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NEW DATA ON THE GENUS *ANISOPYGIA* SAUSSURE (DICTYOPTERA, BLATTELLIDAE), WITH DESCRIPTION OF TWO NEW SPECIES

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ABSTRACT

Two new species of the genus *Anisopygia* Saussure, 1893 (*A. latisecta* sp. n. and *A. profundisecta* sp. n.) from Mexico are described. The interrelationships of the genera *Anisopygia* and *Ischnoptera* Burmeister, 1838 are discussed.

Key words: *Anisopygia*, Blattellidae, Blattodea, cockroaches, Dictyoptera, Mexico, Neotropical region

РЕЗЮМЕ

Описываются два новых вида рода *Anisopygia* Saussure, 1893 (*A. latisecta* sp. n. и *A. profundisecta* sp. n.) из Мексики. Обсуждаются таксономические связи между родами *Anisopygia* и *Ischnoptera* Burmeister, 1838.

INTRODUCTION

Despite many efforts to document the Neotropical cockroaches fauna, many taxa still remain undescribed. This paper describes two new species of the family Blattellidae belonging to the genus *Anisopygia* Saussure, 1893. Thus, this genus currently contains two species and two new species from Mexico were found in the course of present study.

The small and insufficiently known genus *Anisopygia* is distributed in Central and South America from Mexico to French Guyana (Princis 1969). It was described as monotypical with the species *A. jocosicluna* Saussure, 1893 from Guatemala (Saussure 1893, Saussure and Zehntner 1893). A second species, *A. decora* Hebard, 1927 was described from French Guiana (Hebard 1927). The latter species was described from a series of females and larva (Hebard 1927), the males being unknown until this paper. A third species, *A. snodgrassii* (McNeil, 1901)

described from Galapagos Islands, was transferred from *Temnopteryx* Brunner von Wattenwyl, 1865 by Hebard (Princis 1969). Later, it was excluded from *Anisopygia* and transferred to the genus *Ischnoptera* Burmeister, 1838 (Peck and Roth 1992).

MATERIAL AND METHODS

All the material studied was collected and preserved in 70% ethanol. In order to study the structures of the male genital complex (anal plate, hypandrium and the male genitalia) the apex of the abdomen of specimens was removed and treated with ~ 10% KOH. The structures of the genital complex were stored in microvials filled with 70% ethanol.

The terminology of the male genitalia follows Klass (1997).

All material studied (including type material) is deposited at the Zoological Institute, Russian Academy of Sciences (St.-Petersburg, Russia).

SYSTEMATICS

Family Blattellidae Karny, 1908

Genus *Anisopygia* Saussure, 1893

Anisopygia latisecta, sp. nov.

(Figs. 1A–F, 2A–E, 3A–E, 4A–D)

Type material. Holotype (male). Mexico, Chiapas, env. of city Tuxtla Gutierrez, near reserve El Ocote, 600–1000 m, tropical forest, 19–24.05.2006, A. Gorochoy, M. Berezin.

Paratypes (1 male, 2 females). Same data as holotype.

Description. Male (holotype). General colour dark reddish brown, antero-lateral margins of pronotum and costal margin of tegmina yellow (Fig. 1B, 4A); partly legs, distal part of anal plate and cerci more light, reddish; coxae, femora and metatarsi partly yellowish; ocellar spots, scapi and partly mouthparts (including lower part of clypeus, thin strip at base of labrum (Fig. 1A, 4B) and three proximal segments of maxillary palps yellow. Surfaces smooth; head with sparse punctation. Head more or less rounded in shape (Fig. 1A); with distance between eyes about 1.2 times shorter than length of eye; interval between antennal sockets about twice the length of scapus; ratio of 3 distal segments of maxillary palps length (from 3rd to 5th) approximately 1.4 : 1 : 1.6. Pronotum rounded along antero-lateral margins, caudal margin nearly straight (Fig. 1B). Armament of antero-ventral margin of front femur of “type B” (*sensu* Bey-Bienko 1950, Roth 2003), with 8 spines including 3 apical ones. Hind metatarsus slightly longer than other tarsal segments combined; 1st to 4th segments with double complete row of spines along ventral margin (row of 4th segment very short) and with additional single larger spine on each side of pulvillus; pulvilli small and apical. Tarsal claws simple and symmetrical; arolia small, about one half of claw length. Tegmina shortened, only reaching 2nd abdominal tergite (Fig. 1B, 4A); venation visible, but weakened; only R, some anterior rami of R and CuP well developed. Wings vestigial, completely hidden under tegmina. Abdomen with 7th and 8th tergites specialized (Fig. 1B–D): 7th tergite partially membranous, with pair of lateral round dark spots, and pair of rod-like processes (oblique or longitudinal rods – according to Roth 2001) directed backwards (Fig. 1C), rod-like processes with a few spines on inner side; 8th tergite with medial longitudinal elevation (Fig. 1D). Anal

plate (X, ultimate tergite) transverse (Fig. 2A), with caudal margin roundly incised; left lobe ventrad with regular row of dark spines, right lobe ventrad with irregular row of dark spines (Fig. 2C). Paraprocts strongly asymmetrical (Fig. 2C): left paraproct in shape of large and strongly sclerotized plate, right paraproct of more complicated shape, with slender spines and median impression. Cerci elongated, with 11 distinctly separated segments (Fig. 2A); accessory sclerite of left cercus with medially directed process; accessory sclerite of right cercus with large curved spine (Fig. 2C). Hypandrium asymmetrical, more or less rectangular in shape (Fig. 2D), with caudal margin weakly sclerotized, interstyler margin very slightly protruded; styles slightly asymmetrical, with minute spines at apex (Fig. 2E).

Male genitalia (Fig. 3A–E). Sclerite L2 single, not separated in apical and basal parts, rod-like (Fig. 3A), with apex obtuse and covered with spinules (Fig. 3B). Sclerite L3 comparatively short and robust, well sclerotized (Fig. 3A, C, D); with groove **hge** (subapical incision *sensu* Roth (1970) along anterior surface of hook **hla** (Fig. 3C). Right phallomere as in Fig. 3E.

Variations. Male (paratype). Yellow border of pronotum and tegmina slightly wider than that of holotype. Distance between eyes about 1.4 times shorter than length of eye; ratio of 3 distal segments of maxillary palps length (from 3rd to 5th) approximately 1.2 : 1 : 1.8. Caudal margin of anal plate in shape slightly differs from that of holotype (Fig. 2B). Accessory sclerite of right cercus slightly more robust and inner margin of left paraproct more rounded as compared with that of holotype.

Female (paratypes). Comparatively larger than male (Fig. 1F). Pattern of colouration similar to that of male, but general colour more dark, upper part of body nearly black (Fig. 4C, D); yellow parts more distinct. Head with distance between eyes about 1.1 times shorter than length of eye; interval between antennal sockets about 2.2 times the length of scapus; ratio of 3 distal segments of maxillary palpi length (from 3rd to 5th) approximately 1.2 : 1 : 1.4. Anal plate transverse, caudally rounded (Fig. 1F).

Measurements (mm). Length: head of male 2–2.1 (2), female 2.3–2.4; pronotum of male 2.2 (2.2), female 2.5–2.6; tegmen of male 2.6–2.9 (2.6), female 2.9–3.1. Width: head of male 1.8–1.9 (1.9), female 2.1; pronotum of male 3.4–3.5 (3.5), female 4.2. Measurements in parentheses are those of holotype.

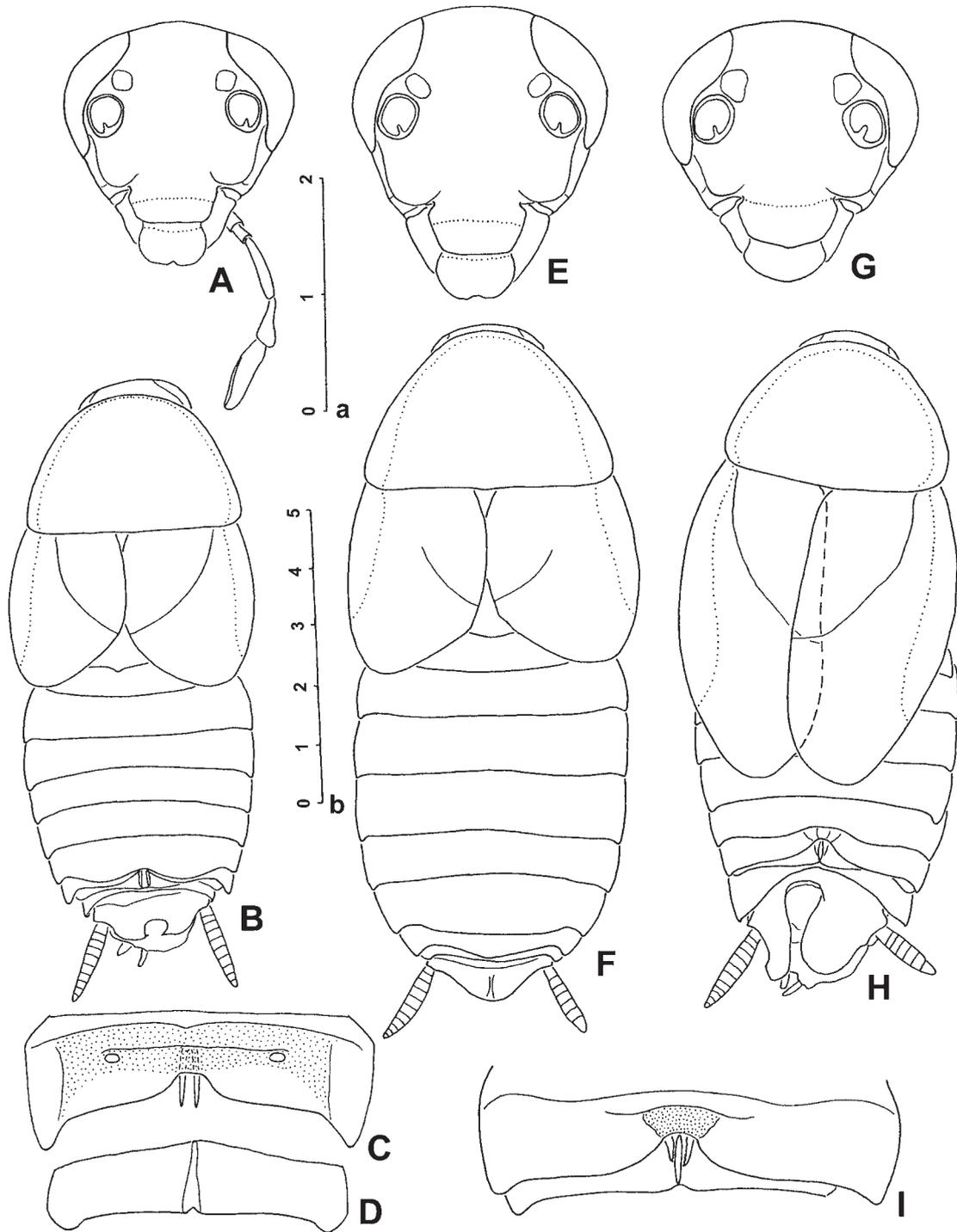


Fig. 1. *Anisopygia* sp., external morphology: A–F – *A. latisecta* sp. n. (A–D – holotype, male; E, F – paratype, female) ; G–I – *A. profundisecta* sp. n. (holotype, male). Head in frontal view (A, E, G); body outline from above (B, F, H); 7th abdominal tergite from above (C); 8th abdominal tergite from above (D); 7th and 8th abdominal tergites from above (I). Dotted line shows outlines of parts with light colouration (A, B, E–H), dotted area shows membranous parts (C, I). Scale bar (mm): **a** belong to Figs. A, C–E, G, I; scale bar **b** belong to Figs. B, F, H.

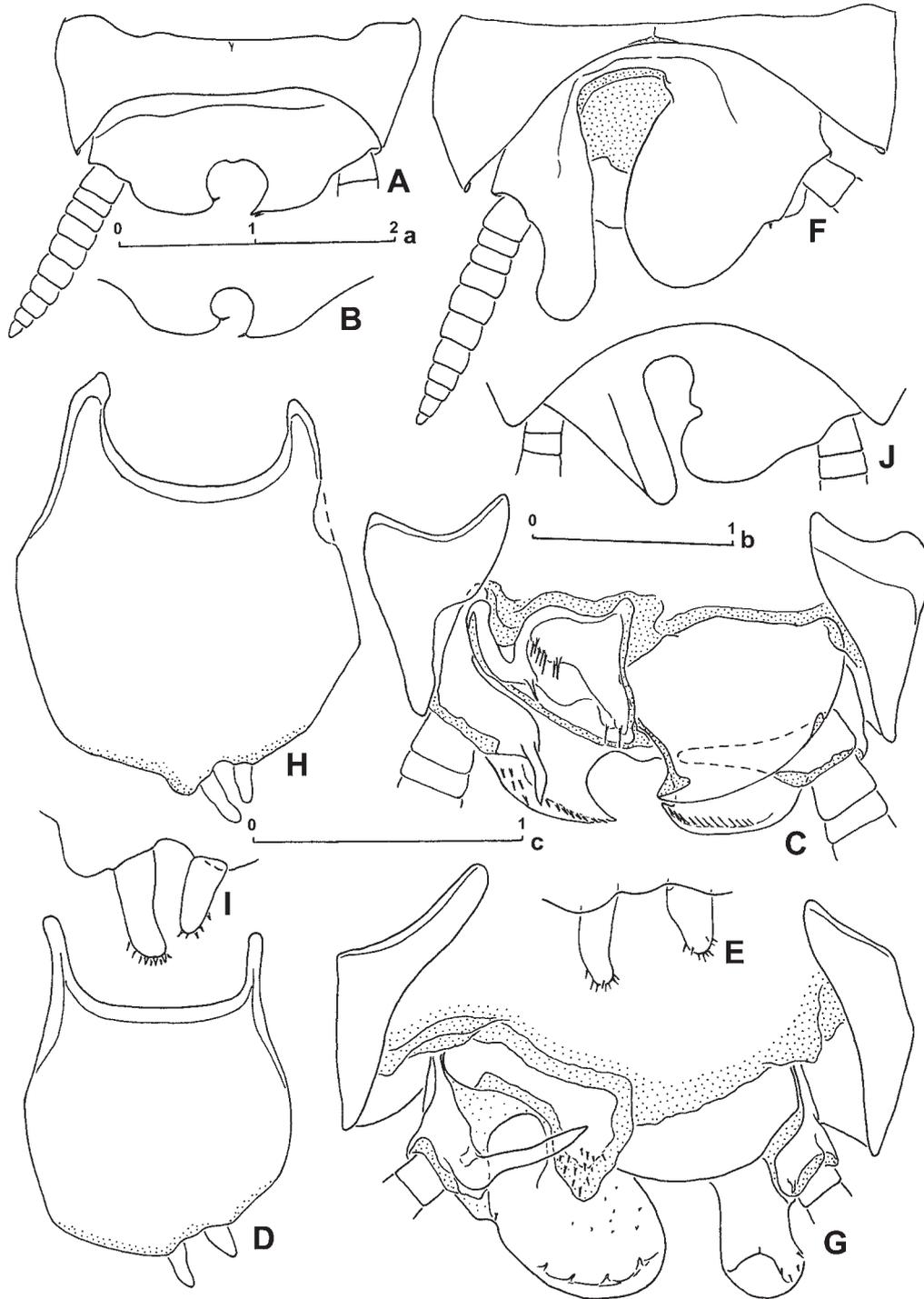


Fig. 2. *Anisopygia* sp., male abdominal apex structures: A–E – *A. latisecta* sp. n. (A, C–E – holotype; B – paratype); F–I – *A. profundisecta* sp. n. (holotype); J – *A. jocosicluna* Sauss. Abdominal apex from above (A, F, J); outline of anal plate (B); abdominal apex from below, hypandrium and genitalia removed (C, G); hypandrium from below (D, H); styles from below (E, I). Dotted area shows membranous parts. Scale bar (mm): a belong to Figs. A, B, D, F, H; scale bar b belong to Figs. C, G; scale bar c belong to Figs. E, I; Fig. J is out of scale. Fig. J from Saussure and Zehntner (1893).

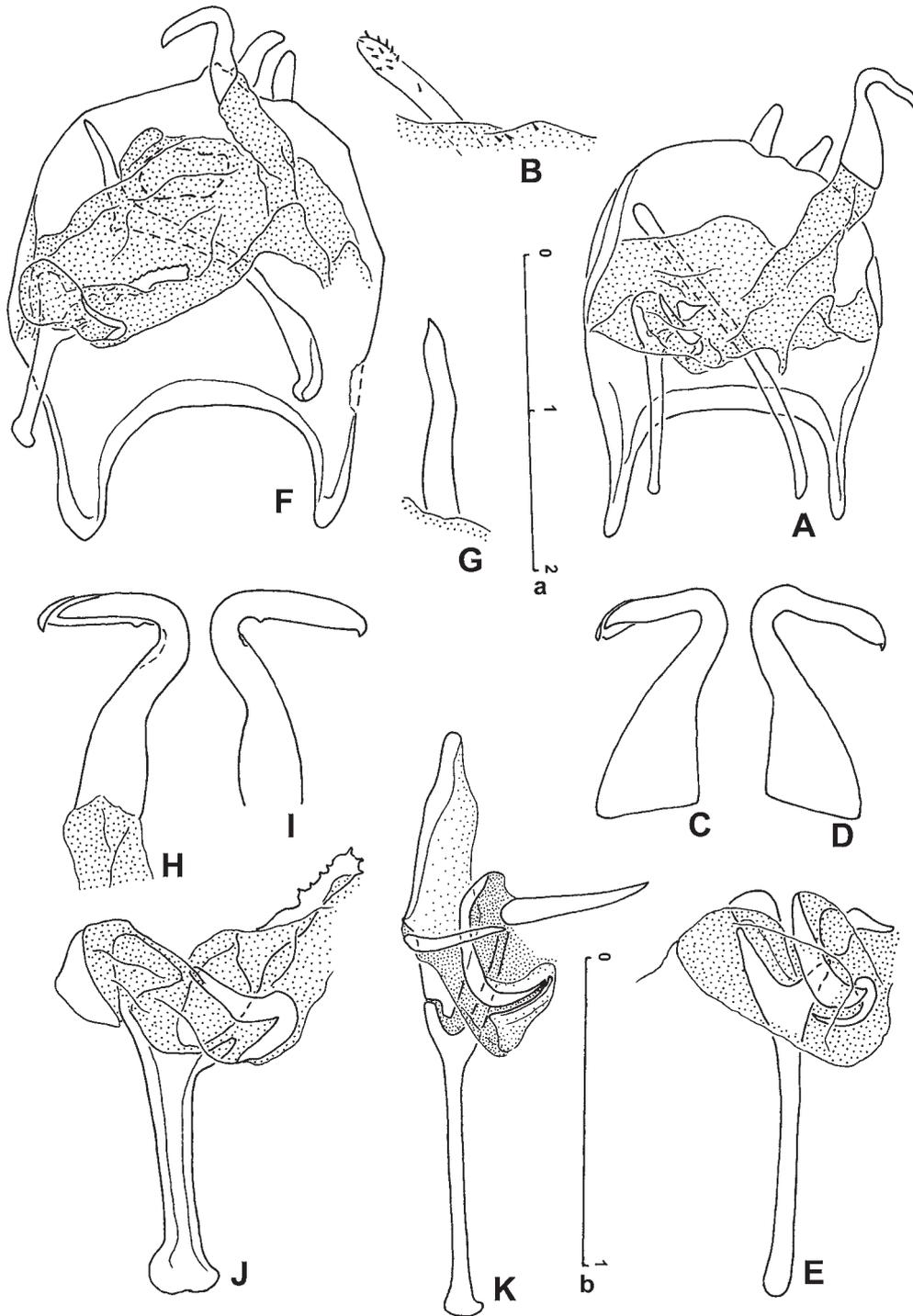


Fig. 3. Male genitalia: A–E – *Anisopygia latisecta* sp. n. (holotype); F–J – *A. profundisecta* sp. n. (holotype); K – *Blattella germanica* L. Hypandrium and genitalia from above (A, F); apex of sclerite L2 (B, G); sclerite L3 (C, D, H, I); right phallomere from above (E, J, K). Figs. A, F show *hla* sclerite in protracted state. Dotted area shows membranous parts (A, B, E–H, J, K). Scale bar (mm): **a** belong to Figs. A, F; scale bar **b** belong to Figs. B–E, G–J; Fig. K is out of scale.

Comparison. The new species is readily differs from *A. jocosicluna* and *A. profundisecta* sp. n. in the shape of anal plate (compare Figs. 2A, B and F, J), which is distinctly less incised. From *A. decora* the new species differs in the much more developed tegmina of female (Fig. 1F), which is reduced to wing-scales (lateral tegminal pads) in *A. decora*.

A. latisecta sp. n. could be classified as belonging to the subgroup A of *darlingtoni*-species group of the genus *Ischnoptera* (*sensu* Roth 2001). From single species of this subgroup – *I. linguiforma* Roth, 2001 the new species is readily differs in less incised anal plate and the shape of hypandrium.

***Anisopygia profundisecta*, sp. nov.**

(Figs. 1G–I, 2F–I, 3F–J, 4E, F)

Type material. Holotype (male). Mexico, Chiapas, 130 km WN of city Tapachula, vill. Ejido Las Golondrinas (reserve El Triunfo), 800–1000 m, 13–17.05.2006, A. Gorochoy, M. Berezin.

Description. Male (holotype). Similar to *A. latisecta* sp. n., differing from it in the following features. General colour more light, tegmina, thorax from below and legs yellowish (Fig. 4E, F). Head (Fig. 1G) with distance between eyes about 1.2 times shorter than length of eye; interval between antennal sockets about 1.9 times length of scapus; ratio of 3 distal segments of maxillary palps length (from 3rd to 5th) approximately 1.2 : 1 : 1.4. Caudal margin of pronotum slightly more protruded caudally (Fig. 1H). Antero-ventral margin of front femur with 7 spines including 3 apical ones. Hind legs absent in holotype. Tegmina developed more, reaching 4th abdominal tergite (Fig. 1H); venation clearly visible. Wings developed, with clearly visible venation; slightly shorter than tegmina. Abdomen with 7th and 8th tergites specialized (Fig. 1I): 7th tergite with comparatively small, membranous spot medially, dark spots absent; rod-like processes slightly shorter than those of *A. latisecta* sp. n. Anal plate (X, ultimate tergite) deeply divided into 2 lobes (Fig. 2F); left lobe ventrad with 6, right lobe with 4 small dark spines (Fig. 2G). Paraprocts strongly asymmetrical (Fig. 2G): left paraproct strongly sclerotized, plate-like; right paraproct partially membranous, with slender spines. Cerci of 11 (Fig. 2F) and 6 segments respectively (right, 6-segments cercus evidently abnormal); accessory sclerite of left cercus comparatively small, with single denticle; accessory sclerite of right cer-

cus with large curved spine (Fig. 2G). Hypandrium as in Fig. 2H, with interstyler margin not protruded and caudal margin medially projected (Fig. 2I).

Male genitalia (Fig. 3F–J). Sclerite L2 single, not separated in apical and basal parts, slightly curved, enlarged proximally, and with outgrowth distally (Fig. 3F); apex thorn-like, without spinules (Fig. 3G). Large plate-like sclerite of unclear homology situated near apex of L2 (Fig. 3F). Sclerite L3 slightly more slender than that of *A. latisecta* sp. n., with small teeth at inner side of **hla**-hook (Fig. 3H, I). Right phallomere as in Fig. 3J.

Female unknown.

Measurements (mm). Length: head 2.2; pronotum 2.6; tegmen 5.3. Width: head 2; pronotum 3.7.

Comparison. The new species is closely related to *A. chichicastenanga* (Roth, 2001), but differs from it in the interocular space slightly larger than distance between antennal sockets (about the same as the width between antennal sockets in *A. chichicastenanga*), the evenly rounded antero-lateral margin of pronotum (straight anterior margin of pronotum in *A. chichicastenanga*), the shorter tegmina (reaching to the end of the abdomen in *A. chichicastenanga*), and the number of spines on ventral side of anal plate (six and four spines on left and right lobes of anal plate of *A. profundisecta* sp. n., instead of two on the both lobes in *A. chichicastenanga*). *A. profundisecta* sp. n. is somewhat similar to *A. jocosicluna*, but readily differs from it in the shape of anal plate (compare Figs. 2F and J) and the structure of antennae (antennae are not incrassate in *A. profundisecta* sp. n., while in the original description of *A. jocosicluna* by Saussure (1893) they are described as “Antennae crassiusculae”). *A. profundisecta* sp. n. differs from *A. latisecta* sp. n. in the more developed tegmina (compare Fig. 1B, H), the shape of the 8th abdominal tergite (compare Figs. 1C and I), the shape of anal plate (compare Figs. 2A, B and F), and the male genitalia structures, for instance shape of L2 sclerites (compare Figs. 3A, B and F, G) and right phallomeres (compare Figs. 3E and J). From *A. decora* the new species differs in the not contrastingly coloured apex of abdomen.

DISCUSSION

It was noted as a diagnostic feature of the genus *Anisopygia* the peculiar structure of anal plate: “This remarkable genus may be known by the irregular anal segment, which has the dorsal plate

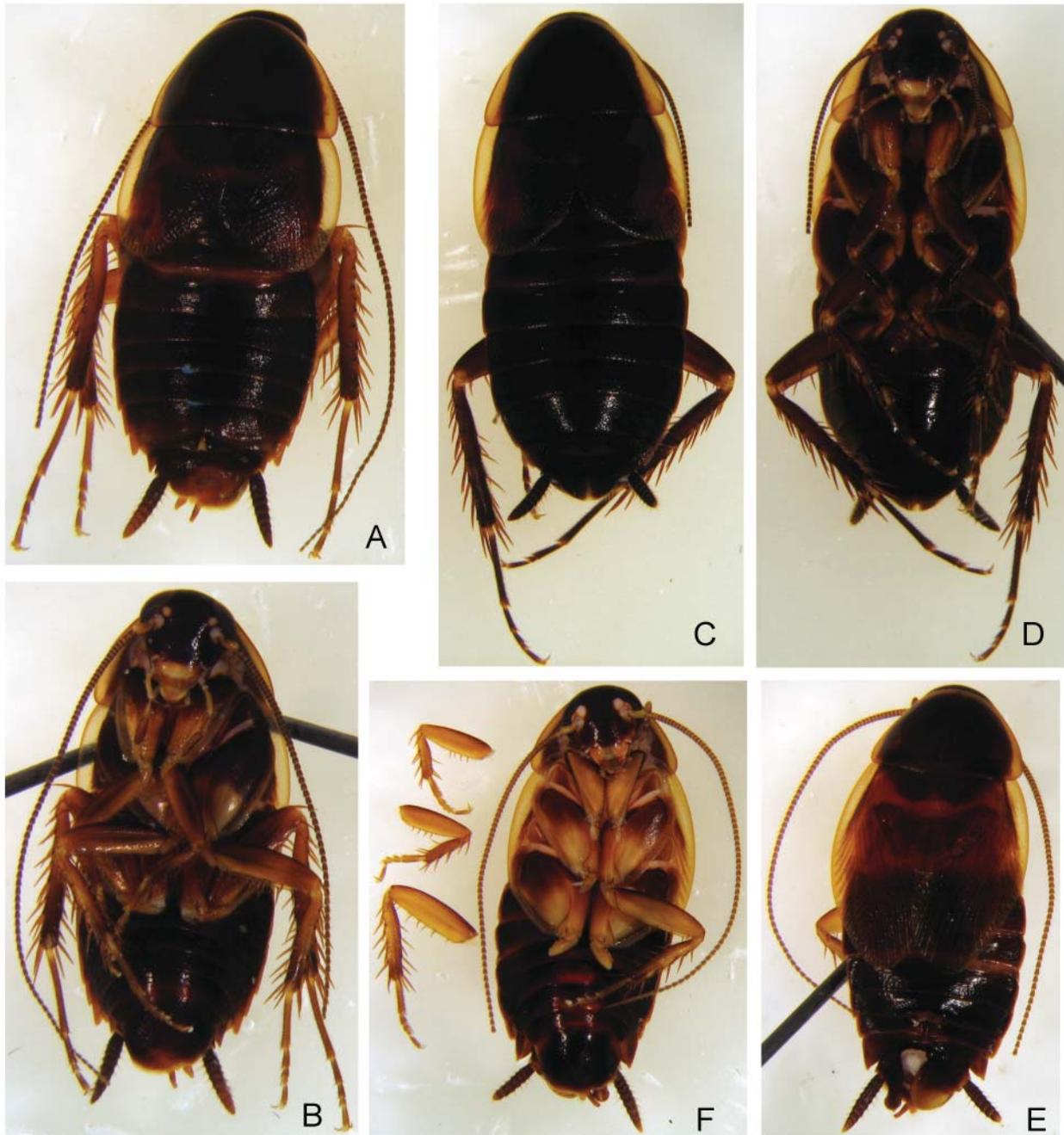


Fig. 4. *Anisopygia* sp., General view. A–D – *Anisopygia latisecta* sp. n. (A–B – holotype, male; C, D – paratype, female); E, F – *A. profundisecta* sp. n. (holotype). General view from above (A, C, E); general view from below (B, D, F). See text for measurements of the specimens.

[anal plate – L.A.] very deeply divided into two large irregular lobes.” (Saussure and Zehntner 1893, p. 49). Later Roth (2001) includes in the *darlingtoni*-species group of the genus *Ischnoptera* a number of species,

which are characterized with: “Supra-anal plate [anal plate – L.A.] strongly asymmetrical, deeply excised or excavated forming 2 dissimilar lobes or processes” (ibid., p. 521). Some of these species (*I. linguiforma*, *I.*

chichicastenanga, *I. zacualtipana* Roth, 2001) are evidently closely related to representatives of *Anisopygia*. Consequently, if we adopt the genus *Ischnoptera sensu* Roth (2001, 2002), then *Anisopygia* is a junior synonym of it.

However, the present author considers that the synonymy of *Anisopygia* with *Ischnoptera* premature. The genus *Ischnoptera* is a very large and diverse group, with many of the contained subgroups considerably different from anisopygia-like species. The type species of *Ischnoptera*, *I. morio* Burmeister, 1838, is insufficiently studied, but the anal plate is dissimilar to the anisopygia-like species (Hebard 1916).

If the monophyly of the group characterized with anisopygia-like type anal plate is proven and other synapomorphies found, that the generic status of *Anisopygia* will be confirmed. In this case, the *darlington*-species group of *Ischnoptera* must be transferred to *Anisopygia*.

To clarify this problem a phylogenetic analysis of the genera *Ischnoptera*, *Anisopygia* and other closely related genera must be conducted.

The taxonomic position of genera *Ischnoptera* and *Anisopygia* in the family Blattellidae are also unresolved. The characteristically displaced sclerites R2 and R1S ("cleft sclerite" – according to Roth 2003) are common feature for group united genera *Blattella* Caudell, 1903 (Fig. 3K), *Parcoblatta* Hebard, 1917 (Klass 1997), *Ischnoptera* (Roth 2001, 2002) and *Anisopygia* (Fig. 3E, J). If it is not a homoplasy, this feature could be to characterize a clade of blattellid cockroaches.

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