Notogastral setae shorter ( $c_1/c_1-d_1=0.2$ ); setae *ps*<sub>3</sub> anteriorly of *an*<sub>1</sub> and *ad*<sub>1</sub> setae . . . . . *I. (A.) nuda*

**Key for determination of genera in family  
Euphthiracariidae**

1. Two triangles, one anterior and one posterior join the left with the right anoadanal plates, bothridial scale situated below bothridium . . . *Euphthiracarus*  
— Only one anterior triangle joins the left with the right anoadanal plate, bothridial scale situated above bothridium . . . . . 2

2. Genitoaggenital plates with 4–5 genital setae, trochanter of legs III and IV with one seta . . . . . *Microtritia*  
— Genitoaggenital plates with 7–9 genital setae, trochanter of legs III and IV with two setae . . . . . *Acrotritia*

**Key for determination of subgenera in genus  
*Euphthiracarus***

1. Rostral setae anteriorly of lamellar setae; genito-anal cleft absent . . *Euphthiracarus (Euphthiracarus)*  
— Rostral setae between lamellar setae; genito-anal cleft present . . . . . *Euphthiracarus (Pocsia)*

**Key for determination of species in subgenus  
*Euphthiracarus (Pocsia)***

1. Both, longest notogastral setae *c*<sub>3</sub> and *cp* equal in length . . . . . 2  
— Seta *cp* at least three times longer than setae *c*<sub>3</sub> . 3
2. 3 posterior genital setae longer than genital setae in progenital position; setae *ag*<sub>2</sub> longer than setae *ag*<sub>1</sub> . . . . . *E. (P.) africanus*  
— One posterior pair of genital setae the longest; aggenital setae similar in length . . . . . *E. (P.) trentus*
3. Tarsi of legs monodactylous . . . . . 4  
— Tarsi of legs heterotridactylous . . . . . 6
4. Seven pairs of genenital setae . . . . . *E. (P.) secundus*  
— Six pairs of genital setae . . . . . 5
5. One pair of genital setae in progenital position; genital setae *g*<sub>6</sub> longest . . . . . *E. (P.) paraafricanus*  
— No one of genital setae in progenital position; genital setae *g*<sub>5</sub> and *g*<sub>6</sub> longest . . . *E. (P.) heterotrichus*
6. Seven pairs of genital setae, 2 posterior pairs longest . . . . . *E. (P.) uluguruensis*

— Six pairs of genital setae, one posterior longest or all short, similar in length ..... 7

7. One posterior pair of genital setae longest; three pairs of genital setae in progenital position .....  
..... *E. (P.) parakunsti*

— All genital setae short, similar in length; two pairs of genital setae in progenital position .....  
..... *E. (P.) kunsti*

**Key for determination of species in genus  
*Acrotritia***

1. Lateral carinae of prodorsum forked distally ....  
..... *A. vestita*

— Lateral carinae of prodorsum simple, not forked  
..... 2

2. Notogastral integument covered with polygonal reticulation ..... *A. reticulata*

— Integument punctated ..... 3

3. Tarsi of legs I – bidactylous, tarsi of legs II–IV – heterotridactylous ..... *A. ardua*

— Tarsi of legs monodactylous ..... 4

4. Sensilli longer ( $ss > \frac{1}{2}$  prodorsal height) with oblongly extended head ..... *A. rustica*

— Sensilli shorter ( $ss < \frac{1}{2}$  prodorsal height) with well-separated, claviform head ..... *A. spiculifera*

**Key for determination of species in genus  
*Microtritia***

1. Distance  $ro-ro > le-le$ ; 5 pairs of genital setae .....  
..... *M. tropica*

— Distance  $ro-ro < le-le$ ; 4 pairs of genital setae ..... 2

2. Prodorsum without lateral carinae; anal setae  $an_2$  and  $an_3$  absent ..... *M. parahauseri*

— Prodorsum with lateral carinae; anal setae  $an_2$  and  $an_3$  present ..... *M. diaphoros*

**Key for determination of genera, subgenera and species in superfamily Phthiracaroidae**

1. Four setae ( $ad_1, an_1, an_2, ad_2$ ) in a row near paraxial margin of anoadanal plates ..... *Steganacarus (Steganacarus)*

— Three setae ( $ad_1, an_1, an_2$ ) in a row near paraxial margin of anoadanal plates ..... 2

— Two setae ( $an_1$  and  $an_2$ ) near paraxial margin of anoadanal plates ..... 4

2. Setae  $d$  on tibiae of legs IV long, independent of solenidia ..... *Steganacarus (Rhacaplacarus)*

— Setae  $d$  on tibiae of legs IV short, coupled with solenidia ..... 3

3. Genital setae  $g_{7-9}$  displaced towards paraxial margin of genitoaggenital plates and arranged in a row with setae  $g_{1-5}$ , setae  $g_6$  not displaced .....  
..... *Protophthiracarus*

— All genital setae located in a row along paraxial margin ..... *Atropacarus (Hoplophorella)*

4. Setae  $d$  on tibiae of legs IV long, independent of solenidia ..... 5

— Setae  $d$  on tibiae of legs IV short, coupled with solenidia ..... 6

5. Genital setae arranged in two rows,  $g_{6-9}$  always in some distance from paraxial margin .....  
..... *Plonaphacarus*

— Genital setae  $g_{1-5}$  situated in one row with setae  $g_{7-9}$ , setae  $g_6$  remote from paraxial margin .....  
..... *Hoplophthiracarus ambiguus*

6. Genital setae arranged in two rows, setae  $g_{6-9}$  remote from paraxial margin or at least setae  $g_6$  and  $g_7$  distinctly remote ..... 7

- Genital setae displaced towards paraxial margin and arranged in a row or nearly, or setae  $g_{7-9}$  displaced towards margin, setae  $g_6$  remote from margin.....8
- 7. Setae on notogaster smooth, thin, tapering .....  
..... *Phthiracarus anonymus*
- Setae of notogaster covered with spines .....  
.....*Austrophthiracarus aokii*
- 8. Genital setae arranged in a row near paraxial margin of plates.....*Notophthiracarus*
- Genital setae  $g_{7-9}$  displaced towards paraxial margin and forming a row with setae  $g_{1-5}$ .....  
.....*Arphthiacarus*

**Key for determination of species in genus  
*Plonaphacarus***

- 1. Lateral carinae of prodorsum very long, reach anterior end of rostrum; two pairs of lyrifissures *ia* and *im* present.....*P. kugohi*
- Lateral carinae of prodorsum (if exist) not so long, reach the sinus; four pairs of lyrifissures on notogaster *ia*, *im*, *ip* and *ips* present.....2
- 2. Distance between rostral setae (directed inwards) greater than their length..... *P. tanzicus*
- Distance between rostral setae (directed forwards) smaller than their length.....3
- 3. Microsculpture of integument slightly rugged with polygonal ornamentation..... *P. paramachadoi*
- Integument finely punctuate or covered with concavities..... 4
- 4. Integument finely punctuate.....*P. ngongi*
- Integument covered with concavities..... 5
- 5. Vestigial setae of notogaster  $f_1$  posteriorly of setae  $h_1$ .....*P. ecphylus*

- Vestigial setae  $f_1$  anteriorly of setae  $h_1$ .....6
- 6. Sensilli narrow, setiform, slightly sickle-shaped without head.....*P. styphelos*
- Sensilli with round or lanceolate head.....7
- 7. Exobothridial setae vestigial; notogastral setae shorter ( $c_1 < c_1 - d_1$ ), setae  $h$  of mentum shorter than distance between them..... *P. brevisetus*
- Exobothridial setae minute; notogastral setae longer ( $c_1 / c_1 - d_1 = 1$ ), setae  $h$  of mentum longer than distance between them.....*P. machadoi*

**Key for determination of species in subgenus  
*Steganacarus (Rhacaplacarus)***

- 1. Sensilli short with rounded head; notogastral setae short, dilate, phylliform..... *S. (R.) zicsii*
- Sensilli long, sickle-shaped, without head; notogastral setae short, spiniform..... *S. (R.) spiniferus*

**Key for determination of species in subgenus  
*Steganacarus (Steganacarus)***

- 1. Four pairs of lyrifissures on notogaster *ia*, *im*, *ip* and *ips* present; setae *in*,  $h_1$ ,  $ps_1$  and  $ps_2$  distinctly flagellate distally..... *S. (S.) vestitus*
- Two pairs of lyrifissures on notogaster *ia* and *im* present; setae *in* and notogastral setae not flagellate..... 2
- 2. Sensilli and rostral setae longer ( $ss > \text{height of prodorsum}$ ); notogastral setae shorter ( $c_1 < c_1 - d_1$ ) and uniform..... *S. (S.) wallworki*
- Sensilli and rostral setae longer ( $ss \approx \frac{1}{2} \text{height of prodorsum}$ ); notogastral setae longer ( $c_1 > c_1 - d_1$ ), setae  $h_3$ ,  $ps_2$  and  $ps_3$  considerably shorter than other setae..... *S. (S.) sol*

**Key for determination of species in genus**

*Arphthacarus*

- 1. Sensilli with rounded head; notogastral setae shorter ( $c_1 < c_1 - d_1$ ) ..... *A. sculptilis*
- Sensilli with lanceolate head; notogastral setae longer ( $c_1 > c_1 - d_1$ ) ..... *A. marginatus*

**Key for determination of species in genus**

*Protophthiracarus*

- 1. Setae *in* erect, *le* procumbent, setae *ro* directed forwards ..... *P. venustus*
- Setae *in* and *le* procumbent, setae *ro* directed inwards ..... 2
- 2. Irregular lines in dorsal side of notogaster; notogastral setae spiniform, rough; setae  $c_3$  close to anterior margin, setae  $c_1$  remote, setae  $c_2$  far from anterior margin ..... *P. mayottei*
- No lines in dorsal side of notogaster; notogastral setae thick covered with small spines in distal end, setae  $c_2$  and  $c_3$  remote more than setae  $c_1$  ..... *P. turianensis*

**Key for determination of species in genus**

*Notophthiracarus*

- 1. Notogaster with strong anterior collar ..... *N. tuberculus*
- Anterior collar on notogaster absent ..... 2
- 2. Prodorsum with very high median crista; body surface covered by tubercles and short ribs ..... *N. cavernosus*
- Prodorsum without high median crista; surface of body not covered by tubercles and short ribs ... 3
- 3. Surface of notogaster with polygonal reticulation or feeble mosaic or with foveolae which are flower-shaped ..... 4

— Surface of notogaster porose or covered with simple foveolae ..... 6

4. Surface of notogaster with polygonal reticulation; sensilli bulbous in proximal part ..... *N. armatus*

— Surface of notogaster with feeble mosaic or with foveolae which are flower-shaped; sensilli narrow, tapering, without head or with fusiform head rounded distally ..... 5

5. Surface of notogaster with feeble mosaic; sensilli narrow, tapering, without head; setae  $ad_2$  remote from other setae; femora I bifurcate distal end ..... *N. sacyae*

— Surface of notogaster with foveolae which are flower-shaped; sensilli with fusiform head rounded distally; setae  $ad_1$  and  $ad_2$  situated close to each other; setae *d* of femora I not bifurcate distal end ..... *N. uluguruensis*

6. Sensilli short, with rounded head; setae *in* and *le* longer, bacilliform, spinose ..... *N. lineatus*

— Sensilli without rounded head; setae *in* and *le* shorter, spiniform or needleform, rough ..... 7

7. Sensilli shorter, weakly dilated, pointed distally; sigillar fields not joined; arrangement of genital setae: 4: 5 ..... *N. subcillatus*

— Sensilli longer, slightly dilated in the middle and again narrow with small dilated head, obtuse distally; sigillar fields joined; arrangement of genital setae: 5: 4 ..... *N. quasiuluguruensis*

**Key for determination of species in subgenus**

*Atropacarus (Hoplophorella)*

1. Notogaster with developed anterior collar ..... 2

— Notogaster without anterior collar ..... 3

2. Sensilli short, with short pedicel and club-shaped, smooth head; formula of genital setae: 6: 3; anoadanal plates with minute, needleform setae, shorter

- than distances between them . . . . . (A.) (*H.*) *stenos*  
 — Sensilli fairly long, with longer pedicel and narrowly fusiform head finely barbed; formula of genital setae: 4 5; setae of anoadanal plates with longer setae, longer than distances between them (except *ad*<sub>3</sub>) . . . . . (A.) (*H.*) *onkos*
3. Notogastral setae phylliform . . . . . (A.) (*H.*) *vitrinus*  
 — Notogastral setae other shapes . . . . . 4
4. Notogaster with anterior hood; majority of setae inserted on tubercles . . . . . (A.) (*H.*) *tuberculosissimus*  
 — Notogaster without anterior hood and tubercles . . . . . 5
5. Sensilli fusiform, with short pedicel and oval, smooth head; setae *ad*<sub>2</sub> near paraxial margin, very close *ad*<sub>1</sub> setae . . . . . (A.) (*H.*) *brevipilis*  
 — Sensilli long, without head, rod-like covered with cilia in distal half or whip-shaped, rough in proximal part; setae *ad*<sub>2</sub> remote from paraxial margin . . . . . (A.) (*H.*) *curtisetosus*

**List of localities from the Uluguru and Nguru Mts**

The new material of ptyctimous mites, collected in 2010 by V. Grebennikov, described in this monograph comprises the samples deposited at the Institute of Soil Biology, České Budějovice, (with the original numbers of samples preserved) provided by Dr J. Starý. The presence of over half of the species hitherto known from Tanzania has been confirmed in this material.

TAN-022, Tanzania, the Southern Uluguru Mts, east slope, 07°07'25"S, 37°37'60"E, 2220 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 08, 7.XI.2010, leg. V. Grebennikov *Indotritia* (*Afrotritia*) *nuda* (8), *Indotritia* (*Indotritia*) *tropica* (4), *Microtritia parahauseri* (2), *Arphthi-carus marginatus* (ca 60), *Phthi-racarus anonymus* (1), *Plonaphacarus ec-phyllus* (2), *Notophthi-racarus quasiuluguruensis* (2), *No-tophthi-racarus tuberculus* (8), *Notophthi-racarus ulugu-ruensis* (1)

TAN-002, Tanzania, east slope of the Southern Uluguru Mts, 07°07'20"S, 37°38'37"E, 2058 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 18, 18.XI.2010, leg. V. Grebennikov *Indotritia* (*Afrotritia*) *nuda* (13), *Indotritia* (*Indotritia*) *tropica* (ca 60), *Euphthi-racarus* (*Pocsia*) *uluguruensis* (2), *Arphthi-carus marginatus* (30), *Notophthi-racarus quasiuluguru-ensis* (1), *Notophthi-racarus tuberculus* (8), *Atropacarus* (*Hoplophorella*) *curtisetosus* (1)

TAN-003, Tanzania, east slope of the Southern Uluguru Mts, 07°07'20"S, 37°38'37"E, 2038 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 17, 18.XI.2010, leg. V. Grebennikov *Indotri-tia* (*Indotritia*) *krakatauensis* (1), *Indotritia* (*Indotritia*) *tropica* (ca 40), *Arphthi-carus sculptilis* (9), *Atropacarus* (*Hoplophorella*) *onkos* **sp. nov.** (1)

TAN-018, Tanzania, the Uluguru Mts, Bunduki village, 07°03'23"S, 37°37'24"E, 2051 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 23, 23.XI.2010, leg. V. Grebennikov *Oribotri-tia africana* (90), *Arphthi-carus marginatus* (19), *Notoph-thi-racarus quasiuluguruensis* (1), *Notophthi-racarus tu-berculus* (10), *Notophthi-racarus uluguruensis* (8)

TAN-017, Tanzania, the Uluguru Mts, Bunduki village, 07°00'15"S, 37°37'50"E, 1848 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 24, 24.XI.2010, leg. V. Grebennikov *Indotritia* (*Afrotri-tia*) *nuda* (ca 200), *Indotritia* (*Indotritia*) *tropica* (ca 60), *Euphthi-racarus* (*Pocsia*) *parakunsti* (3), *Acrotritia rus-tica* (8), *Acrotritia vestita* (1), *Microtritia parahauseri* (1), *Phthi-racarus anonymus* (1), *Arphthi-carus margina-tus* (ca 50), *Notophthi-racarus tuberculus* (ca 40), *No-tophthi-racarus uluguruensis* (1)

TAN-019, Tanzania, the Uluguru Mts, Bunduki village, 07°03'59"S, 37°38'17"E, 1818 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 25, 25.XI.2010, leg. V. Grebennikov *Oribotri-tia africana* (38), *Euphthi-racarus* (*Pocsia*) *paraafricanus* (1), *Acrotritia rustica* (1), *Phthi-racarus anonymus* (1), *Arphthi-carus marginatus* (10)

TAN-015, Tanzania, the Uluguru Mts, Bunduki village, 07°01'17"S, 37°39'10"E, 1602 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 20, 22.XI.2010, leg. V. Grebennikov *Indotritia* (*Afrotritia*) *nuda* (2), *Indotritia* (*Indotritia*) *tropica* (13), *Microtritia parahauseri* (6), *Arphthi-carus marginatus*

(4), *Notophthiracarus quasiuluguruensis* (1), *Notophthiracarus tuberculus* (1)

TAN-016, Tanzania, the Uluguru Mts, Bunduki village, 07°01'17"S, 37°39'10"E, 1592 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 21, 26.XI.2010, leg. V. Grebennikov *Indotritia (Afrotritia) nuda* (27), *Indotritia (Indotritia) paraconsimilis* (17), *Indotritia (Indotritia) tropica* (12), *Euphthiracarus (Pocsia) africanus* (2), *Euphthiracarus (Pocsia) paraafricanus* (1), *Euphthiracarus (Pocsia) trentus* (4), *Euphthiracarus (Pocsia) uluguruensis* (1), *Plonaphacarus paramachadoi* (1), *Arphthricarus sculptilis* (1), *Notophthiracarus uluguruensis* (1), *Atropacarus (Hoplophorella) stenosis* (1), *Atropacarus (Hoplophorella) tuberculosissimus* (1)

TAN-014, Tanzania, the Uluguru Mts, Bunduki village, 07°01'06"S, 37°39'45"E, 1569 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 27, 26.XI.2010, eg. V. Grebennikov *Mesoplophora pulchra* (1), *Indotritia (Indotritia) krakatauensis* (1), *Indotritia (Afrotritia) nuda* (3), *Indotritia (Indotritia) paraconsimilis* (4), *Euphthiracarus (Pocsia) parakunsti* (1) *Acrotritia rustica* (1), *Plonaphacarus brevisetus* (ca 300), *Hoplophthiracarus ambiguus* (13), *Arphthricarus marginatus* (1), *Notophthiracarus armatus* (1), *Atropacarus (Hoplophorella) tuberculosissimus* (1)

TAN-027, Tanzania, the Uluguru Mts, Tchanzema village, 07°05'38"S, 37°37'09"E, 2654 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 11, 10.XI.2010, leg. V. Grebennikov *Indotritia (Afrotritia) nuda* (7), *Indotritia (Indotritia) tropica* (17), *Arphthricarus marginatus* (36), *Notophthiracarus quasiuluguruensis* (2), *Notophthiracarus tuberculus* (1), *Notophthiracarus uluguruensis* (1)

TAN-028, Tanzania, the Uluguru Mts, Tchanzema village, 07°06'50"S, 37°36'18"E, 2318 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 12, 11.XI.2010. leg. V. Grebennikov *Oribotritia africana* (9), *Indotritia (Indotritia) tropica* (10), *Arphthricarus marginatus* (9), *Notophthiracarus tuberculus* (1)

TAN-023, Tanzania, the Uluguru Mts, Tchanzema village, 07°06'44"S, 37°36'16"E, 2258 m a.s.l., mid-altitude Afromontane deciduous forest, litter sifting 14, 13.XI.2010, leg. V. Grebennikov *Indotritia (Afrotritia) nuda* (35), *Indotritia (Indotritia) tropica* (ca 50), *Euphthiracarus (Pocsia) uluguruensis* (2), *Microtritia parahauseri* (2), *Arphthricarus marginatus* (ca 80), *Notophthiracarus quasiuluguruensis* (2), *Notophthiracarus tuberculus* (9), *Notophthiracarus uluguruensis* (1)

TAN-009, Tanzania, the Nguru Mts, Turiani, 06°04'29"S, 37°32'19"E, 1277 m a.s.l., deciduous forest on a steep slope, litter sifting 06, 4.XI.2010, leg. V. Grebennikov *Mesoplophora (Mesoplophora) invisitata* (15), *Oribotritia africana* (23), *Indotritia (Afrotritia) nuda* (9), *Euphthiracarus (Pocsia) secundus* (6), *Acrotritia rustica* (36), *Microtritia diaphoros* (12), *Phthiracarus anonymus* (1), *Plonaphacarus brevisetus* (4), *Plonaphacarus ephylus* (4), *Plonaphacarus paramachadoi* (48), *Arphthricarus marginatus* (2), *Protophthiracarus turianiensis* (4)

TAN-007, Tanzania, the Nguru Mts, Turiani, 06°06'24"S, 37°31'48"E, 1236 m a.s.l., deciduous forest on a steep slope, litter sifting 05, 3.XI.2010, leg. V. Grebennikov *Indotritia tropica* (ca 100), *Euphthiracarus (Pocsia) parakunsti* (3), *Acrotritia rustica* (ca 100), *Phthiracarus anonymus* (25), *Plonaphacarus brevisetus* (ca 100), *Plonaphacarus ephylus* (25), *Atropacarus (Hoplophorella) stenosis* (19)

TAN-006, Tanzania, the Nguru Mts, Turiani, 06°06'24"S, 37°31'48"E, 1236 m a.s.l., deciduous forest on a steep slope, litter sifting 07, 5.XI.2010, leg. V. Grebennikov *Indotritia (Indotritia) tropica* (16), *Euphthiracarus (Pocsia) parakunsti* (1), *Acrotritia rustica* (ca 30), *Acrotritia vestita* (1), *Phthiracarus anonymus* (10), *Plonaphacarus brevisetus* (15), *Plonaphacarus ephylus* (10), *Arphthricarus marginatus* (ca 40), *Atropacarus (Hoplophorella) stenosis* (13)

TAN-012, Tanzania, the Nguru Mts, Turiani, 06°02'33"S, 37°32'20"E, 1059 m a.s.l., deciduous forest on a steep slope, litter sifting 04, 1.XI.2010, leg. V. Grebennikov *Mesoplophora (Mesoplophora) invisitata* (2), *Indotritia (Indotritia) paraconsimilis* (10), *Euphthiracarus (Pocsia) paraafricanus* (3), *Euphthiracarus (Pocsia) uluguruensis* (1), *Acrotritia rustica* (5), *Microtritia tropica* (1), *Phthiracarus anonymus* (1), *Plonaphacarus brevisetus* (74), *Atropacarus (Hoplophorella) tuberculosissimus* (5)

TAN-008, Tanzania, the Nguru Mts, Turiani, 06°06'24"S, 37°33'26"E, 677 m a.s.l., deciduous forest on a steep slope, litter sifting 02, 30.X. 2010, leg. V. Grebennikov *Indotritia (Indotritia) tropica*

(ca 100), *Euphthiracarus (Pocsia) paraafricanus* (1), *Euphthiracarus (Pocsia) parakunsti* (14), *Euphthiracarus (Pocsia) uluguruensis* (4), *Acrotrititia ardua* (1), *Acrotrititia rustica* (20), *Acrotrititia spiculifera* (3), *Microtrititia tropica* (1), *Arphthiracarus marginatus* (10), *Protophthiracarus turianiensis* (5), *Atropacarus (Hoplophorella) tuberculosissimus* (25), *Atropacarus (Hoplophorella) vitrinus* (7)

## RESULTS

Majority of collected samples with ptyctimous mites comes from Tanga, Dodoma Regions, Kilimanjaro Mts. and newly analysed material from Nguru and Uluguru Mts. The number of ptyctimous mite species found hitherto in the territory of Tanzania is 61. The diagnoses of the species have been presented in the review of species; 37 species have been redescribed on the basis of types, while 15 are redescribed in in this monograph. One new species *Atropacarus (Hoplophorella) onkos* n. sp. is described, eight species are new to Tanzania and one is new to Afrotropical Region. A keys for identification of the species and higher taxa are presented.

The fauna of ptyctimous mites of Tanzania reveals some specificity and uniqueness but on the other hand is shows some similarity to the fauna of nearby Madagascar and Afrotropical Region, and even to the faunas of distanced zoogeographic regions of south hemisphere. First of all the fauna of TAN comprises a similar number of subgenera and genera – 19, while in MAG – 18, although in MAG the number of species found was much higher than in TAN, 111 and 61 species, respectively.

The most abundant genera are *Pocsia*, *Plonaphacarus* and *Notophthiracarus* (tab. 1).

*Pocsia* is represented by the highest number of species found in Afrotropical Region, particularly in Tanzania in area with favourable conditions which permitted speciation, and it is highly probable that Tanzania is the center of origin of species of this subgenus, because seven endemic species have been described from this hotspot. Three other species occur also in eastern Africa (Kenya, Uganda) and in central Africa (Dem. Rp. Congo). Five species are known from Neotropical Region (Cuba,

Guatemala, Brazil) and one species from Oriental Region (Malaysia) (Niedbala 2000, 2004).

*Plonaphacarus* is relatively abundant in Oriental Region (Niedbala 2000), while in the neighbouring hotspot of MAG it is not so specious (Niedbala 2017).

*Notophthiracarus* is relatively abundant in southern hemisphere, especially in the eastern part, in the entire Afrotropical Region, Australian and South Africa Regions. It is also abundant in the fauna of MAG.

In TAN the percentage ratio of Mesoplophora: Euphthiracaroidea: Phthiracaroidea is 5: 38: 57. In comparison to MAG Euphthiracaroidea have a bit greater contribution than Phthiracaroidea. From among Euphthiracaroidea the percentage ratio of Oribotritiidae: Euphthiracaridae in the fauna of TAN is 30: 70, so a strong disproportion between the contributions of the species from these two families is seen. It is in contrast not only to the fauna of MAG but it has not been noted in any of the zoogeographical regions of the world; in general, the proportions of species representing these two families are similar.

From among Phthiracaroidea only one species in TAN belongs to Phthiracaridae, while over 97 % to Steganacaridae, which is a great disproportion that has not been reported from any other zoogeographic region.

It should be clearly noted that in TAN the abundance of the primitive species in both superfamilies Euphthiracaroidea and Phthiracaroidea is low. The fauna of the MAG hotspot is more conservative than that of TAN, the fauna of MAG includes more species from primitive species Oribotritiidae and Phthiracaridae.

The high number of species associated with TAN – 51 (81 %) is comparable to the number of species associated with MAG and other regions, however, the number of endemic species is much lower and the proportions of endemic species 29 (47 %) and indigenous species 21 (34%) are close, in contrast to the fauna of MAG, entire Afrotropical Region and in other regions in which the number of endemites is higher. The richness of widespread

TABLE 1: Number of species of ptyctimous mites of Tanzania in systematic order.

Taxa	N of species	%
<i>Mesoplophora</i> Berlese, 1904		
Subgenus <i>Mesoplophora</i> Berlese, 1904	2	-
Subgenus <i>Parplophora</i> Niedbała, 1986	1	-
<b>Sum</b>	<b>3</b>	<b>-</b>
<i>Oribotritia</i> Jacot, 1924	1	4.3
<i>Mesotritia</i> Forsslund, 1963	1	4.3
<i>Indotritia</i> Jacot, 1929		
Subgenus <i>Indotritia</i> Jacot, 1929	3	13.0
Subgenus <i>Afrotritia</i> Mahunka, 1988	2	8.7
<i>Euphthiracarus</i> Ewing, 1917		-
Subgenus <i>Pocsia</i> Mahunka, 1983	8	34.8
<i>Acrotritia</i> Jacot, 1923	5	21.7
<i>Microtritia</i> Märkel, 1964	3	13.0
<b>Sum</b>	<b>23</b>	<b>100</b>
<i>Phthiracarus</i> Perty, 1839	1	2.9
<i>Plonaphacarus</i> Niedbała, 1986	8	22.8
<i>Hoplophthiracarus</i> Jacot, 1933	1	2.9
<i>Steganacarus</i> Ewing, 1917		-
Subgenus <i>Rhacaplacarus</i> Niedbała, 1986	2	5.7
Subgenus <i>Steganacarus</i> Ewing, 1917	3	8.6
<i>Austrophthiracarus</i> Balogh et Mahunka, 1978	1	2.9
<i>Arphthi-carus</i> Niedbała, 1994	2	5.7
<i>Protophthiracarus</i> Balogh, 1972	3	8.6
<i>Notophthiracarus</i> Ramsay, 1966	8	22.8
<i>Atropacarus</i> Ewing, 1917		-
Subgenus <i>Hoplophorella</i> Berlese, 1923	6	17.1
<b>Sum</b>	<b>35</b>	<b>100</b>
<b>Total</b>	<b>61</b>	<b>-</b>



species: semicosmopolitan (3 and 5%) and pantropical (6 and 10%) is comparable to that in the other regions. A relatively high number of indigenous species with respect to that of endemic species is comparable to the analogous proportions in the faunas of Neotropical and Australasian Regions. The high percent of common species of the fauna of TAN with that of Afrotropical Region is noted, 18 species (29 %) are of afrotropical origin, of which only 7 (11 %) has eastern afrotropical distribution. The percent of common species of the faunas of TAN and MAG is faint. Three species: *P. tanzicus*, *A. sculptilis* and *P. mayottei* found in TAN also occur in east African islands. The TAN fauna differs from the fauna of Oriental Region by the non widespread species, only 8 widespread species, semicosmopolitan and pantropical, are common.

The new material collected in 2010 by V. Grebennikov, presented in this monograph, comes from 17 samples from Uluguru (12 samples) and Nguru Mts (5 samples). These samples contained over half of the species known from Tanzania (37) (tab. 2). The faunas of the two mountain ranges show some specific features, related to narrow areas of occurrence, 13 species were present only in Uluguru and 8 species were collected only in Nguru. Two endemic species *M. diaphoros*, *P. turianiensis*, occur in Nguru, while 7 species are endemic to Uluguru: *E. (P.) africanus*, *M. parahauseri*, *N. quasiuluguruensis*, *N. tuberculus*, *N. uluguruensis*, *A. (H.) curtisetosus*, *A. (H.) onkos*.

## DISCUSSION AND SYNTHESIS

So far in Tanzania (TAN) 61 ptyctimous mites species have been found whose diagnoses are presented. On the basis of the types 15 species are re-described in this monograph, while 22 have been re-described in earlier works. One new species *Atropacarus (Hoplophorella) onkos* n. sp. is described, eight species are new to TAN, including one new to Afrotropical Region. The keys for identification of species and higher taxa are presented.

The fauna of ptyctimous mites of TAN on the one hand shows some specificity and difference from the faunas of neighbouring regions, but on the

other hand it is similar to that of MAG and that of Afrotropical Region. Although the ptyctimous fauna of MAG is represented by more species (111) than that of TAN (61 species), the number of genera and subgenera are similar TAN (19) and MAG (18).

The most speciose are: subgenus *Pocsia*, and genera *Plonaphacarus* and *Notophthiracarus*. *Pocsia* is represented by 10 Afrotropical species and 7 were found endemic in TAN. *Plonaphacarus* is also relatively rich in species in Oriental Region (20 % species of Phthiracaroida), while in the neighbouring hotspot of MAG the number of its species is much smaller (5 % of Phthiracaroida). *Notophthiracarus* is relatively numerous in the fauna of MAG (41 % species of Phthiracaroida) and other regions of southern hemisphere, especially in Australian in which it reaches 42 %.

The ratio (expressed as percent) of the species representing *Mesoplophora*: Euphthiracaroida: Phthiracaroida in TAN is 5: 38: 57 and in MAG is 5: 28: 67 thus in TAN the relative number of Euphthiracaroida species is greater (38: 28 %) while that of Phthiracaroida is smaller (57: 67 %). Within Euphthiracaroida in the fauna of TAN there is a strong disproportion between the contribution of the species from Oribotriidae (30 %) and Euphthiracaridae (70 %), in contrast to the fauna of MAG and other zoogeographic regions of the world (Niedbala 1998, 2000, 2001, 2004, 2006a, 2011) in which the proportions of the contributions of species from these two families are close.

Over 97 % of Phthiracaroida species belong to Steganacaridae and a single to Phthiracaridae contrarily to the other zoogeographic regions. Thus a characteristic feature of TAN is the low number of primitive species representing both superfamilies of Euphthiracaroida and Phthiracaroida.

The high number of species associated with TAN – 51 (81 %), endemic and indigenous, is comparable to that high number of endemic and indigenous species in MAG and other zoogeographic regions. However, the number of endemic species is much smaller and the proportions of endemic (47 %) and indigenous species (34%) are close, in contrast to MAG and entire Afrotropical Region and other re-

TABLE 2: Presence of species of ptyctimous mites in Uluguru and Nguru Mts.

Taxa	Uluguru			Nguru
	Bunduki	Tchanzema	east slope	Turiani
Number of samples	(6)	(3)	(3)	(5)
<i>Mesoplophora (M.) invisitata</i>				x
<i>Mesoplophora (P.) pulchra</i>	x			
<i>Oribotritia africana</i>	x	x		x
<i>Indotritia (A.) nuda</i>	x	x	x	x
<i>Indotritia (I.) krakatauensis</i>	x		x	
<i>Indotritia (I.) paraconsimilis</i>	x			x
<i>Indotritia (I.) tropica</i>	x	x	x	x
<i>Euphthiracarus (P.) africanus</i>	x			
<i>Euphthiracarus (P.) paraafricanus</i>	x			x
<i>Euphthiracarus (P.) parakunsti</i>	x			x
<i>Euphthiracarus (P.) secundus</i>				x
<i>Euphthiracarus (P.) trentus</i>	x			
<i>Euphthiracarus (P.) uluguruensis</i>	x	x	x	x
<i>Acrotritia ardua</i>				x
<i>Acrotritia rustica</i>	x			x
<i>Acrotritia spiculifera</i>				x
<i>Acrotritia vestita</i>	x			x
<i>Microtritia diaphoros</i>				x
<i>Microtritia parahauseri</i>	x	x	x	
<i>Microtritia tropica</i>				x
<i>Phthiracarus anonymus</i>	x		x	x
<i>Plonaphacarus brevisetus</i>	x			x
<i>Plonaphacarus ephylus</i>			x	x
<i>Plonaphacarus paramachadoi</i>	x			x
<i>Hoplophthiracarus ambiguus</i>	x			
<i>Arphthiracarus marginatus</i>	x	x	x	x
<i>Arphthiracarus sculptilis</i>	x		x	
<i>Protophthiracarus turianiensis</i>				x
<i>Notophthiracarus armatus</i>	x			
<i>Notophthiracarus quasiuluguruensis</i>	x	x	x	
<i>Notophthiracarus tuberculus</i>	x	x	x	
<i>Notophthiracarus uluguruensis</i>	x	x	x	
<i>Atropacarus (H.) curtisetosus</i>			x	
<i>Atropacarus (H.) onkos n. sp.</i>			x	
<i>Atropacarus (H.) stenosis</i>	x			x
<i>Atropacarus (H.) tuberculosissimus</i>	x			x
<i>Atropacarus (H.) vitrinus</i>				x
Number of species	26	9	14	24

gions in which the number of endemic species is always much higher than indigenous.

The similarity between the faunas of TAN and Afrotropical Region is rather high, 29 % species originate from Afrotropical Region and 11 % of them has eastern afrotropical distribution. The similarity between the faunas of TAN and MAG is very small. Only 3 species found in TAN are also met in eastern African islands (Reunion Mauritius, Seychelles and Comores), no similarity with the fauna of Oriental Region has been noted.

The new material collected in 2010, analysed in this monograph comes from 17 samples collected in the Uluguru and Nguru Mts. The samples contained over half (37) of the known species of Tanzania. The ptyctimous fauna from the two mountain ranges is characterised by some specificity related to narrow areas of occurrence, the fauna of Nguru with presence of 2 endemic species: *M. diaphoros*, *P. turianiensis*, while that of Uluguru 7 ones: *E. (P.) africanus*, *M. parahauseri*, *N. quasiuluguruensis*, *N. tuberculosis*, *N. uluguruensis*, *A. (H.) curtisetosus*, *A. (H.) onkos*. Moreover, 13 species found in the samples from Uluguru were not found so far in the samples from Nguru and 8 species from Nguru were absent so far in the samples from Uluguru.

It should be remembered that the area studied is localized in the Eastern Arc hotspot known of a high diversity of species and assumed as the center of speciation of plants and animal species (Newmarc 1991). Many invertebrates endemites are also known from Tanzania (f.ex. Lahaise and Chassagnard 2001, Reed and Cumberlidge 2006). In view of the above and having in mind the fact of data scarcity, it is highly probable that the formal classification of endemites and indigenous species of ptyctimous mites will be confirmed in future.

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