



**Taxonomic revision of the genus *Monastria* Saussure,
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Taxonomic revision of the genus *Monastria* Saussure, 1864 (Blattodea: Blaberidae, Blaberinae) from the South American Atlantic forest, with the descriptions of five new species

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Abstract

The genus *Monastria* Saussure, 1864 includes medium to large sized (40–55 mm) dark brown or black cockroaches found in the understory of the Neotropical Atlantic Forest from the Northeast of Brazil to Paraguay and Argentina. The genus shows evident sexual dimorphism: males are elongated with fully developed wings extending beyond the apex of cerci and females are oval and brachypterous. This study is a revision of the genus with redescription of the three already known species, *Monastria biguttata* (Thunberg, 1826), *Monastria similis* (Serville, 1838) and *Monastria angulata* Saussure, 1864, and description of five new ones, *Monastria itubera* **sp. n.** and *Monastria itabuna* **sp. n.** from state of Bahia, *Monastria cabocla* **sp. n.** from state of Sergipe, *Monastria kaingangue* **sp. n.** from state of São Paulo and *Monastria sagittata* **sp. n.** from state of Minas Gerais. The morphology of the genus and all species is described in details, including male genitalia. Based on this revision, we proposed a new combination for *Hiereoblatta papillosa* (Thunberg, 1826) **comb. n.**, excluding it from the genus *Monastria*. For the first time, the juvenile stages of *Monastria* are characterized and compared to other genera of Blaberinae of the Atlantic forest. Three determination keys are provided. The two first are aimed at identifying the adults and juvenile stages of the five genera of the Blaberinae radiation endemic to the Atlantic forest, respectively. The third concerns the identification of the species of the genus *Monastria*. A map indicating the localities where species were sampled is also provided.

Key Words: Neotropical Atlantic Forest, endemic cockroach, male genitalia, juvenile stages, distribution range, review.

Resumo

O gênero *Monastria* Saussure, 1864a inclui baratas de tamanho médio a grande (40 – 55 mm), marrom escura ou negra, encontradas no sub-bosque da floresta Atlântica neotropical do Nordeste do Brasil até o Paraguai e Argentina. O gênero apresenta evidente dimorfismo sexual: os machos são alongados

com asas longas completamente desenvolvidas se estendendo além do ápice dos cercos e as fêmeas são braquípteras e ovais. Este estudo é uma revisão do gênero com re-descrição das três espécies conhecidas, *Monastria biguttata* (Thunberg, 1826), *Monastria similis* (Serville, 1838) e *Monastria angulata* Saussure, 1864a e descrição de cinco novas espécies: *Monastria itubera* **sp. n.** e *Monastria itabuna* **sp. n.** do estado da Bahia, *Monastria cabocla* **sp. n.** do estado de Sergipe, *Monastria kaingangue* **sp. n.** do estado de São Paulo e *Monastria sagittata* **sp. n.** do estado de Minas Gerais. A morfologia do gênero e de todas as espécies é descrita em detalhes, inclusive a genitália do macho. Com base nesta revisão, nós propusemos uma nova combinação para *Hiereoblatta papillosa* (Thunberg, 1826) **comb. n.**, excluindo-a do gênero *Monastria*. Pela primeira vez o estágio juvenil deste gênero é caracterizado e comparado com os de outros gêneros de Blaberinae da Mata Atlântica. Três chaves de determinação são fornecidas. As duas primeiras são destinadas a identificar os adultos e juvenis dos cinco gêneros da radiação de Blaberinae endêmica da Mata Atlântica, respectivamente. A terceira concerne a identificação das espécies do gênero *Monastria*. Um mapa indicando as localidades onde as espécies foram coletadas também é fornecido.

Introduction

Cockroaches have evolved with diverse continental radiations. One of the most conspicuous corresponds to the subfamilies Zetoborinae (Grandcolas, 1993a; Grandcolas & Pellens, 2002; Brugerolle et al. 2003; Pellens et al. 2002; 2007a) and Blaberinae distributed in the Neotropical region (Grandcolas 1993b, c, 1998; Pellens & Grandcolas, 2007; Pellens *et al.* 2007b; Grandcolas & Pellens, 2012; Legendre *et al.*, 2015). Blaberinae, an early-recognized group (McKittrick, 1964; Roth, 1970a, 2003), has been the subject of several behavioral and ecological studies (Grandcolas, 1998). Despite this early recognition, some of its components have been poorly studied, such as the genera endemic from the Atlantic forest in Brazil, namely *Monastria* Saussure, 1864a, *Monachoda* Burmeister, 1838, *Petasodes* Saussure, 1864, *Hiereoblatta* Rehn, 1937, and *Minablatta* Rehn, 1940 (Grandcolas 1993b,c, 1998; Pellens *et al.* 2007b; Grandcolas & Pellens, 2012). The genus *Monastria* Saussure, 1864a is certainly the best known amongst them (Pellens & Grandcolas, 2003, 2007). Nevertheless, its taxonomy needs a complete revision.

The genus *Monastria* was erected by Saussure (1864a), two previously known species *Blatta biguttata* Thunberg, 1826 and *Blabera similis* Serville, 1838 were transferred to *Monastria* and described two new taxa *Monastria angulata* and *Monastria semialata*. Walker (1868) included the known species of *Monastria* in his catalogue. He also described a new species and new genus *Tarraga guttiventris* and a new species *Blabera nigripennis* of cockroaches that were subsequently brought back into *Monastria*. Kirby (1904) recognized that *Monastria semialata* (Saussure, 1864a) was a synonym of *Monastria cassidea* (Eschscholtz, 1822), *Blabera nigripennis* (Walker, 1868) was a synonym of *M. biguttata*, and *Monachoda granosa* Brunner von Wattenwyl, 1865 was a synonym of *Monastria papillosa*. He also

incorrectly synonymized *Tarraga gutiventris* with *Blaberus giganteus* (Linnaeus, 1758). Shelford (1907–1908) in his study on the species published by Thunberg incorrectly synonymized *Monastria semialata* (Saussure, 1864a), *Monachoda granosa* Brunner von Wattenwyl, 1865 and *Phoraspis cassidea* (Dalman, 1823) with *Monastria papillosa* (Thunberg, 1826). In the same study *Blabera monstrosa* Stål, 1855 was considered a synonym of *Monastria biguttata* (Thunberg, 1826). Kirby (1910) published a correction in which *Blatta papillosa* Thunberg, 1826 was synonymized with *Monastria cassidea* (Eschscholtz, 1822). Rehn (1937) described the genus *Hiereoblatta* and accepted *Monastria semialata* (Saussure, 1864a) as the only synonym of *Hiereoblatta cassidea* (Eschscholtz, 1822). Princis (1946) described *Monastria flavomarginata*, but in 1951 he stated that it was a synonym of *Monastria similis* (Serville, 1838). Princis (1949) maintained *Blatta papillosa* Thunberg, 1826 as a synonym of *Monastria papillosa* (Thunberg, 1826). In 1958, Princis synonymized *Tarraga gutiventris* Walker, 1868 with *M. biguttata* (Thunberg, 1826). In the catalogue published in 1963, Princis included four valid species to the genus: *Monastria angulata* Saussure, 1864a; *Monastria biguttata* (Thunberg, 1826); *Monastria papillosa* (Thunberg, 1826); *Monastria similis* (Serville, 1838). In the present study, we revised the genus *Monastria*.

Material and Methods

Specimens were measured with a digital caliper and stereoscopic microscope Leica MZ12 equipped with an eyepiece micrometer scale. Measurements of interocular and interantennal distance and genitalia were taken. After dissection of a re-hydrated specimen, its genitalia was treated in cold 10% KOH to remove remains of soft tissue and rinsed with water. Finally, it was kept in glass vial with glycerin and pinned under the specimen. Nomenclature of male genitalia sclerites follow Grandcolas (1996), modified from Grandcolas (1991, 1993c). Abbreviations: L1, L2d, R2, R3d, N, R3v, Lb (Lateral Branch), Cs (Crown of spines), Notch (Subapical incision) and Clf (Cleft).

Digital images of habitus, pronotum, head, supra-anal plate and juvenile stages were taken with a camera Cannon 6D. Genital sclerites were photographed with a stereomicroscope Nikon attached to a camera Cannon 6D. Images of external morphology and genitalia were combined with the Helicon Focus 6.7.1 software and edited in Adobe Photoshop Elements 11. The cuticle of juvenile stages of five specimens were critical point dried, coated with gold–palladium and digitally photographed using a HITACHI SU3500 scanning electron microscope.

The material examined are part of the collections of the following institutions: Muséum National d'Histoire Naturelle in Paris (MNHN), Muséum d'Histoire Naturelle de la Ville de Genève (MHNG), Natural History Museum London (NHM), Museu de Zoologia Universidade de São Paulo (MZUSP), Museu Nacional do Rio de Janeiro (MNRJ) and Uppsala University Museum of Evolution, Uppsala in Sweden (UUZM).

Results

Key to the genera of the subfamily Blaberinae endemic from the Neotropical Atlantic forest

Adults

1 Pronotum with lateral margin rounded, without notch or spine ... 2

- Pronotum with lateral margin inclined, most often with a notch or a spine ... 3

2 Pronotal cuticle smooth; dark brown with two orange spots; male brachypterous (Fig. 1C) ...

Minablatta Rehn

- Pronotum strongly gibbous; yellow darker in the middle; male brachypterous (Fig. 1D) ...

Hiereoblatta Rehn, 1937

3 Pronotum unicolored (tawny beige); fore margin very abruptly curved upward. The head ventrally inserted strongly protruded (Fig. 1B) ... *Petasodes*

- Pronotum with a more complex coloration; roughly triangular; lateral margin inclined most often with a notch or a spine ... 4

4 Pronotum smooth, with a very light prominence above the head and a black complex spot in the postero-central area and reaching the posterior margin (Fig. 1E) ... *Monachoda* Burmeister

- Pronotum gibbose, with a complex dark and brightly-colored pattern in the middle (Fig. 1A) ...

Monastria Saussure

Juvenile stages

1 Pronotum hind margin nearly straight ... 2

- Pronotum hind margin not straight ... 3

2 Dorsal surface totally covered by very abundant long thorn-like spines (including pronotum) with a row of larger spines at hind margins; supra anal plate bilobed with a deep incision; each lobe forming straight angles; hind region wider (Figs. 2E, 3E) ... *Monachoda* Burmeister

- Dorsal surface covered by microsculptures formed by triangular spines, except pronotum; supra-anal plate bilobed with a very small median incision, fore region wider (Figs. 2C, 3C)... *Minablatta* Rehn

3 Ratio between total body length and width $\approx 2:1$; pronotum strongly gibbous; yellow, darker in the middle; dorsal microsculptures very short ending with a seta (Figs. 2D, 3D). *Hiereoblatta* Rehn

- Ratio between total body length and width $\approx 1,7:1$; pronotum hind margin forming 120° angle... 4

4 Very flat, smooth, specially dorsally, with dark spots very visible in the dorsal surface from the pronotum to the fore region of the supra-anal plate, dorsal microsculptures very slender, making like a row of columns along the hind margins of pronotum and tergites (Figs. 2B, 3B)... *Petasodes* Saussure

- Not very flat, dorsal surface of pronotum and tergites very rough covered by thorn-like cuticular microsculptures much more abundant near the hind margins (Figs. 2A, 3A)... *Monastria* Saussure

***Monastria* Saussure, 1864**

Monastria Saussure, 1864a: 255, 1864b: 348; Kirby, 1904: 161; Princis, 1958: 75, Princis, 1963: 141. *Tarraga* Walker, 1868: 16; Princis, 1963: 141 (as syn. of *M. biguttata*).

Type Species. *Monastria biguttata* (Thunberg, 1826) = *Blatta biguttata* Thunberg, 1826 (Fig. 4).

Diagnosis. Dark brown to black or shiny black cockroaches with pronotum having orange or ochre spots in the middle. Evident sexual dimorphism, males elongated with wings extending beyond the apex of cerci, and females brachypterous. Male pronotum with a characteristic pentagonal transverse shape, lateral margins with sharp angles and a conspicuous small notch. Female pronotum subtriangular with a depression near the margins, and lateral margins with conspicuous small notch or spine. Coxae covered by setae in males, antero-ventral femora margins with spines of equal size. Apical and genicular spines absent. First meta tarsomere of hind leg short and without spines, claws symmetrical and simple, small arolia. L1 present as a single sclerite, its posterior margin almost entirely covered by a crown of small spines, closely packed.

Generic description. Male (Fig. 5). Medium size (40–55 mm). Head subtriangular; eyes extending antero-laterally beyond the antennal socket (Fig. 5C); interocular space narrow at its closest distance and smaller than the one between the antennal sockets (0.8–1.8 mm). Antennae not surpassing the apex of the tegmina, filiform and setose from the eighth flagellar segment. First flagellar segment larger than the pedicel. Maxillary palps with the fifth segment more dilated and very tomentose. Pronotum pentagonal with fore margin strongly arcuate, hind margin nearly very weakly arcuate, and a specific black coloration pattern in the central region (Fig. 5B). Tegmina developed, extending beyond the apex of cerci; marginal field short and slightly concave; scapular field tapering toward apex; mid-field discoidal, extended apically, slightly angular along veins; subcostal vein with a carina on its ventral surface, anal veins reaching the posterior border (Fig. 5A). Wing marginal field narrow, subcostal vein reaching basal third of scapular field; cubital vein with numerous complete and few incomplete veins; apical triangle absent. Setae in the dorsal region of the three thoracic segments and in the first abdominal segment. Fore-femora ventro-anterior margins with 16 spines of the same size arranged side by side, the last one near the apex directed outward, ventro-posterior margins with 3 spines distributed in uniform spaces along the fore-femora and the last one near the apex. Middle legs ventro-anterior margins of with 3 or 4 spines, the last one close to the apex. Tarsomeres 1-4 with pulvilli, the pulvillus of the first metatarsomere very long, covering more than half of the length of metatarsomere; tarsal claws simple and symmetrical; small arolium present. First abdominal tergite unspecialized. Supra-anal plate quadrangular, posterior border bilobated with a strong median incision. Cerci short, cylindrical, with different coloration in the last segments. Subgenital plate slightly asymmetric. Internally, attached to this plate, a membranous pouch with genital sclerites L1 (Figs. 5G,

H), L2d (Figs. 5F, I) and R (right phallomere) (Figs. 5D, E). Sclerite L1 long and thin with the apical part distinct, quite sclerotized and the left branch tooth-shaped; central portion with a small posterior projection and a branch on the right side directed upwards; apical region with a crown of sclerotized spines. Sclerite L2d hook-shaped, like in most species of Ectobiidae and Blaberidae. Distal area elongated with subapical notch. Sclerite R (right phallomere) formed by sclerotized regions R2, R3d, R3v and N (Figs. 5D). Sclerite R2 (“cleft”) curved, deep and directed upward. Sclerite R3d wide and elongated longitudinally with a dorsal part reduced and a large ventral one in the distal region. Sclerite R3v with a flattened and inverted v shape in ventral view; rounded anterior lateral apex, and short caudal branch (Fig. 5E).

Female (Figs. 4, 6A–D). Species of medium size (30–45 mm). Head rounded, with wide interocular space measuring 1/2 the distance between the antennal sockets (2.0–3.1 mm). Eyes reniform with straight interocular margin. Antennae reaching the apex of the tegmina, filiform and setose from the eighth flagellar segment. Ocelli developed and deflected. Front broad and frontal suture with a cuticular invagination (Fig. 6D). Pronotum subtriangular with anterior region rounded and slightly concave near the margins, dorsal region rough with striae, lateral angles rounded ending in a corner, posterior margin slightly curved in the median region (Fig. 6B). Brachypterous. Tegmina truncated with a marked curvature towards the interior and not extending further than the second abdominal tergite; wings much shorter and undeveloped (Fig. 6A). Legs short and robust. Fore femora ventro-anterior margins with 13 spines of the same size, the last one close to the apex; ventro-posterior margins with 4 spines, the last one close to the apex. Middle legs ventro-anterior margins with 4 spines, the last one close to the apex. Supra-anal plate bilobed with a small median incision, each lobe with slightly rounded lateral and straight posterior margin (Fig. 6C). Tergites with slightly rounded lateral angles (Fig. 6A).

Juvenile stages. Juveniles of both sexes are oval, almost rectangular with a body length and width ratio $\approx 1,7:1$. Beige to light brown, uniformly colored, the dorsal surface of pronotum and tergites is very rough (Fig. 7), covered by thorn-like cuticular microsculptures, often more abundant at their hind margins. (Fig. 3A). Head, eyes, antennae, legs, supra-anal and subgenital plate very similar to those in adults (Fig. 7E).

Habitat and Behavior. Specimens of *Monastria* were observed in a large array of forest ecosystems, ranging from semi-deciduous forests at the Northeast to the humid montane forests in the central region and the *Araucaria* forests in the South. All specimens were observed and collected in the forest understory on the underside of dead trunks of various sizes, as it was described in details for *M. biguttata* (Pellens & Grandcolas, 2003). Very often found grasping on the underside of the bark or the wood of dead trunks, immediately freezing when disturbed. The body of the juveniles are covered by

fine particles of the substrate where they are found, which are attached to the tegument structures (Fig. 7). Adult males have never been seen flying, even if they look able to do so with their large and mobile wings. As any blaberid species, they are ovoviviparous, the females retract the large oothecae in the brood sac. Juvenile stages are often observed in groups that remain near each other until adulthood.

Key to the species of the genus *Monastria*

1 Female pronotum with acute lateral angles; absence of notch or spines (Fig. 9A, B) ... *M. angulata*

Saussure

- Male and Female pronotum with sharp or rounded lateral angles; with notch or spines ... 2

2 Female tegmina long, reaching the fifth abdominal tergite; hind margins curved and rounded. Male with L1 sclerite with lateral branch curved, rounded and with some small spines3

- Female tegmina short, not extending further than the fourth abdominal tergite; hind margin truncated or with a curvature. Male with L1 sclerite with lateral branch slightly curved forward, with the aspect of a big sharp tooth4

3 L1 sclerite with lateral branch curved, rounded and smooth with some small spines; R3d sclerite with a clear prominence like a tooth in ventral view (Fig. 14)....*M. kaingangue* sp. n.

- L1 sclerite with lateral branch curved and rounded with large spines directed downwards (Fig. 8); R2 sclerite shorter and forming a right angle*M. similis* (Serville)

4 Male L1 sclerite with a big lateral dilatation and an edge in the posterior median region (Fig. 10).

Female supra-anal plate with straight posterolateral angles....*M. cabocla* sp. n.

- Male L1 sclerite without a big lateral dilatation and an edge in the median region. Female, supra-anal plate posterolateral angles rounded...5

5 L1 sclerite slightly concave region with irregular distal margins with grooves (Fig. 11). Female frons with a prominence*M. itubera* sp. n.

- L1 sclerite without slightly concave region and irregular distal margins with grooves. Female frons flat. ..6

6 L1 sclerite with lateral branch slightly curved with some spines reaching the crown of spines at the posterior region (Fig. 13)*M. itabuna* sp. n.

- L1 sclerite without lateral branch with some spines reaching the crown of spines in the posterior region ..7

7 L1 sclerite with a sharp dorsal protuberance and with a projection in the right side turned forward; L2d sclerite, hook with internal ventral margin concave (Fig. 5).... *M. biguttata* (Thunberg)

- L1 sclerite with a roughly triangular spear-shaped apical region, hind margin with a large non-sclerotized projection. L2d sclerite, hook with internal ventral margin strongly convex (Fig. 16)... *M.*

sagittata sp.n

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Species

***Monastria biguttata* (Thunberg, 1826)**

Male – Figure 5.

Female – Figures 4; 6A–D.

Blatta biguttata Thunberg, 1826: 276; Scudder, 1868: 13.

Blaberus biguttata Serville, 1831.

Monachoda biguttata Burmeister, 1838: 514; Brunner v. W, 1865: 365; Saussure, 1870: 120; Finot, 1897: 207

Blabera biguttata Serville, 1839: 80.

Monastria biguttata Saussure, 1864a: 256; Saussure, 1864b: 348; Walker, 1868: 11; Kirby, 1904: 161; Shelford, 1907–1908: 469; Rehn, 1911: 248, Rehn, 1913: 282, Rehn, 1915: 275, Rehn, 1920: 217; Hebard, 1921: 246; Princis, 1949: 66; Princis, 1958: 75, Princis, 1963: 141.

Blabera nigripennis Walker, 1868: 6; Finot, 1897: 210; Princis, 1963: 142 (as syn. of *M. biguttata*).

Tarraga guttiventris Walker, 1868: 16; Finot, 1897: 213; Princis, 1963: 142 (as syn. of *M. biguttata*).

Blabera monstrosa Stål, 1855: 351; Kirby, 1904: 165; Princis, 1963: 142 (as syn. of *M. biguttata*).

Blabera mostruosa Sjostedt, 1933: 10; Princis, 1963: 142 (as syn. of *M. biguttata*, lapsus calami).

Examined material. Brazil – Rio de Janeiro: 7m# 3f# Niterói. “Parque da Cidade”, 225m, 22°55’42”S, 43°05’10”W, 500m de la plage du saco de São Francisco, Forêt semp. humide, 21 IX 2009, R. Pellens & P. Grandcolas rec. (MNHN). 1m# Angra dos Reis, Ilha Grande, “Sentier Abraão/Enseada das Palmas”, 50m, 23°08’34”S, 44°08’91”W, 21km E Angra Dos Reis, Forêt semp. humide, 07 VIII 2007, R. Pellens & P. Grandcolas rec. (MNHN). 1m#, 1f# Visconde de Mauá, “Apa da Serrinha do Alambari”, 528m, 22°23’16.4”S, 44°29’58.1”W, 26 XI 2010, R. Pellens & P. Grandcolas rec. (MNHN). 1m# Montagnes des Orgues, Prov. de Rio de Janeiro, Environs de la Tijuca, E. R. Wagner – 1902 (MNHN). 1m# Floresta da Tijuca, V 1966, M. Alvarenga col. (MZUSP). 1f# “Tejuca”, I 1857, coll. H. Clark (NHM). Espirito Santo: 2m#, 3f# Res de Linhares, “CVRD”, 19°09’10.2”S, 40°11’07.8”W, 19 X 1999, 40km NNE Linhares, Forêt semi-décidue, “Mata Alta”, R. Pellens & P. Grandcolas rec. (MNHN). 1m# Linhares, Fragment “Sítio São Pedro”, 19°09’14.2”S, 40°11’34.3”W, 11 VII 2005, 40km NNE Linhares, Forêt semi-décidue, R. Pellens & P. Grandcolas rec. (MNHN). Santa Teresa, Est. Biol. Santa Lucia, 810m, 19°58’18.5”S, 40°32’07.6”W, 6 – 9 IV 2001, Malaise, ponto 3 trilha, C. O. Azevedo & equipe col. (MZUSP). **Without locality:** 3f# (America Meridionale) (MHNG). 2m#, 6f# (NHM).

Diagnosis. This species is characterized by the presence of two additional cuticular depressions in the frons near the clypeus. L1 sclerite with lateral branch slightly curved forward, with the aspect of a big sharp tooth, and with spines in the ventral region near the crown of spines; a pointy medial region with a projection in the right side turned forward. R2 sclerite cleft very sclerotized, rounded at the side of N sclerite. N sclerite tiny in the dorsal region, and large and globular in the ventral one. R3d slightly curved dorsally and wider and straight in ventral view. R3v sclerite with a wide and rounded latero-distal region and a short and slightly narrow caudal branch.

Redescription. Male. Head subtriangular, with interocular space measuring approximately 1/5 of the distance between the antennal sockets. Ocelli developed and slightly deflected. Frontal suture with a cuticular invagination. Two additional cuticular depressions in the frons near the clypeus (Fig. 5C). Pronotum transverse, pentagonal, dorsal surface rough with striae, fore margin rounded, lateral margins with sharp angles and round ends, hind margin nearly straight (Fig. 5B). Legs short and robust. Fore-femora ventro-anterior margins with 16 spines of the same size; ventro-posterior margins with 3 spines. Middle-legs ventro-anterior margins with 3 or 4 spines. Supra-anal plate quadrangular with setae on the surface, hind margin straight and slightly rounded laterally, bilobed with a strong invagination in the median portion. Subgenital plate asymmetrical with long styles, funneled in the apical region.

L1. With the left side of the apical region with a lateral branch (Lb) slightly curved forward, with the aspect of a big sharp tooth with spines near the crown of spines. The right side of the apical region with a pointy medial protuberance and a projection turned forward (Fig. 5G, H). L2d sclerite hook with a soft subconical and slightly narrow anterior region, a short apical sclerotized region, and a wide space connecting them. Apex internal cavity concave, short lateral-external margin and with a typical sub-apical notch (Fig. 5F, I). R2 sclerite cleft very sclerotized, rounded and curved inward with the apex directed upward (Fig. 5D). Sclerite N tiny in the dorsal region, and large and globular in the ventral one. R3d slightly curved dorsally and wider and straight in ventral view. Sclerite R3v with a flattened and inverted v shape in ventral view; rounded anterior lateral apex, and short caudal branch. (Fig. 5D, E).

Female. Head rounded, with wide interocular space measuring 1/2 the distance between the antennal sockets. Eyes with slightly inclined interocular margins. Ocelli developed and deflected. Front broad and frontal suture with a cuticular invagination (Fig. 6D). Pronotum subtriangular with anterior region rounded and slightly concave near the margins, dorsal region rough with striae, lateral angles rounded ending in a corner, hind margin slightly curved in the median region (Fig. 6B). Tegmina with anterior margin slightly triangular; hind margin truncated with a marked curvature inside; very short and not extending further than the second abdominal tergite (Fig. 6A). Legs short and robust. Fore femora ventro-anterior margins with 13 spines of the same size, ventro-posterior margin with 4 spines. Middle

legs ventro-anterior margins with 4 spines. Supra-anal plate bilobed with a small median incision, each lobe with a slightly rounded lateral margin and a straight posterior margin (Fig. 6C). Tergites with straight lateral angles (Fig. 6A).

Measurements (mm). m#: Body length 51.70; pronotum length 12.36×17.35 maximum width; tegmen length 42.55×15.90 width; interocular width 1.0; interantennal width between sockets 5.5
f#: Body length 38.50 ; pronotum length 11.20×17.55 maximum width ; tegmen length 10.00×11.25 width; interocular width 2.3; interantennal width between sockets 5.0.

Coloration. m#: General coloration brown (Fig. 5A). Pronotum dark brown with anterior margin buff brown; central disk pale brown with scattered black marks (Fig. 5B). Head dark brown-black; clypeus and labrum amber. Antennae with basal segments brown pigmented and apical segments pale brown. Ocelli pale brown (Fig. 5C). Legs and spines dark brown; tarsal claws, pulvilli and arolia amber. Tegmina and abdomen following general coloration of body (Fig. 5A) but with dark brown tergites and sternites hind margins.

Distribution. Brazil (Rio de Janeiro, Espirito Santo). See Fig. 17 for details.

Monastria similis (Serville, 1838)

Male – Figure 8.

Female – Figure 6E–H.

Blabera similis Serville, 1839: 81.

Monastria similis Saussure, 1864a: 256; Walker, 1868: 11; Scudder, 1868: 54; Kirby, 1904: 161; Princis, 1958: 75, Princis, 1963: 142.

Monachoda similis Brunner v. W, 1865: 367; Saussure, 1870: 120; Finot, 1897: 207.

Monastria flavomarginata Princis, 1946: 162, Princis, 1963: 142 (as syn. of *M. similis*).

Examined material. Brazil – Paraná: 1f# Aurora do Iguaçu, “Fazenda Dona Iolanda”, 260m, 25°23’047”S, 54°07’048”W, 20km NE São Miguel do Iguaçu, Fragment=60ha, Forêt semp. Humide, 18 XI 2008, Jour, coll. R. Pellens & P. Grandcolas (MNHN). 2m#, 1f# Foz do Iguaçu, “Fazenda John Keller”, 220 m, 25°34’9.14”S, 54°26’7.41”W, 1km Parc National do Iguaçu, Forêt semp. humide, 20 XI 2008, R. Pellens & P. Grandcolas rec. (MNHN). Santa Catarina: 1m# Blumenau, VI 1919, coll. Luderm? (MZUSP). 3m#, 2f# Campo Alegre, “Ilha, Fazenda Sr. Egon”, 830m, 26°10’29”S, 49°16’22”W, 1km Campo Alegre, 14 VIII 2007, Forêt d’*Araucaria*, R. Pellens & P. Grandcolas rec. (MNHN). 1f# Campo Alegre, “Fazenda Sr. Gilson”, 853m, 26°12’6.61”S, 49°18’4.58”W, 5km W Campo Alegre, Forêt d’*Araucaria*, 15 VIII 2007, R. Pellens & P. Grandcolas rec. (MNHN). 1f#

370 Florianopolis, “Chemin Mirante. route Lagoa da Conceição”, 295m, 27°35’5.05”S, 48°28’6.08”W,
 371 Forêt semp. humide, 01 XII 2008, R. Pellens & P. Grandcolas rec. (MNHN). 2f# Joinville, “Alto da
 372 Serra Dona Francisca”, 755m, 26°11’882” S, 49°03’144” W, 35km NW Joinville, Forêt semp.
 373 humide, III 2007, R. Pellens & P. Grandcolas rec. (MNHN). 1m# 4f# Lages, Brunner d. w. (MHNG).
 374 1m# 1f# Rio Capivary, 1888, H. Fruhstorfer (MHNG). Rio Grande do Sul: 2m# Lhering, (MNHG).
 375 São Paulo: 1m# Poa, 13 IV 1963, Rabello col. (MZUSP). 1m# Salesópolis, “Estação biológica de
 376 Boracéia, Trilha do poço verde”, 23°38’56.9”S, 45°52’50”W, Malaise, pt1, 17 – 28 IV 2003, coll. A.P.
 377 Aguiar & F.M. Rodrigues (MZUSP). 1m# Salesópolis, “Est. biológica de Boracéia”, 850m, (MZUSP).
 378 **Paraguay**: 1f# Asunción, sept.1922–apl.1923, E.G.Kent, B.M. 1925 – 262 (NHM). 1m#, Carlos
 379 Pfanni (MHNG) **Without locality**: 1m# Brésilien, H. Fruhstorfer, 1903 – 321(NHM). 2f# (NHM).
 380 1m# (America Meridionale/Colombie?), D. Ruhl (MHNG). 1m# coll. Pantel, co-type (MNHN).

381

382 **Diagnosis.** Male - The apical left side of L1 with a short rounded lateral branch turned downwards
 383 with strong spines near the crown of spines and a wide region slightly concave with a slight curvature
 384 ending in a small projection towards the front on the right side. L2d sclerite hook with internal cavity
 385 strongly concave, external lateral margin very near the very narrow sub-apical notch. R2 sclerite
 386 shorter and forming a right angle. Sclerite N reduced in the dorsal region and a wide and globular
 387 ventral surface. R3d slightly curved dorsally and wider and straight in ventral view. R3v small,
 388 triangular, with a short and slightly quadrangular latero-distal region; caudal branch short with a finger
 389 shaped apex.

390

391 **Redescription. Male.** Head subtriangular, with interocular space measuring nearly 1/3 of the distance
 392 between the antennal sockets. Ocelli developed and slightly deflected. Frontal suture with a slight
 393 cuticular invagination (Fig. 8C). Pronotum transverse, pentagonal, dorsal surface rough with deep
 394 striae, anterior margin rounded, lateral margins with sharp angles and round ends, hind margin nearly
 395 straight (Fig. 8B). Tegmina with orange lateral margins in the first half of its length (Fig. 8A). Legs
 396 short and robust. Fore-femora ventro-anterior margins with 21 or 22 spines decreasing in size from
 397 basal to apical; ventro-posterior margins with 3 long and 2 slightly smaller spines. Middle legs ventro-
 398 anterior margins with 10 spines. Supra-anal plate quadrangular with setae on the surface, hind margin
 399 straight and slightly rounded laterally, bilobed with an invagination in the median portion. Subgenital
 400 plate asymmetrical with long styles, funneled in the apical region. L1 sclerite with apical region with
 401 two distinct parts: a short, rounded lateral branch turned downwards, with strong spines near the
 402 crown of spines of the posterior region; a wide region slightly concave with a slight curvature ending
 403 in a small projection towards the front on the right (Fig. 8H, I). L2d sclerite hook with anterior region
 404 subconical and slightly wide and a short apical region; internal cavity strongly concave, external
 405 lateral margin very near the very narrow sub-apical notch (Fig. 8F, G). R2 sclerite cleft curved inwards
 406 with the apex very sclerotized and directed upwards; shorter and forming a right angle (Fig. 8D).

Sclerite N dorsal region reduced, ventral surface wide and globular. R3d slightly curved dorsally and wider and straight in ventral view. R3v small, triangular, with a short and slightly quadrangular latero-distal region; caudal branch short with a finger shaped apex (Fig. 8D, E).

Female. Head rounded, with wide interocular space measuring 1/2 of the distance between the antennal sockets. Eyes with straight interocular margin. Ocelli small and located on the area slightly deflected above the antennal socket. Frons broad and flattened, frontal suture with a small cuticular depression. Clypeus distal half larger and yellow transparent (Fig. 6H). Pronotum subtriangular with anterior region rounded and slightly concave near the margins, dorsal region rough with deep striae, lateral angles rounded ending in a corner, hind margin slightly curved in the median region (Fig. 6F). Tegmina with a rounded anterior margin, orange lateral margin, and rounded and curved hind margin. Long, reaching the fifth abdominal tergite (Fig. 6E). Legs short and robust. Fore-femora ventro-anterior margins with 21 or 19 long spines of the same size, ventro-posterior margins with 5 spines. Middle legs ventro-anterior margins with 5 spines. Supra-anal plate bilobed with a small median notch, each lobe with a slightly rounded lateral and a straight hind margin (Fig. 6G). Tergites with rounded lateral angles (Fig. 6E).

Measurements (mm). m#: Body length 49.35; pronotum length 10.95 × 16.80 maximum width; tegmen length 39.75 × 15.45 width; interocular width 1.6; interantennal width between sockets 4.6. f#: Body length 36.65; pronotum length 11.35 × 16.90 maximum width; tegmen length 16.50 × 11.00 width; interocular width 2.6; interantennal width between sockets 5.6.

Coloration. m#: General coloration brown (Fig. 8A). Pronotum dark brown with anterior margin buff brown; central disk orange with large dark brown mark (Fig. 8B). Head dark burnt umber; clypeus amber and labrum orange. Antennae with basal segments brown pigmented and apical segments pale brown. Ocelli white (Fig. 8C). Legs brown and spines with brown base and dark brown apex; pulvilli yellowish white; tarsal claws and arolia amber. Tegmina with orange lateral margins (Fig. 8A). Abdomen following general coloration of body but with brown tergites and sternites hind margins.

Distribution. Brazil (São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), Paraguay (Asunción). See Fig. 17 for details.

***Monastria angulata* Saussure, 1864a**

Figure 9A–D.

Monastria angulata Saussure, 1864a: 257; Walker, 1868: 11; Kirby, 1904: 161; Princis, 1963: 142.
Monachoda angulata Saussure, 1870: 120; Finot, 1897: 207.

Examined material. Syntype f#. Brazil, Bahia. (MHNG)

Diagnosis. Pronotum triangular, with rounded anterior region slightly concave near the margins, inconspicuous dorsal roughness and striae. Lateral angles pointy, without corners, hind margin slightly curved in the median region. Tegmina anterior angle nearly square, hind margin truncated with a marked curvature towards the medial margin. CuP vein ending at the half of the hind margin. Supra-anal plate bilobed, lateral margins of each lobe very rounded.

Redescription. Female. Head subtriangular, with wide interocular space measuring 1/2 of the distance between the antennal sockets. Eyes with straight interocular margin. Ocelli developed and deflected. Front broad and frontal suture with a small cuticular invagination (Fig. 9D). Pronotum triangular, with anterior region rounded and slightly concave near the margins; dorsal roughness and striae inconspicuous. Lateral angles pointy, without corners, hind margin slightly curved in the median region (Fig. 9B). Tegmina very short and not extending further than the second abdominal tergite; anterior angle nearly square, hind margin truncated with a marked curvature towards the medial region. CuP vein ending at the half of the hind margin (Fig. 9A). Legs short and robust. Fore-femora ventro-anterior margins with 16 or 17 spines of the same size, ventro-posterior margins with 4 spines. Middle legs ventro-anterior margins with 4 spines. Supra-anal plate bilobed with a small median notch, each lobe with a very rounded lateral margin and a slightly straight hind margin (Fig. 9C). Tergites with quadrangular lateral angles (Fig. 9A).

Male. Unknown

Measurements (mm). Syntype #f: Body length 30.70; pronotum length 10.00 × 17.57 maximum width ; tegmen length 9.80 × 12.20 width; interocular width 2.6; interantennal width between sockets 5.6.

Coloration. Syntype #f: General coloration burnt umber (Fig. 9A). Pronotum burnt umber with a anterior margin ochre; central disk yellowish brown with scattered dark brown marks (Fig. 9B). Head burnt umber and clypeus and labrum dark brown (Fig. 9D). Antennae with segments yellowish brown. Ocelli ochre. Legs and spines dark brown; tarsal claws, pulvilli and arolia yellowish brown. Tegmina with anal field burnt umber and marginal field brown; abdomen following general coloration of body but with tergites and sternites hind margins dark brown (Fig. 9A). Supra-anal plate burnt umber (Fig. 9C).

Distribution. Brazil (Bahia).

***Monastria cabocla* Tarli, Grandcolas & Pellens sp. n.**

Male – Figure 10.

Female – Figure 9E–H.

Type material. Holotype #m, Brazil, Sergipe, Santo Amaro das Brotas, “Gravata” 13 I 1979 (MZUSP). Allotype #f and Paratypes 1#m, 2#f, same data as holotype (MZUSP). 1#f Sergipe, Santo Amaro das Brotas, “871”, 10°46'51.2"S, 37°03'22.8"W (coordinates assigned à posteriori) (MNRJ).

Diagnosis. Frons depressed below the antennal sockets and prominent above the ocelli. Ocelli positioned laterally. Pronotum dorsal surface slightly rough and striated, with two quite evident lobes with plain surface, and a wider central lobe covering the head. Short lateral margins with sharp angle and a conspicuous small spine. Legs longer and less robust. L1 sclerite with a lateral branch little sclerotized slightly curved downwards, smooth and with only a small spine and a region with a big lateral dilatation and an edge in the posterior median region with a lateral projection turned forward. Crown with a smaller number of sclerotized spines in the posterior region. L2d sclerite, hook with subconical and very wide anterior region. Sclerite N triangular on the dorsal region. R3d with a slight depression in the dorsal median region.

Description. Male. Head subtriangular, with interocular space measuring 1/4 of the distance between the antennal sockets. Frons with a depression below the antennal sockets and prominent above the ocelli. Frontal suture localized in a deep cuticular invagination, ocelli developed and positioned laterally (Fig. 10C). Pronotum transverse, pentagonal, dorsal surface slightly rough and striated, with two quite evident lobes with plain surface and a wider central lobe covering the head, anterior margin rounded, short lateral margins with sharp angle and a conspicuous small spine, hind margin nearly straight (Fig. 10B). Legs longer than in other species and less robust. Fore-femora ventro-anterior margins with 24 or 22 spines slightly decreasing in size from basal to apical; ventro-posterior margins with 5 spines. Middle legs ventro-anterior margins with 5 spines. Supra-anal plate quadrangular with setae on the surface, hind margin straight and slightly rounded laterally, bilobed, lobes very narrow and with a strong invagination in the median portion. Subgenital plate asymmetrical with long styles, funneled in the apical region. L1 sclerite apical region with two distinct parts: a lateral branch little sclerotized slightly curved downwards, smooth and with only a small spine, and a region with a big lateral dilatation and an edge in the posterior median region with a lateral projection turned forward. Crown with a smaller number of sclerotized spines. (Fig. 10G, H). L2d sclerite hook with subconical and very wide anterior region, a median apical region, and a narrow space connecting them. Apex internal cavity concave with short lateral external margin and narrow subapical notch (Fig. 10F, I). R2 sclerite cleft sclerotized, curved inward with a conic opening at its base and an apex directed upwards.

Sclerite N triangular on the dorsal region (Fig. 10D) and with a small surface in the ventral one. R3d with a slight depression in the dorsal median region and narrow in ventral view (Fig. 10D, E). R3v sclerite with a long, rectangular and slightly wide latero-distal region, and quadrangular caudal branch very near R3d (Fig. 10E).

Female (Allotype). Head rounded, with wide interocular space measuring 1/2 of the distance between the antennal sockets. Eyes with curved interocular margin. Ocelli developed and deflected. Frons broad, frontal suture with a large cuticular invagination (Fig. 9H). Pronotum subtriangular, dorsal surface slightly rough and striated, with two quite evident lobes with plain surface, and a wider central lobe covering the head; anterior margin rounded, lateral margins short with sharp angle and a conspicuous small spine, hind margin nearly straight (Fig. 9F). Tegmina latero-anterior angle nearly straight; lateral margin wider, and hind margin with a strong curvature near the radial vein; extends further than the third abdominal tergite. CuP vein very marked (Fig. 9E). Legs short and robust. Fore-femora ventro-anterior margins with 19 small spines of the same size, ventro-posterior margins with 4 spines. Middle legs ventro-anterior margins with 9 spines. Supra-anal plate bilobed with a median incision, and each lobe with straight posterolateral angles (Fig. 9G).

Measurements (mm). Holotype #m: Body length 42.95; pronotum length 9.85×15.70 maximum width; tegmen length 35.25×13.45 width; interocular width 0.9; interantennal width between sockets 3.6. Paratypes #m: Body length 41.54; pronotum length 09.94×15.20 maximum width; tegmen length 31.36×13.19 width; interocular width 0.5; interantennal width between sockets 1.8. Allotype #f: Body length 41.60 ; pronotum length 13.20×20.15 maximum width ; tegmen length 16.05×14.50 width; interocular width 2.9; interantennal width between sockets 6.0. Paratype #f : Body length 40.82 – 41.96; pronotum length $12.15 - 12.86 \times 20.12 - 19.91$ maximum width; tegmen length $14.53 - 15.06 \times 12.48 - 13.76$ width; interocular width 1.3 – 1.4 ; interantennal width between sockets 2.4 – 2.5.

Coloration. Holotype #m: General coloration sienna brown (Fig. 10A). Pronotum sienna brown with a brown anterior margin; central disk seal brown with scattered dark marks (Fig. 10B). Head reddish brown; clypeus and labrum amber. Antennae with basal segments dark brown pigmented and apical segments brown. Ocelli pale brown (Fig. 10C). Legs and spines dark brown; tarsal claws, pulvilli and arolia whitish brown. Tegmina sienna brown with marginal and scapular field with a buff brown part (Fig. 10A). Abdomen following general coloration of body.

Etymology. A term from the Tupi meaning taken out of the forest. Here it refers to the habitat and the color patterns of this species.

Distribution. Brazil (Sergipe). See Fig. 17 for details.

***Monastria itubera* Tarli, Grandcolas & Pellens sp. n.**

Male – Figure 11.

Female – Figure 12A–D.

Type material. Holotype #m, Brazil, Bahia, Itubera, “Reserva ecológica Michelin”, 92 – 383m, 13°48'4.62''S, 39°10'23.2''W. 100km N Itabuna, Forêt semi-décidue, 28 VIII 2007, R. Pellens & P. Grandcolas rec. (MZUSP). Allotype #f, and Paratype 1 #m, same data as holotype (MNHN).

Diagnosis. This species is characterized by having triangular head. L1 sclerite lateral branch slightly curved with some spines turned downwards and a slightly concave region with irregular distal margins with grooves ending in a long projection towards the front; L2d sclerite hook with subconical slightly narrow anterior region, short apical region, and a large space connecting them. Apex internal cavity concave with small lateral external margin and narrow subapical notch with pointy margin; R2 sclerite cleft curved inward with a conic opening at its base and with a sclerotized apex directed upwards. Sclerite N wider on the dorsal region, narrow and small in ventral surface. R3d narrow in the right and rectangular in the left when in dorsal view. R3v sclerite small, subtriangular, with rounded latero-distal end.

Description. Male. Head triangular, with narrow interocular space measuring approximately 1/6 of the distance between the antennal sockets. Ocelli developed and slightly deflected; frontal suture with a strong cuticular invagination (Fig. 11C). Pronotum transverse, pentagonal, dorsal surface rough with deep striae; anterior margin rounded; lateral margins with sharp angles, round ends and a conspicuous small protuberance; hind margin nearly straight (Fig. 11B). Legs short and robust. Fore-femora ventro-anterior margins with 20 or 18 spines of the same size; ventro-posterior margins with 4 small spines. Middle-legs ventro-anterior margins with 5 or 4 large spines. Supra-anal plate quadrangular with setae on the surface, hind margin straight and slightly rounded laterally, bilobed with a slight invagination in the median portion. Subgenital plate asymmetrical with long styli, left funneled in the apical region, right with same caliper all along. L1 sclerite apical region with two distinct parts, a lateral branch slightly curved with some spines turned downwards and the right branch slightly concave region with irregular distal margins with grooves ending in a long projection towards the front. Crown with less robust spines in the posterior region (Fig. 11H, I). L2d sclerite, hook with subconical slightly narrow anterior region and short apical region, with a large space connecting them. Apex internal cavity concave with small lateral external margin and narrow subapical notch with pointy margin (Fig. 11F, G). R2 sclerite cleft curved inward with a conic opening at its base and with a sclerotized apex

directed upwards (Fig. 11D). Sclerite N wider and near of R2 on the dorsal region, and a narrow and small ventral surface. R3d narrow in the proximity of R2, and wider and rectangular in the distal region when in ventral view (Fig. 11D, E). R3v sclerite small, subtriangular, with rounded latero-distal end (Fig. 11E).

Female (Allotype). Head rounded, with interocular space measuring approximately 1/3 of the distance between the antennal sockets. Eyes reniform with rounded interocular margin. Ocelli developed and deflected. Concavity between eyes and ocelli reaching the frontal suture. Frons with a prominence (Fig. 12D). Pronotum subtriangular, anterior region rounded with a depression near the margins; dorsal surface rough with deep striae, presence of small spine at the end of lateral region, hind margin nearly straight (Fig. 12B). Tegmina with rounded lateral anterior angle, hind margin truncated with a slight curvature in the region of radial vein and merging to the CuP vein at the end, not extending further than the second abdominal tergite (Fig. 12A). Legs short and robust. Fore-femora ventro-anterior margins with 21 or 20 spines of the same size, ventro-posterior margins with 4 spines. Middle-legs ventro-anterior margin with 8 spines, plus one near the apex. Supra-anal plate bilobed with a median incision and each lobe slightly rounded (Fig. 12C).

Measurements (mm). Holotype #m: Body length 52.98; pronotum length 12.61×18.49 maximum width; tegmen length 42.22×15.43 width; interocular width 0.4; interantennal width between sockets 2.6. Paratype #m: Body length 40.98; pronotum length 09.21×15.14 maximum width; tegmen length 31.22×14.31 width; interocular width 0.2; interantennal width between sockets 1.8.

Allotype #f: Body length 35.79; pronotum length 9.70×17.05 maximum width; tegmen length 8.90×11.15 width; interocular width 1.5; interantennal width between sockets 4.5.

Coloration. Holotype #m: General coloration brown (Fig. 11A). Pronotum brown with the anterior margin pale brown; central disk pale brown with scattered black marks (Fig. 11 B). Head dark brown/black; clypeus and labrum brown. Antennae with basal segments dark pigmented and apical segments whitish yellow. Ocelli light brown (Fig. 11C). Legs dark brown. Spines and tarsal claws brown, pulvilli and arolia pale brown. Tegmina and abdomen following general coloration of body, but with tergites and sternites dark hind margins (Fig. 11A).

Etymology. The specific name refers to the type locality Itubera, state of Bahia, northeast Brazil

Distribution. Brazil (Bahia). See Fig. 17 for details.

***Monastria itabuna* Tarli, Grandcolas & Pellens sp. n.**

Male – Figure 13.

Female – Figure 12E–H.

Type material. Holotype #m, Brazil, Bahia, Itabuna. CEPLAC, Matinha. 14°46'20''S, 39°13'18''W. Elevation 46m, 11 V 2007, J. A. Rafael & F. F. Xavier F (INPA). Allotype #f, and 1 Paratype #m, same data as holotype (INPA).

Diagnosis. This species is characterized by having L1 sclerite with apical region having a lateral branch slightly curved with some spines that contact the crown in the posterior region. L2d sclerite, hook with short apical region, internal margin concave, lateral external margin strongly curved, with large sub-apical notch. R2 sclerite cleft curved inward with the apex directed forward. Sclerite N smaller in the dorsal region and with a large rough ventral surface. R3d narrow near R2 in dorsal view and wider, rectangular in the distal region in ventral view. R3v sclerite large, with quadrangular and truncated latero-distal end. Caudal branch long, wide in the center and narrow in the apex.

Description. Male. Head subtriangular, with narrow interocular space measuring approximately 1/6 of the distance between the antennal sockets. Ocelli developed and slightly deflected; frontal suture with a strong cuticular invagination. Clypeus distal half narrower transversally and orange brown (Fig. 13C). Pronotum transverse, pentagonal, dorsal surface rough with striae; anterior margin rounded; lateral margins slightly wider with sharp angles, round ends and a conspicuous small protuberance; hind margin nearly straight (Fig. 13B). Legs short and robust. Fore-femora ventro-anterior margins with 20 or 18 spines of the same size; ventro-posterior margins with 4 small spines. Middle-legs ventro-anterior margins with 5 or 4 large spines. Supra-anal plate quadrangular with setae on the surface, hind margin straight and slightly rounded laterally, bilobed with a slight invagination in the median portion. Subgenital plate asymmetrical with long styles, left funneled in the apical region, right with same caliper all along. L1 sclerite with apical region with two distinct parts, a lateral branch slightly curved with some spines that contact the crown in the posterior region (Fig. 13G, H). L2d sclerite, hook with short apical region, internal margin concave, lateral external margin strongly curved, with large sub-apical notch (Fig. 13F, I). R2 sclerite cleft curved inward with the apex directed forward (Fig. 13D). Sclerite N smaller in the dorsal region and with a large rough ventral surface. R3d narrow near R2 in dorsal view and wider, rectangular in the distal region when in ventral view (Fig. 13D, E). R3v sclerite large, with quadrangular and truncated latero-distal end. Caudal branch long, wide in the center and narrow in the apex (Fig. 13E).

Female (Allotype). Head rounded, with wide interocular space measuring 1/2 the distance between the antennal sockets. Eyes with straight interocular margin. Ocelli developed and deflected. Frons broad, frontal suture with a cuticular invagination (Fig. 12H). Pronotum subtriangular, fore region

rounded and slightly concave near the margins, dorsal region rough with deep striae, lateral margins rounded ending in a small corner, hind margin slightly curved in the median region (Fig. 12F). Tegmina with straight lateral anterior angle, hind margin truncated with a slight curvature in the region of radial vein; not extending further than the second abdominal tergite and lateral margin orange all along its extension (Fig. 12E). Legs short and robust. Fore-femora ventro-anterior margins with 19 small spines of the same size; ventro-posterior margins with 4 spines. Middle-legs ventro-anterior margins with 9 spines. Supra-anal plate bilobed with a median incision and each lobe slightly rounded (Fig. 12G). Tergites with nearly straight lateral angles (Fig. 12E).

Measurements (mm). Holotype #m: Body length 53.05; pronotum length 12.70×19.37 maximum width; tegmen length 40.40×15.55 width; interocular width 0.9; interantennal width between sockets 2.7. Paratype #m: Body length 54.09; pronotum length 12.22×21.02 maximum width; tegmen length 43.12×19.61 width; interocular width 0.5; interantennal width between sockets 2.8. Allotype #f: Body length 40.70; pronotum length 11.25×19.80 maximum width; tegmen length 12.30×13.00 width; interocular width – 3.0; interantennal width between sockets 5.7.

Coloration. Holotype #m: General coloration dark brown (Fig. 13A). Pronotum dark brown with the anterior margin yellowish brown; central disk yellowish brown with scattered black marks (Fig. 13B). Head dark brown; clypeus and labrum yellowish brown. Antennae with basal segments dark pigmented and apical segments whitish yellow. Ocelli yellowish/pale brown (Fig. 13C). Legs and spines brown; tarsal claws, pulvilli and arolia yellowish brown. Tegmina and abdomen following general coloration of body but with tergites and sternites with brown posterior margin (Fig. 13A).

Etymology. The specific name refers to the type locality Itabuna, state of Bahia, northeast Brazil.

Distribution. Brazil (Bahia). See Fig. 17 for details.

***Monastria kaingangue* Tarli, Grandcolas & Pellens sp. n.**

Male – Figure 14.

Female – Figure 15.

Type material. Holotype #m, Brazil, São Paulo, Campinas. “Pico das Cabras”. $22^{\circ}54'23.9''\text{S}$ $46^{\circ}49'34.4''\text{W}$. 14 october 2014, coll. V. M. Ghirotto (MZUSP). Allotype: 1#f, same data as holotype (MZUSP).

Paratypes – Santa Catarina: 1#m, Urubici, “Parque Nacional de São Joaquim, Vacas Gordas”, 977m, $28^{\circ}08'44.4''\text{S}$, $49^{\circ}37'09.3''\text{W}$, 22 X 2015, coll. R. Pellens (MNHN). 2m#, 1f#, São Bonifácio, Santo

Amaro da Imperatriz, -27.830854 -48.964832, 09 X 2014, P. Grandcolas & Vitor D. Tarli rec. (MNHN). São Paulo: 1#m Bocaina, IV 1924, Luderm? “27” (MZUSP). 1#m Bocaina, IV 1924, “29” (MZUSP). Rio Grande do Sul: 1#m, 2#f, Derrubadas, Parque Estadual do Turvo, 391m, -27.236413 - 53.979640, 05 X 2014, R. Pellens & Vitor D. Tarli rec. (MNHN).

Diagnosis. This species is characterized by having two intercalated rows of spines in the ventro-anterior margins of fore-femora; one row with 5 or 6 spines, and another with 32 or 33 spines of the same size. L1 sclerite with lateral branch curved, rounded and smooth with some small spines, and a curved region with grooves in its interior and a projection with a rounded end directed upwards at its right side. L2d sclerite hook with long apical region, and rounded curvature of the margin near the notch. R2 sclerite cleft curved inward with a wide and sclerotized apex directed forward. R3d with a clear prominence like a tooth in ventral view. R3v sclerite with quadrangular and truncated latero-distal region, and caudal branch near the tooth from R3d sclerite.

Description. Male. Head subtriangular, interocular space approximately 1/3 distance between antennae. Frons slightly elevated. Ocelli developed and deflected. Frontal suture with a cuticular invagination (Fig. 14C). Pronotum pentagonal, fore margin rounded, with rounded lateral angles, hind margin slightly curved in the medial portion (Fig. 14B). Legs short and robust. Fore-femora ventro-anterior margins with two intercalated rows of spines, one with 6 or 5, and another with 33 or 32 spines of the same size; ventro-posterior margins with one large and a thin spine out of the row, 6 small spines. Middle legs ventro-anterior margins with 11 or 10 spines. Tegmina with orange lateral margins in the first half of its length (Fig. 14A). Supra-anal plate quadrangular with setae on the surface, hind margin straight and slightly rounded laterally, bilobed with a slight invagination in the median portion. Subgenital plate asymmetrical with long styles, left funneled in the apical region, right with same caliper all along. L1 sclerite with apical region with two distinct parts: a lateral branch curved, rounded and smooth with some small spines, and a curved region with grooves in its interior and a projection with a rounded end directed upwards at its right side (Fig. 14G, H). L2d sclerite hook with long apical region and rounded curvature of the margin near the notch (Fig. 14F, I). R2 sclerite cleft curved inward with a wide and very sclerotized apex directed forward (Fig. 14D). Sclerite N tiny in dorsal and large and wide in ventral view. R3d with a clear prominence like a tooth in ventral view (Fig. 14D, E). R3v sclerite with quadrangular and truncated latero-distal region, and caudal branch near the tooth from R3d sclerite (Fig. 14E).

Female (Paratype). Head rounded, with wide interocular space measuring approximately 1/2 the distance between the antennal sockets. Eyes with straight interocular margin. Ocelli developed and slightly deflected. Frontal suture with a cuticular invagination. Clypeus distal half transparent yellow and larger (Fig. 15D). Pronotum subtriangular with anterior region rounded and slightly concave near

the margins; dorsal region rough with deep striae, lateral angles rounded ending in a corner and hind margin slightly curved in the median region (Fig. 15B). Tegmina with little rounded lateral anterior angles, orange lateral margins, and rounded and curved hind margins. Long, reaching the fifth abdominal tergite (Fig. 15A). Legs short and robust. Fore-femora ventro-anterior margins with 31 or 32 spines of the same size; ventro-posterior margins with 3 spines. Middle legs ventro-anterior margins with 5 spines. Supra-anal plate bilobed with a very small median incision. Lobe lateral margins slightly rounded and posterior margin straight (Fig. 15C). Tergites with rounded lateral angles (Fig. 15A).

Measurements (mm). Holotype m#: Body length 52.80; pronotum length 12.05×17.35 maximum width; tegmen length 40.75×14.70 width; interocular width 1.7; interantennal width between sockets 5.5. Paratypes m#: Body length 52.60 – 64.30; pronotum length $11.15 - 14.13 \times 15.08 - 19.07$ maximum width; tegmen length $36.16 - 42.34 \times 13.81 - 20.73$ width; interocular width 0.9 – 1.2; interantennal width between sockets 2.5 – 3.1. Allotype f#: Body length 42.52; pronotum length 11.03×17.86 maximum width; tegmen length 17.05×12.55 width; interocular width 3.1; interantennal width between sockets 5.6. Paratypes f#: Body length 39.15 – 47.18; pronotum length $10.04 - 12.22 \times 16.12 - 19.41$ maximum width; tegmen length $14.86 - 18.72 \times 09.92 - 13.34$ width; interocular width 1.4 – 1.6; interantennal width between sockets 2.7 – 3.0.

Coloration. Holotype m#: General coloration dark brown (Fig. 14A). Pronotum dark brown with the anterior margin yellowish brown; central disk orange brown with scattered dark brown marks (Fig. 14B). Head dark brown; clypeus and labrum yellowish brown. Antennae with basal segments dark pigmented and apical segments whitish yellow. Ocelli pale brown (Fig. 14C). Legs dark brown and spines brown; pulvilli white, tarsal claws and arolia light brown. Tegmina with orange lateral margins and abdomen following general coloration of body (Fig. 14A).

Etymology. The word kaingangue derives from the Tupi – Guarani. It is the name of an Indian group originally distributed from São Paulo to Rio Grande do Sul. The name is an allusion to the similarity of their distribution ranges and a tribute to this people that were certainly aware of the existence of this cockroach.

Distribution. Brazil (São Paulo, Santa Catarina, Rio Grande do Sul). See Fig. 17 for details.

***Monastria sagittata* Tarli, Grandcolas & Pellens sp. n.**

Figure 16.

Type material. Holotype m#. Brazil, Minas Gerais, Serra do Cipó. March 1967, coll. D. Vital (MZUSP).

Diagnosis. This species is characterized by having pronotum with shallow, smooth and slightly striated dorsal surface; wide lateral margins with sharp angles. Tegmina anal field wide with the CuP vein perpendicular to the lateral. Subgenital plate asymmetrical with one small style. L1 sclerite with a distinct spear shaped apical region, hind margin with a large non-sclerotized projection, and fore region with a small projection directed upwards. Lateral branch small with strong teeth and spines. L2d sclerite, hook with subconical and narrow anterior region, very short and curved and internal ventral margin strongly convex.

Description. Male. Head subtriangular, with interocular space measuring approximately 1/3 of the distance between the antennal sockets. Ocelli developed and slightly deflected; frontal suture with a cuticular invagination (Fig. 16C). Pronotum broad, transverse and pentagonal; dorsal surface shallow, smooth and slightly striated; anterior margin rounded; lateral margins wider with sharp angles; hind margin nearly straight (Fig. 16B). Tegmina characterized by a wide anal field with the CuP vein perpendicular to the lateral (Fig. 16A). Legs short and robust. Fore-femora ventro-anterior margins with 21 or 20 spines of the same size; ventro-posterior margins with 4 spines. Middle-legs ventro-anterior margins with 5 or 4 large spines. Supra-anal plate quadrangular with setae on the surface, hind margin straight and slightly rounded laterally, bilobed with narrower lobes and strong invagination in the median portion. Subgenital plate asymmetrical with one small style. L1 sclerite with a roughly triangular spear-shaped apical region, hind margin with a large non-sclerotized projection, fore region with a small lateral projection directed upwards, and lateral branch small with strong teeth and spines (Fig. 16G, H). L2d sclerite hook with subconical and narrow anterior region, very short, curved and internal ventral margin strongly convex (Fig. 16F, I). R2 sclerite cleft slightly curved inwards with the apex slightly sclerotized (Fig. 16D, E). The other sclerites were partially destroyed with an unhappy manipulation.

Female. Unknown

Measurements (mm). Holotype m#: Body length 51.28; pronotum length 11.94×21.54 maximum width; tegmen length 41.97×17.00 width; interocular width 1.8; interantennal width between sockets 5.4.

Coloration. Holotype m#: General coloration pale brown (Fig. 16A). Pronotum pale brown with a buff anterior margin; central disk brown ochre with scattered dark brown marks (Fig. 16B). Head with dark brown interocular space, orange frons and amber clypeus and labrum. Antennae with segments yellowish brown. Ocelli brown (Fig. 16C). Legs and spines yellowish brown; pulvilli yellow whitish, tarsal claws and arolia yellowish brown. Tegmina and abdomen following general coloration of body (Fig. 16A).

Etymology. The name “sagittata” derives from the Latin sagitta, meaning arrow, referring to arrow-shaped apex of the L1 sclerite.

Distribution. Brazil (Minas Gerais). See Fig. 17 for details.

***Hiereoblatta papillosa* (Thunberg, 1826) comb. n.**

Figure 18.

Blatta papillosa Thunberg, 1826: 276; Scudder, 1868: 18.

Monastria papillosa Shelford, 1907–1908: 467; Kirby, 1910: 565; Princis, 1949: 66; Princis, 1963: 142.

Among all the material examined to revise the genus *Monastria* was the type of *Blatta papillosa* Thunberg, 1826. This species was assigned to *Monastria* very early and maintained until today after being synonymized several times. As can be seen in the Fig. 18, the coloration, pronotum, head, tegmina and general shape of this specimen does not correspond to those that characterize the genus *Monastria*. In fact, the general characteristics of this species are in accordance with the genus *Hiereoblatta* Rehn, 1937 (see Fig. 1D) as described in our identification key. Here, for the sake of delimiting the genus *Monastria* we propose the new combination *Hiereoblatta papillosa*. We do not propose here to solve the synonyms of this species because, as was the case for *Monastria*, the genus *Hiereoblatta* needs to be revised, and any proposition of solution of the several synonymies would be premature without a careful study.

Conclusions

With this revision, the genus *Monastria* is now known as having 8 species, and one of the species previously accepted as belonging to this genus is now assigned to *Hiereoblatta*. The records of occurrence of the specimens analyzed here indicate that the distribution range of the genus is much broader than previously known, and confirm the initial hypothesis of an endemism to the Neotropical Atlantic forest. The characterization of juveniles and adults of the radiation of Blaberinae of the

Atlantic forest and the determination keys provided will significantly contribute to a rapid identification of the species belonging to this group that are often found together in the field.

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Legends

Figure 1. Five genera of Blaberinae endemic from the Neotropical Atlantic forest. Habitus, dorsal view: A) *Monastria*; B) *Petasodes*; C) *Minablatta*; D) *Hiereoblatta*; E) *Monachoda*. Scales: 1 cm.

Figure 2. Juveniles stages of five genera of Blaberinae endemic to the Neotropical Atlantic forest. Habitus, dorsal view: A) *Monastria*, B) *Petasodes*, C) *Minablatta*, D) *Hiereoblatta*, E) *Monachoda*. Scales: 1 cm.

Figure 3. Scanning electron photographs showing dorsal cuticular microsculptures of juveniles: A) *Monastria*, B) *Petasodes*, C) *Minablatta*, D) *Hiereoblatta*, E) *Monachoda*. Note that the scale differs among pictures.

Figure 4. *Monastria biguttata*, female holotype. Scales: Habitus=1 cm

Figure 5. *Monastria biguttata*, ♂: **A)** Habitus, dorsal view; **B)** Pronotum, dorsal view; **C)** Head, ventral view; **D)** Right phallomere, dorsal view; **E)** Right phallomere, ventral view; **F)** Left phallomere (L2d), ventral view; **G)** Median sclerite (L1), dorsal view; **H)** Median sclerite (L1), detail; **I)** Left phallomere (L2d), dorsal view. Scales: Habitus=1 cm, Pronotum=5 mm, Head=2 mm, all others =1 mm.

Figure 6. Figs. **A-D)**, *Monastria biguttata*, ♀: **A)** Habitus, dorsal view; **B)** Pronotum, dorsal view; **C)** Supra-anal plate, dorsal view; **D)** Head, ventral view. Figs. **E-H)**, *Monastria similis*, ♀: **E)** Habitus, dorsal view; **F)** Pronotum, dorsal view; **G)** Supra-anal plate, dorsal view; **H)** Head, ventral view. Scales: Habitus=1 cm, Pronotum=5 mm, Supra-anal plate=5 mm, Head=2 mm.

Figure 7. Male juveniles of *Monastria* in different stages of development. Scales: Habitus=5 mm. Note the rough surface covered by particles in all stages.

Figure 8. *Monastria similis*, ♂: **A)** Habitus, dorsal view; **B)** Pronotum, dorsal view; **C)** Head, ventral view; **D)** Right phallomere, dorsal view; **E)** Right phallomere, ventral view; **F)** Left phallomere (L2d),

ventral view; **G**) Left phallomere (L2d), dorsal view; **H**) Median sclerite (L1), dorsal view; **I**) Median sclerite (L1), detail (see Fig. 5 for abbreviations). Scales: Habitus=1 cm, Pronotum=5 mm, Head=2 mm, all other figures=1 mm.

Figure 9. Figs. **A–D**, *Monastria angulata*, Syntype ♀: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal view; **C**) Supra-anal plate, dorsal view; **D**) Head, ventral view. Figs. **E–H**, *Monastria cabocla* sp. n. Allotype ♀: **E**) Habitus, dorsal view; **F**) Pronotum, dorsal view; **G**) Supra-anal plate, dorsal view; **H**) Head, ventral view. Scales: Habitus=1 cm, Pronotum=5 mm, Supra-anal plate=5 mm, Head=2 mm.

Figure 10. *Monastria cabocla* sp. n., Holotype ♂: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal view; **C**) Head, ventral view; **D**) Right phallomere, dorsal view; **E**) Right phallomere, ventral view; **F**) Left phallomere (L2d), ventral view; **G**) Median sclerite (L1), dorsal view; **H**) Median sclerite (L1), detail; **I**) Left phallomere (L2d), dorsal view (see Fig. 5 for abbreviations). Scales: Habitus=1 cm, Pronotum=5 mm, Head=2 mm, all others =1 mm.

Figure 11. *Monastria itubera* sp. n., Holotype ♂: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal view; **C**) Head, ventral view; **D**) Right phallomere, dorsal view; **E**) Right phallomere, ventral view; **F**) Left phallomere (L2d), ventral view; **G**) Left phallomere (L2d), dorsal view; **H**) Median sclerite (L1), dorsal view; **I**) Median sclerite (L1), detail (see Fig. 5 for abbreviations). Scales: Habitus=1 cm, Pronotum=5 mm, Head=2 mm, all others =1 mm.

Figure 12. Figs. **A–D**, *Monastria itubera* sp. n., Allotype ♀: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal view; **C**) Supra-anal plate, dorsal view; **D**) Head, ventral view. Figs. **E–H**, *Monastria itabuna* sp. n., Allotype ♀: **E**) Habitus, dorsal view; **F**) Pronotum, dorsal view; **G**) Supra-anal plate, dorsal view; **H**) Head, ventral view. Scales: Habitus=1 cm, Pronotum=5 mm, Supra-anal plate=5 mm, Head=2 mm.

Figure 13. *Monastria itabuna* sp. n., Holotype ♂: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal view; **C**) Head, ventral view; **D**) Right phallomere, dorsal view; **E**) Right phallomere, ventral view; **F**) Left phallomere (L2d), ventral view; **G**) Median sclerite (L1), dorsal view; **H**) Median sclerite (L1), detail; **I**) Left phallomere (L2d), dorsal view (see Fig. 5 for abbreviations). Scales: Habitus=1 cm, Pronotum=5 mm, Head=2 mm, all others =1 mm.

Figure 14. *Monastria kaingangue* sp. n., Holotype ♂: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal view; **C**) Head, ventral view; **D**) Right phallomere, dorsal view; **E**) Right phallomere, ventral view; **F**) Left phallomere (L2d), ventral view; **G**) Median sclerite (L1), dorsal view; **H**) Median sclerite (L1),

1068 detail; **I**) Left phallomere (L2d), dorsal view (see Fig. 5 for abbreviations). Scales: Habitus=1cm,
1069 Pronotum=5mm, Head=2 mm, all others =1 mm.

1070

1071 Figure 15. *Monastria kaingangue* sp. n., Allotype ♀: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal
1072 view; **C**) Supra-anal plate, dorsal view; **D**) Head, ventral view. Scales: Habitus=1cm, Pronotum=5mm,
1073 Supra-anal plate=5mm, Head=2 mm.

1074

1075 Figure 16. *Monastria sagittata* sp. n., Holotype ♂: **A**) Habitus, dorsal view; **B**) Pronotum, dorsal view;
1076 **C**) Head, ventral view; **D**) Right phallomere, dorsal view; **E**) Right phallomere, ventral view; **F**) Left
1077 phallomere (L2d), ventral view; **G**) Median sclerite (L1), dorsal view; **H**) Median sclerite (L1), detail;
1078 **I**) Left phallomere (L2d), dorsal view (see Fig. 5 for abbreviations). Scales: Habitus=1cm,
1079 Pronotum=5mm, Head=2 mm, all other figures=1 mm.

1080

1081 Figure 17. Geographic location of sites where the different species of *Monastria* were collected.
1082 *Monastria angulata* is not included in the map for it is only known from a specimen from Bahia,
1083 without any mention of locality.

1084

1085 Figure 18. *Hiereoblatta papillosa* (Thunberg, 1826) comb. n., female holotype. Not to scale.

1086

1087

A



B



C



D



E



Figure 1

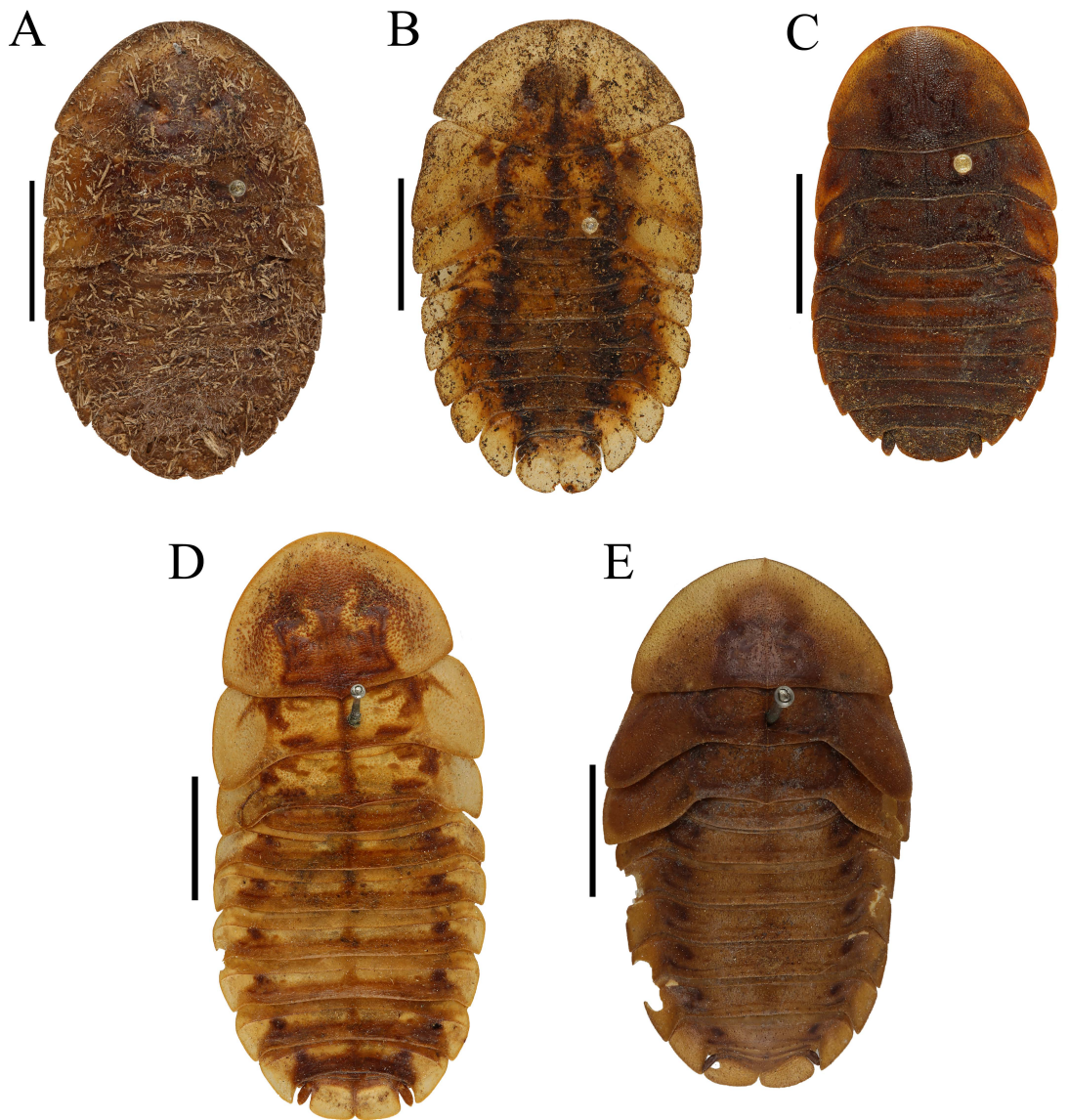


Figure 2

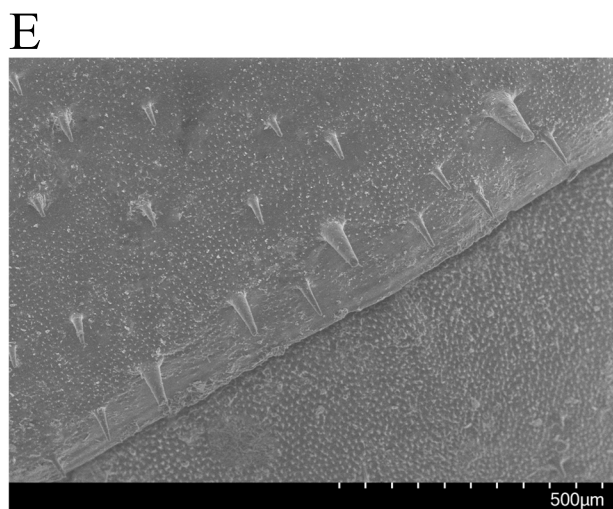
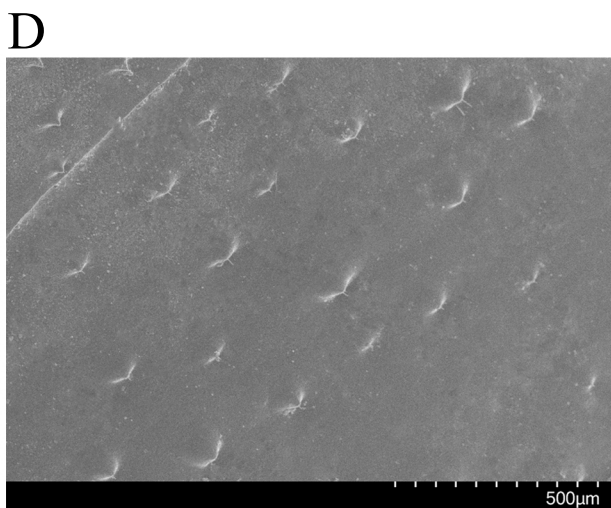
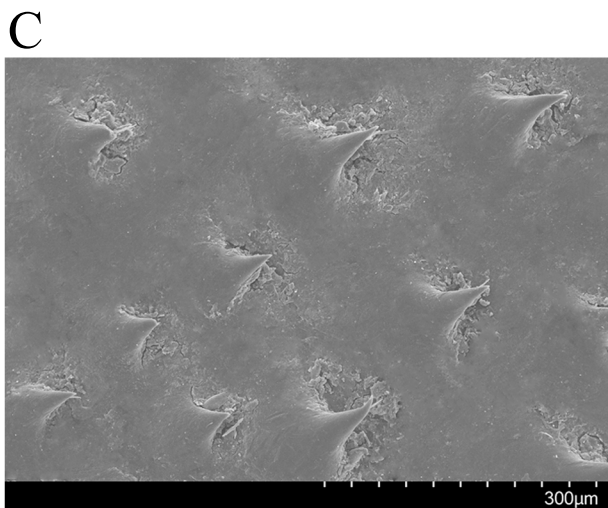
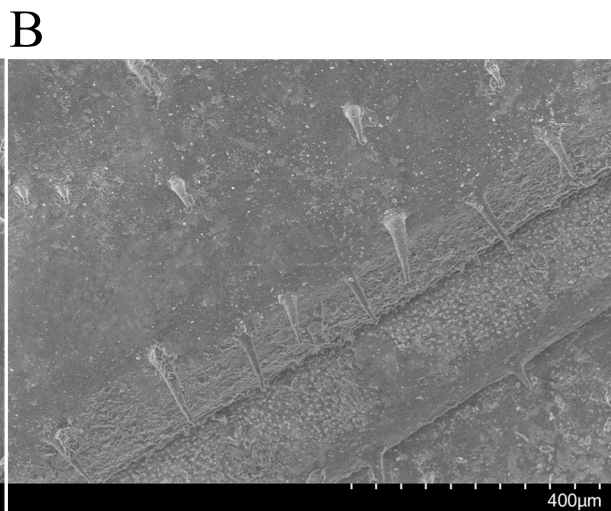
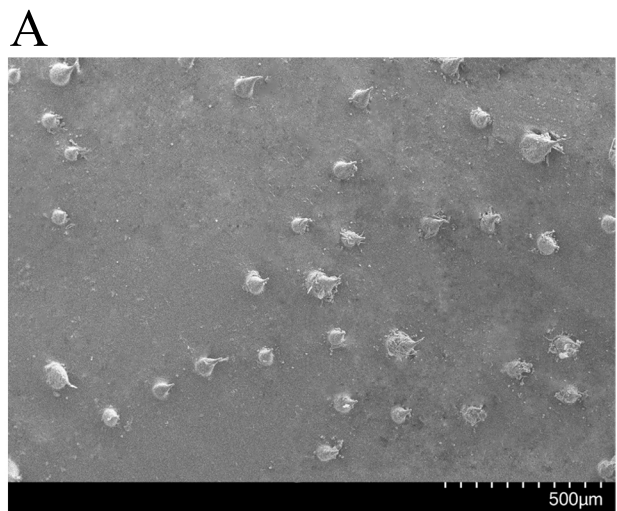
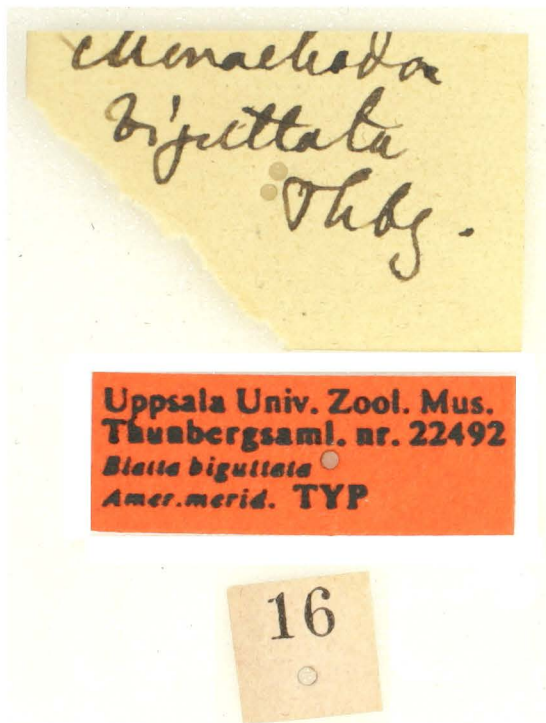


Figure 3



Uppsala Univ. Zool. Mus.
Thunbergsaml. nr. 22492
Blatta biguttata
Amer. merid. TYP

16

Figure 4

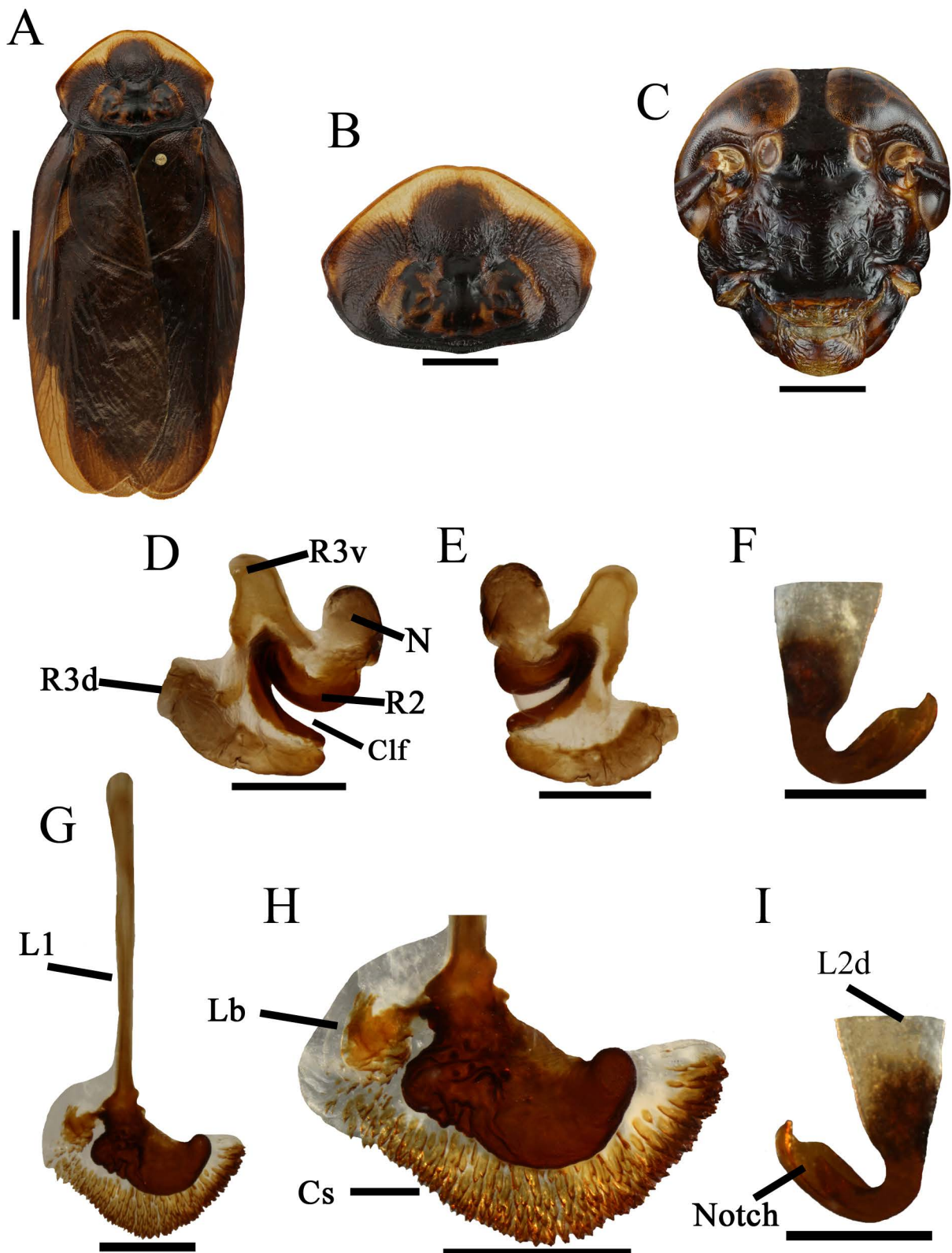


Figure 5

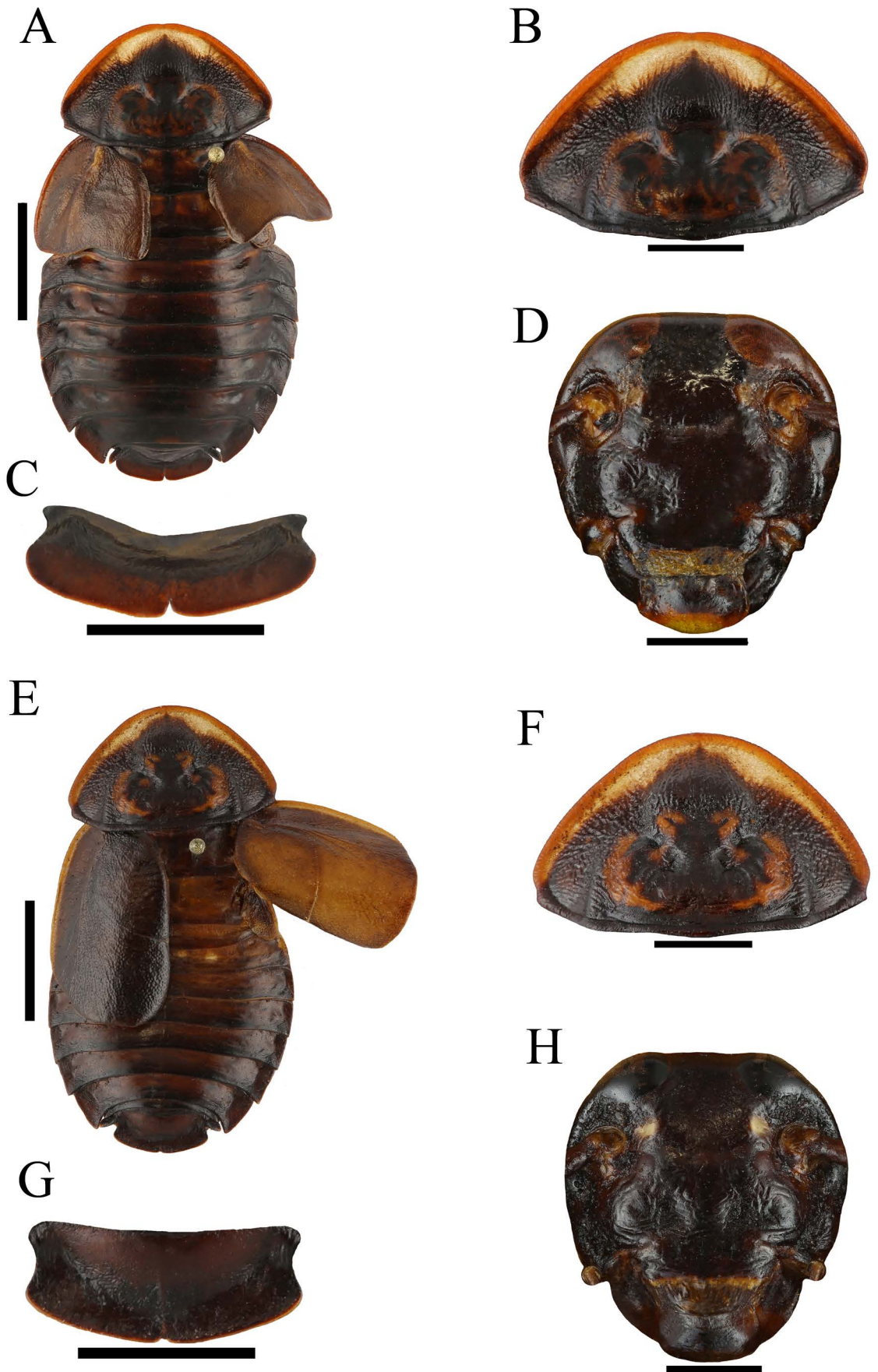


Figure 6

A



B



C



D



E



Figure 7

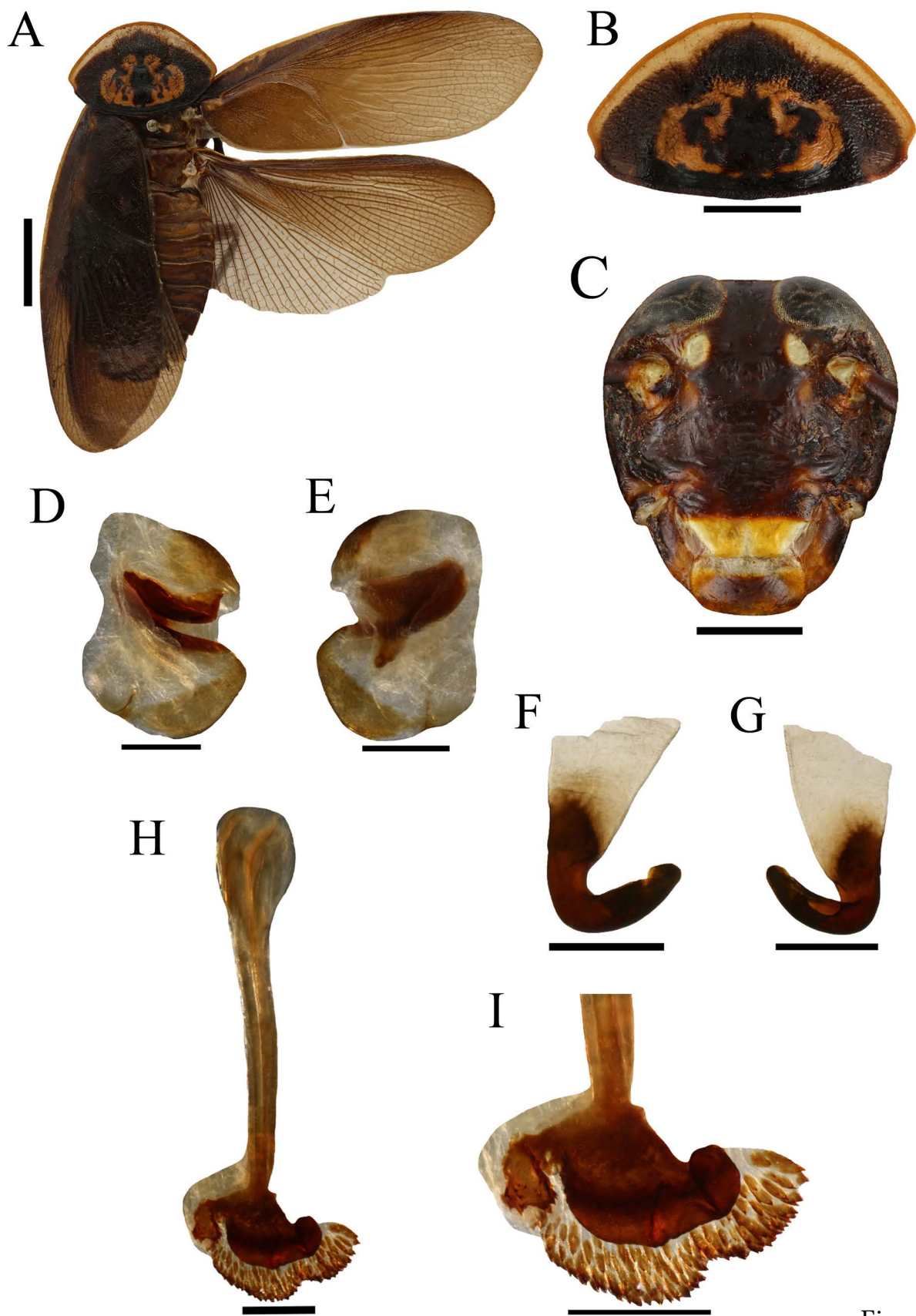


Figure 8

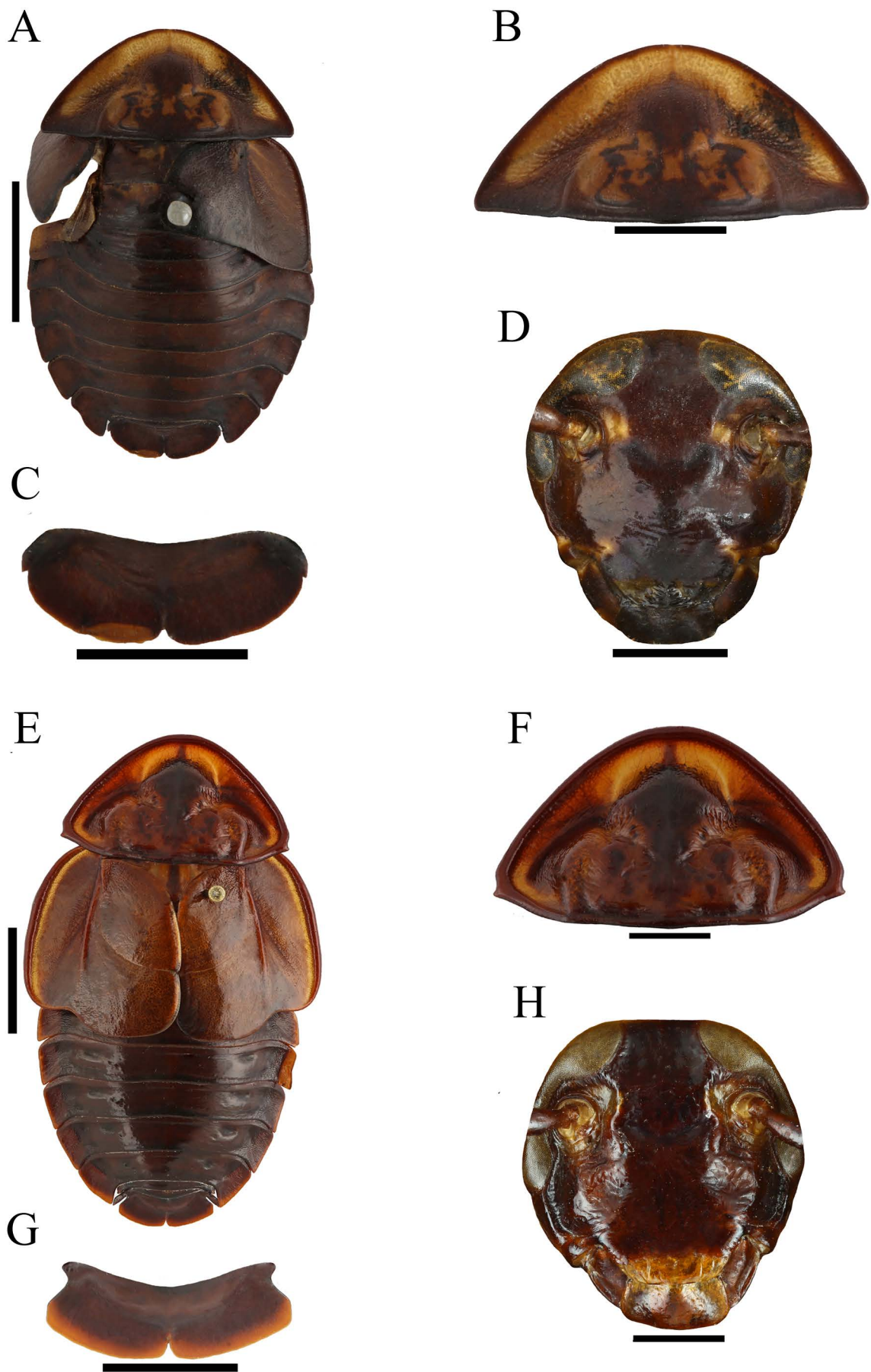


Figure 9

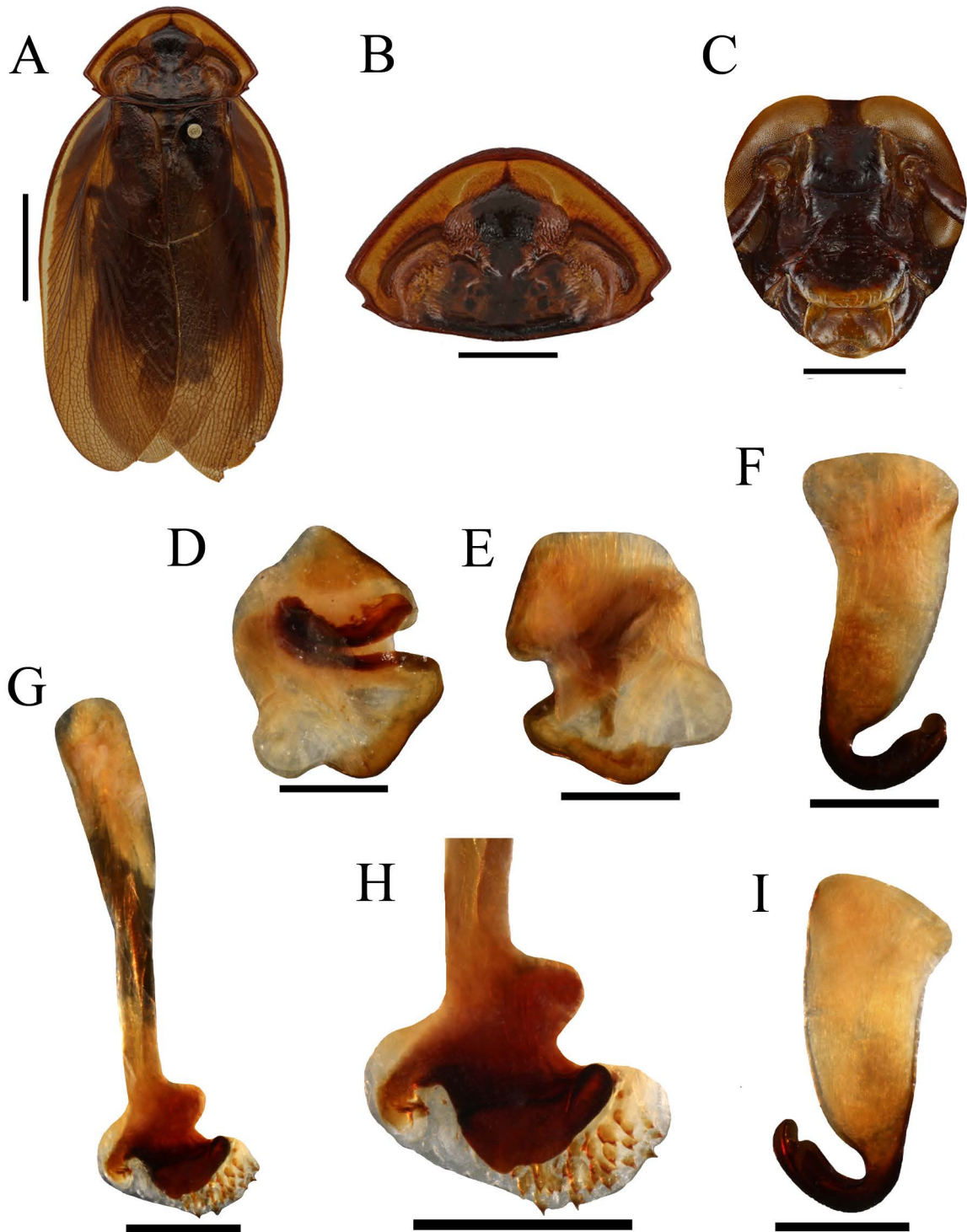


Figure 10

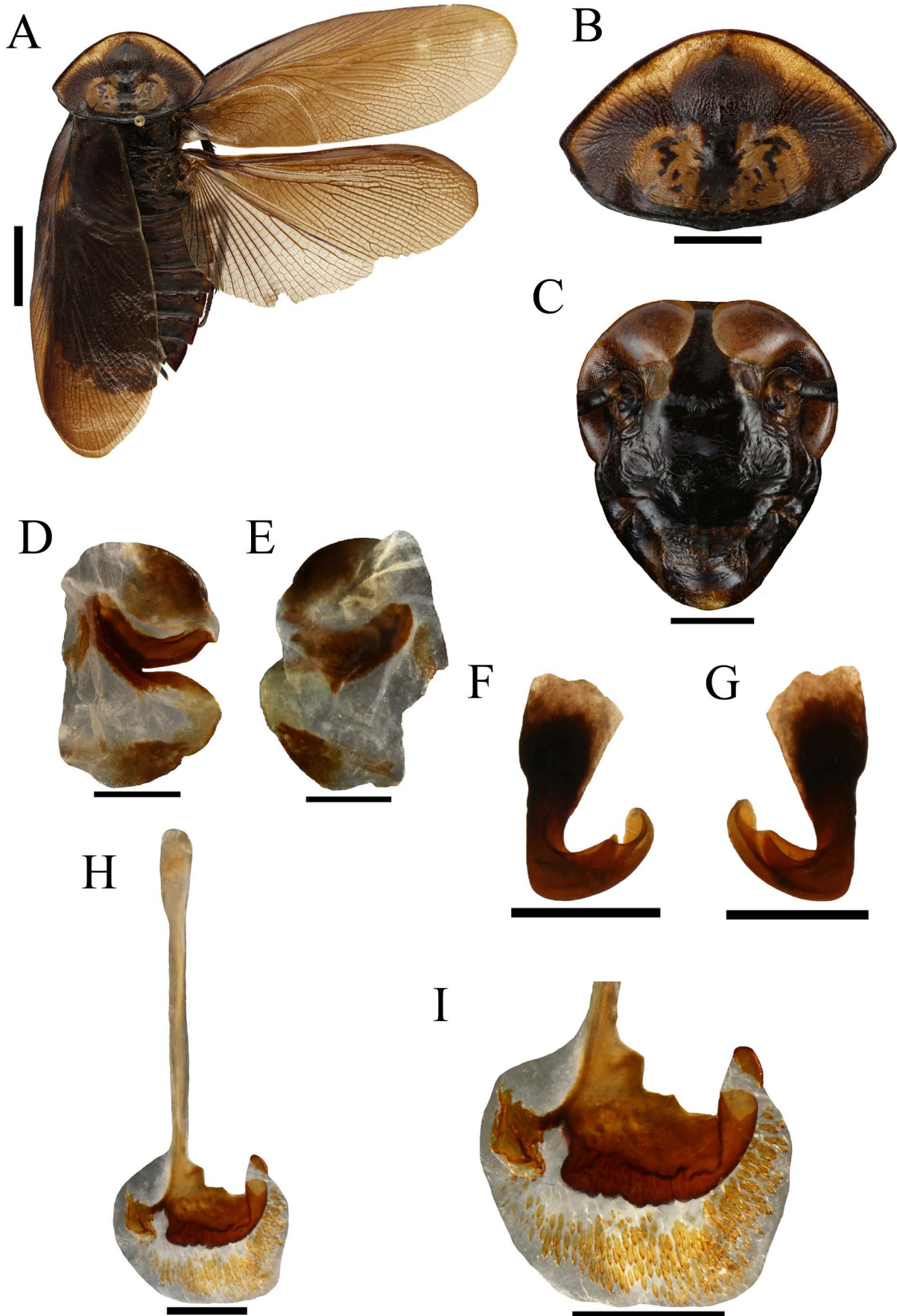


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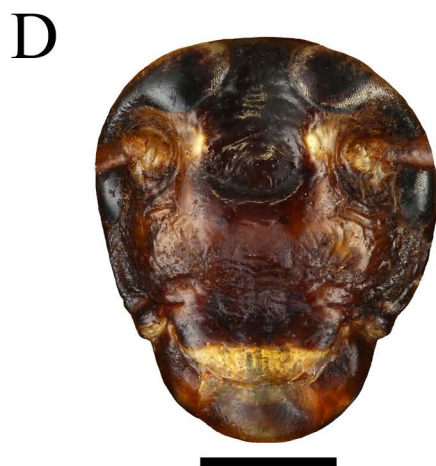


Figure 12

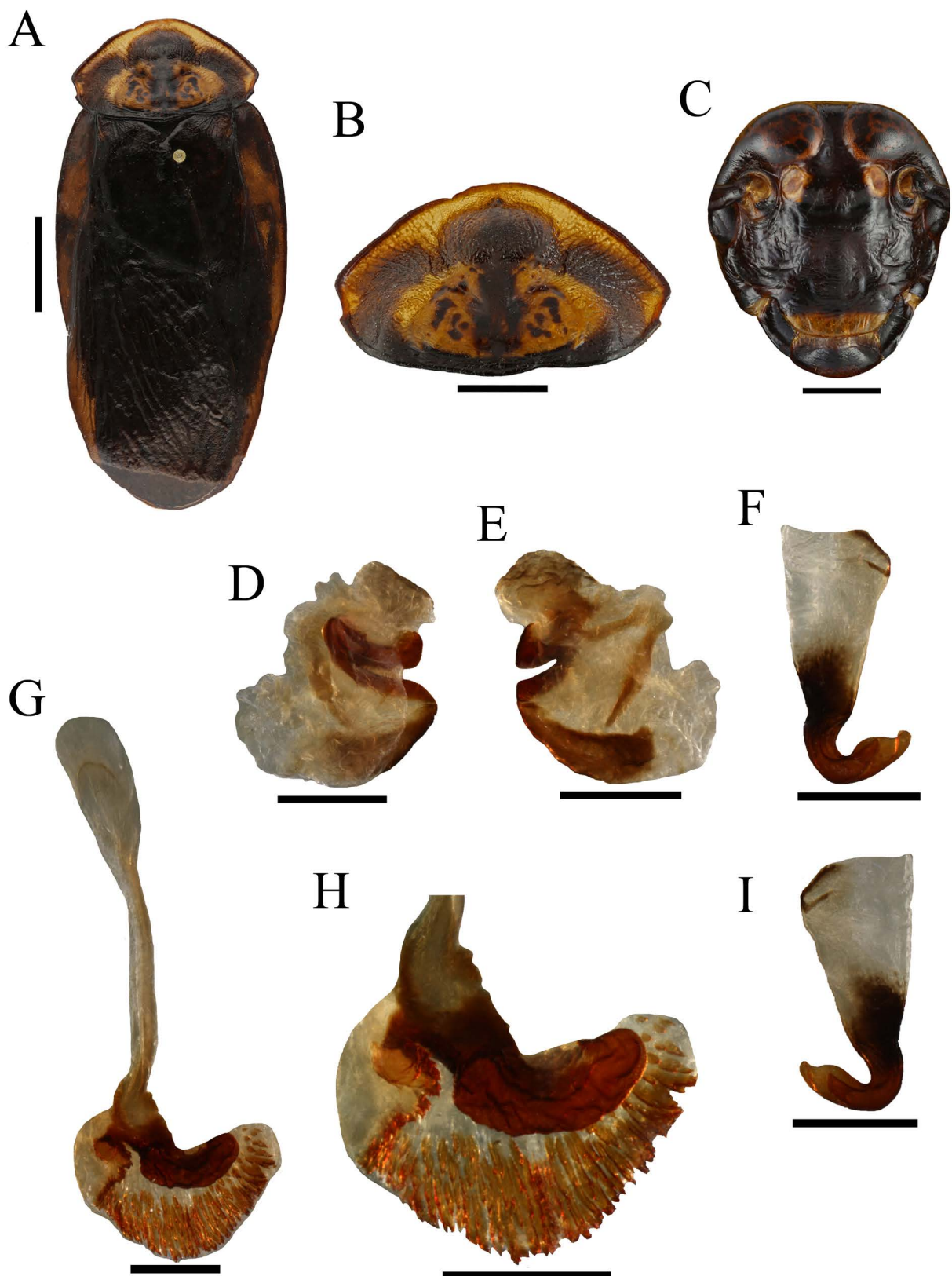


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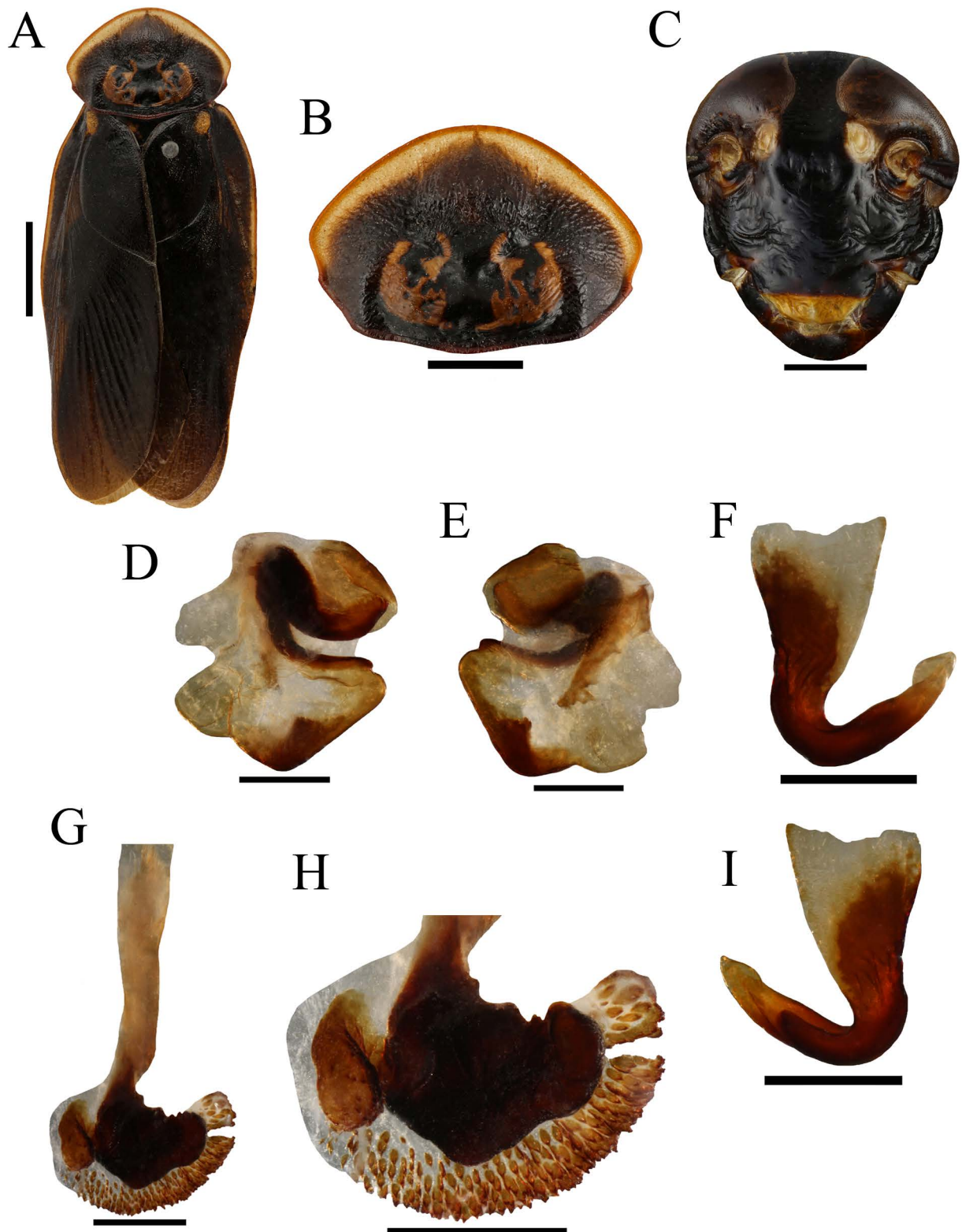


Figure 14

A



B



D



C



Figure 15

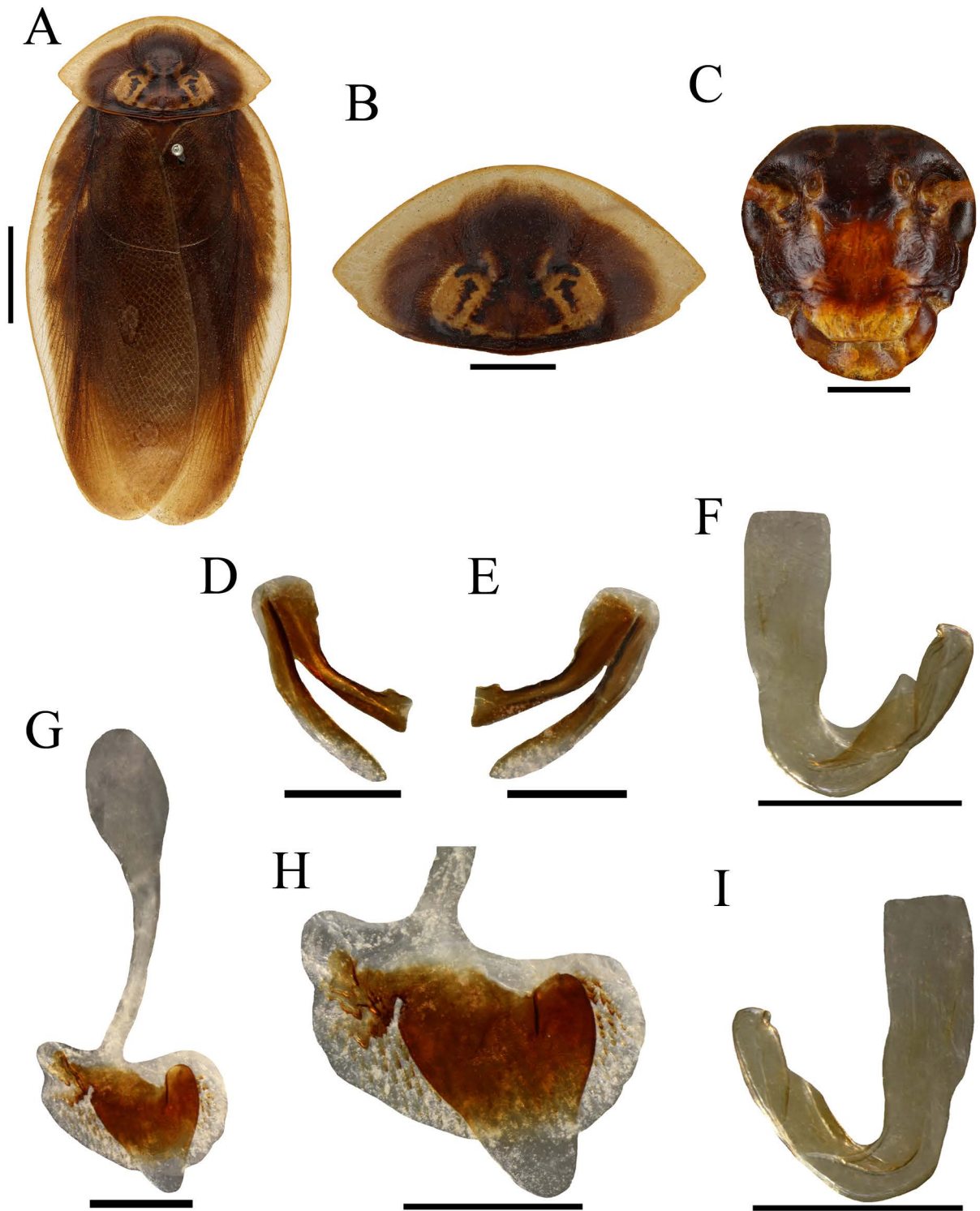


Figure 16

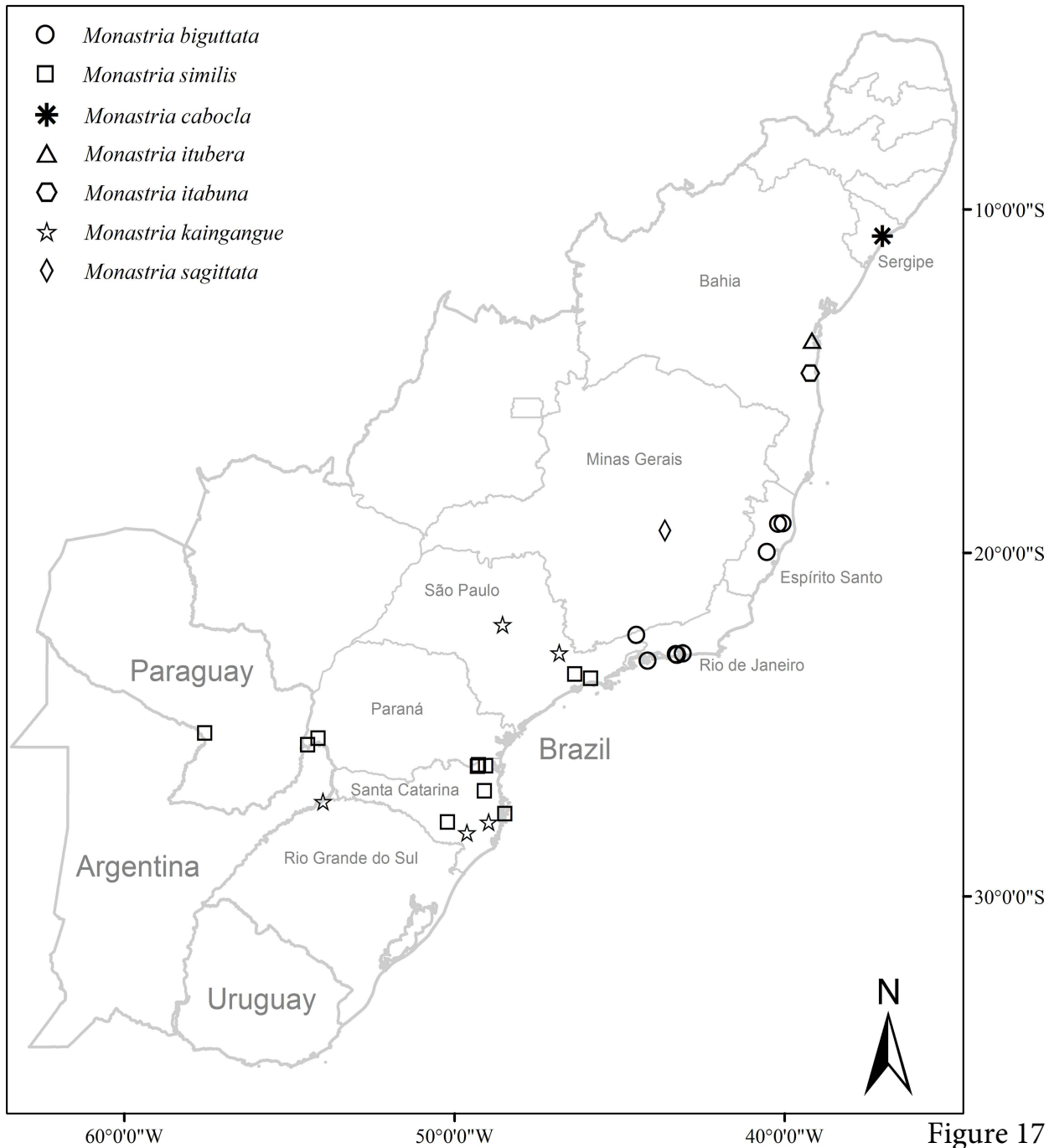


Figure 17