INSTITUTO DE BIOCIÊNCIAS
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FILOGENIA E TAXONOMIA DE PERCEVEJOS-CAVADORES DO GÊNERO *Cyrtomenus* AMYOT & SERVILLE (HEMIPTERA: CYDNIDAE), PRAGAS DE DIFERENTES CULTURAS NA AMÉRICA DO SUL

PORTO ALEGRE
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Orientadora: Profa. Dra. Jocelia Grazia

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UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL

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SUMARIO

RESUMO

A família Cydnidae inclui espécies de percevejos-cavadores, tem distribuição mundial, com mais de 750 espécies em 93 gêneros, divididos em cinco subfamílias. São fitófagos e a maioria das espécies provavelmente polífagas, com algumas espécies que causam danos a diferentes culturas na região Neotropical. Embora a taxonomia de Cydnidae seja considerada bem compreendida, muitos estudos básicos sobre os táxons da região Neotropical ainda precisam ser desenvolvidos. Para algumas espécies, vários registros têm sido errôneos e a correta identificação é essencial para definir e delinear estudos sobre eles, bem como eventuais medidas de controle. Em alguns casos, a taxonomia ao nível de espécie ainda aguarda revisão e é provável que novas espécies ainda precisem ser descritas. A subfamília Cydninae é a que apresenta o maior número de espécies e inclui o gênero *Cyrtomenus* Amyot & Serville com oito espécies reconhecidas até este trabalho, divididas em dois subgêneros: *C. (Cyrtomenus) ciliatus* (Perty) [espécie tipo], *C. (Cyrtomenus) bergi* Froeschner, 1960; *C. (Cyrtomenus) crassus* Walker, 1867; *C. (Cyrtomenus) mirabilis* (Perty, 1830); *C. (Syllobus) emarginatus* Stål, 1862; *C. (Syllobus) grossus* Dallas, 1851; *C. (Syllobus) marginalis* Signoret, 1881, e *C. (Syllobus) teter* (Spinola, 1837). A distribuição do gênero inclui praticamente toda América continental, desde os Estados Unidos até o Uruguai e Argentina. As espécies de *Cyrtomenus* se destacam pela combinação dos seguintes caracteres compartilhados: ausência de uma estria transversal completa na margem anterior do pronoto, tíbias posteriores achatadas dorso-ventralmente e com espinhos muito desenvolvidos, segundo segmento do rostro simples. No entanto tais características não são únicas entre os cydníneos, e a monofilia do gênero e dos subgêneros nunca foram testadas. Além disso, questões taxonômicas na identificação das espécies ainda dificultam a delimitação do gênero e o desenvolvimento de outros estudos, tanto na área básica (por ex. biogeografia) como aplicada (por ex. monitoramento e controle). As espécies *C. bergi* e *C. mirabilis* são consideradas pragas e amplamente distribuídas, ocorrendo desde o sul do México até Brasil e Argentina. No entanto a identidade destas espécies ainda não tem uma boa resolução, baseada na proporção da distância ocelo-olho em relação à largura do ocelo (menor em *C. mirabilis* e maior em *C. bergi*) e pelo nível de rugosidade da superfície das jugas (muito rugosa em *C. mirabilis*, pouco rugosa em *C. bergi*). Este trabalho teve como objetivos 1) fazer atualização da diversidade taxonômica da subfamília Cydninae no Brasil; 2) revisar *Cyrtomenus* a partir do estudo morfológico; 3) testar a monofilia do gênero e dos subgêneros; 4) estabelecer a identidade de *C. bergi* e *C. mirabilis*; 5) confeccionar mapas de distribuição e chaves para a identificação dos gêneros de Cydninae Neotropical e das espécies incluídas em *Cyrtomenus*. Uma nova espécie, *Tominotus ondulatus* nov. sp. é descrita de Cidreira, Rio Grande do Sul, Brasil. Novos registros de espécies ampliaram o número de espécies de Cydninae no Brasil para 47, o que corresponde a mais da metade da diversidade do grupo na região Neotropical. O estudo da morfologia da genitália, dados de distribuição, morfometria linear e geométrica suportam a conclusão que *C. bergi* é sinônimo júnior de *C. mirabilis*. A monofilia de *Cyrtomenus* é parcialmente suportada, suas espécies sempre incluídas em um clado junto com *Prolobodes*; as espécies destes dois gêneros compartilham a tíbia posterior fortemente achatada, característica única entre os cidnineos Neotropicais. Os resultados não suportam o reconhecimento de dois subgêneros dentro de *Cyrtomenus*.

ABSTRACT

The Cydnidae includes species of burrower-bugs and has a worldwide distribution, with more than 750 species in 93 genera, divided into five subfamilies. The species are phytophagous and most species are probably polyphagous, with some species causing damage to different crops in the Neotropical region. Although the taxonomy of Cydnidae is considered well understood, many basic studies in the Neotropical region still need to be done. For some species, several records have been erroneous and proper identification is essential for defining and delineating comparative and general biological studies, as well as eventual control measures. In some cases, taxonomy at the species level is still awaiting review, and it is very likely that new species still need to be described. The subfamily Cydninae is the most speciose taxa and includes the genus *Cyrtomenus* Amyot & Serville, with 8 species recognized until this work, divided into two subgenres: *C. (Cyrtomenus) ciliatus* (Perty), *C. (Cyrtomenus) bergi* Froeschner, 1960; *C. (Cyrtomenus) crassus* Walker, 1867; *C. (Cyrtomenus) mirabilis* (Perty, 1830); *C. (Syllobus) emarginatus* Stål, 1862; *C. (Syllobus) grossus* Dallas, 1851; *C. (Syllobus) marginalis* Signoret, 1881, and *C. (Syllobus) teter* (Spinola, 1837). The distribution of the genus includes practically all continental America, from the United States to Uruguay and Argentina. The species of *Cyrtomenus* are distinguished by the combination of the following shared characters: absence of a complete transverse stria in the anterior margin of the pronotum, posterior tibia flattened dorso-ventrally and with well developed spines, second segmento of labium simple. However, such characteristics are not unique among the cydnins, and the monophyly of the genus and subgenus included have never been tested. In addition, taxonomic issues in species identification still hamper the delimitation of the genus. The species *C. bergi* and *C. mirabilis* are considered pests and widely distributed, occurring from southern Mexico to Brazil and Argentina. However, the identity of these species still does not have a good resolution, and are based on the proportion of the ocellar-eye distance in relation to the width of the ocellus (smaller in *C. mirabilis* and larger in *C. bergi*) and by the level of surface roughness of the juga (rugose in *C. mirabilis*, slightly rough in *C. bergi*). This work aimed to 1) update the taxonomic diversity of the Cydninae subfamily in Brazil; 2) review the taxonomy of *Cyrtomenus* using morphological data; 3) to test the monophyly of the genus and subgenera; 4) to establish the identity of *C. bergi* and *C. mirabilis*; 5) to make distribution maps and identification keys to all genera of Neotropical Cydninae and species included in *Cyrtomenus*. A new species, *Tominotus ondulatus* nov. sp. is described from Cidreira, Rio Grande do Sul, Brazil. New species records increased the number of Cydninae species in Brazil to 47, which corresponds to half the diversity of the group in the Neotropical region. The use the morphology of the genitalia, distribution ranges, linear and geometric morphometric supported *C. bergi* as a junior synonym of *C. mirabilis.* The monophyly of *Cyrtomenus* is partially supported, its species always recognized in a clade with *Prolobodes* Amyot & Serville; species of these two genera share the posterior strongly flattened, a unique derived characteristic among Neotropical cydnins. The recognition of two subgenera within *Cyrtomenus* is not corroborated.

INTRODUÇÃO GERAL

Cydnidae tem distribuição mundial, presente nas regiões tropicais e temperadas (Froeschner 1960, Lis 1999, 2002) e representa o único grupo de percevejos (Heteroptera) com hábitos cavadores. A família possui mais de 750 espécies em 93 gêneros, divididos em cinco subfamílias (Grazia et al. 2008, Pluot-Sigwalt & Lis 2008). Porém faltam hipóteses filogenéticas para a classificação do grupo e muitos táxons precisam revisão sistemática com rigorosa base filogenética.

Os percevejos-cavadores, como são conhecidos, são fitófagos e a maioria das espécies provavelmente polífagas (Froeschner 1960, Lis et al. 2000). O grupo tem sido considerado de pouca importância econômica (Lis et al. 2000), no entanto os danos às culturas na região Neotropical têm crescido nos últimos 15 anos (Oliveira et al. 2000, Oliveira et al. 2013).

A subfamília Cydninae, que contém *Cyrtomenus* Amyot & Serville, é a que apresenta o maior número de espécies. Espécies de importância econômica na região Neotropical são incluídas em *Cyrtomenus* e *Pangaeus* Stål, ninfas e adultos alimentam-se de raízes, tubérculos (Riis et al. 2005) e frutos de solo (Riis et al. 2005; Chapin et al. 2004, 2006) reduzindo a produtividade e facilitando infecções pelos patógenos de solo, por ex. os fungos *Fusarium, Aspergillus* e *Pythium* (Riis et al. 2005), além do desenvolvimento de aflatoxinas (Chapin et al. 2004). *Cyrtomenus* foi proposto por Amyot & Serville (1843) para incluir *C. castaneus*, atualmente sinônimo júnior de *Pentatoma ciliata* Palisot de Beauvois, 1805 (Froeschner 1960). Além da espécie-tipo, outras sete espécies são incluídas no gênero, dividido em dois subgêneros: *C. (Cyrtomenus) bergi* Froeschner, 1960; *C. (Cyrtomenus) crassus* Walker, 1867; *C. (Cyrtomenus) mirabilis* (Perty, 1830); *C. (Syllobus) emarginatus* Stål, 1862; *C. (Syllobus) grossus* Dallas, 1851; *C. (Syllobus) marginalis* Signoret, 1881 e *C. (Syllobus) teter* (Spinola, 1837). A distribuição do gênero inclui praticamente toda América continental, desde os Estados Unidos até o Uruguai e Argentina. Pelo menos duas espécies são pragas de plantas cultivadas na América do Sul.

Entre os gêneros da subfamília Cydninae que ocorrem no continente americano, *Cyrtomenus* pode ser reconhecido pela combinação dos seguintes caracteres: ausência de uma estria transversal completa na margem anterior do pronoto, tíbias posteriores achatadas dorso-ventralmente e com espinhos muito desenvolvidos, segundo segmento do rostro simples (Froeschner 1960). O subgênero nominal pode ser diferenciado do subgênero *Syllobus* pelo evaporatório mesopleural contínuo, não interrompido por uma banda submarginal de diferente textura. No entanto tais características não são únicas entre os cidníneos, e a monofilia do gênero e dos subgêneros incluídos nunca foram testadas. Além disso, questões taxonômicas na identificação das espécies ainda dificultam a delimitação do gênero e o desenvolvimento de outros estudos, tanto na área básica (por ex. biogeografia) como aplicada (por ex.

monitoramento e controle). Chama atenção que toda a taxonomia de Cydnidae está baseada em caracteres morfológicos não genitais, existindo poucos estudos sobre a morfologia de genitália ao nível de gênero e espécie (por ex. Becker & Galileo 1982). Pluot-Sigwalt & Lis (2008) demonstraram o potencial do uso de características genitais para estudos sobre classificação e filogenia de Cydnidae.

C. bergi é polífaga e considerada praga agrícola em diversos países, causando danos em muitas plantas diferentes (Riis et al. 2005). A maioria dos danos tem sido reportados em mandioca (*Manihot suculenta*) e amendoim (*Arachis hypogaea*) (Garcia & Bellotti 1980, Arias & Bellotti 1985, CIAT 1989, Bellotti et al. 1999, Riis et al. 2005). Em amendoim, *C. bergi* perfura a casca da vagem subterrânea e se alimenta dos grãos, podendo, em um ataque severo, causar perda total da safra (Riis et al. 2005). Em mandioca, os danos provocados por *C. bergi* são ocasionados pela inserção do estilete na epiderme das raízes, facilitando a infecção por microorganismos do solo como *Fusarium, Aspergillus, Genicularia, Pytium, Diplodia* e *Phythopthora* (CIAT 1989). De acordo com Arias & Bellotti (1985), 20 a 30 % das raízes afetadas resultam em 100% de perdas econômicas.

C. mirabilis é considerada uma espécie importante nas culturas de amendoim no Peru, Paraguai, Argentina e Brasil (Froeschner 1960, Zucchi et al. 1993, Gallo et al. 2002). No Brasil, Waquil et al. (2003) reportaram a ocorrência de alimentação nas raízes de *Sorghum bicolor* L.

As espécies *C. bergi* e *C. mirabilis* foram incluídas no subgênero *Cyrtomenus* por Froeschner (1960). Ambas as espécies são consideradas amplamente distribuídas: *C. bergi* ocorre desde o sul do México até Brasil e Argentina, *C. mirabilis* com distribuição em Colômbia, Brasil, Peru, Paraguai e Argentina. No entanto a identidade destas espécies ainda não tem uma boa resolução. Froeschner (1960) separou essas duas espécies pela proporção da distância ocelo-olho em relação à largura do ocelo (menor em *C. mirabilis* e maior em *C. bergi*) e pelo nível de rugosidade da superfície das jugas (muito rugosa em *C. mirabilis*, pouco rugosa em *C. bergi*). Becker & Galileo (1982), com base no estudo da genitália do macho, sugeriu que *C. bergi* e *C. mirabilis* podem ser sinônimos. De fato ambas as espécies são morfologicamente indistinguíveis e os caracteres propostos por Froeschner (1960) para separá-los são difíceis de determinar e polimórficos dentro das populações (CF Schwertner, dados não publicados).

Embora a taxonomia de Cydnidae seja considerada bem compreendida (Schuh & Slater, 1995), muitos estudos nos táxons da região Neotropical ainda precisam ser feitos. Para algumas espécies, vários registros têm sido errôneos e a correta identificação é essencial para definir e delinear estudos sobre eles, bem como medidas de controle. Em alguns casos, a taxonomia ao nível de espécie ainda aguarda revisão (por ex. *C. bergi* e *C. mirabilis*) e é provável que novas espécies ainda esperam por descrições (por ex. Mayorga & Cervantes 2001, 2005). Além das espécies já relatadas como economicamente importantes (Lis et al. 2000), outros percevejos-cavadores podem se tornar pragas agrícolas e uma

classificação bem estabelecida e identificações corretas são fundamentais para compreender esse potencial. Além disso, estudos sobre evolução de cidnídeos em geral ainda são escassos; a classificação filogenética do grupo, em qualquer nível, é necessária (Weirauch & Schuh 2011). As investigações sobre as relações filogenéticas dos táxons neotropicais devem testar a classificação atual e formular novas hipóteses evolutivas para o grupo.

Considerando esse contexto, esta dissertação teve como objetivos fazer atualização da diversidade taxonômica da família Cydninae no Brasil, revisar *Cyrtomenus* a partir do estudo morfológico de todas as espécies atualmente incluídas, testar a monofilia do gênero e dos subgêneros a partir de uma análise filogenética baseada em morfologia e estabelecer a identidade de *C. bergi* e *C. mirabilis*, com foco multidisciplinar.

A dissertação está organizada em três capítulos:

O capitulo 1 faz uma compilação taxonômica da diversidade da subfamília Cydninae no Brasil. É atualizada a lista de táxons para 47 espécies, incluindo 90 novos registros de localidade para o país. Uma nova espécie, *Tominotus ondulatus* nov. sp. é descrita de Cidreira, Rio Grande do Sul e se fornecem mapas de distribuição e fotos de hábito dorsal de várias espécies.

No capítulo 2 são utilizadas diferentes metodologias para resolver um problema taxonômico, a identidade de duas espécies de interesse econômico, *Cyrtomenus bergi* e *C. mirabilis.* Por meio de morfologia comparada das estruturas genitais, distribuição geográfica e morfometria linear e geométrica, é obtida evidência que suporta a sinonimia de *C. bergi* com *C. mirabilis.*

Por fim, o capítulo 3, apresenta a primeira hipótese filogenética do gênero *Cyrtomenus*, baseado em caracteres morfológicos e a revisão taxonômica do gênero *Cyrtomenus*. No capítulo também foram incluindas chaves de identificação para os gêneros neotropicais de Cydninae e para as espécies de *Cyrtomenus*, assim como mapas de distribuição atualizados.

No anexo I se inclui a revisão taxonômica do *Prolobodes*, grupo irmão de *Cyrtomenus*.

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CAPITULO I[1]

Cydninae (Hemiptera, Heteroptera, Cydnidae) in Brazil: updated checklist, new records, and description of *Tominotus ondulatus* sp. nov.

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Abstract

Cydninae is the largest subfamily among burrower bugs all around the world and for Brazil the genera *Cyrtomenus, Dallasiellus, Ectinopus, Melanaethus, Onalips, Pangaeus, Prolobodes* and *Tominotus* were reported with a total of 39 species, so far. Basing on the material of nine entomological collections, we updated the list to 47 species including new records and a new species, *Tominotus ondulatus* sp. nov. described from Restinga, Rio Grande do Sul. Distribution maps and photos of dorsal habits for several species are also provided.

Key Words: Burrower bugs, *Cyrtomenus, Dallasiellus, Melanaethus, Pangaeus, Prolobodes, Tominotus*, new species.

Resumo

Cydninae é a maior subfamília entre os percevejos cavadores para o mundo inteiro e para Brasil são reportados os gêneros *Cyrtomenus, Dallasiellus, Ectinopus, Melanaethus, Onalips, Pangaeus, Prolobodes* e *Tominotus* com 39 espécies no total. A partir de material de nove coleções entomológicas, nos atualizamos a lista para 47 espécies incluindo novos registros. *Tominotus ondulatus* sp. nov. é descrita de Restinga, Rio Grande do Sul. Mapas de distribuição e fotos de habito dorsal de varias espécies são também fornecidos.

Palavras chave: Percevejos cavadores, *Cyrtomenus, Dallasiellus, Melanaethus, Pangaeus, Prolobodes.*

The family of burrower bugs, Cydnidae, is a group of true bugs widely distributed across the tropical and temperate regions (Froeschner 1960, 1981; Lis 1999), characterized by the morphological adaptations for digging that are unique in Hemiptera (Schuh & Slater 1995). Among six subfamilies, Cydninae is the largest with 576 species in 67 genera around the world, usually of reddish brown to black coloration and small to medium size (Schwertner & Nardi 2015). In the Neotropical region, 11 genera and 78 species are known (Schwertner & Nardi 2015).

For Brazil, there are records for 39 species in eight genera of Cydninae (Froeschner 1960, 1975). Despite some of the species are considered pests (Chapin & Thomas 2003; Marrero *et al.* 2012; Riis *et*

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al. 2003; Stock *et al.* 2005), the faunistic knowledge has not been updated since Froeschner (1960), however some authors have contributed bringing new data about brazilian cydnids. Froeschner (1975) described a new species from genus *Dallasiellus* in association with ants. Becker & Galileo (1982) studied the male genitalia from five genera of Cydninae. Link (2003) listed the cydnids collected in light traps in Santa Maria, south Brazil. Grazia & Schwertner (2011), in their list of true bugs from the state of São Paulo, reported 11 species of Cydninae, some of them new records. More recently, Schwertner & Nardi (2015) made a revision for the family in the Neotropics, reviewing information about the species of Cydninae of economic importance.

Materials and methods

The specimens studied belong to the following collections: Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina (MACN); Museu Nacional do Rio de Janeiro, Rio de Janeiro, Brazil (MNRJ); Coleção Entomológica do Instituto Oswaldo Cruz, Rio de Janeiro, Brazil (FIOC); Departamento de Zoologia, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil (UFRG); Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Brazil (MCNZ); Universidade Federal de São Paulo, São Paulo, Brazil (UNIFESP); Instituto Biológico de São Paulo, Coleção Entomológica Adolph Hempel, São Paulo, Brazil (IBSP); American Museum of Natural History, New York, USA (AMNH); Naturhistorisches Museum Wien, Wien, Austria (NHMW). The information about localities of the species not found in collections was obtained from the literature. Published distributional data that represents new records after Froeschner (1960) is highlighted in each species. Information on the general distribution of species come from (Froeschner 1981; Froeschner & Maldonado-Capriles 1992; Grazia & Schwertner 2011; Link 2003; Mayorga M. 2002; Schmidt & Barcellos 2007). Morphological nomenclature follow Becker & Galileo (1982), Froeschner (1960) and Grazia *et al.* (2008); the nomenclature of the head chaetotaxy follows Lis (2000) and of the evaporatoria follows (Kment & Vilímová 2010).

Photos of dorsal and lateral views and details of structures, were taken with a digital camera coupled to a stereomicroscope Nikon AZ 100M, maps of distribution were constructed using the software ArcGis (ESRI).

Results

To the list of 39 species occurring in Brazil (Froeschner 1960, 1975), we add seven new records to the Cydninae Brazilian fauna: *Cyrtomenus (Syllobus) grossus* Dallas, *Dallasiellus (Dallasiellus) bacchinus* Froeschner, *Dallasiellus (Dallasiellus) horvathi* Froeschner, *Dallasiellus (Dallasiellus) orchidiphilus* Froeschner, *Dallasiellus (Dallasiellus) solitaria* (Horvath), *Prolobodes gigas* (Signoret), *Tominotus signoreti* (Mulsant & Rey). One new species, *Tominotus ondulatus* sp. nov. is described based on a single male collected at Cidreira, Rio Grande do Sul State (Fig. 12). From those 39 species reported in the literature, we found 31 in the entomological collections examined and bring new localities for their distribution.

***Cyrtomenus (Cyrtomenus) bergi* Froeschner**

(Figs. 1A, 2)

Cyrtomenus ciliatus Berg, 1879: 10 (nec Palisot de Beauvois, 1805).

Cyrtomenus (Cyrtomenus) bergi Froeschner, 1960: 527.

Material examined: 2M# 1F#, **AP**, Porto Grande, CODEPA, 17-Sep-1982, UFRG; 2M# 19F#, Porto

Platon, 1982, J.I. Lacerda col., UFRG; 1 specimen, **PA**, Belém, 01-Mar-1951, Rego col., MNRJ; 3 specimens, Cachimbo, 14 to 21-Sep-1955, Travassos col., FIOC; 9 specimens, Cachimbo, 09-Oct-1956, Travassos col., FIOC; 3 specimens, Mocajuba, 01-Oct-1952, Rego col., MNRJ; 1M#, Natal, 01-Nov-1963, MCNZ; 1M#, **AM**, Borba, Rio Madeira, Dirings col., MCNZ; 1F#, Manaus, Independência, AMNH; 1F#, Manaus, Mamoré. Madeira, AMNH; 1 specimen, **CE**, Marinha, 01-Jan-1964, MNRJ; 3 specimens, **RN**, Natal, 01-Jan-1950, Alvarenga col., MNRJ; 1 specimen, **PB**, Santa Luzia, 01-Aug-1956, Cincinato col., MNRJ; 1M# 1F#, **TO**, Palmas, Serra do Langeado, 17-Nov-1992, UFRG; 1F#, Palmas, Serra do Langeado. Fazenda Céu, Nov-1992, UFRG; 1 specimen, **MT**, Alto Xingú, 01-Jun-1953, Alencar col., FIOC; 1 specimen, Cuiabá, 15-Oct-1956, Ador col., MNRJ; 1F#, Rio Paraná, "Riacho do Herv.", 01-Dec-1952, Dirings col., MCNZ; 2 specimens, Salobra, 21 to 27-Jan-1941, De Amico col., FIOC; 6 specimens, Salobra, 01-Nov-1941, FIOC; 1 specimen, Salobra, 22 to 27-Jan-1955, Travassos col., FIOC; 1 specimen, **RO**, Porto Velho, Guaporé, May-1944, Parko col., MNRJ; 1 specimen, **AC**, Cruzeiro do Sul, 01-Sep-1956, Gonçalves col., MNRJ; 2 specimens, **GO**, Aragarças, 14-Oct-1959, Alvarenga col., MNRJ; 1F#, **MG**, Sapucaí Mirim, 01-Jan-1992, Ferrarezzi M. col., UFRG; 1M# 2F#, Sete Lagoas, 04-Nov-1998, J.M Waquil col., UFRG; 2 specimens, Xavantina, 01-Jan-1953, Oliveira col., MNRJ; 1M# 1F#, **DF**, Brasilia, 20-Oct-1965, M. Becker col., MCNZ; 3 specimens, **ES**, Itá, Córrego, 01-Nov-1954, Zikán col., MNRJ; 1 specimen, Linhares, Parque Sooretama, 15-Oct-1958, Zajciw col., MNRJ; 1 specimen, **RJ**, Coroa Grande, Feb-1957, Freitas col., FIOC; 1 specimen, Guaratiba, 24-Nov-1952, Silva col., MNRJ; 4 specimens, Itatiaia, 14-Oct-1943, Zikán col., FIOC; 1 specimen, Jacarepaguá, 02-Mar-1952, Rego col., MNRJ; 1 specimen, Jacarepaguá, 24-Aug-1952, Rego col., MNRJ; 1 specimen, Jacarepaguá, 26-Oct-1974, FIOC; 1 specimen, Rio de Janeiro, Parque do Museu da República, 14-Sep-2011, Balon col., MNRJ; 2 specimens, Rio de Janeiro, Tijuca, Zajciw col., MNRJ; 1 specimen, Vassouras, 01-Jan-1940, Machado col., FIOC; 3 specimens, **MS**, Corumbá, Nhecolandia, 17-Oct-1953, Gonçalves col., MNRJ; 1F#, **SP**, Balsamo, Seringueira, 29-Oct-1987, EC Bergmann col., UNIFESP; 2F#, Balsamo, 15-Sep-1989, EC Bergmann col., UNIFESP; 2 specimens, Grajaú, 01-Apr-1946, MNRJ; 3F#, Mogi-Mirim, ca. 9 km W, 02-Feb-2009, MCNZ; 1 specimen, Pirassununga, 10-Dec-1946, Travassos col., FIOC; 2M# 1F#, Pradópolis, Oct-1976, P.M.S. Botelho col., MCNZ; 1F#, Registro, Petropen, 02-Feb-1992, Fernandes J.A.M. col., UFRG; 3 specimens, **PR**, Rolândia, 01-Feb-1954, Maler col., MNRJ; 1F#, **SC**, Florianópolis, Bal. Canasvieiras, 19-May-1996, Schwertner C.F. col., UFRG; 1M# 2F#, Itapiranga, Feb-1954, P. Buck col., MCNZ; 1M#, **RS**, Frederico Westphalen, 17-Oct-2005, Massolino & Mansur col., UFRG; 1F#, Guaíba, 10-Apr-1975, H.A. Gastal col., MCNZ; 4M# 4F#, Guaíba, 14-Mar-1976, M.H. Galileo col., MCNZ; 2F#, Itaúba, 06-Apr-1978, L. Buckup col., MCNZ; 1M# 2F#, Pinhal, 03-Apr-1965, M. Becker col., MCNZ; 2M#, Porto Alegre, Oct-1956, L. Buckup col., MCNZ; 2M# 2F#, Porto Alegre, Vila Assunção, 27-Feb-1965, L. Buckup col., MCNZ; 1F#, Santa Maria, 19-May-1971, M. Tarra col., MCNZ; 1F#, Santa Maria, 16-Dec-1971, D. Link col., MCNZ; 12M#, Santa Maria, 17-Dec-1971, D. Link col., MCNZ; 7M# 8F#, Santa Maria, 21-Dec-1971, D. Link col., MCNZ; 3F#, Santa Maria, 21-Jan-1972, D. Link col., MCNZ; 1F#, Santa Maria, 22-Dec-1972, D. Link col., MCNZ; 1F#, Santa Maria, 13-Feb-1973, D. Link col., MCNZ; 1M# 1F#, Santa Maria, 19 to 20-Jun-1979, MCNZ; 1F#, São Salvador, 29-Apr-1964, P. Buck col., MCNZ; 1M#, Sapucaía do Sul, 17-Jul-1953, L. Buckup col., MCNZ; 2M# 1F#, Sapucaía do Sul, 19-Jul-1953, L. Buckup col., MCNZ; 1F#, Torres, Nov-1953, L. Buckup col., MCNZ; 1M#, Triunfo, 23-Jun-1977, H. Bischoff col., MCNZ.

Distribution: Mexico, Guatemala, Granada, Trinidad, Nicaragua, Costa Rica, Panama, Venezuela, Colombia, British Guiana, Suriname, Brazil (AP new rec., PA, AM new rec., CE new rec., RN new rec., PB new rec., PE, BA, MT, TO new rec., RO new rec., AC new rec., GO new rec., MG, DF new rec., ES, RJ, MS new rec., SP, PR new rec., SC, RS), Peru, Bolivia, Paraguay, Argentina.

Remarks: *C. bergi* is the best known species in the family, with 6 to 10 mm length and the biology well described (Riis *et al.* 2005; Riis & Esbjerg 1998). This species is widely distributed in South and Central America (Froeschner 1960; Schwertner & Nardi 2015) and has been reported as pest in several countries feeding on peanut, corn and cassava (Riis *et al.* 2003; Stock *et al.* 2005), seriously affecting production (Melo Molina *et al.* 2006). Individuals are found buried in soil and are collected in light trap.

C. bergi presents similar morphological characteristics with *C. mirabilis* but differs in the proportion between the width of the ocellus and the distance between the ocellus and the eye, which is greater for *C. mirabilis*. According to studies that are being developed by the authors, the characteristic proposed by Froeschner (1960) is not enough for accurate identification, but it was used in this paper for naming the specimens included. Also, new records are based in specimens previously identified by researchers and deposited in the collections examined.

***Cyrtomenus (Cyrtomenus) mirabilis* (Perty)**

(Figs. 1B, 2)

Cydnus mirabilis Perty, 1830: 166.

Cyrtomenus mutabilis Dallas, 1851: 112; Walker, 1867: 147. Usage of the spelling *mutabilis* appears to be due to an error on the caption of the plate accompanying the original description of *Cydnus mirabilis* (Froeschner 1981).

Cyrtomenus mirabilis: Stål 1876: 18; Distant, 1880: 3; Signoret, 1881: 199; Lethierry & Severin, 1893: 62.

Macroscytus umbonatus Berg, 1878: 14; syn. by Signoret, 1881.

Cyrtomenus (Cyrtomenus) mirabilis: Froeschner, 1960: 536.

Material examined: 1 specimen, **PA**, Cachimbo, Sep-1954, Alvarenga col., MNRJ; 1 specimen, **MT**, Barra do Bugres, Oct-1989, Magno col., MNRJ; 1 specimen, **GO**, Aragarças, 28-Jan-1953, MNRJ; 1 specimen, Aragarças, 14-Oct-1959, Alvarenga col., MNRJ; 1 specimen, **MG**, Passa Quatro, 1955, MNRJ; 9M# 3F#, Sete Lagoas, 04-Nov-1998, J.M Waquil col., UFRG; 16 specimens, **ES**, Barra de São Francisco, Córrego do Itá, Oct-1954, Zikán col., MNRJ; 8 specimens, Linhares, Parque Sooretama, Oct-1959, MNRJ; 1 specimen, **RJ**, Estrada RJ-SP Km 47, 22-Oct-1942, Braja col., MNRJ; 1 specimen, Estrada RJ-SP Km 48, 18-Jan-1943, Wygodzinsky col., MNRJ; 1 specimen, Estrada RJ-SP Km 49, 20-Jan-1943, Braja col., MNRJ; 1 specimen, Estrada RJ-SP Km 50, 14-Oct-1943, MNRJ; 2 specimens, Estrada RJ-SP Km 51, 11-Jan-1944, MNRJ; 1 specimen, Estrada RJ-SP Km 52, 31-Oct-1944, Wygodzinsky col., MNRJ; 1 specimen, Estrada RJ-SP Km 53, 07-Dec-1945, Miranda col., MNRJ; 1 specimen, Estrada RJ-SP Km 54, 20-Oct-1949, Mendes col., MNRJ; 1 specimen, Estrada RJ-SP Km 55, 10-Oct-1958, MNRJ; 2 specimens, Deodoro, 10-Sep-1934, Zikán col., MNRJ; 1 specimen, Deodoro, 24-Jan-1941, Zikán col., MNRJ; 4 specimens, Iguaba Grande, 01-Nov-1996, MNRJ; 1 specimen, Itatiaia, Estação Biologica, 01-Nov-1947, Zikán col., MNRJ; 2 specimens, Magé, Gonçalves col., MNRJ; 2M#, Petrópolis, Oct-1979, Costa col., FIOC; 2 specimens, Rio de Janeiro, Ilha Grande, Apr-1956, Santos col., MNRJ; 3 specimens, Ins Oswaldo Cruz. Zona de NOB, 18 to 29-Oct-1938, FIOC; 1 specimen, Parque do Museu da República, Nov-10, Moreira col., MNRJ; 3 specimens, Teresópolis, Serra dos Órgãos, 01-Jan-1954, Zajciv col., MNRJ; 1 specimen, **MS**, Campo

Grande, Feb-1941, MNRJ; 1M#, **SP**, Assis, Dirings col., MCNZ; 1 specimen, Campinas, Rezende col., MNRJ; 1M#, Cantareira, Dirings col., MCNZ; 5 specimens, Monte Alegre do Sul, Fazenda Santa Maria, 24 to 30-Nov-1942, Zoppel col., FIOC; 1 specimen, Pirassununga, 10-Oct-1946, Travassos col., FIOC; 1F#, Pradópolis, 01-Dec-1976, P.M.S. Botelho col., MCNZ; 1M#, Ribeirão Preto, Faz Restinga, Nov-1997, AM de Faria col., UNIFESP; 1 specimen, Ribeirão Preto, Rio Tamanduá, 07-Dec-1953, Travassos col., FIOC; 1M#, São Paulo, 1940, MCNZ; 1 specimen, Ypiranga, 10-Oct-1925, Luderwaldt col., MNRJ; 1 specimen, Ypiranga, 02-Apr-1936, FIOC; 2M#, **SC**, Itapiranga, Feb-1954, P. Buck col., MCNZ; 1F#, **RS**, Erechim, 20-Nov-1975, J. Balden col., MCNZ; 3M#, Pelotas, 01-Jan-1962, P. Buck col., MCNZ; Santa Maria, 22-Jun-1955, MCNZ; 1M# 2F#, Santa Maria, 12-Jan-1971, M. Tarra col., MCNZ; 1M#, Santa Maria, 11-Oct-1971, A. Trentini col., MCNZ; 7M# 14F#, Santa Maria, 17-Dec-1971, D. Link col., MCNZ; 5M# 5F#, Santa Maria, 21-Dec-1971, D. Link col., MCNZ; 9M# 12F#, Santa Maria, 21-Jan-1972, D. Link col., MCNZ; 1M# 1F#, Santa Maria, 11-May-1973, MCNZ; 1F#, Santa Maria, 21-Sep-1975, R. Sand col., MCNZ; 2F#, Santa Maria, 10-May-1976, R.Trevisan col., MCNZ; 1F#, Santa Maria, 20-Oct-1978, J. Thomas col., MCNZ; 1F#, Santa Maria, 10-May-1979, N. Schneider col., MCNZ; 1M# 2F#, Vila Gaúcha, 01-Feb-1967, P. Buck col., MCNZ.

Distribution: Mexico, Brazil (PA new rec., MT new rec., GO new rec., MG new rec., ES new rec., RJ new rec., MS new rec., SP, SC, RS), Peru, Paraguay, Argentina.

Remarks: See remarks of *C. bergi*. First record for Mexico in Mayorga M. (2002), not mentioned in Schwertner and Nardi (2015). Since the correct identity of *C. bergi* is pending, probably all records for Mexico and other countries of Central America are *C. mirabilis*.

***Cyrtomenus (Syllobus) emarginatus* Stål**

(Figs. 1C, 2)

Cyrtomenus emarginatus Stål, 1862: 95; 1876: 27; Walker, 1867: 147.

Syllobus emarginatus; Signoret, 1879: clxxiii; 1881: 322; Distant, 1880: 4; Uhler, 1886: 3; Lethierry & Severin, 1893: 64; Torre Bueno, 1939: 177.

Cyrtomenus (Syllobus) emarginatus: Froeschner, 1960: 518.

Material examined: 1M#, **AP**, Porto Platón, 06-Dec-1982, J.I. Lacerda col., UFRG; 2 specimens, **PA**, Belém, Casa da Bomba, 04-Nov-1959, Travassos col., FIOC; 6 specimens, Cachimbo, 14 to 21-Sep-1955, Travassos col., FIOC; 1M#, **AM**, Manaus, Uypiranga. Rio Negro, Dirings col., MCNZ; 4 specimens, **PI**, Teresina, 1953, Oliveira col., MNRJ; 1M# 1F#, **TO**, Palmas, Serra do Langeado. Fazenda Céu, 01-Nov-1992, UFRG; 3 specimens, **MT**, Alto Xingú, Sep-1955, Vilasboas col., FIOC; 2F#, Nova Xavantina, 20-Oct-1999, UNIFESP; 1 specimen, Vale de São Domingos, Nov-1949, Weener col., MACN; 4M# 8F#, Xingú, Sep-1955, O. Vilas col., MCNZ; 1M#, **RO**, Porto Velho, Rio Madeira, Dirings col., MCNZ; 1F#, **GO**, Alto Paraiso, Cerrado, 10-Oct-1999, AM de Faria col., UNIFESP; 2 specimens, Aragarças, 14-Oct-1959, Alvarenga col., MNRJ; 1 specimen, Pires do Rio, 1956, Pacheco col., MNRJ; 3 specimens, **MG**, Xavantina, 1955, Alencar col., MNRJ; 4M# 4F#, **DF**, Brasilia, 20-Oct-1965, M. Becker col., MCNZ; 1 specimen, Brasilia, Sep-1961, Guimarões col., FIOC; 1F#, **RJ**, Itatiaia, 1937, FIOC; 4 specimens, Itatiaia, 02-Nov-1946, Zikán col., FIOC; 2 specimens, Itatiaia, 24-Nov-1947, Zikán col., FIOC; 2 specimens, Itatiaia, 09-Oct-1948, Zikán col., FIOC; 2 specimens, Itatiaia, Estação Biologica, Nov-1941, Zikán col., MNRJ; 1F#, **SP**, Pirassununga, CIEIP-USP, 17-Oct-1992, F. Cordeiro col., UFRG; 4M# 7F#, **SC**, Itapiranga, Sep-1953, MCNZ; 1M#, **RS**,

Derrubadas, Campus UnB, 13-Nov-1965, M. Becker col., MCNZ; 3M#, Frederico Westphalen, 17-Oct-2005, Massolino & Mansur col., UFRG; 2M#, P.E. Turvo, 29-Oct-2003, A. Barcellos col., MCNZ; 1M# 1F#, Porto Alegre, Museu Anchieta. Serro Azul, Feb-1950, MCNZ.

Distribution: Mexico, Guatemala, Honduras, Costa Rica, French Guiana, Brazil (AP new rec., PA new rec., AM new rec., MT, RO new rec., TO new rec., GO new rec., MG, DF new rec., RJ new rec., SP, SC new rec., RS), Peru, Argentina.

Remarks: This species is easily recognizable within the subfamily by the expanded posterior tibia and the apices of the mandibular plates projected frontward (Fig. 1C). First record for SP in Grazia & Schwertner (2011) and for RS in Brazil in Schmidt & Barcellos (2007).

***Cyrtomenus (Syllobus) grossus* Dallas**

(Figs. 1D, 2)

Cyrtomenus grossus Dallas, 1851: 111; Walker, 1867: 148; Stål, 1876: 18; Distant, 1880: 2; Signoret, 1881: 198; Uhler, 1886: 3; Lethierry & Severin, 1893: 62.

Cyrtomenus (Syllobus) grossus; Froeschner, 1960: 520.

Material examined: 2 specimens, **RJ**, Itatiaia, Estação Biologica, 25-Jan-1932, Zikán col., MNRJ; 1 specimen, Itatiaia, Aug-1933, Zikán col., MNRJ; 1F#, **RS**, Porto Alegre, Serro Azul, MCNZ.

Distribution: Mexico, Guatemala, Brazil new rec. (RJ, RS), Ecuador.

Remarks: The apex of the labium surpassing the posterior coxae and the very broad head, marked by the interocular width distinctly greater than length of head, allows the recognition of *C. grossus* among the other species of the genus, even *C. teter*, the more closely allied species according Froeschner (1960).

***Cyrtomenus (Syllobus) marginalis* Signoret**

(Figs. 1E, 2)

Crytomenus marginalis Signoret, 1881: 201; Lethierry & Severin, 1893: 62.

Cyrtomenus (Syllobus) marginalis: Froeschner, 1960: 521.

Material examined: Photos provided by Harald Bruckner from the holotype deposited in NHM Wien, a female specimen labeled: “Brasil”, coll. Signoret.

Distribution: Brazil.

Remarks: The species is only known from the type specimen, that despite the lack of a more precise locality and material for study, presents typical features as the general shape, the expanded posterior tibia and the appearance of the peritreme to be placed in *Cyrtomenus*; also the row of numerous setigerous punctures on the lateral submargin of the pronotum (25) and on the costa (21–23) (Fig. 1E), are unique for *C. marginalis* within the genus.

***Cyrtomenus (Syllobus) teter* (Spinola)**

(Figs. 1F, 2)

Cydnus teter Spinola, 1837: 332.

Cyrtomenus teter: Dallas, 1851: 111; Walker, 1867: 147; Stål, 1876: 18; Distant, 1880: 2; Signoret, 1881: 197; Uhler, 1886: 3; Van Duzee, 1917: 18; Torre Bueno, 1939: 177.

Cyrtomenus excavatus Distant, 1880: 2; syn. by Froeschner, 1960.

Cyrtomenus (Syllobus) teter: Froeschner, 1960: 523.

Material examined: 2F#, **MG**, Rio José Pedro, Zikán col., FIOC; 1F#, **ES**, Linhares, Parque Sooretama, 20-Oct-1958, Zajciw col., MNRJ; 3 specimens, **RJ**, Itatiaia, Jul-1924, Zikán col., FIOC; 5 specimens, Itatiaia, 04-Dec-1928, Zikán col., FIOC; 2 specimens, Itatiaia, 04-Feb-1945, Zikán col., FIOC; 5M#, 3F#, Itatiaia, Nov-1950, Travassos col., MNRJ; 7 specimens, Itatiaia, Zikán col., FIOC; Itatiaia, Estação Biologica, 14-Dec-1930, Zikán col., MNRJ; 2 specimens, Petrópolis, Apr-2014, Moreira col., MNRJ; 1F#, Rio de Janeiro, Corcovado, Nov-1958, Alvarenga col., MNRJ; 2 specimens, Rio de Janeiro, Zajciw col., MNRJ; 1 specimen, Teresópolis, 01-Jan-1940, Travassos col., FIOC; 2 specimens, Teresópolis, Barreira, 01-Mar-1957, FIOC; 1F#, Teresópolis, Serra dos Órgãos, 1940, Parko col., MNRJ; 2 specimen, Vassouras, 1940, Machado col., FIOC; 2 specimens, **SP**, 18-Dec-2016, Costa-Lima col., MNRJ; 2M#, Pirassununga, 13-Mar-1948, Schubart col., FIOC; 1F#, Ypiranga, Lange de Morretes, 12-Oct-1936, FIOC; 8 specimens, **SC**, Corupa, Dec-1951, Maller col., MNRJ; 1M#, Corupá, Dec-1953, A. Mallor col., MCNZ; 1M#, Itapiranga, 1954, MCNZ; 1 specimen, Seara, Nova Teutonia, 01-Sep-1994, Plaumann col., MNRJ; 1F#, **RS**, Cachoeirinha, 14-Jan-1981, H.A. Gastal col., MCNZ.

Distribution: Guatemala, Costa Rica, Panama, Ecuador, Brazil (MG, ES, RJ, SP, PR, SC, RS new rec.).

Remarks: *C. teter* presents a combination of morphological characteristics that makes it recognizable among the others species of the subgenus, the rounded outline of the head without the projections of *C. emarginatus*, the number of setigerous punctures of pronotal lateral submargin (16–18) and on the costa (5–7) (Fig 1F) and the labium apex reaching posterior coxae. First record for Ecuador in Froeschner (1981).

***Dallasiellus (Dallasiellus) alutaceus* Froeschner**

(Figs. 3A, 4)

Dallasiellus (Dallasiellus) alutaceus Froeschner, 1960: 598.

Material examined: 1M#, **MG**, Viçosa, 20-Jan-1985, M.C. Picanço col., UFRG; 1M#, Viçosa, 26-May-1985, M.C. Picanço col., UFRG; 1F#, **MS**, Camapua, Dec-1967, F. Silverbauer col., MCNZ; 1M#, **SP**, Pradópolis, 01-Oct-1976, P.M.S. Botelho col., MCNZ; 1 specimen, **SC**, Corupá, 1953, MNRJ; 7M#, **RS**, Cachoeirinha, 22-Nov-1980, H.A. Gastal col., MCNZ; 11M# 9F#, Cachoeirinha, 22-Nov-1980, M.H. Galileo col., MCNZ; 3F#, Cachoeirinha, 04-Dec-1980, M.E.L. de Souza col.,

MCNZ; 3F#, Cachoeirinha, 10 to 22-Dec-1980, M.H. Galileo col., MCNZ; 1F#, Canoas, 01-Jul-1962, MCNZ; 1F#, Guaíba, 08-Jan-1974, M.H. Galileo col., MCNZ; 1M#, Porto Alegre, Jun-1963, MCNZ; 3F#, Porto Alegre, 16-Nov-1973, Cesar Trois col., MCNZ; 30F#, Porto Alegre, Vila Asunção, 27-Feb-1965, L. Buckup col., MCNZ;1F#, Salto do Jacuí, Horto da CEEE, 17 to 21-Jan-2000, A. Franceschini col., MCNZ; 2F#, Santa Maria, 30-Sep-1970, MCNZ; 2M#, Santa Maria, 22-Dec-1972, D. Link col., MCNZ; 51M# 134F#, Santa Maria, 17-Dec-1971, D. Link col., MCNZ.

Distribution: Colombia, Brazil (MG, RJ, MS new rec., SP new rec., SC, RS), Bolivia.

Remarks: The specific name was propsed based on the leathery appearance of the corium (Fig 3A). That characteristic and the apex of the labium not surpassing the middle coxae may separate this species from others similar. First record for RS in Brazil in Link (2003).

***Dallasiellus (Dallasiellus) bacchinus* Froeschner**

(Figs. 3B, 4)

Dallasiellus (Dallasiellus) bacchinus Froeschner, 1960: 599.

Material examined: 7F#, **MG**, Sapucaí Mirim, 1992, Ferrarezzi M. col., UFRG.

Distribution: Mexico, Panama, Brazil new rec. (MG).

Remarks: Among the species of the subgenus which body length is less than 7.5 mm, this one reaches between 6.5 and 7.2 mm length and presents as diagnostic features, a cup-like impression in the apex of the head, clypeus elevated apically and three secondary submarginal setigerous punctures on the mandibular plate.

***Dallasiellus (Dallasiellus) dilatipes* Froeschner**

(Figs. 3C, 4)

Dallasiellus (Dallasiellus) dilatipes Froeschner, 1960: 602.

Material examined: 1M#, **SP**, Itapetininga, UPD APTA, 17-Dec-2011, CF Schwertner col., UNIFESP; 1M#, São Bernardo do Campo, Acamp. dos Eng., 10 to 17-Mar-2011, UC Entomologia 2011 col., UNIFESP.

Distribution: Brazil (SP new rec., SC).

Remarks: Only the male form is known and can be recognized by the polished corium (Fig 3C) and the expanded anterior tibia along with the polished band transversally placed at the mesopleural evaporatorium.

***Dallasiellus (Dallasiellus) horvathi* Froeschner**

(Figs. 3D, 4)

Dallasiellus (Dallasiellus) horvathi Froeschner, 1960: 606.

Material examined: 1M#, **SP**, Boracéia, 28 to 29-Jan-2011, Genevcius e Schwertner col., UNIFESP; 1F#, **PR**, Irati, 01-Oct-1961, MNRJ; 1F#, **RS**, Porto Alegre, 04-May-1974, Cesar Trois col., MCNZ; 4F#, Porto Alegre, 25-Feb to 07-Mar-1980, M.H. Galileo col., MCNZ; 1F#, Salto do Jacuí, Horto da CEEE, 17 to 21-Jan-00, A. Franceschini col., MCNZ; 2F#, Triunfo, COPESUL, 26-Sep to 23-Oct-2001, R. Otto col., MCNZ; 2F#, Viamão, 03-Feb to 22-Mar-1980, M.H. Galileo col., MCNZ.

Distribution: Costa Rica, Brazil new rec. (SP, PR, RS), Peru.

Remarks: *D. horvathi* presents scarce punctures on the pronotum disk and the posterior pronotal lobe impunctate which helps with its identification (Fig 3D).

***Dallasiellus (Dallasiellus) interruptus* Froeschner**

(Figs. 3E, 4)

Dallasiellus (Dallasiellus) interruptus Froeschner, 1960: 608.

Material examined: 2M#, **PA**, Mocajuba, Mangabeira, Dec-1952, O.M. Rego col., MCNZ.

Distribution: Brazil (PA), Argentina.

Remarks: The specific epithet refers to the polished band that interrupts transversally near the posterior margin of the mesopleural evaporatorium; differs from *D. dilatipes* by the anterior tibia not expanded.

***Dallasiellus (Dallasiellus) leurus* Froeschner**

(Fig. 5)

Dallasiellus (Dallasiellus) leurus Froeschner, 1975: 109.

Distribution: Brazil (SP).

Remarks: This species is probably associated with ant nests (Froeschner 1975) and is only known from the type specimens, 1 male and 1 female, deposited in the entomological collection of IBSP, labeled: **SP**, Barueri, 19-Mar-1967, K. Lenko col.

***Dallasiellus (Dallasiellus) levipennis* (Signoret)**

(Figs. 3F, 5)

Geotomus levipennis Signoret, 1883: 35.

Geocnethus prosternalis Horváth, 1919: 246, syn. by Froeschner, 1960.

Dallasiellus (Dallasiellus) levipennis: Froeschner, 1960: 609.

Material examined: 1 specimen, **PA**, Mocajuba, Mangabeira, 1953, Rego col., MNRJ; 1F#, Mocajuba, Mangabeira, Feb-1953, O.M. Rego col., MCNZ; 1 specimen, **AM**, Manaus, Aug-1955, Elias col., MNRJ; 1M#, **ES**, Santa Teresa, Parque Municipal São Lourenço, 15-Mar-2008, Carvalho col., MNRJ; 1F#, **RJ**, Jacarepaguá, "D. Federal", 12-Mar-1952, O.M. Rego col., MCNZ; 2 specimens, Rio de Janeiro, Corcovado, 25-Nov-1952, Zajciw col., MNRJ.

Distribution: Panama, Venezuela, Ecuador, Brazil (PA new rec., AM, MT, MG, ES new rec., RJ new rec., SP).

Remarks: According to Froeschner (1960) this species shows important morphological variations on its characteristics; however the body length (9.6–12 mm), the mesopleural evaporatorium not interrupted by a polished band (pseudoperitreme) and the prosternal carinae higher than labial II may separate it of the remaining species of the subgenus. First record for SP in Brazil in Grazia & Schwertner (2011).

***Dallasiellus (Dallasiellus) longulus* (Dallas)**

(Figs. 5, 6A)

Aethus longulus Dallas, 1851: 119; Walker, 1867: 152; Stål, 1876: 26.

Stenocoris longulus: Signoret, 1880: xliv; 1882: 242; Distant, 1880: 5; Uhler, 1886: 3; Lethierry & Severin, 1893: 69.

Dallasia longulus: Bergroth, 1891: 235.

Dallasiellus longulus: Berg, 1901: 281.

Dallasiellus (Dallasiellus) longulus: Froeschner, 1960: 611.

Material examined: 3M# 4F#, **MG**, Sete Lagoas, 04-Nov-1998, J.M Waquil col., UFRG; 2F#, **MS**, Corumbá, Nhecolândia, 17-Oct-1953, C.R. Gonçalves col., MCNZ; 1M#, **SP**, Mogi-Mirim, ca. 9 km W, 02-Feb-2009, MCNZ; 2F#, Pradópolis, Oct-1976, P.M.S. Botelho col., MCNZ; 2M#, **RS**, Cachoeirinha, 22-Nov to 11-Dec-1980, H.A. Gastal col., MCNZ; 1M#, Cachoeirinha, 22-Nov-1980, M.H. Galileo col., MCNZ; 1M#, Guaíba, 08-Jan-1974, M.H. Galileo col., MCNZ; 1F#, Santa Maria, 22-Dec-1972, D. Link col., MCNZ.

Distribution: Ecuador, Brazil (PA, MG new rec., MS new rec., SP new rec., RS), Bolivia, Paraguay.

Remarks: The labium length which surpasses the posterior coxae, gives the name to this species. First record for RS in Brazil in Link (2003) and for Ecuador in Froeschner (1981).

***Dallasiellus (Dallasiellus) lugubris* (Stål)**

(Figs. 5, 6B)

Aethus lugubris Stål, 1860: 13.

Geotomus obscurus Signoret, 1883: 39, syn. by Froeschner, 1960.

Geotomus nigrocinctus Signoret, 1883: 40, syn. by Froeschner, 1960.

Geotomus semilevis Signoret, 1883: 44, syn. by Froeschner, 1960.

Geotomus pangaeoides Signoret, 1883: 45, syn. by Froeschner, 1960.

Geocnethus reversus Barber and Bruner, 1932: 237, syn. by Froeschner, 1960.

Dallasiellus (Dallasiellus) lugubris: Froeschner, 1960: 613.

Material examined: 2 specimens, **PA**, Prainha, 06-Jan-1920, Mendes col., MNRJ; 1M# 1F#, **MT**, Rosario Oeste, 01-Nov-1963, Alvarenga col., MNRJ; 1 specimen, **RO**, Boa Vista, Alvarenga col., MNRJ; 3 specimens, **MG**, Carmo do Rio Claro, Sep-1947, Carvalho col., MNRJ; 2 specimens, **ES**, Linhares, Parque Sooretama, 17-Oct-1958, Sajciw col., MNRJ; 1F#, **RJ**, Flamengo, "D. Federal", 15-Apr-1955, A. Silva col., MCNZ; 1F#, Flamengo, "D. Federal", 12-Feb-1957, C. Seabra col., MCNZ; 1 specimen, Itatiaia, Nov-1950, Travassos col., MNRJ; 3 specimens, Rio de Janeiro, Corcovado, 01-Oct-1947, Alvarenga col., MNRJ; 1 specimen, Rio de Janeiro, Floresta da Tijuca, 1950, Alvarenga col., MNRJ; 1F#, **SP**, Ibitinga, Seringueira, 29-Nov-1989, AM de Faria col., UNIFESP; 1M# 2F#, Ibitinga, Seringueira, 13-Dec-1989, AM de Faria col., UNIFESP; 28M# 20F#, Mogi-Mirim, ca. 9 km W, 02-Feb-2009, MCNZ; 1M#, São Sebastião, Praia de Juquehy, 01-Feb-1992, F. Silveira col., UFRG; 1F#, **RS**, Derrubadas, Campus UnB, 25-Nov-1965, MCNZ; 1F#, Viamão, 13-Apr-1983, C.J. Becker col., MCNZ.

Distribution: EUA, Mexico, Puerto Rico, Guatemala, Nicaragua, Costa Rica, Panama, Ecuador, Brazil (PA, MT, RO new rec., MG new rec., ES new rec., RJ, SP, RS new rec.), Bolivia, Argentina.

Remarks: Among the species of the subgenus of small size (less than 6 mm), despite the great variation on its external features and the wide geographic range, the two or more secondary submarginal close-set setigerous punctures in front of eye seems to be useful to identify *D. lugubris*. First record for SP in Brazil in Grazia & Schwertner (2011) and for Ecuador in Froeschner (1981).

***Dallasiellus (Dallasiellus) orchidiphilus* Froeschner**

(Figs. 5, 6C)

Dallasiellus (Dallasiellus) orchidiphilus Froeschner, 1960: 618.

Material examined: 1F#, **RJ**, Guaratiba, "D. Federal", 21-Sep-1941, A. Silva col., MCNZ; 1F#, Jacarepaguá, "D. Federal", 18-Mar-1952, O.M. Rego col., MCNZ.

Distribution: Panama, Colombia, Brazil new rec (RJ).

Remarks: The specific name refers to numerous collections of specimens in orchids.

***Dallasiellus (Dallasiellus) ovalis* Froeschner**

Dallasiellus (Dallasiellus) ovalis Froeschner, 1960: 620.

Distribution: Brazil (SC).

Remarks: Species only known from the type specimens: a female holotype and two female paratypes, deposited in the collection of J.C. Lutz in Philadelphia.

***Dallasiellus (Dallasiellus) planicollis* (Horvath)**

(Figs. 6D, 7)

Geocnethus planicollis Horváth, 1919: 247.

Dallasiellus (Dallasiellus) planicollis; Froeschner, 1960: 621.

Material examined: 1F#, **AP**, Porto Platón, 18-May-1983, J.I. Lacerda col., UFRG; 1F#, **RJ**, Rio de Janeiro, Floresta da Tijuca, 1958, Alvarenga col., MNRJ.

Distribution: Brazil (AP new rec., RJ)

Remarks: This species is characterized among other members of the subgenus for the numerous and coarse punctures in the scutellum (Fig. 6D).

***Dallasiellus (Dallasiellus) puncticeps* Froeschner**

(Figs. 6E, 7)

Dallasiellus (Dallasiellus) puncticeps Froeschner, 1960: 622.

Material examined: 1M#, **RJ**, Rio de Janeiro, ″H. Forestal, D. Federal″, 1952, J. Simoes col., MCNZ.

Distribution: Brazil (ES, RJ new rec.).

Remarks: The coarse punctures covering the mandibular plates, pronotum and scutellum (Fig. 6E) allows to distinguish this species in the subgenus except for *D. solitaria* which has the bucculae termination evanescent while *D. punticeps* has it abrupt.

***Dallasiellus (Dallasiellus) solitaria* (Horvath)**

(Figs. 6F, 7)

Colobophrys solitaria Horvath, 1919: 244.

Dallasiellus (Dallasiellus) solitaria: Froeschner, 1960: 624.

Material examined: 1 specimen, **AP**, Santana, Porto Santana, Feb-1951, Carvalho col., MNRJ; 1 specimen, **MT**, Cáceres, 02-Dec-1958, Alvarenga col., MNRJ; 1 specimen, **RJ**, Jacarepaguá, MNRJ; 2 specimens, Petrópolis, Alto Mosela, 24-Jun-1956, D'Albuquerque col., MNRJ.

Distribution: Peru, Brazil new rec. (AP, MT, RJ).

Remarks: See remarks in *D. puncticeps.*

***Dallasiellus (Dallasiellus) viduus* (Stål)**

(Fig. 8A)

Aethus viduus Stål, 1860: 13; Walker, 1867: 153.

Macroscytus viduus: Stål, 1876: 19.

Geotomus viduus: Signoret, 1883: 45; Lethierry & Severin, 1893: 74.

Dallasiellus (Dallasiellus) viduus: Froeschner, 1960: 627.

Material examined: 1F#, Brasil, "Trapicheiro", 26-Sep-1960, MNRJ.

Distribution: Brazil (MG, DF, RJ).

Remarks: The lack of punctures in the scutellar disc (Fig. 8A) is a remarkable characteristic and allows unambiguously identification of this species.

***Dallasiellus (Ecarinoceps) americanus* (Stål)**

(Figs. 7, 8B)

Aethus americanus Stål, 1860: 12; Walker, 1867: 152.

Macroscytus americanus: Stål, 1876: 19.

Geotomus americanus: Signoret, 1883: 34; Lethierry & Severin, 1893: 72.

Dallasiellus (Ecarinoceps) americanus: Froeschner, 1960: 585.

Material examined: 1 specimen, **PA**, Prainha, 06-Jan-1920, Mendes col., MNRJ; 1 specimen, **RJ**, Petrópolis, Alto Mosela, 23-Feb-1956, D'Albuquerque col., MNRJ; 4 specimens, Petrópolis, Alto Mosela, 01-Mar-1957, MNRJ; 1F#, **SP**, Luiz Antonio, 13-Aug-2008, Perioto N col., UNIFESP; 1F#, **RS**, Cachoeirinha, 09-Feb-1981, M.H. Galileo col., MCNZ; 1F#, Itaúba, 06-Apr-1978, E.H. Buckup col., MCNZ; 1F#, Porto Alegre, 30-Oct-1973, Cesar Trois col., MCNZ.

Distribution: Brazil (PA new rec., RJ, SP new rec., SC, RS new rec.).

Remarks: The two species of the subgenus that present the evaporatorium not attaining the mesopleural lateral margin; can be differentiated for the number of secondary setigerous punctures on the submargin of mandibular plates along with the mesocorium surface, which is almost impunctate in *D. americanus* (Fig. 8B) with only one primary setae close to the eye, while in *D. foratus* is coarsely punctate and presents three secondary submarginal setigerous punctures on each mandibular plate.

***Dallasiellus (Ecarinoceps) foratus* (Signoret)**

Geotomus foratus Signoret, 1883: 38; Lethierry & Severin, 1893: 72.

Dallasiellus (Ecarinoceps) foratus: Froeschner, 1960: 587.

Distribution: "Amazones".

Remarks: See remarks in *D. americanus.* Species only known from the type specimen deposited in the British Museum.

***Dallasiellus (Ecarinoceps) longirostris* Froeschner**

Dallasiellus (Ecarinoceps) longirostris Froeschner, 1960: 591.

Distribution: Brazil (AM).

Remarks: Species only known from the male holotype collected in Manaus, deposited in the collection of J.C. Carvalho in Rio de Janeiro.

***Dallasiellus (Ecarinoceps) megalocephalus* Froeschner**

(Figs. 7, 8C)

Dallasiellus (Ecarinoceps) megalocephalus Froeschner, 1960: 592.

Material examined: 1F#, **AP**, Porto Platón, 18-May-1983, J.I. Lacerda col., UFRG; 1F#, **RO**, Porto Velho, Rio Madeira, Dirings col., MCNZ; 1F#, **RS**, Frederico Westphalen, 17-Oct-2005, Massolino & Mansur col., UFRG.

Distribution: Panama, British Guiana, Brazil (AP new rec., AM, MT, RO new rec., RS new rec.).

Remarks: This species has a large head, broader than half the width of the pronotum (Fig. 8C), characteristic unique among the subfamily.

***Ectinopus holomelas* (Burmeister)**

(Figs. 9A, 10)

Cydnus holomelas Burmeister, 1835: 375.

Ectinopus holomelas: Dallas, 1851: 122; Stål, 1862: 96; 1876: 20; Walker, 1867: 164; Distant, 1880: 8; Signoret, 1881: 320; Uhler, 1886: 3; Lethierry & Severin, 1893: 64; Froeschner, 1960: 412.

Aethus fusiformis Walker, 1867: 150, syn. by Distant, 1880.

Pangaeus ? fusiformis: Uhler, 1877: 389.

Ectinopus opacus Distant, 1900: 688, syn. by Froeschner, 1960.

Material examined: 1 specimen, **RJ**, Rio de Janeiro, Corcovado, MNRJ.

Distribution: Mexico, Costa Rica, Nicaragua, Panama, Colombia, Brazil (PA, RJ, new rec.), Bolivia.

Remarks: The lack of abundant, coarse punctures on the impressed line and on the lateral surface of the pronotum, head and scutellum (Fig. 9A) separates this species from *E. rugoscutum* (Fig. 9B).

***Ectinopus rugoscutum* Signoret**

(Figs. 9B, 10)

Ectinopus rugoscutum Signoret, 1881: 319; Lethierry & Severin, 1893: 64; Froeschner, 1960: 414.

Material examined: 1 specimen, **AM**, 1945, Patro col., MNRJ; 1M# 1F#, Rio Negro, Barcellos, 28-Jul-1927, Zikán col., FIOC; 1 specimen, Tefé, Thayer Exp., 1865 to 1866, MNRJ; 10M# 5F#, **PA**, Mocajuba, Mangabeira, Apr-1953, O.M. Rego col., MCNZ; 67 specimens, Mocajuba, Mangabeira, Jun-1953, Rego col., MNRJ; 3F#, Óbidos, 1955, F.M. Oliveira col., MCNZ; 8 specimens, 1955, Oliveira col., MNRJ; 1 specimen, Óbidos, Colônia Rio Branco, May-1953, Brazilino col., MNRJ.

Distribution: Brazil (PA, AM) (Fig 8), Peru, Bolivia.

Remarks: See remarks in *E. holomelas.*

***Melanaethus spinolae* (Signoret)**

(Figs. 9C, 10)

Aethus spinolae Signoret, 1863: 545; Walker, 1867: 152; Stål, 1876: 27.

Melanaethus spinolae: Uhler, 1877: 392*;* Froeschner, 1960: 449.

Geotomus (Cydnus) spinolai: Signoret, 1883: 209.

Geotomus spinolai: Uhler, 1886: 3; Lethierry & Severin, 1893: 74; Barber & Bruner, 1932: 238.

Geotomus minusculus Jensen-Haarup, 1926: 50, syn. by Froeschner, 1960.

Material examined: 1F#, **RR**, Uraricoera, Ilha de Maracá, 22 to 25-Mar-1987, M.H. Galileo col., MCNZ; 2M#, **MA**, São Luis, 17-Jul-1984, A. Brisolla col., UNIFESP; 4M#, 24-Jul-1984, A. Brisolla col., UNIFESP; 1F#, **RJ**, Guaratiba, 02-Oct-1953, Aristoteles Silva col., MCNZ; 1M#, Pinheiral, Esc Sup de Agric. Pinheiro. E do Rio, MCNZ; 1 specimen, **MS**, Campo Grande, 1946, Carvalho col., MNRJ; 1F#, **SP**, Ibitinga, Seringueira 3005-ALII, 29-Nov-1989, AM de Faria col., UNIFESP; 4F#, Mogi-Mirim, ca. 9 km W, 02-Feb-2009, MCNZ; 7F#, **RS**, Cachoeirinha, 22-Dec-1980, M.E.L. de Souza col., MCNZ.

Distribution: Dominican Republic, Puerto Rico, Panama, British Guiana, Brazil (RR new rec., MA new rec., MT, ES, RJ, MS new rec., SP, RS new rec.), Paraguay, Argentina, Chile.

Remarks: *M. spinolae* is the only one species of the genus present in Brazil, characterized by the thick margin of the head without secondary setae and with two primary hair-like setae. First record for Puerto Rico in Froeschner & Maldonado-Capriles (1992).

***Onalips bisinuatus* Froeschner**

(Figs. 9D, 10)

Onalips bisinuatus Froeschner, 1960: 417.

Material examined: 1F#, **PA**, Santarém, Taperinha, 01-Apr-2016, Hagmann col., MNRJ.

Distribution: Brazil (PA).

Remarks: This species can be recognized among others in the genera by the smooth, impunctate surface of the pronotal and scutellar disc (Fig. 9D) plus the numerous coarse punctures at the sides of the sixth sternite.

***Onalips completus* Froeschner**

(Figs. 9E, 10)

Onalips completus Froeschner, 1960: 418.

Material examined: 1 specimen, **PI**, Teresina, 1953, Oliveira col., MNRJ; 1F#, **GO**, Aragarças, 14-Oct-1959, Alvarenga col., MNRJ.

Distribution: Brazil (MT, PI, GO), Bolivia, Paraguay, Argentina.

Remarks: *O. completus* differs from *O. bisinuatus* for the lack of lateral punctures on the sixth sternite.

***Pangaeus (Pangaeus) docilis* (Walker)**

(Figs. 11A, 12)

Aethus docilis Walker, 1867: 154.

Pangoeus [!] dallasi Signoret, 1882: 263, syn. by Froeschner, 1960.

Pangaeus dallasi: Lethierry & Severin, 1893: 69.

Pangaeus docilis: Distant, 1899: 221.

Pangaeus (Pangaeus) docilis: Froeschner, 1960: 484.

Material examined: 1M#, **AM**, Marabitanas, 01-Jan-1949, Carvalho col., MNRJ; 1M#, **RJ**, Estrada RJ-SP Km 47, 28-Oct-1947, Zikán col., MNRJ.

Distribution: Guatemala, Panama, Venezuela, Colombia, Ecuador, Brazil (AM, MT, RJ, SC), Peru.

Remarks: Along with *P. serripes*, *P. docilis* presents a ventral, subbasal angulation on the posterior tibia but the first one show two setigerous punctures on the costal margin (Fig. 11F) while *P. docilis* shows just one (Fig. 11A).

***Pangaeus (Pangaeus) laevigatus* Signoret**

Pangoeus [!] laevigatus Signoret, 1882: 250.

Pangoeus [!] stali Signoret, 1882: 256, syn. by Froeschner, 1960.

Pangoeus [!] buchanani Signoret, 1882: 260, syn. by Froeschner, 1960.

Pangaeus laevigatus: Lethierry & Severin, 1893: 69.

Pangaeus buchanani: Lethierry & Severin, 1893: 69.

Pangaeus stali: Lethierry & Severin, 1893: 70.

Pangaeus (Pangaeus) laevigatus; Froeschner, 1960: 487.

Distribution: Brazil.

Remarks: Species known only from the male holotype of *P. laevigatus* and the female holotype of *P. stali*, deposited in the NHMW.

***Pangaeus (Pangaeus) moestus* (Stål)**

(Figs. 11B, 12)

Aethus moestus Stål, 1860:13; Walker & Gray 1867: 153.

Pangaeus moestus: Stål, 1876: 19; Lethierry & Severin, 1893: 70.

Pangoeus [!] maestus [!]: Signoret, 1882: 257.

Pangaeus (Pangaeus) moestus: Froeschner, 1960: 489.

Material examined: 1M#, **PA**, Belém do Pará, 31-Jul-1961, MCNZ; 1M#, **MA**, São Luis, BA17-1923, 19-Jun-1984, A. Brisolla col., UNIFESP.

Distribution: Brazil (PA new rec., MA new rec., RJ).

Remarks: Like some other species of the subgenus, this one is recognized by the combination of morphological characteristics that is constant on male individuals as the three primary setigerous punctures on each mandibular plate and two on the costal margin plus the polished corium (Fig. 11B).

***Pangaeus (Pangaeus) neogeus* Froeschner**

(Figs. 11C, 12)

Pangaeus (Pangaeus) neogeus Froeschner, 1960: 491.

Material examined: 1M#, **MT**, Rio Paraná, "Riacho do Herv.", 01-Dec-1952, Dirings col., MCNZ; 1M#, **MG**, Sapucaí Mirim, Jan-1992, Ferrarezzi M. col., UFRG; 1M#, **RJ**, Niterói, Jan-1993, Tato

col., MNRJ; 1M#, **SP**, Barra Bonita, 1978, D. Botelho col., MCNZ; 1M#, Indiana, Dirings col., MCNZ; 44M# 21F#, Mogi-Mirim, ca. 9 km W, 02-Feb-2009, MCNZ; 1M#, Pradópolis, Oct-1976, D. Botelho col., MCNZ; 1 M#, **SC**, Corupá, Nov-1953, Meller col., MNRJ; 1M#, Itapiranga, Sep-1953, MCNZ; 1M#, Porto Belo, Bombas, 02-Jan-1993, Fernandes J.A.M. col., UFRG; 2F#, **RS**, Cachoeirinha, 22-Dec-1980, M.H. Galileo col., MCNZ; 2M#, Itaúba, 06 to 11-Apr-1978, C.J. Becker col., MCNZ; 2M#, Porto Alegre, Ipanema, Oct-1956, M. Palova col., MCNZ; 24M# 33F#, Porto Alegre, Parque Farroupilha, 23 to 30-Oct-1985, L. Diefenbach col., UFRG; 1M#, Porto Alegre, Rio Branco, Feb-1955, L. Buckup col., MCNZ; 5M#, Santa Maria, 21-Jan-1972, D. Link col., MCNZ.

Distribution: Brazil (MT new rec., MG new rec., RJ new rec., SP new rec., SC, RS), Paraguay.

Remarks: *P. neogeus* presents similar features of *P. moestus* but with the corium alutaceus (Fig. 11C).

***Pangaeus (Pangaeus) piceatus* Stal**

(Figs. 11D, 12)

Pangaeus piceatus Stål, 1862: 96; 1876: 19; Uhler, 1877: 388; 1886: 3; Distant, 1880: 6; 1899: 221; Lethierry & Severin, 1893: 70; Banks, 1910: 101; Van Duzee, 1917: 21; Barber & Bruner, 1932: 237; Torre Bueno, 1939: 180;

Aethus piceatus: Walker, 1867: 150.

Aethus tenuis Walker, 1867: 151, syn. by Froeschner, 1960.

Aethus parilis Walker, 1867: 153, syn. by Froeschner, 1960.

Aethus nitidulus Walker, 1867: 154, syn. by Lethierry & Severin, 1893.

Pangaeus ? tenuis: Uhler, 1877: 390.

Pangoeus [!] sallei Signoret, 1882: 262, syn. by Froeschner, 1960.

Pangoeus [!] piceatus: Signoret, 1882: 262.

Pangoeus [!] petersi Signoret, 1882: 264, syn. by Froeschner, 1960.

Pangoeus [!] minimus Signoret, 1882: 265, syn. by Froeschner, 1960.

Pangaeus minimus: Uhler, 1886: 3; Lethierry & Severin, 1893: 70.

Pangaeus sallei: Uhler, 1886: 3.

Cydnus nitidulus Lethierry & Severin, 1893: 67, syn. by Froeschner, 1960.

Pangaeus petersi: Lethierry & Severin, 1893: 70.

Pangaeus tenuis: Lethierry & Severin, 1893: 70.

Pangaeus parilis: Lethierry & Severin, 1893: 81.

Pangaeus (Pangaeus) piceatus: Froeschner, 1960: 492.

Material examined: 1M#, **AP**, Porto Platón, 05-Aug-1971, MCNZ; 2M#, **RJ**, Rio de Janeiro, Corcovado, Sep-1958, Alvarenga col., MNRJ; 2 specimens, **SP**, Sumaré, Jul-1960, MNRJ.

Distribution: Mexico, Puerto Rico, Guatemala, Costa Rica, Nicaragua, Colombia, Brazil (AP new rec., PA, RJ new rec., SP new rec.), Peru.

Remarks: As in *P. moestus* the female forms are not easily recognizable, the male form presents three primary setigerous punctures on each mandibular plate and just one on the costal margin (Fig. 11D). This combination of characters is not unique in the subgenus, but it is for the species reported in Brazil.

***Pangaeus (Pangaeus) rubrifemur* (Walker)**

(Figs. 11E, 13)

Aethus rubrifemur Walker, 1867: 153.

Aethus rubrifemur: Lethierry & Severin, 1893: 81.

Pangaeus (Pangaeus) rubrifemur: Froeschner, 1960: 492.

Material examined: 1 specimen, **PA**, Mocajuba, Mangabeira, Feb-1953, Rego col., MNRJ; 14M# 11F#, **BA**, Ituaçu, Gruta da Mangabeira, 21-Dec-1983, E.P. Gouvea col., UFRG; 1F#, **GO**, Formosa, Jul-1960, MNRJ; 2F#, **MG**, Viçosa, 06-Jun-1985, A.C. Picanço col., UFRG; 2F#, Viçosa, 04-Aug-1985, A.C. Picanço col., UFRG; 1 specimen, **RJ**, Maricá, May-1954, Figueiredo col., MNRJ; 1 specimen, Rio de Janeiro, Corcovado, 23-Nov-1952, Zajciw col., MNRJ; 1M#, **SP**, São Paulo, rua Maestro Cardim, 987. Capital, Dirings col., MCNZ; 2M#, **RS**, Marcelino Ramos col., MCNZ.

Distribution: Brazil (PA new rec., BA new rec., GO new rec., MG new rec., RJ, SP new rec., RS new rec.), Paraguay.

Remarks: The four secondary setigerous punctures on the submargin of mandibular plate and the only one on the costa (Fig. 11E), allows the recognition of this species among others in the subgenus.

***Pangaeus (Pangaeus) rugonotum* Froeschner**

Pangaeus (Pangaeus) rugonotum Froeschner, 1960: 501.

Distribution: Brazil (MT).

Remarks: Species known only from the type specimens: the female holotype and one female paratype, deposited in the Smithsonian museum of natural history.

***Pangaeus (Pangaeus) serripes* (Westwood)**

(Figs. 11F, 13)

Cimex aethiops Fabricius, 1787: 296.

Cydnus aethiops: Fabricius, 1803: 186.

Cydnus serripes Westwood, 1837: 19, syn. by Froeschner, 1960.

Aethus ? aethiops: Walker, 1868: 534.

Pangaeus aethiops: Stål, 1868: 7.

Cydnus serripes: Stål, 1876: 26.

Aethus margo Dallas, 1851: 116; Walker, 1867: 151, syn. by Froeschner, 1960.

Pangaeus margo: Stål, 1862: 95; 1876: 19; Uhler, 1877: 387; Distant, 1880: 5; Lethierry & Severin, 1893: 70; Banks, 1910: 100; Van Duzee, 1917: 20; Torre Bueno, 1939: 180.

Pangoeus [!] confusus Signoret, 1881: 642; 1882: 249, syn. by Froeschner, 1960.

Pangoeus [!] serripes: Signoret, 1882: 247.

Pangoeus [!] margo: Signoret, 1882: 248.

Pangaeus serripes: Uhler, 1886: 3; Lethierry & Severin, 1893: 70; Rider, 1998: 449.

Pangaeus confusus: Uhler, 1886: 3.

Pangaeus (Pangaeus) aethiops: Froeschner, 1960: 504.

Pangaeus (Pangaeus) serripes: Marco & Coscarón, 2011: 61.

Material examined: 3 specimens, **PA**, Mocajuba, Mangabeira, 10 to 20-Jan-1953, Rego col., MNRJ; 1M# 1F#, **MA**, São Luis, 26-Jun-1984, A. Brisolla col., UNIFESP; 2F#, São Luis, AL08-19971, 13-Jun-1984, A. Brisolla col., UNIFESP; 1 specimen, **RN**, Natal, Feb-1950, Alvarenga col., MNRJ; 1M# 13F#, **MG**, Sapucaí Mirim, Jan-1992, Ferrarezzi M. col., UFRG; 1 specimen, **ES**, Linhares, Parque Sooretama, 05-Feb-1959, Zajciw col., MNRJ; 3 specimens, **RJ**, Grajaú, Apr-1946, Carvalho col., MNRJ; 1 specimen, Rio de Janeiro, Quinta Boa Vista, 18-Jan-18, Gomes col., MNRJ; 1 specimen, Teresópolis, Serra dos Órgãos, Nov-1940, Parko col., MNRJ; 2F#, **SP**, Barra Bonita, Jan-1978, D. Botelho col., MCNZ; 1 specimen, Barueri, 20-Oct-1954, Lenko col., MNRJ; 1M#, Ibitinga, Seringueira, 23-Sep-1988, AM de Faria col., UNIFESP; 3F#, Ibitinga, Seringueira, 24-Nov-1989, AM de Faria col., UNIFESP; 3F#, Ibitinga, Seringueira, 29-Nov-1989, AM de Faria col., UNIFESP; 1M#, Ribeirão Preto, 01-Nov-1992, AM de Faria col., UNIFESP; 1F#, Ribeirão Preto, Zona urbana, 25-Feb-1996, AM de Faria col., UNIFESP; 2F#, São Paulo, rua Maestro Cardim, 987. Capital, Dirings col., MCNZ; 16F#, **RS**, Cachoeirinha, 22-Dec-1980, M.H. Galileo col., MCNZ; 1F#, Itaúba, 07-Apr-1978, Bischoff col., MCNZ; 3M# 16F#, Porto Alegre, 16-Nov to 21-Dec-1973, Cesar Trois col., MCNZ; 1F#, Porto Alegre, 25-Jan-1994, Campos L.A. col., UFRG; 2F#, Porto Alegre, Jan-1995, Fernandes J.A.M. col., UFRG; 2M# 117F#, Porto Alegre, Ipanema, Oct-1956, M. Palova col., MCNZ; 1F#, Porto Alegre, Morro do Osso, Mar-1998, Fernandes J.A.M. col., UFRG; 1F#, Porto Alegre, Rio Branco, MCNZ; 16F#, Santa Maria, 14-Dec-1971, D. Link col., MCNZ; 3F#, **SC**, Porto Belo, Bombas, 02-Jan-1993, Fernandes J.A.M. col., UFRG.

Distribution: Mexico, Guatemala, Honduras, Trinidad, Granada, Nicaragua, Panama, Venezuela, Colombia, British Guiana, French Guiana, Ecuador, Brazil (PA, AM, MA new rec., RN new rec., PE, MT, MG new rec., ES new rec., RJ, SP, RS), Peru, Bolivia, Paraguay, Uruguay, Argentina.

Remarks: *P.* serripes is a common species widely distributed in Central and South America and although the male can be identified by the medial emargination of the genital capsule, the female is not so easily recognizable. First record for RS in Brazil in Link (2003).

***Pangaeus (Pangaeus) xanthopus* Signoret**

(Fig. 13)

Pangoeus [!] xanthopus Signoret, 1882: 254.

Pangaeus uhleri xanthopus: Lethierry & Severin, 1893: 70.

Pangaeus (Pangaeus) xanthopus: Froeschner, 1960: 481.

Material examined: 3 specimens, **PI**, Teresina, Jan-1953, Oliveira col., MNRJ; 1M#, **BA**, Paulo Afonso, Estação Ecológica do Raso da Catarina, 06-Aug-1982, Smith col., MNRJ; 2 specimens, **MT**, Porto Estrela, 01-Dec-1984, Magno col., MNRJ; 2F#, Rio Paraná, "Riacho do Herv.", Dec-1952, Dirings col., MCNZ; 1F#, **SP**, Balsamo, Seringueira, 27-Oct-1988, EC Bergmann col., UNIFESP; 1F#, Ibitinga, Seringueira, 29-Nov-1989, AM de Faria col., UNIFESP; 4M# 4F#, **RS**, Cachoeirinha, 22-Dec-1980, M.H. Galileo col., MCNZ; 1F#, Porto Alegre, Ipanema, Oct-1956, M. Palova col., MCNZ; 1M# 2F#, Porto Alegre, Vila Assunção, 07-Feb-1965, L. Buckup col., MCNZ; 339M# 439F#, Santa Maria, 14-Dec-1971, D. Link col., MCNZ.

Distribution: Brazil (BA, CE, PI new rec., MT, SP new rec., PR, RS), Bolivia, Paraguay, Argentina.

Remarks: Both male and female presents bicolored tibiae with the basal part lighter than the distal, which makes its identification easy within the genus. First record for RS in Brazil in Link (2003).

***Prolobodes giganteus* (Burmeister)**

(Figs. 14A, 15)

Cydnus giganteus Burmeister, 1835: 375.

Lobostoma giganteus: Amyot & Serville, 1843: 88.

Prolobodes giganteus: Amyot & Serville, 1843: 676; Lethierry & Severin, 1893: 62; Froeschner, 1960: 510.

Lobostoma gigantea: Walker, 1867: 147; Stål, 1876: 18; Distant, 1880: 1.

Lobostoma giganteum: Dallas, 1851: 111; Signoret, 1881: 194.

Material examined: 1 specimen, **PA**, Mocajuba, Mangabeira, Feb-1953, Rego col., MNRJ; 3 specimens, Óbidos, Nov-1953, Brazilino col., MNRJ; 1M#, **AM**, Benjamin Constant, rio Javary, alto Amazonas, 02-Sep-1942, Dirings col., MCNZ; 6 specimens, **PI**, Teresina, 1953, Oliveira col., MNRJ; 1M#, **TO**, Palmas, Serra do Langeado. Fazenda Céu, Nov-1992, UFRG; 1M#, **MT**, Alto Xingú, 01-Dec-1954, Arlé col., MNRJ; 1F#, Rio Paraná, "Riacho do Herv.", Dec-1952, Dirings col., MCNZ; 1M#, **DF**, Brasilia, 18-Oct-1965, M. Becker col., MCNZ; 1F#, Brasilia, 20-Oct-1965, M. Becker col.,

MCNZ; 1 specimen, **SP**, Angatuba, 1922, Marques col., MNRJ; 1M#, Barra Bonita, Oct-1977, P.M.S. Botelho col., MCNZ; 1 specimen, Barueri, 10-Dec-1955, Lenko col., MNRJ; 1F#, Itirapina, Cerrado, 23-Nov-00, Machado col., MNRJ; 1F#, Pradópolis, Oct-1971, P.M.S. Botelho col., MCNZ; 1M#, São Carlos, 14-Oct-1981, K. Zanoe col., MCNZ; 3M#, **SC**, Ipumirim, Feb-1956, MCNZ; 6F#, Itapiranga, Sep-1953, MCNZ; 1M#, **RS**, Barra do Ribeiro, Fazenda Boa Vista, 16-Dec-2003, Equipe Probio col., MCNZ; 1M#, Faxinal do Soturno, 22-Oct-1978, MCNZ; 2F#, Porto Alegre, Museu Anchieta, 1954, MCNZ; 1F#, Santa Maria, 16-Nov-1973, D. Link col., MCNZ; 1F#, Santa Maria, 02-Apr-1975, MCNZ.

Distribution: Brazil (PA new rec., AM new rec., PI new rec., TO new rec., MT, MG, DF new rec., SP, SC new rec., RS), Bolivia, Paraguay.

Remarks: Despite the resemblance to the genus *Cyrtomenus*, the species presents an expansion in the second labial segment which helps to separate morphologically both genera. That structure, according to Froeschner (1960) can brings clues about the feeding habits, but without direct observations cannot be confirmed. The differences among the three species are mainly on the disposition and number of punctures on the pronotum. First record for RS in Brazil in Link (2003).

***Prolobodes gigas* (Signoret)**

(Figs. 14B, 15)

Lobostoma gigas Signoret, 1881: 195.

Prolobodes gigas: Lethierry & Severin, 1893: 62; Froeschner, 1960: 512.

Material examined: 1M#, **PA**, Monte Alegre, Malata, 27-Jan-1949, C.R. Gonçalves col., MCNZ; 1M#, **MG**, Mirabela, Fazenda Baixa, 07-Dec-2006, Silva PAD col., UFRG; **SC**, Itapiranga, Sep-1953, MCNZ.

Distribution: Mexico, Nicaragua, Panama, Colombia, Brazil new rec. (PA, MG, SC).

Remarks: See remarks in *P. giganteus.* First record for Mexico in Mayorga M. (2002).

***Prolobodes reductum* (Amyot & Serville)**

(Figs. 14C, 15)

Lobostoma reductum Amyot & Serville, 1843: 88; Signoret, 1881: 195.

Prolobodes reductus: Amyot & Serville, 1843: 676; Lethierry & Severin, 1893: 62.

Lobostoma reducta: Stål, 1876: 18.

Prolobodes reductum: Froeschner, 1960: 513.

Material examined: 1 specimen, **PA**, Mocajuba, Mangabeira, Jan-1953, Rego col., MNRJ; Mocajuba, Mangabeira, Apr-1953, O.M. Rego col., MCNZ; 1 specimen, Santarém, Taperinha, Hagmann col., MNRJ; 1 specimen, **RN**, Natal, May-1950, Alvarenga col., MNRJ; 1F#, **ES**, Barra de São Francisco,

Córrego do Itá, Nov-1958, Zikán col., MNRJ.

Distribution: Trinidad, British Guiana, French Guiana, Brazil (PA, RN new rec., ES new rec.), Peru, Bolivia, Paraguay.

Remarks: See remarks in *P. giganteus.*

***Tominotus brevis* (Signoret)**

Aethus (Tominotus) brevis Signoret, 1881: 426.

Aelhus neotropicus Jensen-Haarup, 1926: 49, syn. by Froeschner, 1960.

Tominotus brevis: Froeschner, 1960: 547.

Distribution: Venezuela, Colombia, Brazil.

Remarks: This species is easily recognizable by the markedly yellowed tibiae in contrast with the rest of the body reddish–brown; *T. signoreti* shares the broad scutellar apex in comparison with the others Brazilian species of the genus, but not presents conspicuous differences on the body color (Fig. 14F). The specimens collected in Brazil do not bear exact locality.

***Tominotus inconspicuus* Froeschner**

(Figs. 14D, 16)

Tominotus inconspicuus Froeschner, 1960: 562.

Material examined: 1F#, **PA**, Natal, Nov-1953, P. Melocol col., MCNZ; 2M#, **MA**, São Luis, AL11-2104, 07-May-1987, A. Brisolla col., UNIFESP; 2F#, São Luis, AL12-1610, 13-Jun-1984, A. Brisolla col., UNIFESP; 1F#, São Luis, AL33, 15-Jun-1984, A. Brisolla col., UNIFESP; 1F#, **MT**, Salobra, Nov-1941, Com.I.O.C. col., FIOC; 3F#, **MG**, Sapucaí Mirim, Jan-1992, Ferrarezzi M. col., UFRG; 7M# 11F#, Sete Lagoas, 04-Nov-1998, J.M Waquil col., UFRG; 1M#, **SP**, Ibitinga, Seringueira 3021AL, 28-Dec-1988, AM de Faria col., UNIFESP; 1F#, Ibitinga, Seringueira 3021ALII, 29-Nov-1989, AM de Faria col., UNIFESP; 1M#, Ibitinga, Seringueira 3452AL, 22-Mar-1989, AM de Faria col., UNIFESP; 1F#, Ibitinga, Seringueira 5507AL, 13-Dec-1989, AM de Faria col., UNIFESP; 1M#, Itapetininga, UPD APTA, 24-Jan-2012, CF Schwertner col., UNIFESP; 1F#, Pradópolis, Oct-1976, P.M.S. Botelho col., MCNZ; 1F#, São Paulo, 16-Jan-1940, MCNZ; 1M#, **SC**, Itapiranga, Sep-1953, MCNZ; 1F#, **RS**, Cachoeirinha, 22-Dec-1980, H.A. Gastal col., MCNZ; 2F#, Ijuí, 01-Mar-1996, Fernandes J.A.M. col., UFRG; 1F#, Imbé, "Imbè", Feb-1961, L. Buckup col., MCNZ; 18M# 102F#, Santa Maria, 17-Dec-1971, D. Link col., MCNZ; 1F#, São Salvador, 10-Nov-1965, P. Buck col., MCNZ; 1M#, Torres, Nov-1954, MCNZ.

Distribution: Brazil (PA, MA new rec., RN, MT new rec., MG new rec., SP, RS), Argentina.

Remarks: *T. inconspicuous* and *T. laeviculus* are the smallest species of the genus and differs one of the other for the two subapical setigerous punctures on the clypeus that are only present in *T. laeviculus*. First record for SP in Brazil in Grazia & Schwertner (2011) and for RS in Link (2003).

***Tominotus laeviculus* (Berg)**

(Figs. 14E, 16)

Cydnus laeviculus Berg, 1879: 11.

Aethus insularis Signoret, 1882: 37, syn. by Lethierry & Severin, 1893.

Aethus distinctus Signoret, 1882: 37, syn. by Froeschner, 1960.

Cydnus insularis: Lethierry & Severin, 1893: 66.

Tominotus laeviculus: Froeschner, 1960: 564.

Material examined: 1F#, **RJ**, Jacarepaguá, 12-Mar-1952, Rego col., MNRJ; 1M#, **RS**, Itauba, 06-Apr-1978, C.J. Becker col., MCNZ; 1M#, Santa Maria, 20-Oct-1970, D. Link col., MCNZ; 18M# 12F#, Santa Maria, 17-Dec-1971, D. Link col., MCNZ; 2F#, São Salvador, 14-Mar-1965, P. Buck col., MCNZ; 1M#, **SP**, Araçatuba, ″Tomate branca″, 09-May-1985, Beagmann EC col., UNIFESP; 1F#, Ibitinga, Seringueira 2756AL, 28-Dec-1988, AM de Faria col., UNIFESP; 1F#, Itú, Fazenda Cuiabá, 04-Mar-1989, M.H. Galileo col., MCNZ.

Distribution: Brazil (PA, RN, MT, RJ new rec., SP new rec., SC, RS), Uruguay, Argentina.

Remarks: See remarks in *T. inconspicuus.* First record for RS in Brazil in Link (2003).

***Tominotus signoreti* (Mulsant & Rey)**

(Figs. 14F, 16)

Cydnus (Tominotus) signoreti Mulsant & Rey, 1866: 319.

Cyrtomenus constrictus Berg, 1879: 277, syn. by Berg, 1891.

Aethus (Tominotus) constrictus: Signoret, 1881: 427.

Cydnus signoreti: Lethierry & Severin, 1893: 68.

Tominotus signoreti: Froeschner, 1960: 566.

Material examined: 1F#, **RS**, Pinhal, 03-Apr-1965, M. Becker col., MCNZ.

Distribution: Brazil new rec. (RS), Paraguay, Uruguay, Argentina.

Remarks: See remarks in *T. brevis.* According the reported distribution, presence of *T. signoreti* in Southern Brazil was expected.

Tominotus ondulatus Avendaño, new species.

(Figs. 16, 17A-E)

Material examined: Holotype, 1M#, Brazil, **RS**, Cidreira, (Mata de Restinga), 10-Aug-2003, J. Alvenir col., Pitfall, col. MCN178564, MCNZ. The single specimen was collected using pitfall in vegetation of a Brazilian coastal habitat called “Restinga”, no additional information is provided in the labels.

Holotype deposited in the Museu de Ciências Naturais, Fundação Zoobotânica do Rio Grande do Sul, Porto Alegre, Brazil, under registration number 182417.

Diagnosis: Mesopleural evaporatorium interrupted on posterior half by polished darker band (pseudoperitreme), scutellar apex narrowed distinctly less than half as wide as membranal suture, costa with two setigerous punctures, labium surpassing middle coxae and posterior tibia conspicuously sinuous.

The pseudoperitreme, narrowed scutellar apex and the posterior tibia modified suggest that *T. ondulatus* **sp. nov.** is closely related to *T. communis* (Uhler) and *T. curvipes* (Dallas). Features traditionally used by Froeschner (1960) for distinguish species within cydninae, as the number of setigerous punctures on the costa and lateral margins of the pronotum (Fig. 17 A; 18A, D), are different between those species (six to ten, and 20 respectively) and the new species (two and seven); also the lateral margin of metapleural evaporatorium in its anterior half is oblique and in the posterior half is parallel to the lateral area and the apex of the peritreme is almost continuous with the evaporatorium in *T. communis* (Fig. 18B) and *T. curvipes* (Fig. 18C), but in *T. ondulatus* **sp. nov.** the lateral margin of metapleural evaporatorium is oblique to the lateral area in all its length and the apex of the peritreme is abruptly terminated (Fig. 17E).

The pronotal constriction and the shorter labium length in *T. communis* (Fig. 18A, E) separates this species from *T. curvipes* (Fig. 17B, C) and *T. ondulatus* **sp. nov.** (Fig. 18D, F), while the curvature of the hind tibia is restricted to its apical half in *T. communis* (Fig. 18G) and *T. curvipes* (Fig. 18 H), in *T. ondulatus* **sp. nov.** is present in all its length (Fig. 17 B). The geographical distribution of three species also differs: *T. curvipes* and *T. communis* are restricted to Central and southern North America, *T. ondulatus* **sp. nov.** is described here for southern Brazil.

Description. Measurements (in mm). (n= 1), body length 9.29; head length 1.43; head width including eyes 2.31, interocular width 1.49; eye-ocelli distance 0.26; ocellar width 0.13; labium I to IV length 1.03 - 1.32 - 1.18 - 0.91; antennomere I - V length 0.49 - 0.56 - 0.54 - 0.78 - 0.82; pronotum length on midline 2.48; pronotum maximum width 4.80; scutellum length on midline 3.53, scutellum width at the base 3.08; corium maximum length 4.84; posterior femur length 2.86; posterior tibia length 3.98; posterior tarsus length 0.99.

Color. Body and legs dark red-blackish. Eyes red. Antennae and tarsi brown Labium light brown. Hemelytral membrane brownish.

Structural characters. Head: mandibular plates rounded forming a semicircle, sparsely and finely punctured and with a submarginal complete row of secondary hair-like setae of two different lengths and two primary setae on each plate, longer than most of the secondary setae. Clypeus polished, parallel-sided, not surpassing the mandibular plates and with two subapical setigerous punctures. Eyes not elongated, projecting half of their width and with a stout apical setae. Ocelli present, separated from eye by more than ocellar width (Fig. 17A). Bucculae lower than labial segment II. Labium surpasses middle coxae (Fig. 17C).

Thorax: Anterior margin of the pronotum broadly emarginated with a row of small setae, at the sides

of the head insertion, which extends to the lateral margins continuing in a single row of seven longer setae on each side. Anterior pronotal lobe sparsely covered laterally with minute punctures and with two setae at anterior submargin and one on posterior surface, transverse impression marked by a single row of coarse punctures interrupted medially (Fig. 17A), posterior lobe almost impunctate laterally and with a few coarse punctures near mid line of pronotum. Propleuron polished, prosternal carinae about half as high as labial II, truncate posteriorly (Fig. 17C-D). Scutellum with coarse punctures at basal and lateral margins, surface polished with a few coarse punctures, apex narrowed distinctly less than half as wide as membranal suture. Hemelytron with corial areas well defined, mesocorium minutely punctured, two distinct rows of coarse punctures paralleling clavo-corial suture; exocorium distinctly punctured, costa with two setigerous punctures, clavus with two irregular, longitudinal rows of punctures; membranal suture straight with a small rounded projection at the distal end (Fig. 13B). Evaporatorium interrupted by the pseudoperitreme along posterior margin of mesopleuron, peritreme abruptly terminated, lateral margin of metapleural evaporatorium terminated diagonally, anterior area of mesopleuron posterior and lateral parts of metapleuron polished and impunctated, metepimeral pseudosuture notoriously marked by a line of close set coarse punctures (Fig. 17C - E). Anterior and median legs without distinctive characteristics, posterior legs modified, femora convex ventrally, flattened and slightly wider posteriorly, tibiae abruptly flattened and conspicuously sinusoid all its length, tarsi not modified (Fig. 17B-D).

Abdomen: Sterna III to VI polished and impuctate with a single seta near upper margin, sternum VII with seven long setae at the posterior margin (Fig. 17C-D), pygofore globose, without ornamentations, minutely punctured and with a few shallow rugae laterally, upper margin straight with a faint medial emargination (Fig. 17B, D, G, H), dorsal margin sinuate with three sclerotized projections, lateral ones blunted, central one broad and emarginated (Fig. 17F-H). Given the homogeneity on the genital structures observed within cydninae genera (Becker & Galileo 1982; Froeschner 1960) and the only specimen available being the holotype, the pygofore was not dissected.

Etymology: The specific epithet alludes to the ondulated posterior tibiae.

Distribution: Brazil (RS).

Discussion

The fauna of Cydninae in Brazil (47 spp.) represents more than half the species known from the Neotropical region. The new records increased the number of species in almost twenty percent for the country.

Some of the species have wide geographical distributions and are found in different biogeographical provinces or ecorregions (i.e. *Cyrtomenus mirabilis*, *Dallasiellus lugubris*, *Prolobodes giganteus*). A few species seem to be more restricted in distribution and confined to certain ecorregions (i.e. *Pangaeus neogeus* in the Atlantic Rain Forest, *Ectinopus rugoscutum* in the Amazon region [including localities in Peru and Bolivia]). Other species may be found only in one ecorregion in Brazil but have a wide distribution in the Neotropical region (e.g. *Cyrtomenus teter*). However, we still have a poor knowledge about biological and ecological aspects of the burrower bugs of the subfamily Cydninae (Schwertner & Nardi 2015), and any conclusions about distributional range of these insects is premature. Several species recorded in Brazil have three or less locality records, and a more thoroughly collecting work need to be achieve. The description of *Tominotus ondulatus* and the widely geographical range of some species indicated that certainly the number of species for the Brazilian

fauna is probably underestimated.

As for other groups of insects, some regions of Brazil are better sampled, but there are huge gaps in collecting for some regions. The south and southeast regions have great number of records for cydnins, while north and northeast states are very poorly sampled.

The burrower bugs are a diverse and important group of true bugs, which species evolved to live below the ground, showing unique adaptations and including current or potential crop pests. More comprehensive studies must be conducted about the biology, ecology and evolution of cydnins in general (Schwertner & Nardi 2015), however a first step includes a better understanding of the diversity and distribution of the species. Improve our collecting capabilities will be crucial to future studies on cydnins.

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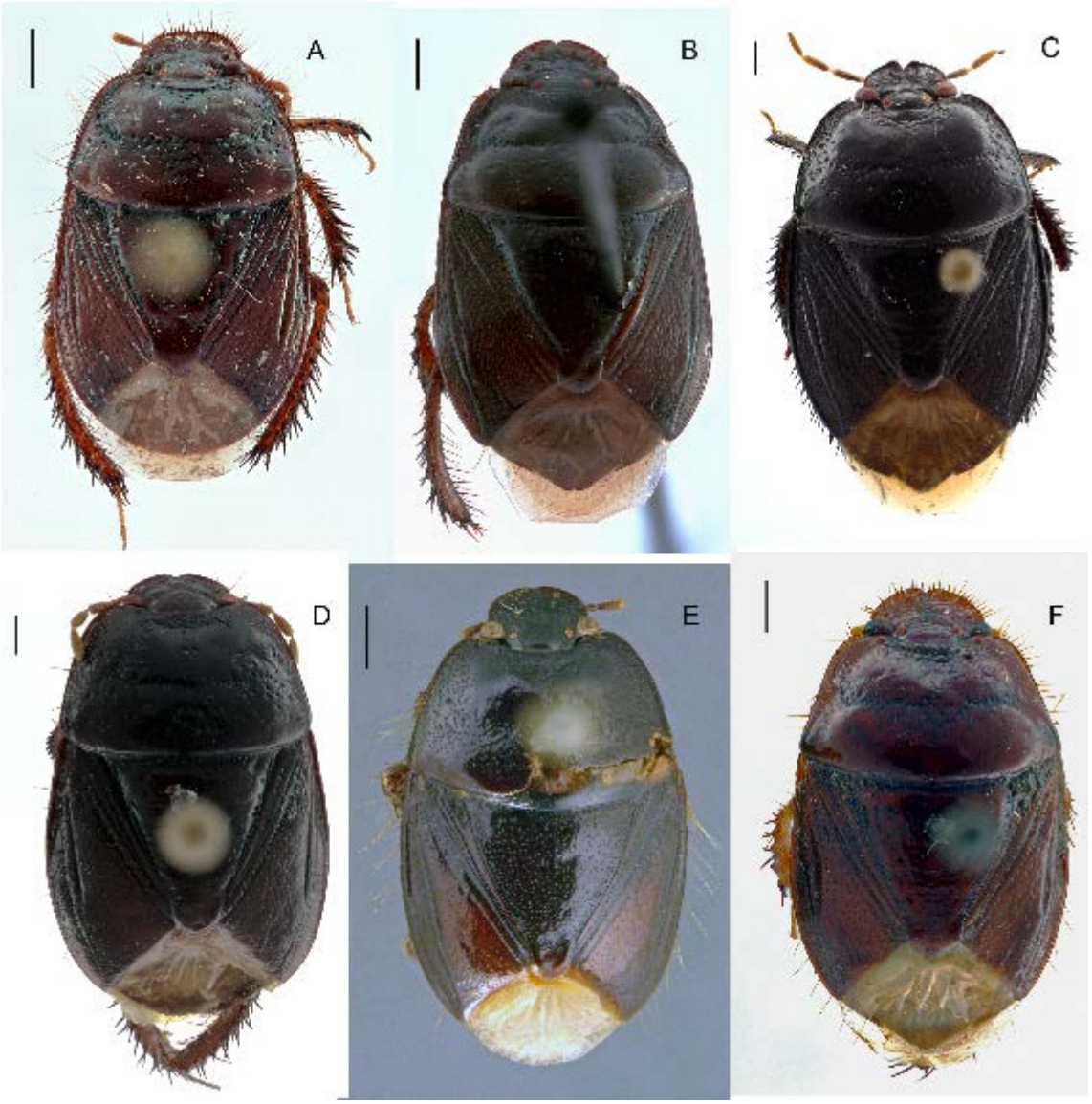

FIGURE 1. Dorsal view of the species of the genus *Cyrtomenus*; *C. bergi* (A), *C. mirabilis* (B), *C. emarginatus* (C), *C. grossus* (D), *C. marginalis* (Photo by Harald Bruckner) (E), *C. teter* (F). Scale bar: 1 mm.

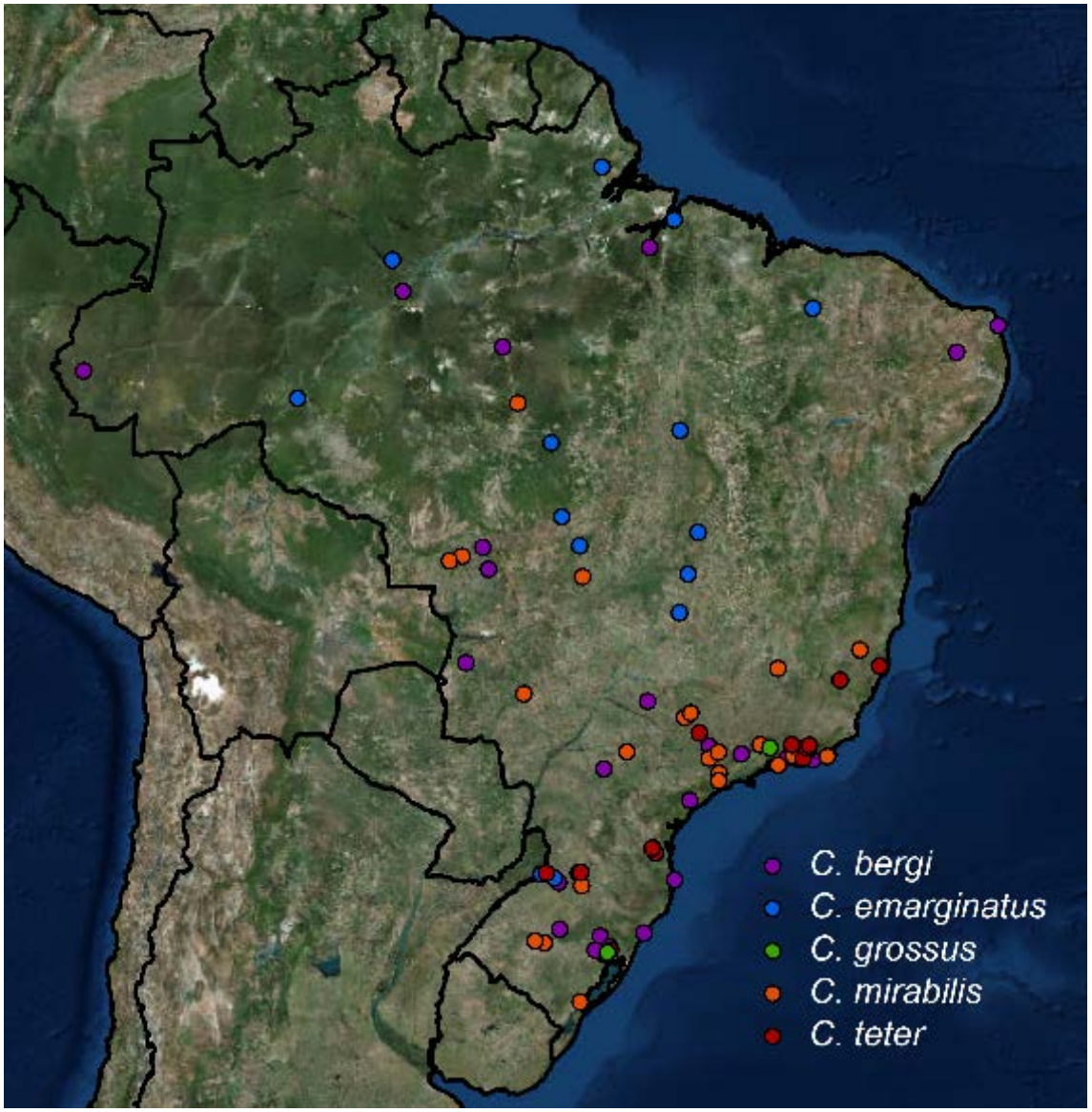

FIGURE 2. Distribution map of *Cyrtomenus bergi*, *C. mirabilis*, *C. emarginatus*, *C. grossus* and *C. teter* in Brazil.

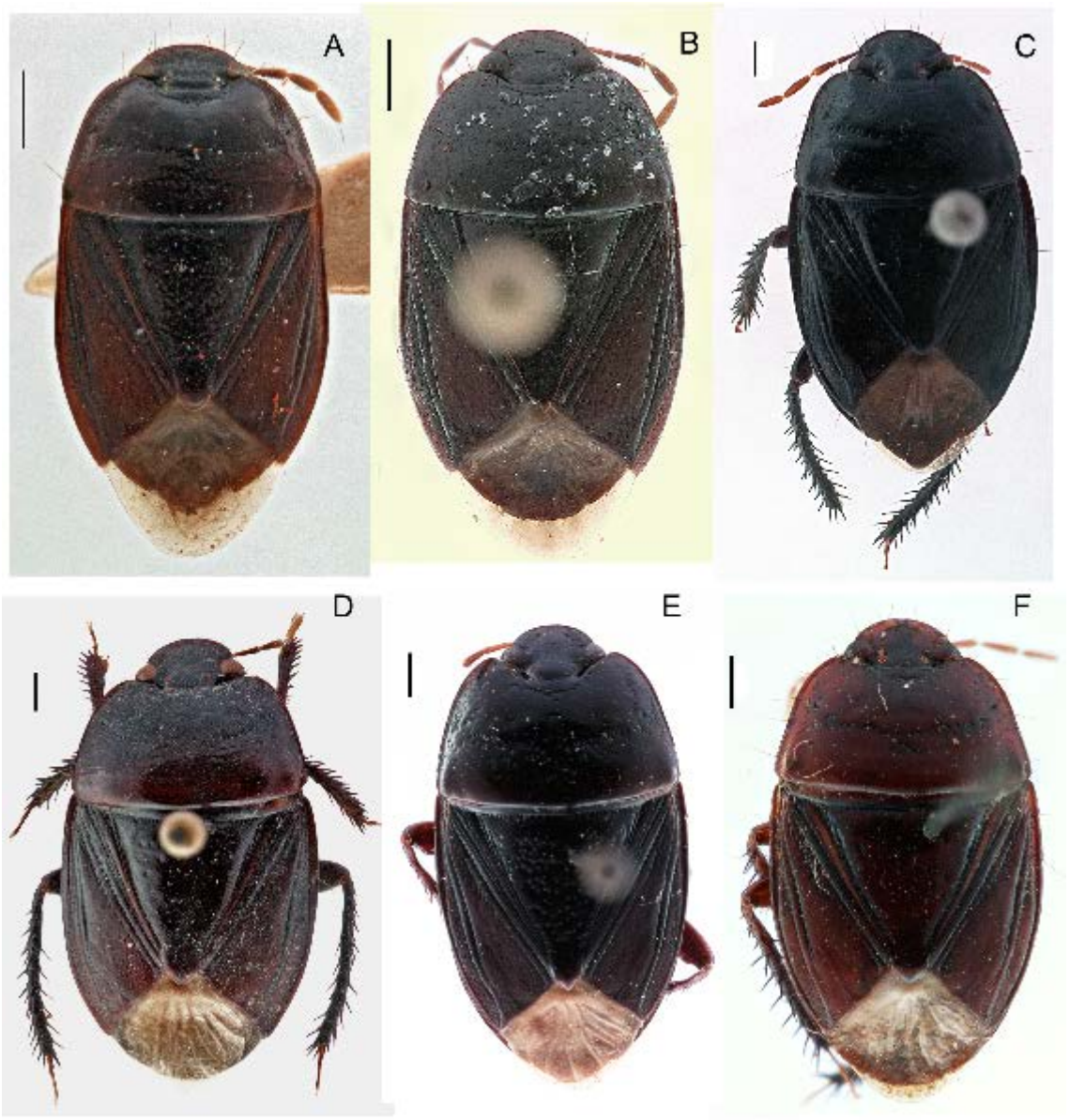

FIGURE 3. Dorsal view of the species of the genus *Dallasiellus*: *D. alutaceus* (A), *D. bacchinus* (B), *D. dilatipes* (C), *D. horvathi* (D), *D. interruptus* (E), *D. levipennis* (F). Scale bar: 1 mm.

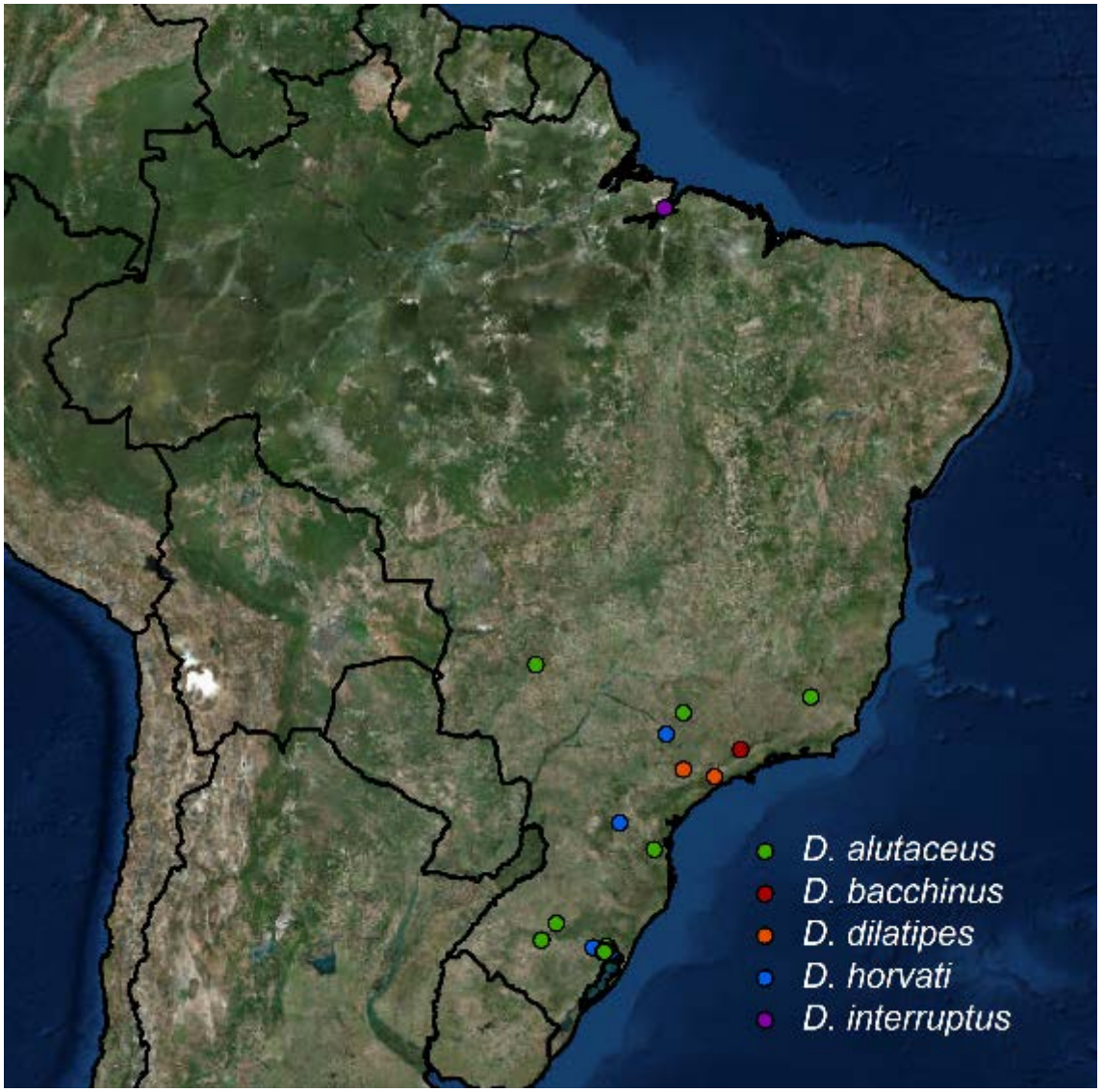

FIGURE 4. Distribution map of *Dallasiellus alutaceus*, *D. bacchinus*, *D. dilatipes*, *D. horvathi* and *D. interruptus* in Brazil.

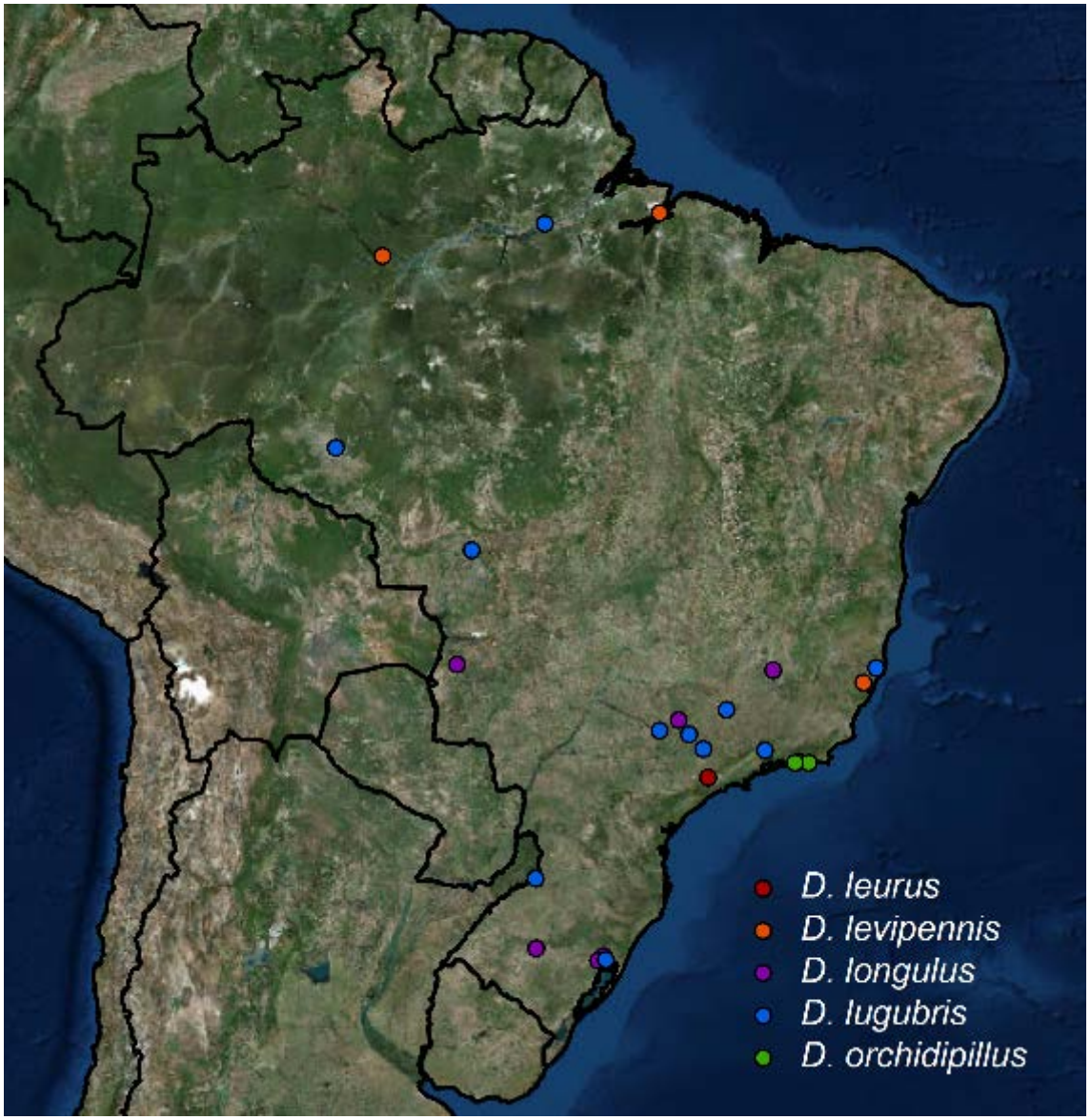

FIGURE 5. Distribution map of *Dallasiellus: D. levipennis, D. leurus, D. longulus, D. lugubris* and *D. orchidiphilus* in Brazil.

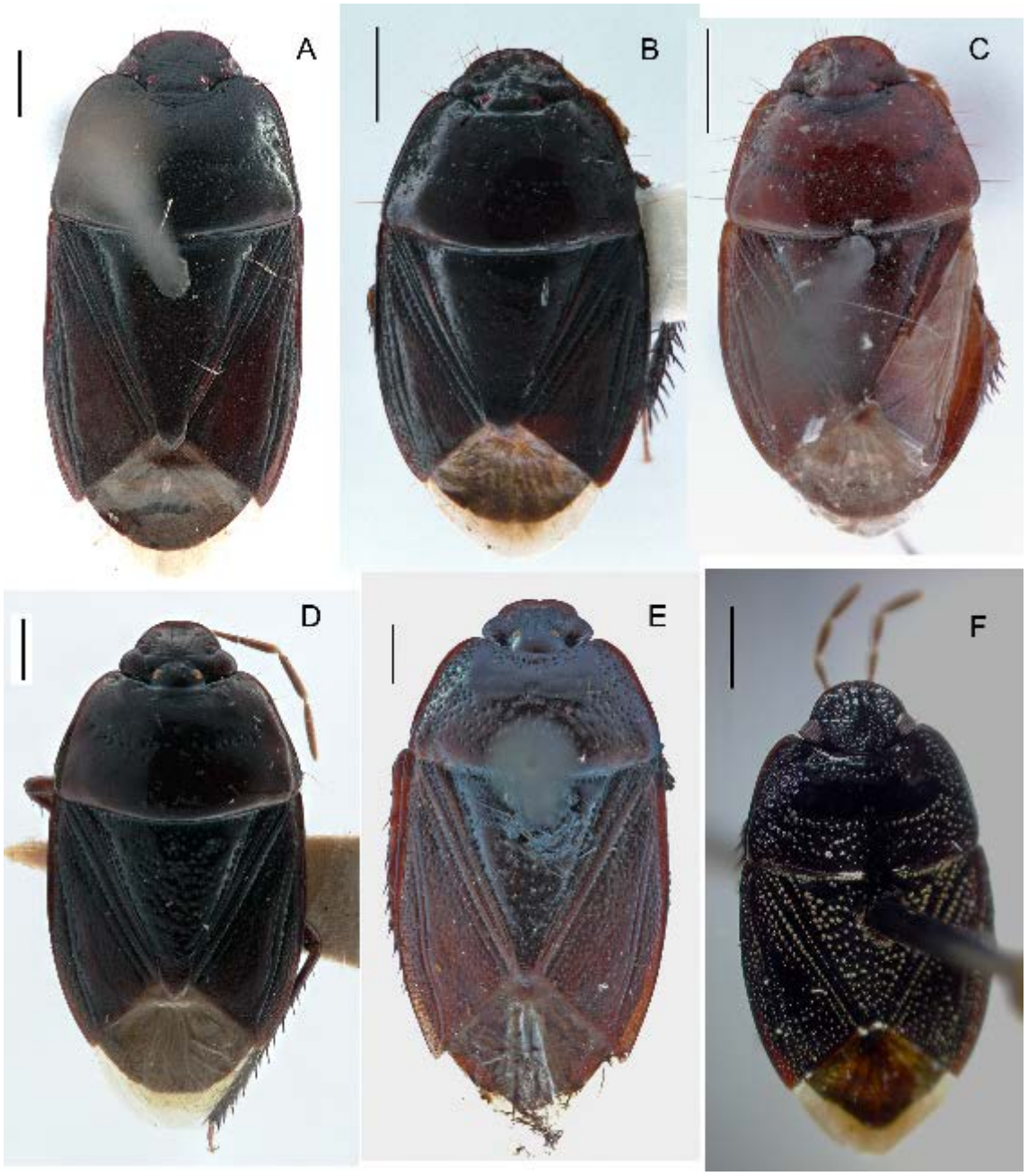

FIGURE 6. Dorsal view of the species of the genus *Dallasiellus*: *D. longulus* (A), *D. lugubris* (B) *D. orchidiphilus* (C), *D. planicollis* (D), *D. solitaria* (E), *D. puncticeps* (F), Scale bar: 1 mm.

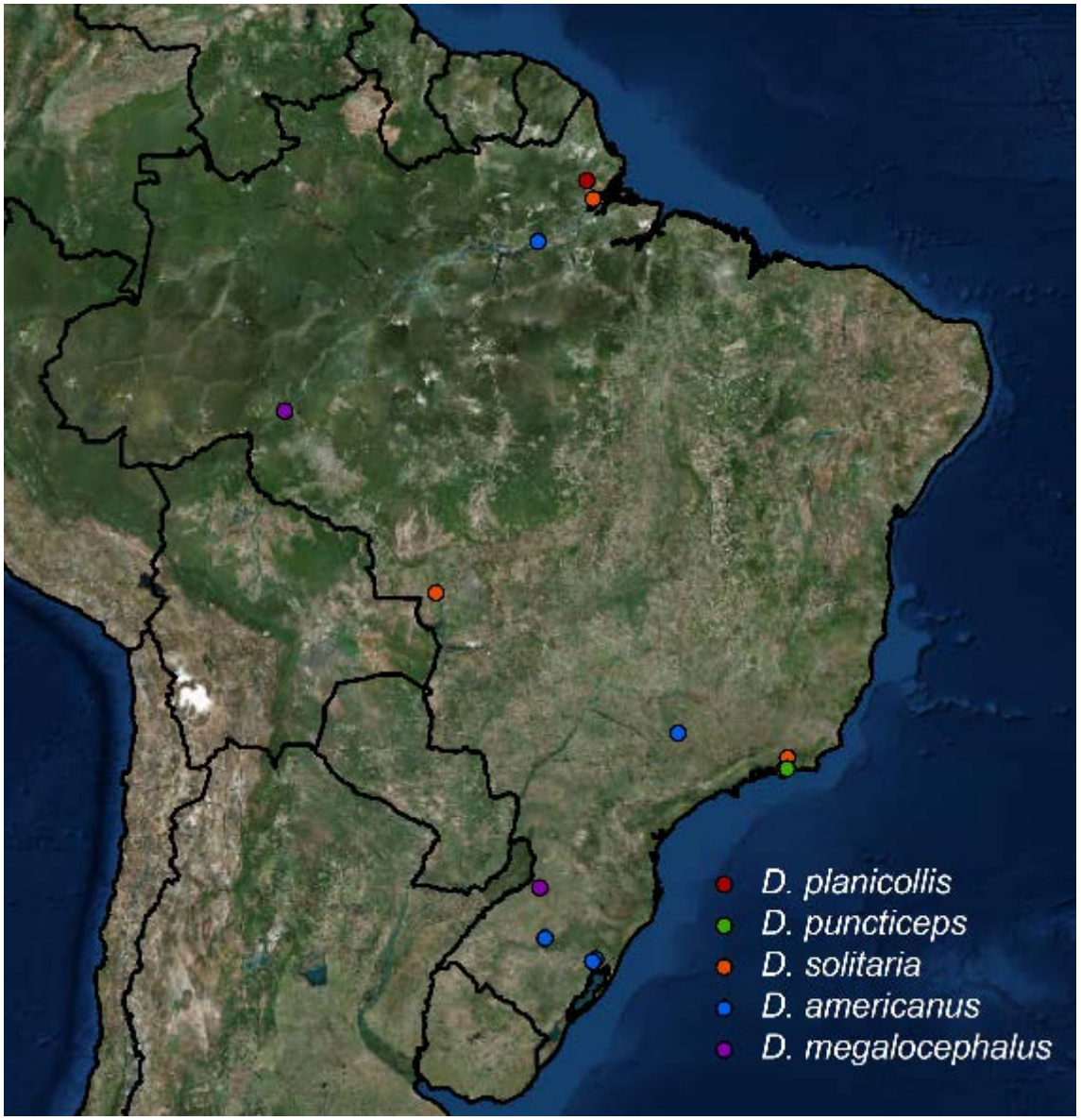

FIGURE 7. Distribution map of *Dallasiellus planicollis*, *D. solitaria*, *D. puncticeps*, *D. americanus* and *D. megalocephalus* in Brazil.

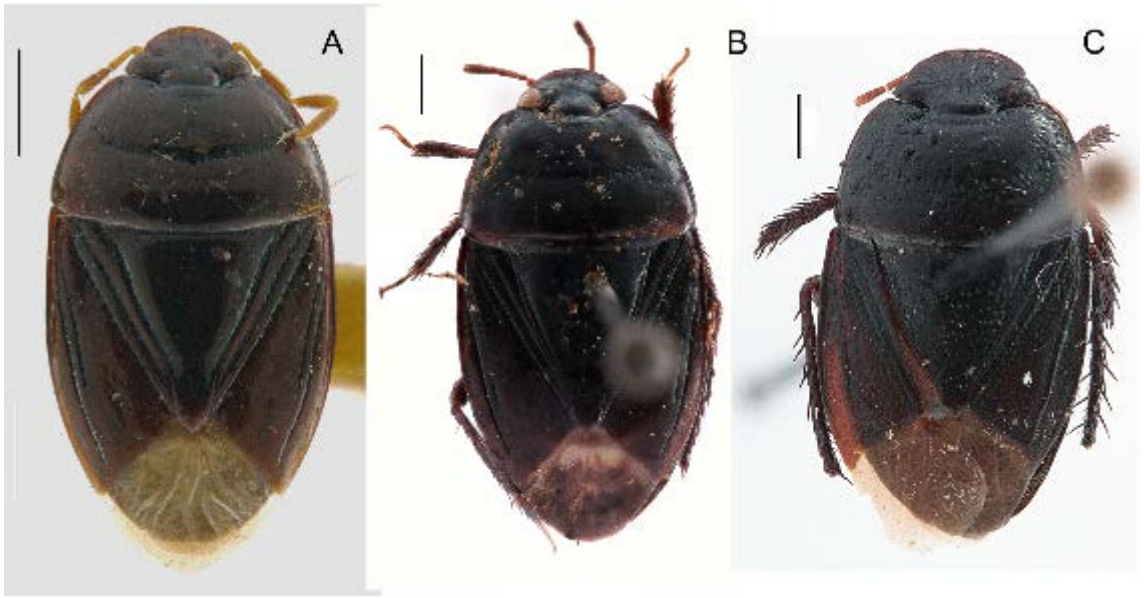

FIGURE 8. Dorsal view of the species of the genus *Dallasiellus*: *D. viduus* (A), *D. americanus* (B), *D. megalocephalus* (C). Scale bar: 1 mm.

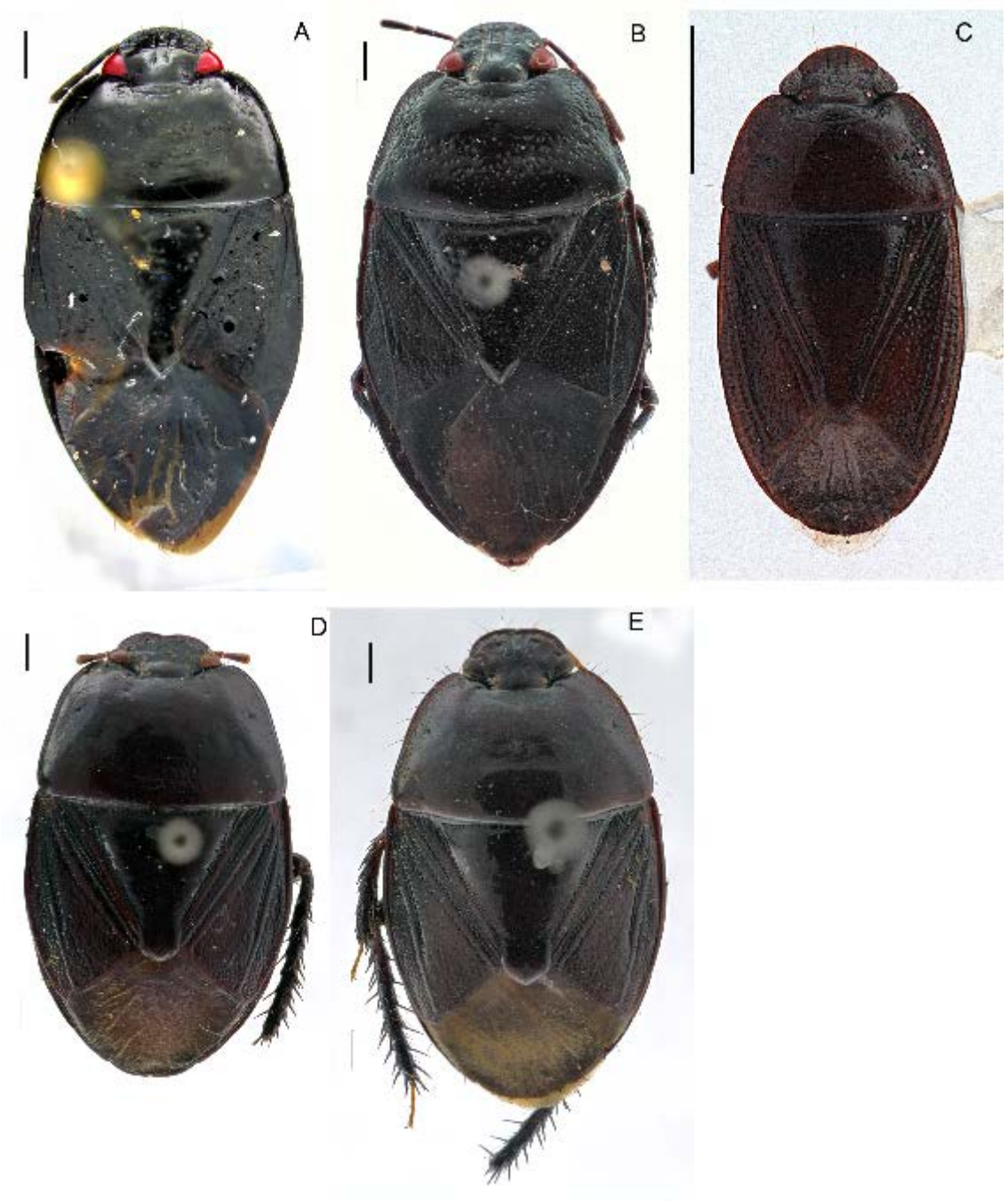

FIGURE 9. Dorsal view of the species of the genus *Ectinopus*, *Melanaethus*, and *Onalips: E. holomelas* (A), *E.rugoscutum* (B). *M. spinolae* (C), *O. bisinuatus* (D), *O. completus* (E). Scale bar: 1 mm.

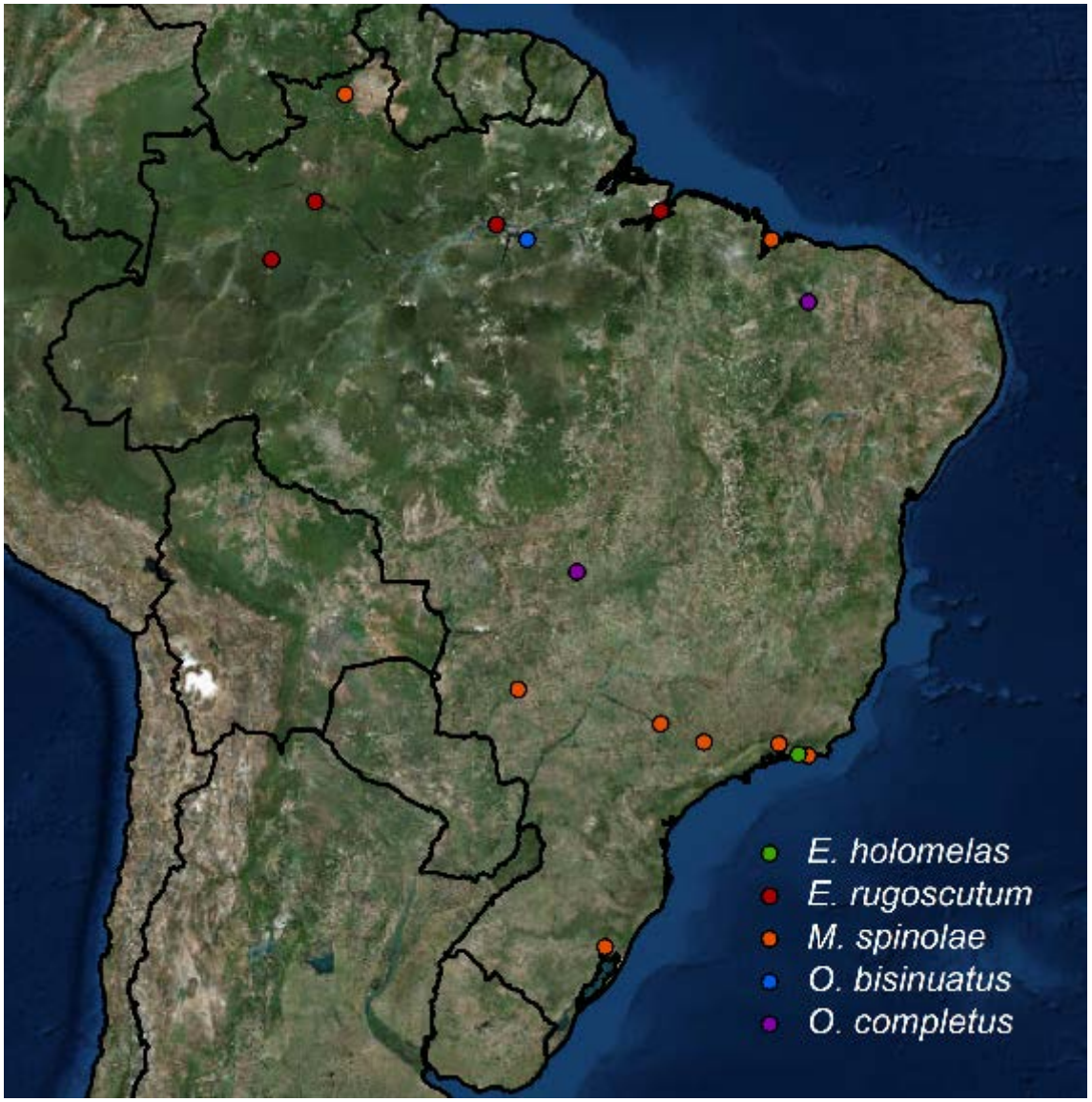

FIGURE 10. Distribution map of *Ectinopus holomelas, E.rugoscutum; Melanaethus spinolae, Onalips bisinuatus* and *O. completus* in Brazil.

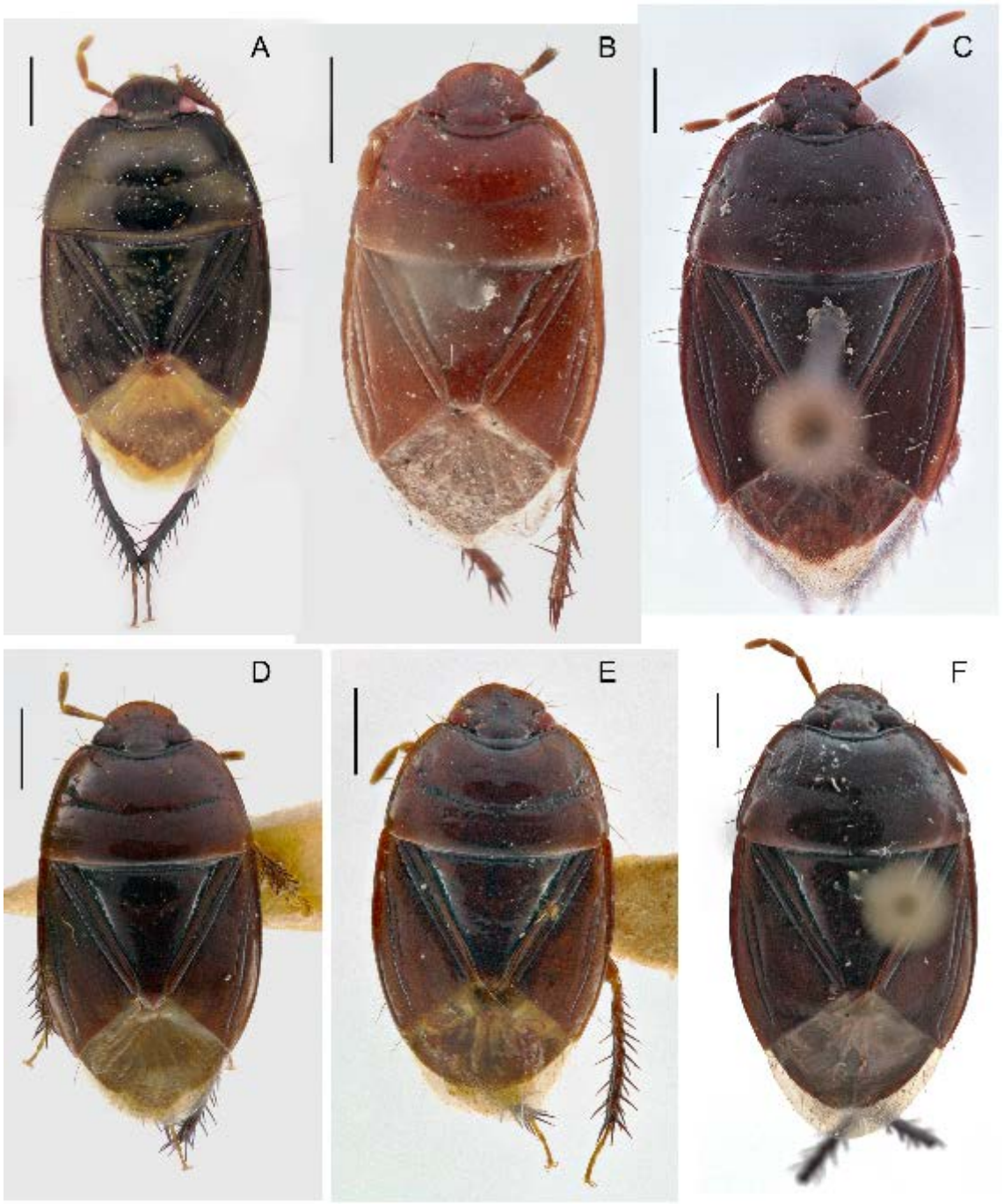

FIGURE 11. Dorsal view of the species of the genus *Pangaeus*: *P. docilis* (A), *P. moestus* (B), *P. neogeus* (C), *P. piceatus* (D), *P. rubrifemur* (E), *P. serripes* (F). Scale bar: 1 mm.

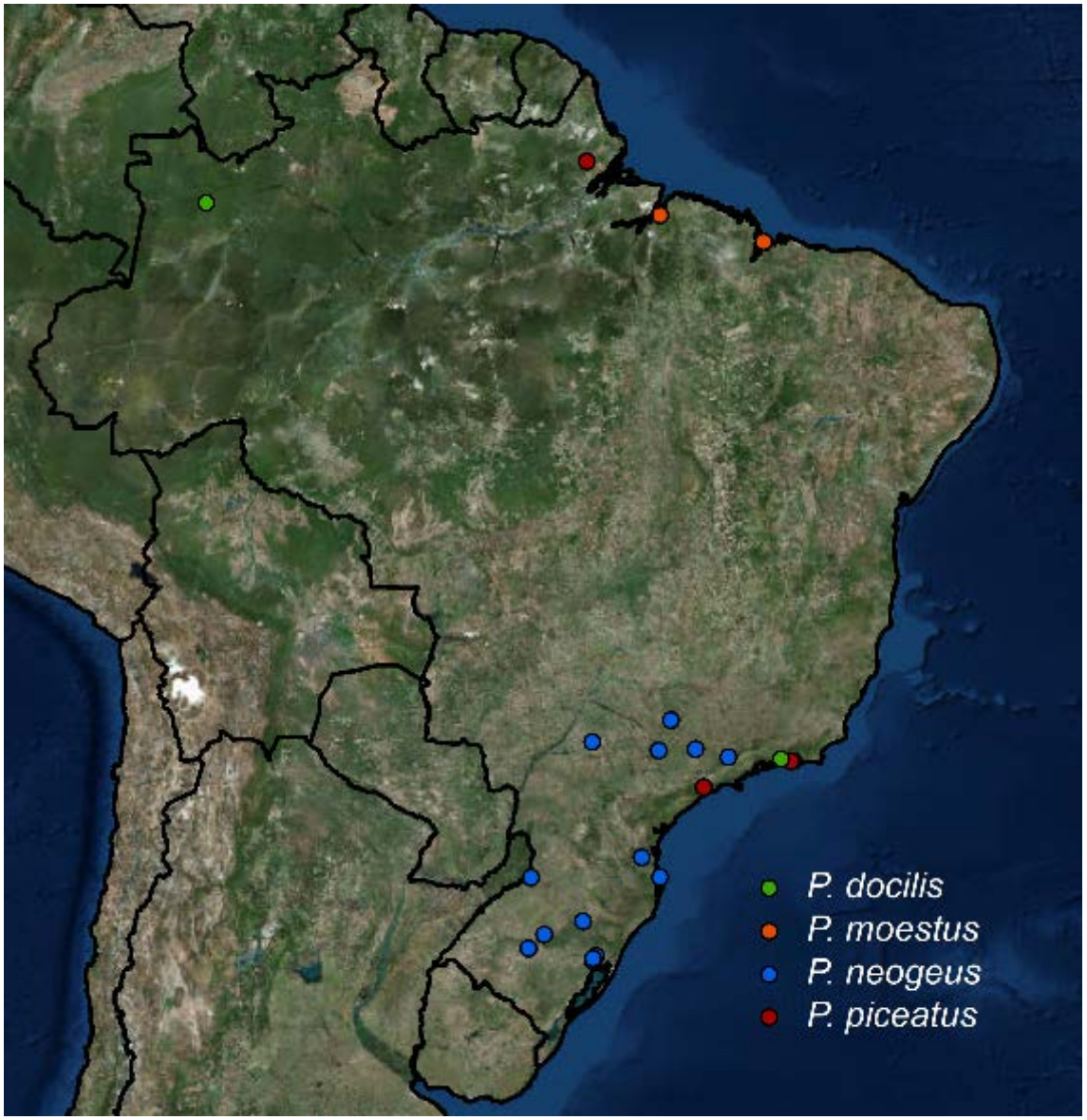

FIGURE 12. Distribution map of *Pangaeus docilis*, *P. moestus*, *P. neogeus* and *P. piceatus* in Brazil.

FIGURE 13. Distribution map of *Pangaeus rubrifemur*, *P. serripes* and *P. xanthopus* in Brazil.

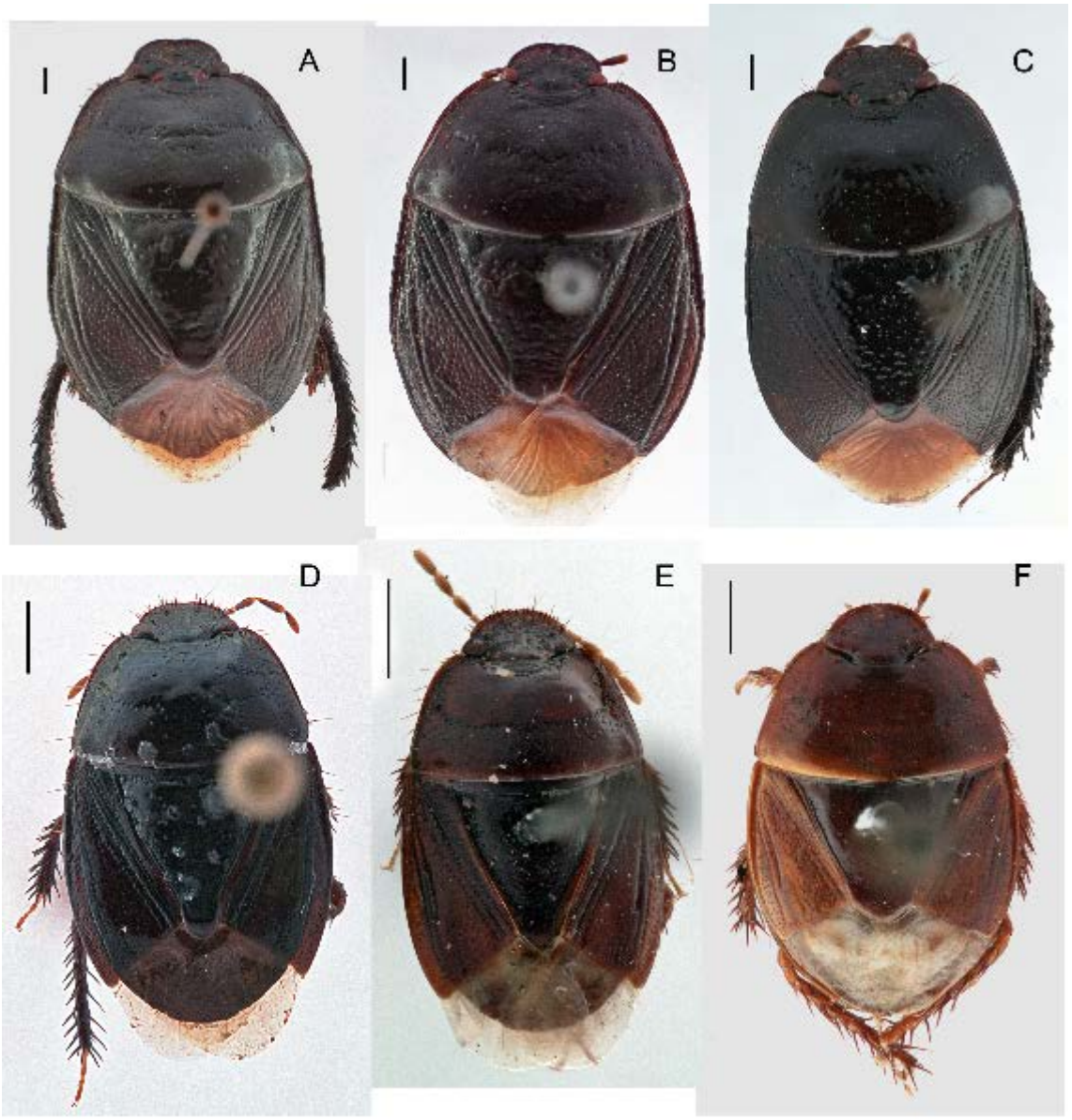

FIGURE 14. Dorsal view of the species of the genus *Prolobodes* and *Tominotus*: *P. giganteus* (A), *P. gigas* (B), *P. reductum* (C), *T. inconspicuus* (D), *T. laeviculus* (E), *T. signoreti* (F). Scale bar: 1 mm.

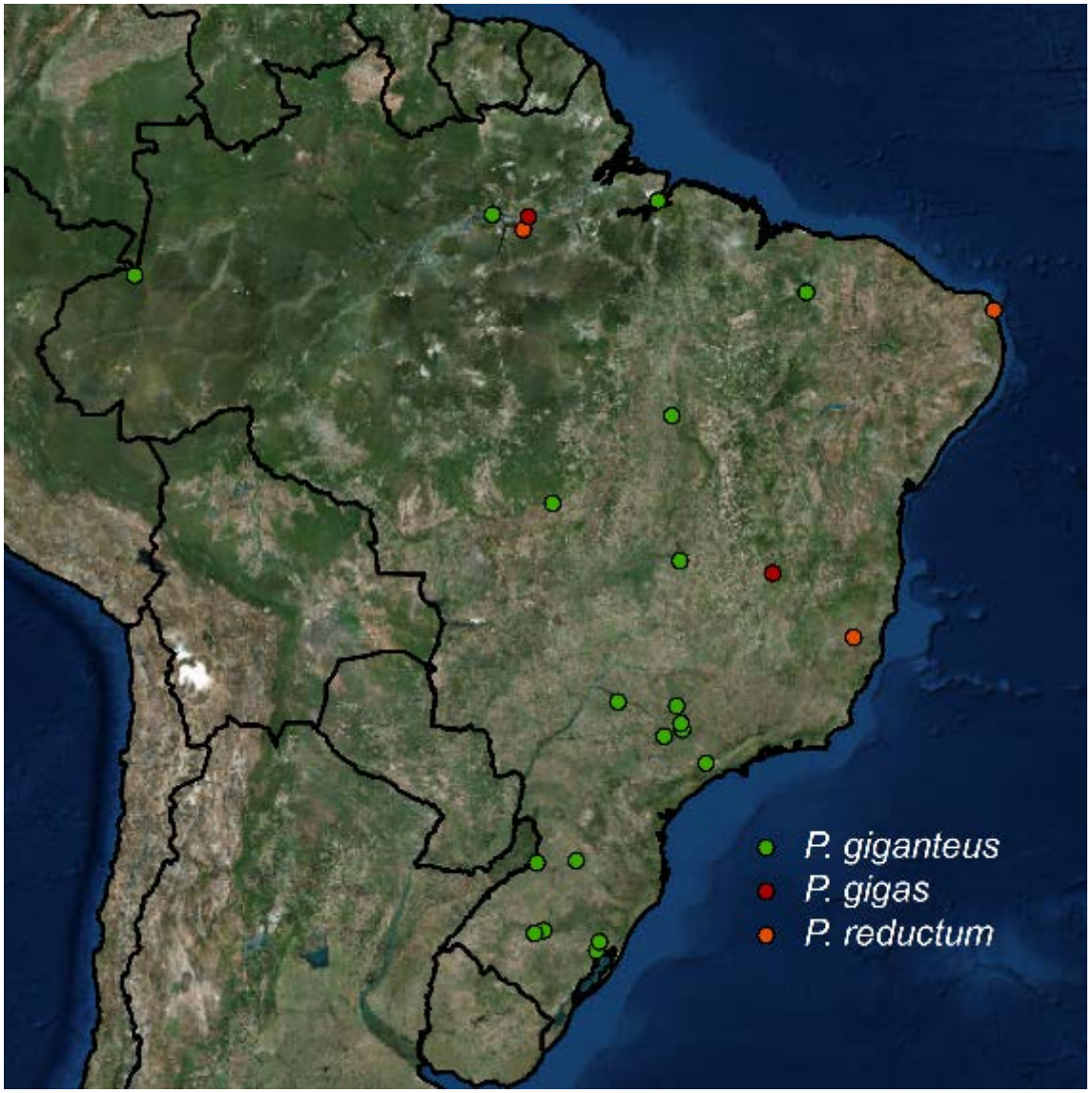

FIGURE 15. Distribution map of *Prolobodes giganteus*, *P. gigas* and *P. reductum* in Brazil.

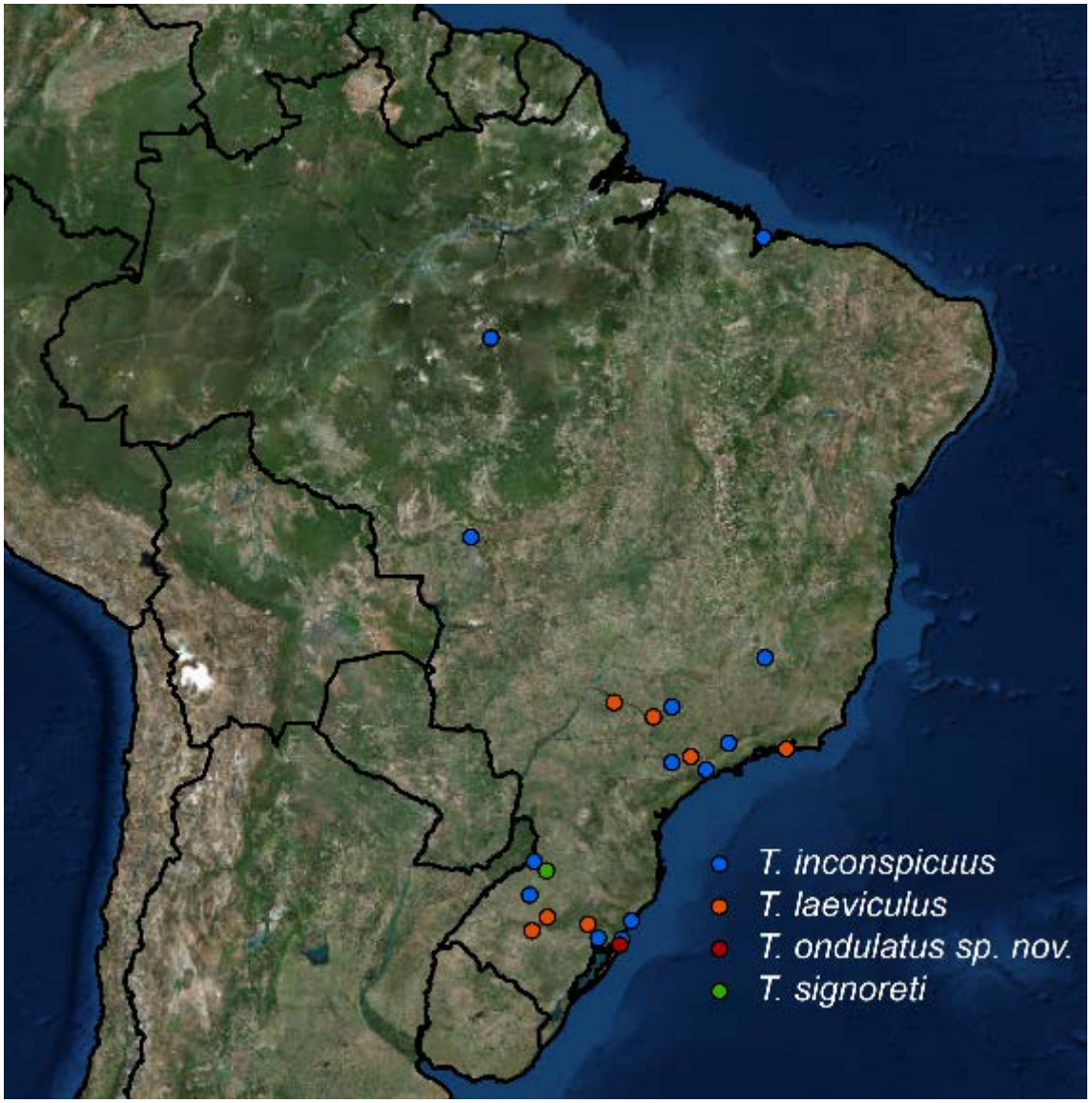

FIGURE 16. Distribution map of *Prolobodes* and *Tominotus inconspicuus*, *T. laeviculus*, *T. ondulatus sp. nov.* and *T. signoreti* in Brazil.

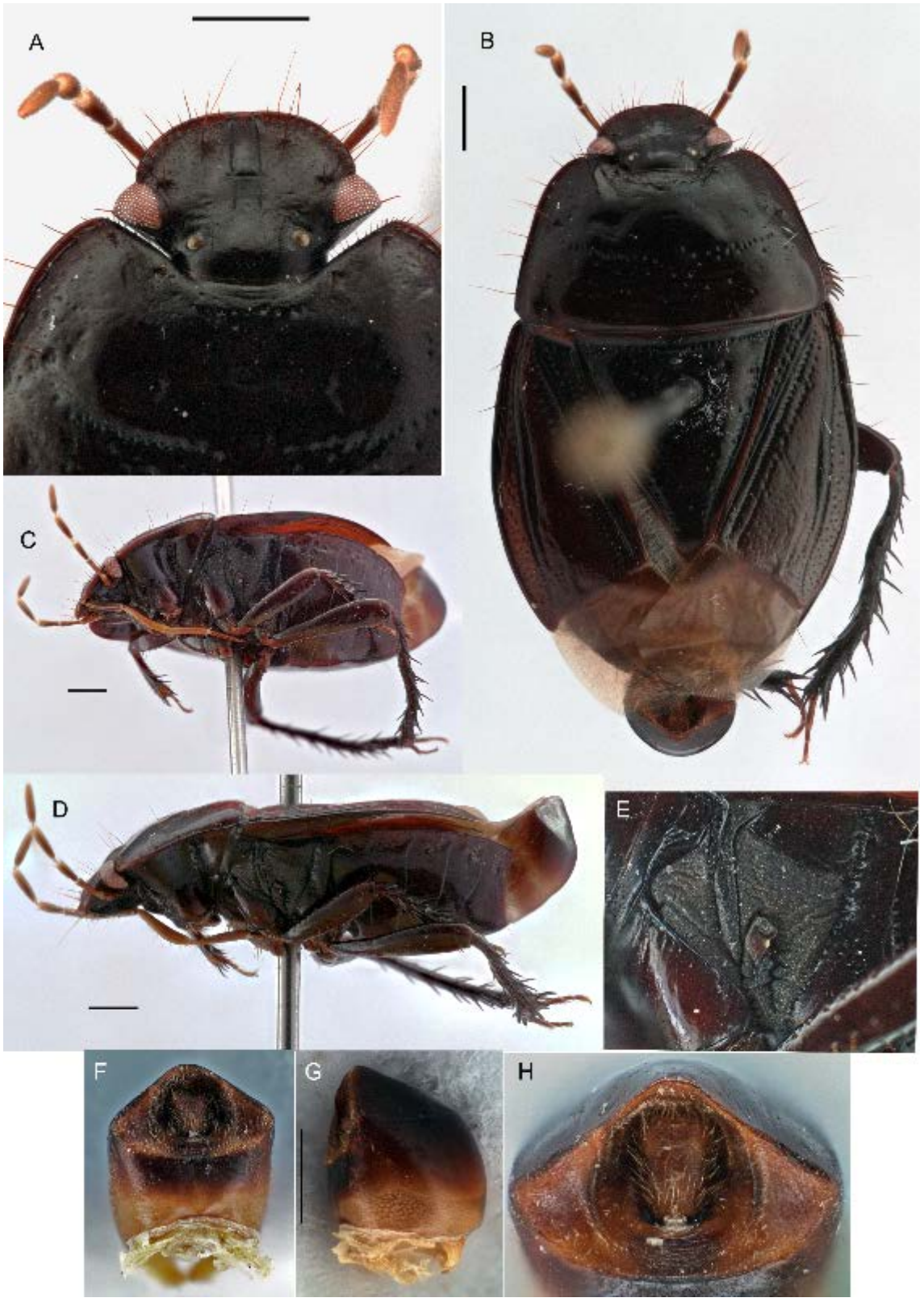

FIGURE 17. *Tominotus ondulatus sp.nov.*; head and anterior pronotal lobe (A), dorsal view and posterior tibia (B), latero-ventral view (C), lateral view (D), evaporatoria (E), pygofore dorsal view (F), pygofore lateral view (F), pygofore posterior view (F). Scale bar: 1 mm.

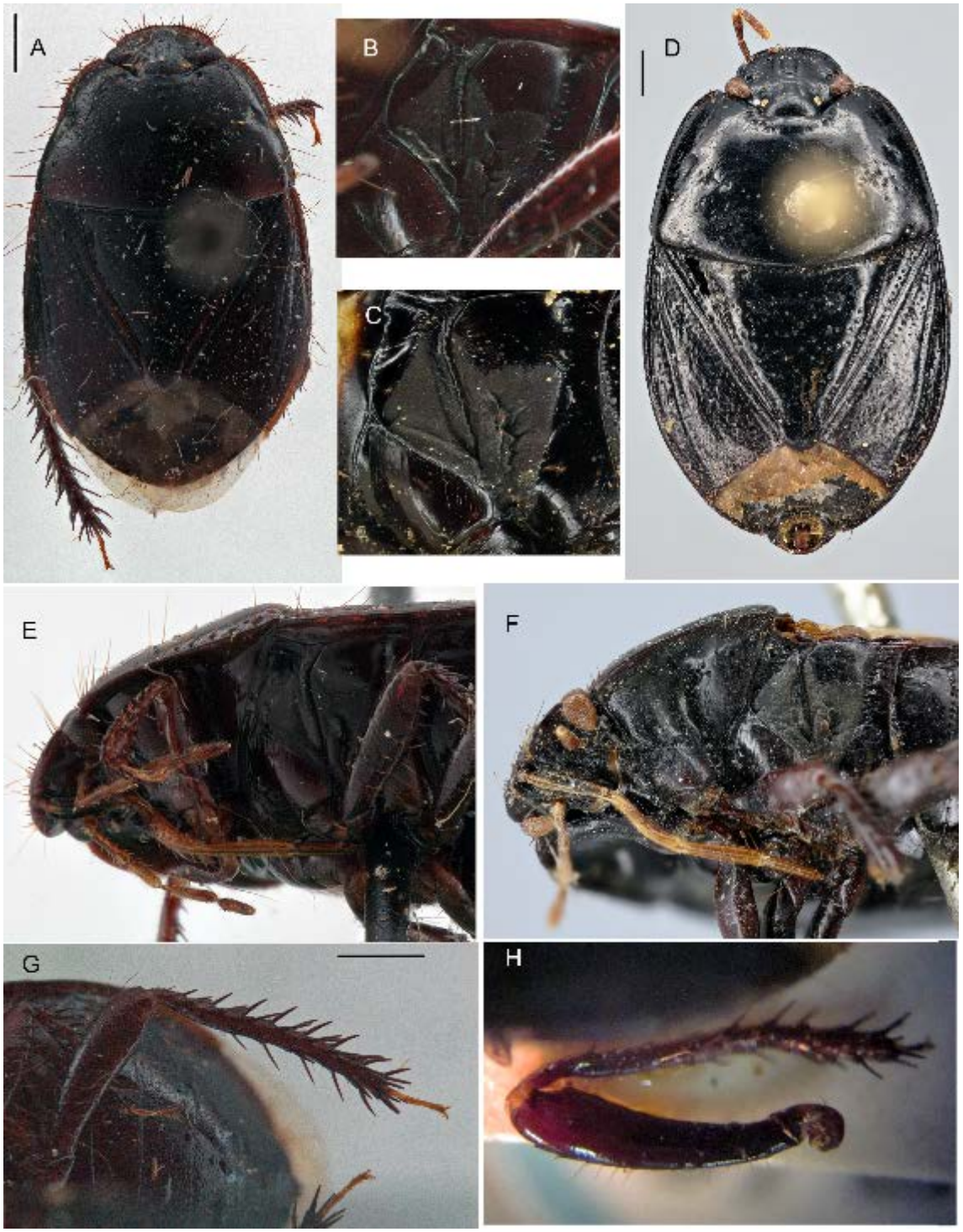

FIGURE 18. Dorsal view *Tominotus communis* (A), evaporatoria *T. communis* (B), evaporatoria *T. curvipes* (C), Dorsal view *T. curvipes* (D), latero-ventral view *T. communis* (E), latero-ventral view *T. curvipes* (F), posterior tibia *T. communis* (G), posterior tibia *T. curvipes* (H). (Photos of *T. curvipes* by Mick Webb). Scale bar: 1 mm.

CAPITULO II

Species delimitation in Cydnidae: synonymy of two relevant crop pests, *Cyrtomenus mirabilis* (Perty) and *C. bergi* Froeschner (Cydnidae), based in a multi-source approach

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Abstract

Taxonomic problems, as species delimitation, can benefit from different approaches. *Cyrtomenus bergi* and *C. mirabilis,* species of economic interest and widely distributed in the Neotropics, have no clear morphological differentiation causing misidentification and hampering further studies. We use the morphology of the genitalia, distribution ranges, linear and geometric morphometric, to access the identity of the two species. Results supported *C. bergi* as a junior synonym of *C. mirabilis.*

Key Words. Allometry, Landmarks, Integrative taxonomy, Synonymy, Morphometry.

Introduction

Different methods and approaches can aid traditional taxonomy with defining criteria for species delimitation, bringing tools and complementary information for establishing a species status (Mutanen & Pretorius 2007; Padial *et al.* 2010; Schlick-Steiner *et al.* 2010). Species complex and polymorphic species pose difficult tests for taxonomy, and their delimitation should not be based solely on traditional taxonomic procedures, but instead in multiple approaches taken together to reduce the error inherent in each one, leading to better resolution of species limits (Halcroft *et al.* 2016; Lehmann *et al.* 2017). Morphometric analyses for example, have been used to solve taxonomic and systematic

questions (Rohlf 1990; Umphrey 1996; Gabrielson *et al.* 2011; Jagersbacher-Baumann 2014; Rivas *et al.* 2014; Davis *et al.* 2016), with consequences for taxonomy.

Cyrtomenus Amyot and Serville (Cydnidae: Cydninae: Geotomini), a genus of Neotropical burrower bugs, includes to date eight species in two subgenera, *Cyrtomenus* and *Syllobus* Froeschner. At least two species are considered pests of cultivated plants, namely *Cyrtomenus (C.) mirabilis* (Perty) and *Cyrtomenus (C.) bergi* Froeschner (Froeschner 1960; Schwertner & Nardi 2015). Both species are widely distributed: *C. bergi* occurs from southern Mexico to Argentina, and *C. mirabilis* is known from Mexico, Colombia, Brazil, Peru, Paraguay, and Argentina (Froeschner 1960; Mayorga 2002; Riis *et al.* 2005a; Schwertner & Nardi 2015). According to Froeschner (1960), *C. bergi* and *C. mirabilis* are similar morphologically, but can be distinguished by the ratio between ocelli-eye distance and ocelli width (smaller in *C. mirabilis* than in *C. bergi*) and by texture of the surface of mandibular plates (strongly rugose in *C. mirabilis*, smoother in *C. bergi*). However, none of these criteria have been evaluated in a quantitative approach.

Since its description, *C. bergi* was subject of several studies, making it the most recorded name of Cydninae in the Neotropics (e.g., García & Bellotti 1980; Riis & Esbjerg 1998a; b; Cortes *et al.* 2003; Riis *et al.* 2003; Struck *et al.* 2004; Riis *et al.* 2005a; b; Rodrigues Netto *et al.* 2005; Melo Molina *et al.* 2006), with special reference to its damage to seeds and roots of cultivated plants (see Schwertner & Nardi 2015 for a summary of the available information). On the other hand, knowledge about *C. mirabilis* is limited to checklists (Grazia & Schwertner 2011, Avendaño *et al.* 2017), morphological studies (Becker & Galileo 1982), and occasional report as pests (Santos *et al.* 2016).

Since Froeschner (1960), both *C. bergi* and *C. mirabilis* have not received taxonomic attention. The characteristics used to identify these species do not show clear boundaries, and are rather continuous and variable among and within populations, raising doubts about the correctness of identifications made to date, even validity of these species (e.g. Becker & Galileo 1982). Incorrect species identification hampers further ecological and biological control studies, most needed especially because of their economic importance.

Aiming to correct establish the identity of *C. bergi* and *C. mirabilis*, we compiled the largest sample of these species to date, including specimens from all distributional ranges. We compared variation in the morphology using three different approaches along a latitudinal range to test whether *C. bergi* and *C. mirabilis* represent independent lineages based on the criteria of diagnosability, i.e. the appearance of fixed differences (Cracraft 1983; Nixon & Wheeler 1990).

Materials and methods

A total of 197 specimens of *C. bergi* and *C. mirabilis* from Mexico, Colombia, Surinam, Brazil, Paraguay, and Argentina were studied. Most of the material borrowed from collections was previously identified by authorities on Cydnidae (i.e R. Froeschner, M. Becker, M. Galileo); identification of the specimens was checked following morphological criteria of Froeschner (1960).

Photographs of dorsal view and details of the head, pronotum, scutellum and hemelytron of each specimen were taken with a digital camera coupled to the stereomicroscope Nikon AZ 100M. Each morphological structure was positioned parallel to the focal plane, imaged in sequential focal planes, and stacked with the NIS Elements AR software (Nikon Instruments Inc). Specimens were measured and landmarks were digitized using the stacked images.

The genitalia of five male and five female specimens from Argentina (♂ 2; ♀ 2), Brazil (♂ 2; ♀ 2), and Mexico (♂ 1; ♀ 1) were dissected, examined, and compared qualitatively. Photographs of the pygophores, phalluses, parameres, and spermathecae were taken following the same procedures used for external structures. Terminology of the genitalia follows Schaefer (1977), Becker & Galileo (1982), and Pluot-Sigwalt & Lis (2008).

A distributional map for each species was generated using the software ArcGis (ESRI). Localities of *C. bergi* (n = 121) and *C. mirabilis* (n = 76) were plotted to compare the distributional range of each species.

A set of 121 specimens (*C. bergi* n= 92, *C. mirabilis* n= 31) was measured for ten body parameters, as follows: head length (HL), head width (HW), interocular distance (IO), ocellar width (OW), ocelli-eye distance (OE) (Fig. 1A), pronotal length (PL), pronotal width (PW), scutellar length (SL), scutellar width (SW), and total length (TL) as the sum of HL+PL+SL+ abdominal length (AL) (Fig. 1B); and the OE/OW ratio. Measurements were taken on each stacked image using MB-Ruler 5.0 free software (http://www.markus-bader.de/MB-Ruler/).

For linear morphometrics, specimens without the ten measurements were removed from the data set. The final linear morphometric data set comprises 85 specimens of *C. bergi* (♂ 28; ♀ 57) and 25 specimens of *C. mirabilis* (♂ 11; ♀ 14). Normality and homoscedasticity on raw data were confirmed through Kolmogorov-Smirnov and Levene tests (Zar 2010), respectively. The effect of body size was removed by linear regressions of each measure and the total body length; residuals were used in subsequent analyses. First, intraspecific, interspecific and sexual dimorphism, were tested by two-way analysis of variance (ANOVA); in case of significant difference, treatments were submitted to Tukey honestly significant difference (HSD) multiple comparison tests. Second, to identify possible most important characters for distinguishing between the species (Manly 2000; StatSoft, Inc. 2013), a multiple-group discriminant function analysis (DFA) was performed. All tests were performed using an alpha = 0.05, on STATISTICA 8 software (StatSoft 2008).

A subset of specimens of *C. mirabilis* (up to 39 specimens) and of *C. bergi* (up to 81 specimens) was selected for geometric morphometric procedures. The number of specimens for each structure was dependent of the integrity of the structure measured. Landmarks (Fig. 1C-F) were defined for the head (18 landmarks), pronotum (ten landmarks), scutellum (seven landmarks), and hemelytron (five landmarks), to cover as much as possible of each structure maintaining landmark homology among specimens and structure. A TPS file containing all images was created using the software tpsUtil (Rohlf 2017b) and landmarks were digitized using the software tpsDig2 (Rohlf 2017a).

A full Procrustes fit was performed to translate, rotate, and scale each landmark configuration of each specimen to a unit centroid size. The full Procrustes fit, which for data sets with unusually large variation, puts less weight on observations that are far from the average shape and therefore is more robust against the influence of outliers (Klingenberg 2011), and removes all the information unrelated to shape and superimposes the objects in a common coordinate system (Rohlf & Slice 1990).

Taxonomic and sexual differences in shape were tested employing Procrustes ANOVA as implemented in MorphoJ (Klingenberg 2011). A DFA was subsequently performed on the Procrustes scores of the symmetric component to examine the degree of separation between species, once sexual dimorphism was not observed for shape. The reliability of the discrimination was assessed by leave-one-out cross-validation procedure (1000 permutations).

A factor map of the first two canonical factors was used to illustrate the main results of comparison

between species and distribution, in which each group was presented as an ellipse corresponding to the 95% confidence interval. The assumptions of the DFA (normality of the variables, homogeneity amongst the covariance matrices, low impact of multicolinearity, and independence of the samples) (Büyüköztürk & Çokluk-Bökeoğlu 2008) were assessed and found to be adequately met by the data sets. All geometric morphometric analyses were performed on software MorphoJ (Klingenberg 2011).

Results

Using the diagnostic criterion of Froeschner (1960), we found that the geographical distribution of *C. mirabilis* and *C. bergi* overlap in most of their ranges, especially in the north-western and southern South America (Fig. 2). Nevertheless, the northernmost records are of *C. mirabilis* (Fig 2A) althought *C. bergi* is more common in Central America than *C. mirabilis* (Fig 2B). Also, individuals of *C. mirabilis* have been collected from 0 to 4.060 m a.s.l. and *C. bergi* from 0 to 2.460 m a.s.l.

The male and female genitalia do not show remarkable variation between *C. bergi* and *C. mirabilis*. For both species the pygophore is globose, covered with fine setae dorsally; ventral wall rugose laterally, apical margin straight, lower than lateral margin of sternite VII (Fig. 3A); dorsal rim sinuous with three short cuticular projections (Fig. 3E, F). The parameres are compressed dorso-ventrally, apex rounded and broad, dorsal surface covered by setae (Fig. 3G, H). Phallotheca tubular, dorsal margin longer than ventral margin; only second conjunctival appendage present, bilobate and sclerotized; vesica two times longer than ejaculatory reservoir, processus vesicae as long as vesical process, both projected outside the phallotheca; processus capitati mushroom-like (Fig. 3C, D).

The female genitalia of both species is characterized by: laterotergites VIII punctate with two setigerous punctures, fused medially by a very narrow section, laterotergites VIII about twice the size of laterotergites IX. Laterotergites IX punctate with two to three setigerous punctures, triangular. Gonocoxite IX punctate, divided medially, its bases not visible externally. Gonocoxites VIII smooth with fine scattered punctures, larger than laterotergites VIII, dorsal outline straight (Fig. 3I, J). Segment X rugose and entire, apically bilobed (Fig. 3J). In the spermatheca: seminal receptacle sclerotized and pigmented, spherical, connected by basal neck-like duct; intermediate part long, delimited apically and proximally by two cuticular, well-developed flanges, the area between the flanges sclerotized and pigmented as the receptacle, flexible zone basal; spermathecal duct short, distal and proximal duct almost as long as intermediate part, dilation spherical with a strongly pigmented central core, latter surrounded by a thick wall of tissue (intima) with external layer translucent and pigmented and serrated internally, spermathecal opening not sclerotized. Ring sclerites present, always associated with a pair of lateral vaginal pouches more or less differentiated (Fig. 3K, L).

Linear measurements (Table 1) of *C. bergi* and *C. mirabilis* showed significant differences between species (two-way ANOVA, $F= 7.028$, $P < 0.001$) but not between sexes (two-way ANOVA, $F = 1.243$, $P = 0.278$); interaction of species and sexes was not significant (two-way ANOVA, $F = 1.927$, $P = 0.057$). Multiple comparison Tukey HSD post hoc tests ($\alpha = 0.05$) showed that species differences are mainly concentrated in the head (Fig. 4). The main feature proposed to distinguish the two species in the original description of *C. bergi*, i.e. OE/OW, showed substantial overlap (Tukey HSD, $q = 3.13$, $P = 0.89$) between species (Fig 4). The ocelli width (OW) tend to be greater in *C. bergi* than in *C. mirabilis* (Fig. 4), but the ocelli-eye distance (OE) greatly overlap in both species (Fig. 4). The summary statistics for all body parameters taken from the 110 specimens are shown in Table 1.

The discriminant function analyses showed shape overlap between *C. bergi* and *C. mirabilis* for the

head, pronotum, scutellum and hemelytron (Fig. 5A, C, E, G). The correct classification scores based on DFA (1000 permutations) were higher for the head (Fig. 5A) and smaller for pronotum, scutellum and hemelytron (Fig. 6C, E, G), but statistically insignificant ($\alpha = 0.05$; $P > 0.01$), with mean correct classification of 66.23%.

As the analysis of the morphology of male and female genitalia and linear and geometric morphometric of non genital characters failed to detect the existence of any fixed morphological differences between *C. mirabilis* and *C. bergi*, especially regarding the OE/OW, we pooled the samples of these two species and explored the potential for latitudinal variation. Specimens were grouped in latitudinal ranges, as follows: southern than 5°S, group ABB (comprising localities in Argentina, Bolivia and Brazil; n = 49); between 15°N and 5°S, group CS (comprising records in Colombia and Surinam; n = 55); and northern than 15°N, group M (comprising localities from Mexico; n = 6), plotted and compared with the results of the analyses by species.

A linear morphometric analysis, in which specimens were classified according to latitudinal classes, showed that PW ($y = 0.0462x - 0.0743$; $R^2 = 0.0308$; $P = 0.0667$; $N = 110$) and SL ($y = -0.0089x + 0.0143$; $R^2 = 0.0018$; $p = 0.6591$; $N = 110$), are the variables less dependent of the distribution; OW ($y = -0.0241x + 0.0387$; $R^2 = 0.1137$; $P < 0.001$; $N = 110$) decrease from south to north (Fig. 4). Other variables do not support the existence of latitudinal clines; however, latitudinal groups overlap in different combinations (Fig. 4). Canonical variate analysis on the shape of head, pronotum, scutellum and hemelytron did not show any trend for shape organization through a latitudinal cline (Fig. 5. B, D, F, H).

Discussion

The cydnid taxonomy is mainly based on somatic morphological features. In contrast, the genitalia as means to recognize species has been little explored in Cydnidae with no satisfactory results in terms of species separation, as it does in other groups of Pentatomoidea (McDonald 1966; Becker & Galileo 1982; Pluot-Sigwalt & Lis 2008). For *Cyrtomenus*, external features, especially of the head, are used as diagnostic characters with satisfactory results for most species. However, for similar species, such as *C. bergi* and *C. mirabilis*, characteristics of head, proposed to separate them, showed continuous variation across their distribution ranges, hampering unambiguously identification of specimens. Based on head morphology, it is not possible to determine if *C. bergi* and *C. mirabilis* are one highly variable species, two very closely related species, or represent a species complex (Froeschner 1960; Becker & Galileo 1982; Pluot-Sigwalt & Lis 2008).

Morphology of the male and female genitalia reveals no differences between *C. mirabilis* and *C. bergi*. Moreover, in both species the male structures are identical and resemble the genitalia of *C. crassus* Walker (McDonald 1966), although *C. mirabilis* and *C. bergi* differ morphologically from *C. crassus* in conspicuous characteristics such as the rows of setae in sternites III to VII, present only in *C. crassus*. The female genitalia is also indistinguishable between putative *C. bergi* and *C. mirabilis* specimens. Even in highly variable features of the spermatheca (e.g. the spermathecal duct and the cuticular wall of the dilation), the specimens are identical, the morphological pattern observed to putative *C. mirabilis* and *C. bergi* is common in Geotomini and is similar to *C. crassus* and *C. teter* (Spinola) (Pluot-Sigwalt & Lis 2008); both species have external morphological features that easily distinguish them from *C. mirabilis* and *C. bergi*.

Comparison of body morphology is insufficient to unambiguously identify individuals of *C. mirabilis*

and *C. bergi*, and these species do not exhibit differences in internal genitalia, neither show sexual dimorphism. The traits historically used to identify *C. bergi* and *C. mirabilis* (Froeschner 1960), show interspecific overlap; however, morphometric analyses could access even slightly differences, providing a robust way to species delimitation (Mutanen & Pretorius 2007). Of the several measurements taken, some of the head measurements (HL, HW, IO, OW and PW) allowed better discrimination of the species, whereas others (OE, PL, SL and SW) do not discriminate the species.

Overlapping in trait values across the geographical distribution may explain the differences as intraspecific variation. Geometric morphometric data followed the same tendency, showing the head as with wide variability, but still no clear morphological delimitation between *C. mirabilis* and *C. bergi*. Plots of the multivariate analyses did not show clear discrimination between clusters. Despite some separation between few latitudinal clusters (i.e. *C. mirabilis* ABB from *C. bergi* CB fig. 5B), the overall trend is a continuum shape variation. The lack of geographical structure suggests that the relative size and shape of the head is highly variable and are not related to its distribution.

The widespread distribution of these taxa suggests adaptations to different climatic conditions and ecoregions. The polyphagous habit suggests a main role in their widespread distribution, taking advantage of cultivated plants. Areas lacking distribution records more probably represent misidentifications or poor sampling.

In this study, we used a combination of qualitative and quantitative morphological and geographical data, to show that there is no clear delimitation between *C. mirabilis* and *C. bergi*, bringing no support to recognize them as two distinct evolutionary lineages. Then, *C. mirabilis* (Perty, 1830) is established as the senior synonym of *C. bergi* Froeschner, 1960. Such a synonymy was highly supported by the morphological similarity, the identical genitalia, the wide distribution of *C. bergi* and *C. mirabilis* that overlaps, and the superimposition of linear measurements and shape across latitudinal distribution.

This synonymy, despite it has been suggested before (Becker & Galileo 1982; Froeschner 1960; Schwertner & Nardi 2015), may affect the previous and current works on *C. bergi* as pest (Riis & Esbjerg 1998a; Cortes *et al.* 2003; Riis *et al.* 2003; Struck *et al.* 2004; Riis *et al.* 2005b), but improves the understanding of species distribution and morphological variability. The few recent checklists including both names (Grazia & Schwertner 2011; Avendaño *et al.* 2017) reduces in one the number of species reported.

The use of different approaches to solve taxonomic problems bring additional evidence to take taxonomic decisions. Schlick-Steiner *et al.* (2010) point on the importance of different types of data to reduce researcher bias in the decision-making process. Future studies should use molecular analyses to test the synonymy established here and help to understand the wide distribution and morphological variability of *C. mirabilis*.

Acknowledgments

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Table 1. Measurements of *C. mirabilis* and *C. bergi.* HL, head length; HW, head width; IO, interocular distance; OW, ocellar width; OE, ocelli-eye distance; PL, pronotal length; PW, pronotal width; SL, scutellar length; SW, scutellar width; TL, total body length.

	Total n= 110				*C. mirabilis* n=85				*C. bergi* n= 25			
	Mean	SD	Min	Max	Mean	SD	Min	Max	Mean	SD	Min	Max
HW	1.83	0.16	1.44	2.24	1.96	0.12	1.72	2.15	1.78	0.15	1.44	2.24
HL	1.33	0.16	1.01	1.76	1.46	0.12	1.22	1.76	1.29	0.14	1.01	1.71
IO	1.37	0.11	1.10	1.71	1.46	0.09	1.26	1.61	1.35	0.11	1.10	1.71
OL	0.21	0.04	0.12	0.30	0.21	0.04	0.14	0.30	0.20	0.05	0.12	0.29
OE	0.18	0.03	0.11	0.26	0.19	0.03	0.13	0.26	0.18	0.04	0.11	0.26
PW	4.25	0.47	3.31	5.48	4.44	0.59	3.34	5.48	4.19	0.41	3.31	5.25
PL	2.42	0.25	1.89	3.05	2.51	0.24	2.10	2.99	2.39	0.25	1.89	3.05
EW	2.94	0.38	2.13	4.19	3.08	0.42	2.26	3.84	2.89	0.36	2.13	4.19
EL	2.78	0.36	1.82	3.58	2.95	0.45	1.82	3.58	2.72	0.32	2.10	3.53
TL	7.86	0.86	6.05	9.83	8.29	0.91	6.45	9.83	7.74	0.80	6.05	9.69

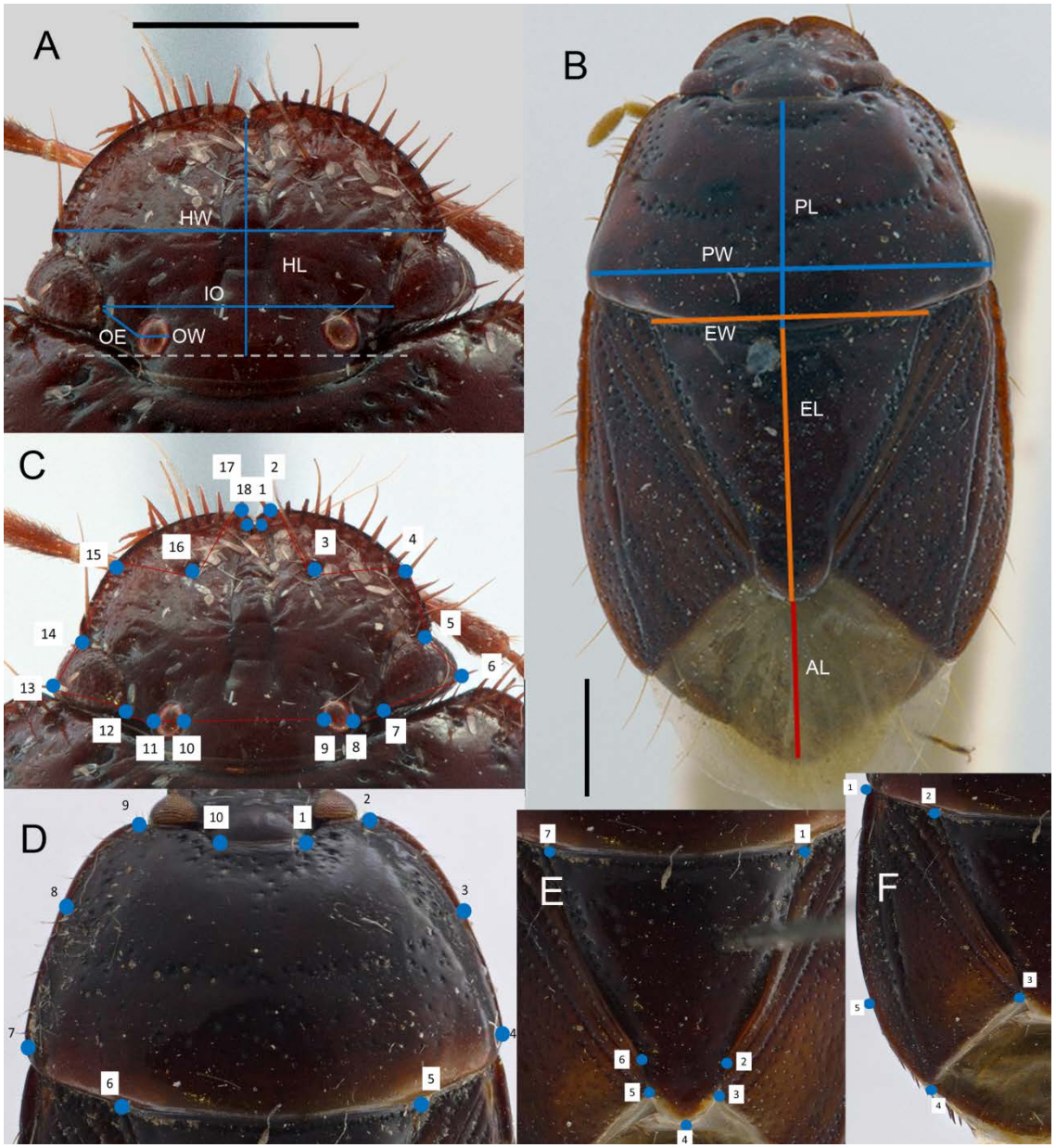

FIGURE 1. Depictions of linear measurements taken and landmarks digitized. (A-B) Measurements taken on the (A) head and (B) body. (C-F) Position of landmarks digitized (C) on the head, (D) pronotum, (E) scutellum, and (F) hemelytron. HL, head length; HW, head width; IO, interocular distance; OW, ocellar width; OE, ocelli-eye distance; PL, pronotal length; PW, pronotal width; SL, scutellar length; SW, scutellar width; AL, abdominal length. Scale bar: 1 mm.

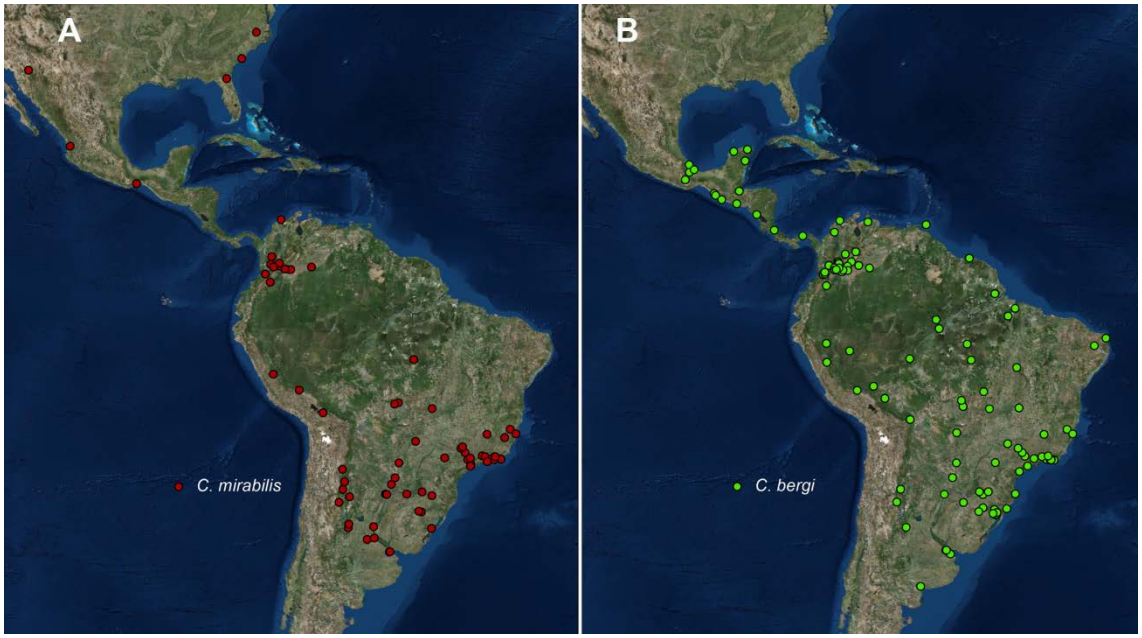

FIGURE 2. Distributional map of (A) *C. mirabilis* and (B) *C. bergi*.

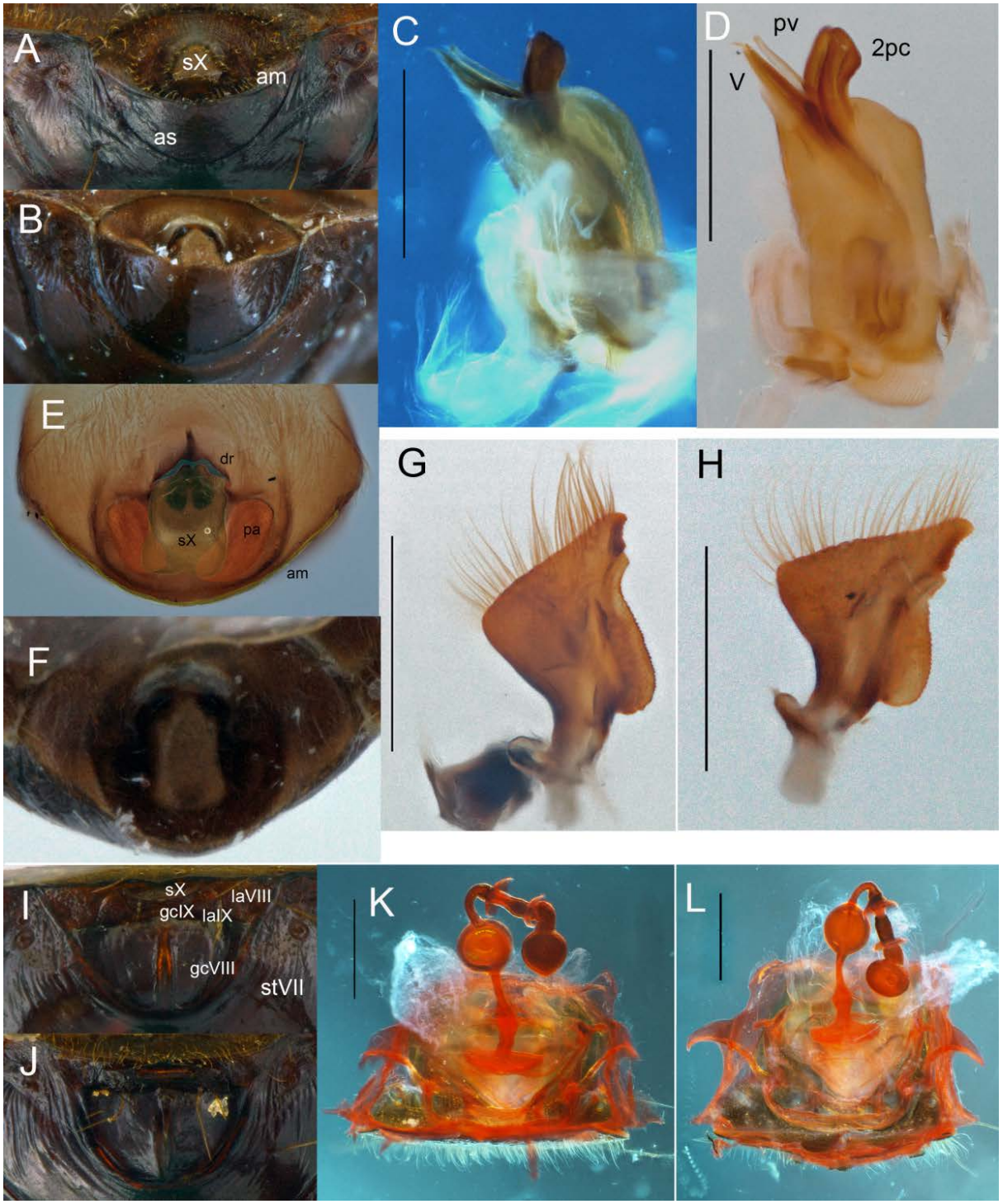

FIGURE 3. Genital structures; (A) external male genitalia *C. mirabilis*, (B) *C. bergi*, (C) phallus lateral view *C. mirabilis*, (D) *C. bergi*, (E) pygophore dorsal view *C. mirabilis*, (F) *C. bergi*, (G) left paramere *C. mirabilis*, (H) *C. bergi*, (I) Female external genitalia *C. mirabilis*, (J) *C. bergi*. (K) spermatheca *C. mirabilis*, (L) *C. bergi*. sX, segment X; am, apical margin; as, apical surface; gcVIII, gonocoxite VIII; gcIX, gonocoxite IX; laVIII, laterotergite VIII; laIX, laterotergite IX; stVII, sternum VII; so, spermathecal opening; rs, ring sclerites; pd, proximal duct; vp, vaginal pouche; di, dilation; in, invagination; dd, distal duct; pf, proximal flange; ip, intermediate part; df, distal flange; nd, “neck” duct; sr, seminal receptacle; dr, dorsal rim; pa, paramere; v, vesica; pv, processus vesicae; 2pc, second conjunctival appendage; pht, phallotheca; pca, processus capitati. Scale bar: 0.5 mm.

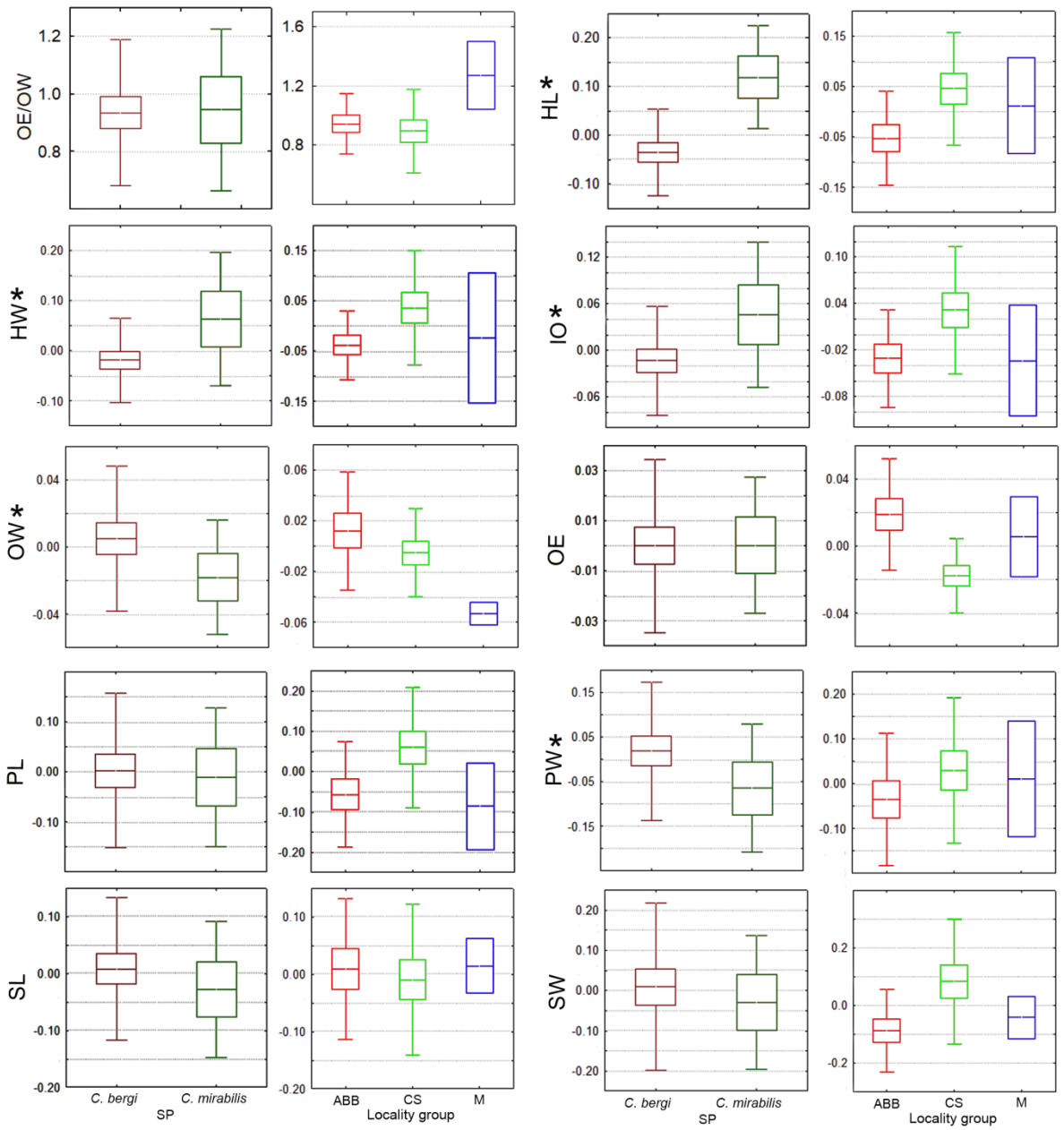

FIGURE 4. Variation in each morphometric character, corrected for total body length by linear regression, of *C. mirabilis* and *C. bergi* and variation in pooled specimens according to latitudinal groupings. Asterisks (*) indicate measurements with significant differences between species. OE/OW, ratio between ocelli-eye distance and ocelli width; HL, head length; HW, head width; IO, interocular distance; OW, ocellar width; OE, ocelli-eye distance; PL, pronotal length; PW, pronotal width; SL, scutellar length; SW, scutellar width.

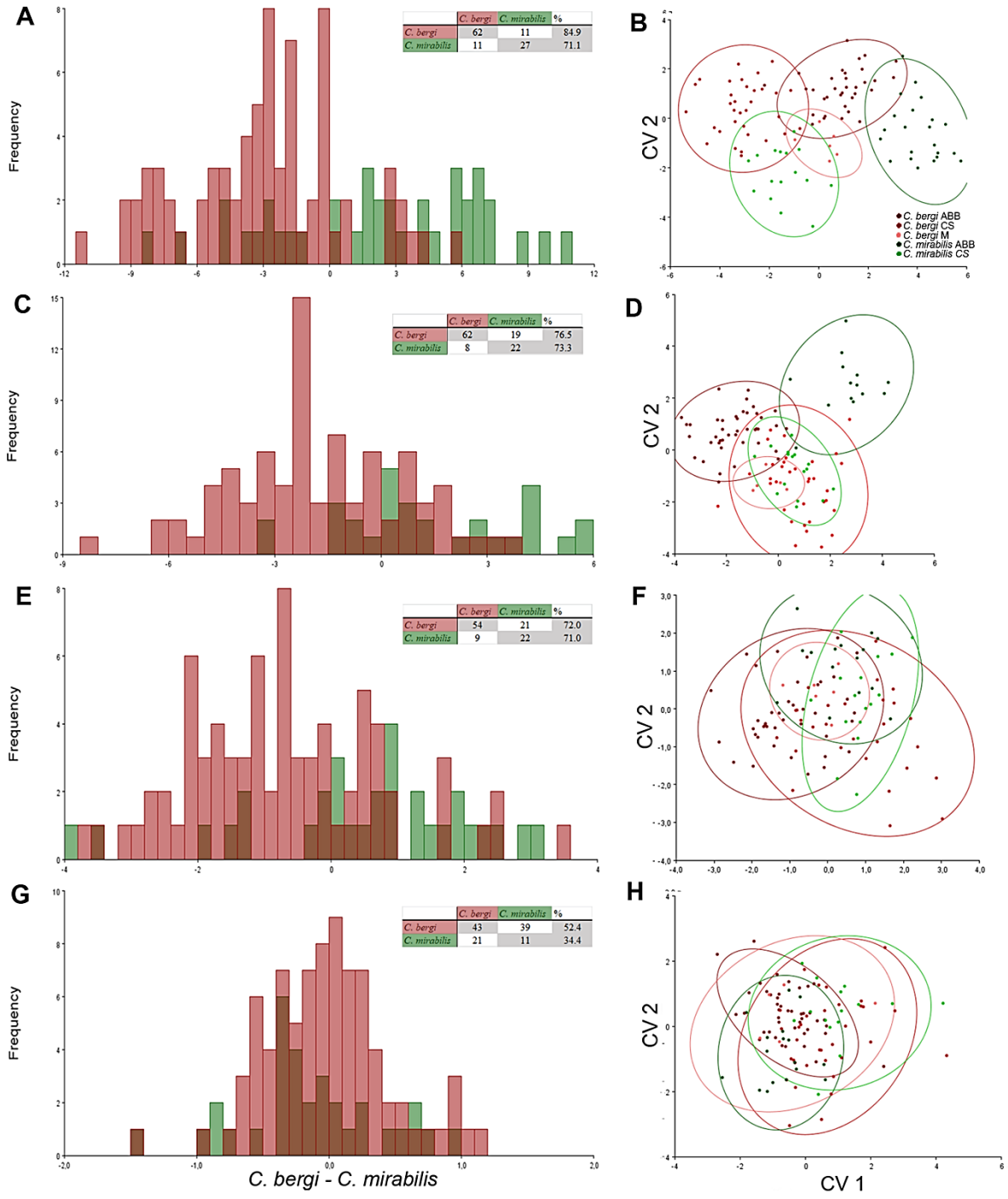

FIGURE 5. Discriminant function analysis plot after cross-validation procedure, based on the discriminant variate of shape analysis and correspondent mean shapes for *C. mirabilis* and *C. bergi* of the head (A), pronotum (C), scutellum (E) and hemelytron (G). Multiple-group discriminant function analysis plot based on canonical variates, CV1 and CV 2 for species in each group of latitude for the head (B), pronotum (D), scutellum (F) and hemelytron (H).

CAPITULO III

Review and phylogeny of *Cyrtomenus* Amyot & Serville (Hemiptera: Cydnidae: Cydninae) based on morphological characters.

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Abstract

Cyrtomenus includes seven species arranged in two subgenera, is part of the most diverse subfamily of burrower bugs, Cydninae. The species present polyphagous habits and at least two species are considered crop pests. We conduct a phylogenetic analysis based on morphological characters to test its monophyly and the validity of the included subgenera. We provide for the first time a phylogenetic hypothesis for *Cyrtomenus*, and taxonomic review including redescriptions, identification key and distribution maps of the included species. Monophyly of *Cyrtomenus* is partially supported, its species always recognized in a clade including *Prolobodes* Amyot & Serville; species of these two genera share the posterior tibia strongly flattened. The recognition of two subgenera within *Cyrtomenus* is not corroborated.

Key Words: Geotomini, implied weights, systematic, taxonomy, genitalia.

Cydnidae has a worldwide distribution, being well represented in tropical and temperate regions (Froeschner 1960; Lis 1999). It includes more than 750 species in 93 genera, divided in six subfamilies (Schwertner & Nardi 2015). Cydnids present unique fossorial life habit among true bugs, with morphologic characteristics suited for digging. They are phytophagous and most of the species seems to be polyphagous feeding on roots, falling seeds or plant tissues (Froeschner 1960; Schuh & Slater 1995; Schwertner & Nardi 2015).

Cyrtomenus Amyot & Serville contains seven species in the two subgenera proposed by Froeschner (1960): the nominal subgenus includes the type-species *C. ciliatus* (Palisot de Beauvois, 1805) along with *C. crassus* Walker and *C. mirabilis* (Perty); the subgenus *Syllobus* Signoret includes *C. emarginatus* Stål, *C. grossus* Dallas, *C. marginalis* Signoret and *C. teter* (Spinola, 1837). The distribution is restricted to the American continent ranging from southern United States to Argentina (Froeschner 1960).

At least two species of *Cyrtomenus* are of economic importance in several countries, with nymphs and adults that feed on roots, tubers and ground pods, reducing productivity and facilitating infection by soil pathogens (Riis *et al.* 2005; Melo Molina *et al.* 2006; Schwertner & Nardi 2015). Until now, there is no proposed phylogenetic classification of the genus and the relationship among the species are

merely assumptions. Identification of the *Cyrtomenus* species is, in some cases, difficult to establish because of their morphological similarity, characteristics variability and the homogeneity of the genitalia (Froeschner 1960; Becker & Galileo 1982; Pluot-Sigwalt & Lis 2008; Schwertner & Nardi 2015).

Given the species of economic importance and the potential to become pests of other species, the understanding of the relationships among cydnids could provide information to understand its evolution and help to study other aspects of the group.

We conduct a phylogenetic analysis of *Cyrtomenus* based on morphological characters to establish a hypothesis of relationship among its species, to test its monophyly and to whether the two proposed subgenera (*Cyrtomenus* and *Syllobus*) represent monophyletic evolutionary lineages. Based on the results, a taxonomic review of *Cyrtomenus* is provided, including redescriptions, identification keys and distribution maps of the included species.

Materials and methods

Phylogenetic analysis

Phylogenetic analyses included all the seven species of the genus *Cyrtomenus.* Sixteen species of other genera of the subfamily Cydninae and two species representing the subfamilies Cephalocteinae and Sehirinae, were used as outgroups.

From the 108 characters, 77 are of general morphology and 31 of genitalia, 74 binary and 34 multistate and all treated as non-additive (unordered); 20 of them were modified from Lis (2000). Characters were scored and described following Sereno (2007) and coded from examination of specimens; some characters of genital structures were coded from literature (McDonald 1966; Schaefer 1977; Becker & Galileo 1982; Pluot-Sigwalt & Lis 2008). Terminology follows Grazia *et al.* (2008) and Kment & Vilímová (2010) for external structures and Schaefer (1977), Becker & Galileo (1982) and Pluot-Sigwalt & Lis (2008) for the genitalia (Fig. 1A-F).

Construction of the character matrix was done using Mesquite (Maddison & Maddison 2017) and the analyses were conducted in TNT (Goloboff *et al.* 2008), with maximum parsimony (MP) as the optimally criterion. Heuristics searches of 10.000 replications, saving 10 trees per replica and TBR as swapping algorithm were conducted. Searches were undertaken using equal weights and implied weights, with 11 different K values, ranging from 1.36 to 12.29, definded under the criteria of Mirande (2009). All unsupported nodes were collapsed after each analysis.

Bremer support (Bremer 1994) was employed for calculate branch support, using the Bremer script in TNT; consistency index (CI) and retention index (RI) were calculated for the EW consensus tree and for each character (Table1).

Trees were rooted between *Sehirus cinctus albonotatus* Dallas and all the other species, based on Grazia *et al.* (2008) that supported Sehirinae among the subfamilies included here as sister group of Cephalocteinae and Cydninae.

Specimens studied

Total of 897 specimens were examined for the present study from the following collections, listed alphabetically according to their acronyms used in the text: AMNH—American Museum of Natural History (New York, USA); CEIOC—Coleção Entomológica do Instituto Oswaldo Cruz (Rio de

Janeiro, BRA); CNIN—Departamento de Zoología, Instituto de Biología, UNAM (México DF, MEX); FZB—Fundação Zoobotânica (Porto Alegre, BRA); ICN—Universidad Nacional de Colombia, Instituto de Ciencias Naturales (Bogotá, COL); UFRG—Laboratório de Entomologia Sistemática da Universidade Federal do Rio Grande do Sul (Porto Alegre, BRA); MACN—Museo Argentino de Ciencias Naturales Bernardino Rivadavia (Buenos Aires, ARG); MLPA—Museo de La Plata (La Plata, ARG); MNRJ—Museu Nacional, Universidade Federal do Rio de Janeiro (Rio de Janeiro, BRA); NMH—Wien Naturhistorisches Museum Wien (Vienna, AUT); NMNH—Smithsonian Institution National Museum of Natural History (Washington, USA); UNAB—Universidad Nacional de Colombia, Facultad de Agronomia (Bogotá, COL); UNIFESP—Universidade Federal de São Paulo (São Paulo, BRA).

Photographs were taken with a digital camera coupled to a stereomicroscope Nikon AZ 100M. Several pictures from different focal planes were combined in the NIS Elements AR software (Nikon Instruments Inc). Maps of distribution were constructed using the software ArcGis (ESRI, 2011).

Results and Discussion

Characters

The total of 108 characters were organized by body part [the symbol "*" refers to the characters modified from Lis (2000)]

Head (Figs. 2-7, 17)

1. Head, clypeus, surface, cuticular sculpture: punctate (0); rugose (1); smooth (2).
2. Clypeus, subapical pair of setigerous punctures*: absent (0); present (1).
3. Clypeus, apex*: narrowed (0); parallel-sided (1).
4. Mandibular plate, dorsal surface, cuticular sculpture: punctate (0); rugose (1); smooth (2).
5. Mandibular plate, lateral margin*: up-curved (0); flat (1).
6. Mandibular plate, length in relation to clypeus: longer (0); shorter (1) equal (2).
7. Mandibular plate, proportions: longer than wide (0); wider than long (1).
8. Mandibular plate, apex: not projected (0); projected anteriorly (1).
9. Mandibular plate, primary setigerous punctures, number: 0 (0), 1 (1), 2 (1) 3 (2).
10. Mandibular plate, submargin, dorsal surface, punctuation: impunctate (0); with a complete row of secondary setigerous punctures (1); with a few secondary setigerous punctures (2).
11. Mandibular plate, lateral margins, submarginal setae shape: hair-like (0); hair and peg-like (1).
12. Eye, lateral single setae: absent (0); present (1).
13. Eye, width proportion laterally surpassing the margin of the mandibular plate: entire (0); two thirds (1) half (2) one third (3).
14. Eye, shape: rounded (0); elongated (1).

15. Interocular space, length in relation to length of head: smaller (0); larger (1).
16. Ocelli, size in relation to the overall head size: small (0); mid (1); large (2).
17. Antenna, antennomeres, number: 5 (0); 4 (1).
18. First antennal segment length in relation to head margin*: surpassing (0); not surpassing (1).
19. Second antennal segment, length in relation to third antennal segment*: shorter (0); equal (1); longer (2).
20. Labial segment II, semicircular lobe: absent (0); present (1).
21. Labium, length: reach between meso and meta coxae (0); reaching mesocoxae (1); surpassing metacoxae (2).

Thorax

Pronotum (Figs. 4, 5)

22. Anterior submarginal surface, cuticular sculpture: punctured (0); with deep impressed line (1); smooth (2).
23. Anterior lobe, surface, cuticular sculpture: punctured (0); smooth (1).
24. Anterior subapical depression, surface, cuticular sculpture: punctate (0); smooth (1).
25. Lateral margin, submarginal setigerous punctures, number: 0 (0); 4-17 (1); 25-30 (2).
26. Transverse impression, disposition of the punctures: band of punctures (0); row of punctures (1); indistinguishable (2).
27. Posterior margin, shape*: rounded (0); straight (1).
28. Posterior lobe, surface, cuticular sculpture: mostly punctate (0); mostly rugose (1); smooth (2).

Propleuron (Figs. 6, 7)

29. Anterior convexity, surface, cuticular sculpture*: densely punctate (0); sparsely punctate (1); smooth (2).
30. Posterior convexity, surface, cuticular sculpture*: densely punctate (0); sparsely punctate (1); smooth (2).

Scutellum (Figs. 4, 5)

31. Scutellum, proportion: longer than wide (0); wider than long (1); as wide as long (2).
32. Scutellum, length in relation to half abdomen length: more (0); less (1).
33. Scutellum, basal margin, surface, cuticular sculpture: punctured (0); smooth (1).
34. Scutellum, lateral margin, punctures*: continuous (0); discontinuous (1).

35. Disc of scutellum, surface, cuticular sculpture*: densely punctate (0); sparsely punctate (1); rugose and punctate (2); smooth (3).
36. Scutellum, apex: not projected (0); projected (1).
37. Scutellum, apex, apical edge, form: rounded (0); acuminate (1).
38. Scutellum, apex, width in relation to half width of scutellum base: narrower (0); wider (1).

Hemelytra (Figs. 4, 5)

39. Costal margin, setigerous punctures, number: 0 (0); 1-9 (1); 21-25 (2).
40. Clavus, well-defined rows of punctures, number*: 1 (0); 2 (1).
41. Clavus, basal part, additional punctures*: present (0); absent (1).
42. Corium, well-defined rows of punctures parallel to clavo-corial suture, number: 1 (0); 2 (1).
43. Corium, row of punctures parallel to clavo-corial suture*: continuous (0); discontinuous (1).
44. Mesocorium, surface, cuticular sculpture: punctured (0); smooth (1).
45. Mesocorium, line of punctures that separates from the exocorium*: only in basal fourth fifths or less (0); along almost their entire length (1).
46. Exocorium, surface, punctuation: dense (0); sparse (1).
47. Membranal suture, form: straight (0); sinuate (1).

Mesopleuron (Figs. 6-9)

48. Mesopleuron, anterior area, surface, cuticular sculpture: punctured (0); smooth (1).
49. Mesopleural evaporatorium: not attaining posterior margin of propleuron (0); attaining posterior margin of propleuron (1).
50. Mesopleural evaporatorium, maximum width in relation to the distance between the evaporatorium and the propleuron: more (0); less (1).
51. Mesopleural evaporatorium, transversal rugae: absent (0); present (1).
52. Mesopleural evaporatorium, pseudoperitreme: absent (0); present (1).

Metapleuron (Figs. 6-9)

53. Metapleural evaporatorium, maximum width proportional to the metapleural width: one third (0); half (1) two thirds (2).
54. Metapleural evaporatorium: not attaining posterior area (0); attaining posterior area (1).
55. Metapleural evaporatorium, peritreme: conspicuous (0); reduced (1).
56. Metapleural evaporatorium, peritreme, length: not attaining the lateral margin of evaporatorium (0); attaining the upper margin of evaporatorium (1).

57. Metapleural evaporatorium, peritreme, subapical process: unnoticeable (0); expanded lobe or band (1); reduced hook-like (2).

58. Metapleural evaporatorium, peritreme, apex, surface*: dull (0); polished (1).

59. Metapleural evaporatorium, peritreme, width: almost same along its length (0); larger at the apex (1).

60. Metapleuron, lateral area, surface: punctured (0); smooth (1).

61. Metapleuron, posterior area, surface: punctured (0); smooth (1).

Legs (Figs. 6, 7, 17)

62. Profemur, shape: slender (0); thick (1).

63. Protibia, external margin, spines: present (0); absent (1).

64. Protibia, base, shape: cylindrical (0); flattened (1).

65. Protibia, apex, shape: clavate (0); cultrate (1), spatulate (2).

66. Protarsi, insertion, position: apical (0); medial (1).

67. Mesofemur, shape: mostly cylindrical (0); compressed and expanded (1).

68. Mesotibia, apex, shape: cylindrical (0); compressed (1).

69. Metafemur, dorsal margin, row of setigerous punctures: single (0); multiple (1).

70. Metafemur, shape: mostly cylindrical (0); compressed and expanded (1); strongly swollen (2).

71. Metatibia, dorsal margin, basal mid, surface: smooth (0); with spines or tubercles (1).

72. Metatibia, ventral margin, spines: thick (0); thin resembling setae (1).

73. Metatibia, apex, shape: cylindrical (0); compressed (1); clavate (2).

74. Metatibia, form: straight (0); curved (1).

75. Metatibia, length in relation to femur and trochanter together*: almost as long (0); longer (1).

76. Metatarsi: present (0); absent (1).

Abdomen (Figs. 6, 7)

77. Sternite IV to VI, surface, conspicuous row of setae: absent (0); present (1).

Female genitalia (Figs. 10, 11)

78. Laterotergites VIII, surface, cuticular sculpture: rugose (0); sparsely punctate (1); densely punctate (2); smooth (3); granulate (4).

79. Laterotergites VIII: continuous (0); joined medially by a narrow bridge above sternum X (1).

80. Laterotergites IX, surface, cuticular sculpture: rugose (0); sparsely punctate (1); densely punctate (2); smooth (3); granulate (4).

81. Laterotergites IX, setigerous punctures: absent (0); present (1).

82. Laterotegites IX: attaining sternum VII (0); not attaining sternum VII (1).

83. Gonocoxites VIII, surface, cuticular sculpture: rugose (0); sparsely punctate (1); densely punctate (2); smooth (3); granulate (4).

84. Gonocoxites VIII, form: wider than long (0); almost as long as wide (1); longer than wide (2).

85. Gonocoxites VIII, dorsal margin: straight (0); elevated towards the sternum X (1).

86. Gonocoxites IX, bases: not visible (0); visible (1).

87. Ring sclerites: present (0); absent (1).

88. Spermatheca, spermathecal duct, dilation and invagination: present (0); absent (1).

89. Spermatheca, spermathecal duct, dilation, form: ovoid (0); elongated (1); spherical (2); radiated (3); reduced (4).

90. Spermatheca, spermathecal duct, dilation, total length in relation to intermediate part: almost twice longer (0); almost four times longer (1); equal (2).

91. Spermatheca, proximal duct: reduced (0); elongated (1).

92. Spermatheca, distal duct, total length in relation to intermediate part: shorter (0); almost twice longer (1); almost three times longer (2); more than five times longer (3).

93. Spermatheca, distal duct, exposed part out of dilation, length in relation to intermediate part: shorter (0); equal (1); longer (2).

94. Spermatheca, distal duct: straight (0), coiled (1).

95. Spermatheca, proximal flange, size in relation to distal flange: longer (0); equal (1).

96. Spermatheca, seminal receptacle, basal neck-like duct: much wider than long (0); almost as wide as long (1); distinctly longer than wide (2).

97. Spermatheca, seminal receptacle: oval (0); spherical (1).

Male genitalia (Figs. 12, 13)

98. Pygophore, apical surface, cuticular sculpture: smooth (0); punctate (1); rugose (2).

99. Pygophore, apical margin in relation to lateral margin of the sternum VII: almost at the same height (0); distinctly lower (1).

100. Pygophore, apical margin, mesial region: convex (0); sinuated (1); emarginated (2).

101. Pygophore, dorsal rim: convex (0); sinuated (1).

102. Phallus, *processus conjunctivae*, number: 2 (0); 4 (1); 6 (2).

103. Phallus, *processus conjunctivae*, sclerotization of second conjunctival appendages*: weak (0); strong (1).

104. Phallus, *processus conjunctivae**: bilobate (0); without lobes (1).

105. Phallus, vesica in rest position: not projected outside the theca (0); projected outside the theca (1).

106. Phallus, *processus vesicae* in rest position: not projected outside the theca (0); projected outside the theca (1).

107. Paramere, hypophysis, pilosity*: scarce (0); abundant (1).

108. Paramere, hypophysis, setae*: long (0); short (1).

Phylogenetic analyses

The analysis under equal weights of the character matrix with 25 terminal taxa and 97 informative characters (Table 2) resulted in 4 most parsimonious trees, with 368 steps, CI = 0.37 and RI = 0.5. Two trees did not corroborate *Cyrtomenus* as monophyletic, included in a politomy with genus *Prolobodes*; the remaining two trees, place *Prolobodes* as sister group to a monophyletic *Cyrtomenus*. Strict consensus resulted in a tree with almost all nodes collapsed, maintaining the clade with *Prolobodes* (monophyletic) and the species of *Cyrtomenus*, with its internal relationship unresolved (Fig. 14A). Bremer supports values for consensus, are given in figure 14B.

The implied weights analyses with K0 (1,36) to K10 (12,23) resulted in 11 trees (one tree each analysis), with 3 different topologies for K0 – K6; K7 – K9 and K10 (Fig. 15). Only the relationship among basal taxa is variable between tree, with the same resolution between *Prolobodes* and *Cyrtomenus* in all trees. The results of the analyses under IW are presented in Table 3.

Consensus tree under IW (Fig. 16) shows *Cyrtomenus* as monophyletic group supported by one non-homoplasyc synapomorphy in character 65, shape of the protibia compressed, expanded and truncate apically (Figs. 19-20D, 22-24D, 26-27D), with full resolution of its internal relationship. The two subgenera *Cyrtomenus* and *Syllobus* were not recovered; however, the four species placed by Froeschner (1960) in the subgenus *Syllobus* (*C. emarginatus*, *C. grossus*, *C. marginalis* and *C. teter*) remain grouped by the character 52, pseudoperitreme present (Figs. 22-24C, 27C). This character state is present in other species of the tribe Geotomini, not included in the present analysis (i.e. *Dallasiellus interruptus* Froeschner, 1960 and *Tominotus ondulatus* Avendaño 2017).

The sister group of *Cyrtomenus* is *Prolobodes*, clade *Prolobodes* + *Cyrtomenus* is supported by two synapomorphies (characters 73 and 74: metatibia compressed and curved (Figs. 17A, D, 19-20A, D). The metatibia shape drew attention by Froeschner (1960) as diagnostic feature to separate these two genera from others Cydninae Neotropical. The diagnostic feature of *Prolobodes*, semicircular lobe on labial II (Figs. 6B, 17C) was found homoplasic (also found in *Scaptocoris minor*), althought supported the monophyly of the genus, being unique among the Cydninae Neotropical.

High level of homoplasy had been suggested for the tribe Geotomini (Froeschner 1960; Becker & Galileo 1982; Lis & Heyna 2001; Lis & Hohol-Kilinkiewicz 2002; Pluot-Sigwalt & Lis 2008), as many morphological features of the head, legs and genital structures are shared among groups not directly related within the family (Dolling 1981); presumably, some of these characters represent

adaptative convergences to fossorial habit of cydnids, unique among true bugs (Heteroptera). Further studies about the relations among subfamilies could elucidate that matter.

Key to genus of Cydninae of the Western Hemisphere. (adapted from Froeschner 1960).

1. Pronotum anteriorly with deep, sharply impressed line (sometimes enclosing punctures but usually impunctate) paralleling anterior margin from side to side, never broken in a row of punctures (Fig. 3D, E) ..... ***Pangaeus*** Stål.
Pronotum anteriorly without a sharply impressed anterior line, although often with a row of punctures in the same area (rarely with partial, vague line laterally (Fig. 3A-C, 3F-H,) **2**

2. Anterior part of osteolar peritreme modified apically into a distinctly differentiated loop, lobe, or band which is wider than basal part of peritreme and in part or wholly polished (Figs. 8A, C, G, F, H, 9A, B) **3**
Anterior part of osteolar peritreme without enlarged, differentiated apical structure, sometimes with a small, subapical, posterior hooklike or flaplike projection (Figs. 8B, D, E, 9C-H, 17C, 19C) **6**

3. Hemelytron with membrane occupying half its length (Fig. 4F) ..... ***Ectinopus*** Dallas.
Hemelytron with membrane occupying less than one-third its length (Figs. 4A-E, G, H, 5) **4**

4. Metapleural evaporatorium very limited, just outlining peritreme, not approaching metapleural lamella posteriorly (Fig. 9B) ..... ***Microporus*** Uhler.
Metapleural evaporatorium more extensive, occupying more than half of sclerite and nearly or quite reaching base of metapleural lamella posteriorly (Figs. 8, 9A, C-H) **5**

5. Terminal process of peritreme scoop-shaped or auricular, with ostiole conspicuously visible ventrally at its base (Fig. 9C) ..... ***Onalips*** Signoret.
Terminal process of peritreme flat, simply expanded posteriorly as a more or less polished lobe, ostieole opening posteriorly, not conspicuous ventrally (Figs. 8H, 9A) ..... ***Melanaethus*** Uhler.

6. Posterior tibia conspicuously compressed, anterior and posterior faces glabrous, not spined; spines of posteroventral margin conspicuously longer, thinner and more tapering than those of dorsal margin (Figs. 17A, D, 19A, D) **7**
Posterior tibia not or only weakly compressed; dorsal and ventral spines about equally developed (Figs. 6, 7) **8**

7. Labial segment II with large, semicircular, foliaceous lobe, this often hidden between anterior coxae (Fig. 17C) ..... ***Prolobodes*** Amyot and Serville.

Labial segment II somewhat compressed, but without large, foliaceous lobe (Figs. 19D, 22D) ..... ***Cyrtomenus*** Amyot and Serville.

8. Head with a complete row (extending from eye to apex of mandibular plate) of coarse, more or less contiguous punctures giving rise to numerous long hairs and usually also to a row of short, blunt pegs (Fig. 3G, H) ..... ***Tominotus*** Mulsant and Rey.
Head without a complete row (absent or extending not more than threefourths of way to apical

angle of mandibular plate) of coarse setigerous punctures; pegs never present (Fig. 2D, E) .....***Dallasiellus*** Berg.

Taxonomy of Cyrtomenus

***Cyrtomenus* Amyot & Serville.**

(Fig. 18-27)

Cyrtomenus Amyot and Serville 1843: 90; Froeschner 1960: 514.

Syllobus Signoret, 1879: CLXXII.

Diagnosis: The apex of the protibia spatulate and the apex of the mesotibia compressed, separates the genus from others in the subfamily.

Redescription. Body oval, length 6.4 to 13 mm, uniformly red-brownish to black, dorsum convex.

Head flat to convex dorsally; mandibular plates equal to longer than clypeus, rounded marginally or triangularly produced, surface rugose, finely punctate or smooth and with a submarginal complete row of secondary setigerous punctures each bearing a single hair-like setae; clypeus narrowed apically, surface rugose to punctate; eyes variable, projecting half of their width and showing a stout setae on the distal margin; ocelli present, well developed; antennae 5-segmented; bucculae lower to slightly high than labial segment II, latter compressed without semicircular foliaceous lobe; labium variable in size, reaching between middle coxae and abdomen base.

Thorax: Anterior margin of the pronotum moderately emarginated, submargin punctured without impressed line, anterior pronotal lobe smooth to densely punctured, transverse impression marked variable, posterior lobe impunctate to densely covered with fine punctures. Lateral margins carinate, submarginal row of 6 to 25 setigerous punctures, posterior margin rounded. Propleuron polished to sparsely punctate. Scutellum disc with widely, irregularly scattered fine or coarse punctures, apex projected with apical edge rounded, distinctly less than half as wide as membranal suture. Hemelytron polished, punctured, with corial areas well defined, costa with 0 to 22 setigerous punctures, clavus usually with single row of punctures; membranal suture straight. Evaporatorium sometimes interrupted by transverse polished band extending from lateral area (pseudoperitreme), peritreme conspicuous, abruptly terminated not showing any kind of expansion or lobe, areas surrounding evaporatorium polished and impunctated. Protibia moderately compressed and modified, femora compressed, metatibia strongly compressed, curved, with rows of spines restricted to dorsal and ventral margin, spines of posteroventral margin much longer and more slender than those of dorsal margin, tarsi present.

Abdomen: Sternites III to VI polished, with or without rows of setigerous punctures across segments.

Male genitalia (Fig. 12N-R): Genital capsule globose and simple, apical margin straight, dorsal rim sinuate; parameres dorso-ventrally compressed, apex rounded and broad (Fig. 12N-R); phallotheca tubular, dorsal margin longer than ventral margin, only the second conjunctival appendage present, bilobulate and sclerotized, processus capitati mushroom-like (Fig. 13F), vesica longer than ejaculatory reservoir, processus vesicae as long as vesica, both projected outside the phallotheca (Fig. 13H, I).

Female genitalia (Fig. 10M-R): Laterotergites VIII with two setigerous punctures, fused medially by a

very narrow section, about twice the size of laterotergites IX, latter punctate with two to three setigerous punctures, triangular; segment X semicircular, rugose and entire; gonocoxite IX punctate, divided medially, bases not visible externally; gonocoxites VIII smooth with fine scattered punctures, larger than laterotergites VIII, dorsal outline straight. Spermatheca (Fig. 11E-G): seminal receptacle sclerotized and pigmented, spherical, connected by basal neck-like duct. Intermediate part long, delimited apically and proximally by two cuticular, well-developed flanges, the area between the flanges sclerotized and pigmented as the receptacle, flexible zone basal. Spermathecal duct short, distal duct twice length of intermediate part and proximal duct almost as long as intermediate part, dilation spherical with a strongly pigmented central core, latter surrounded by a thick wall of tissue (intima) with external layer translucent and internal pigmented and serrated, spermathecal opening not sclerotized. Ring sclerites present, always associated with a pair of lateral vaginal pouches more or less differentiated.

Distribution: Restricted to Western Hemisphere where the included species range from eastern United States through Argentina.

Comments: According with the phylogenetic analysis, the internal classification into two subgenera within *Cyrtomenus* as proposed by Froeschner (1960) was not supported, and not maintained in this work. The species are arranged following the phylogenetic hypothesis obtained from the strict consensus of trees obtained under IW (Fig. 15).

Key to the species of *Cyrtomenus*

1. Mesopleural evaporatorium posteriorly interrupted by the pseudoperitreme (Figs. 23C, 25C, 26C, 27C) **2**
Mesopleural evaporatorium entire (Figs. 19C, 21C, 22C) **5**

2. Costa with 20 or more setigerous punctures (Fig. 27A, D) ..... ***C. marginalis*** Signoret.
Costa with not more than 10 setigerous punctures (Figs. 23D, 25D, 26D) **3**

3. Apices of mandibular plates projecting as blunt to acute triangles (Fig. 25A, B) ..... ***C. emarginatus*** Stål.
Apices of mandibular plates rounded, not projecting triangularly (Fig. 23B, 26B) **4**

4. Interocular width distinctly greater than length of head (Fig 26B); costa not continuing or paralleling outline of lateral margins of pronotum; labium overpass posterior coxae (Fig 26D) .... ***C. grossus*** Dallas.
Interocular width less than length of head (Fig 23B); costa continuing or paralleling outline of lateral margins of pronotum; labium reaching between or slightly beyond posterior coxae (Fig. 23D) ..... ***C. teter*** (Spinola).

5. Sternites IV to VI with postmedian, partial, transverse row of prominent setigerous punctures on lateral third (Fig 21D, 22D) **6**

Sternites IV to VI without a transverse row of prominent setigerous punctures on lateral third (Fig 19D) ..... ***C. mirabilis*** (Perty).

6. Outline of mandibular plates rounded, tending to be somewhat triangular (Fig. 21B); about one-half width of eye projecting laterally beyond posterolateral angle of mandibular plate (Fig. 21D) ..... ***C.***

ciliatus (Palisot de Beauvois).
Outline of mandibular plates very broadly rounded and reflexed (Fig. 22B); about one-third of eye projecting laterally beyond posterolateral angle of mandibular plate (Fig.22D) .. ***C. crassus*** Walker.

***Cyrtomenus mirabilis* (Perty)**

(Figs. 10Q, 12Q, 18, 19)

Cydnus mirabilis Perty, 1830: 166.

Cyrtomenus mutabilis Dallas, 1851: 112; Walker, 1867: 147.

Cyrtomenus mirabilis Stål 1876: 18; Distant, 1880: 3; Signoret, 1881: 199; Lethierry & Severin, 1893: 62.

Macroscytus umbonatus Berg, 1878: 14.

Cyrtomenus ciliatus Berg, 1879: 10.

Cyrtomenus (Cyrtomenus) bergi Froeschner, 1960: 527; Avendaño *et al.* 2017: 402.

Cyrtomenus (Cyrtomenus) mirabilis Froeschner, 1960: 536; Avendaño *et al.* 2017: 403.

Material examined: USA: **SC:** 3 specimens, Charleston, JL Rogers, 25401, MACN; **FL:** 1M#, Baker, Macclenny, 10-Jun-30, NMNH; **AZ:** 1M#, 1F#, Santa Cruz co., Nogales, 28-Jul-56, C. & M. Cazier, 245234, 245204, AMNH; **NC**: 1M#, 1F#, Edgecombe co., Rocky Mount, 4-Jul-53, R. Schrammel, 245243, 234653, AMNH; **MÉXICO: Yucatán**: 1F#, Colonia Yucatán, 21-Aug-52, J. & D. Pallister, 241365, AMNH; 1F#, Merida, 29-Jul-52, J. & D. Pallister, 241362, AMNH; **Chiapas**: 1M#, Rio, Km3 Tapachula - Talisman, 15-Mar-85, M. Vertis, UNAM; 1M#, Tapachula, 5 km al S de Palo Seco, 10-Aug-91, C. Mayorga, UNAM; 1M#, Huixtla, 43, 1-Oct-39, UNAM; **Oaxaca:** 1F#, Tuxtepec, 60, 10-Nov-74, H. Brailovsky, UNAM; 1F#, 15-Jul-64, 16-Jul-64, P.S. Spangler, NMNH; 1F#, Tehuantepec, Santo Domingo Tehuantepec, 12-Jul-55, C. & P. Vaurie, AMNH; **Quintana Roo**: 1F#, Felipe Cerrillo Puerto, 20 km.N., 12-Jun-83, 14-Jun-83, E. Riley, NMNH; **Veracruz**: 1F#, Los Tuxtlas, 17-Apr-90, S. Zragoza, UNAM; 1F#, Tlapacoyan, 2-Aug-85, J. Bueno, UNAM; **EL SALVADOR**: **San Salvador**: 1F#, San Salvador, 6-May-58, O.L. Cartwright, NMNH; 1F#, San Salvador, 20-May-58, 23-May-58, O.L. Cartwright, NMNH; **GUATEMALA**: **Escuintla**: 1M#, Tiquisate, Margin of Río Sicuacán, 10-May-56, T.H. Hubbel, 261-1961, NMNH; **Izabal**: 1F#, Morales, 1-Jan-30, J.J. White, NMNH; **TRINIDAD**: **Maraval**: 1M#, Paramin, 27-Sep-78, NMNH; **NICARAGUA**: **Managua**: 1F#, Managua, 50 masl, K.D. Hummel, NMNH; **COSTA RICA**: **Cartago:** 2M#, Turrialba, 22-Mar-49, NMNH; **PANAMA**: **Panamá**: 1F#, Las Cumbres, 21-Sep-75, Henk Wolda, NMNH; 1M#, 1F#, Panamá, NMNH; **SURINAM**: **Paramaribo**: 1M#, 1F#, 24-Aug-69, 14-Dec-69, N. Nieser, UFGR; **VENEZUELA**: **Falcón**: 1F#, Península de Paraguaná, San José de Cocodite. Cueva Piedra Honda. 10 km SW de Pueblo Nuevo, 3-Mar-71, S. Peck, AMNH; **COLOMBIA**: 1M#, 18-Oct-94, "Pavas. Escallon", UNAB; **Antioquia:** 1M#, Santa Barbara, Versalles. Fca Los Naranjos, 1800 masl, 15-Apr-12, L. Ojeda, UNAB; **Arauca**: 1M#, 1F#, Fortul, 300 masl, 19-Feb-02, N. Ulloa, UNAB; **Bolivar:** 1F#, Zambrano, Hda. Monterrey, 70 masl, 15-Jun-93, F. Fernández & G. Ulloa, ICN; 1F#, Zambrano, Hda. Monterrey, 70 masl, 12-Aug-93, F. Fernández & G. Ulloa, ICN; **Casanare:** 2F#, Orocué, Parque Wisirare, 4-Nov-10, 11-Nov-10, ICN; 1F#, Orocué, Parque Wisirare, 5-Nov-10, ICN; 1M#, Yopal, Vda Palomas. Fca El Paraiso, 350 masl, 31-Dec-11, M.

Angel, UNAB; **Cundinamarca:** 1F#, Vda Chilajara, 17-Sep-95, UNAB; 1M#, Agua de Dios, 400 masl, 1-Nov-96, F. Gallén, UNAB; 1F#, Anapoima, 1676 masl, 22-Mar-08, C. Zamora, ICN; 1F#, Apulo, 421 masl, 16-Sep-95, Fredy, UNAB; 1F#, Bogotá, Sec Bella Suiza, 2573 masl, 19-Jul-14, W. Ladino, UNAB; 1F#, Chinauta, Fca San Fernando, 1150 masl, 11-Jun-11, D. Granados, "Césped", UNAB; 1F#, Chinauta, 1-Oct-03, A. Cuevas, UNAB; 1M#, Girardot, 281 masl, 8-Oct-94, Zambrano, "Suelo", UNAB; 1M#, Guayabetal, 1200 masl, 3-Nov-01, P. Moreno, UNAB; 1M#, 1F#, La Palma, 1462 masl, 1-May-95, Buitrago, UNAB; 1F#, La Vega, Laguna El Tabacal, 20-Jan-98, M. García, UNAB; 1F#, Nimaima, 1185 masl, 17-May-03, C. Avellaneda, "Cultivo mandarina", UNAB; 1F#, San Antonio del Tequendama, Vda Laguna grande, 1324 masl, 26-Jul-12, J. Rivera, UNAB; 1M#, Supatá, Las Lajas. Fca El Recuerdo, 1720 masl, 1-Nov-09, J. Gil, UNAB; 1F#, El Colegio, 983 masl, 5-May-80, E. Galindo, UNAB; 1M#, Villeta, Cune. Fca Rubiano, 804 masl, 1-Mar-03, A. Beltrán, UNAB; **Huila:** 1M#, Pitalito, Vda Yamboró. Tecnoparque SENA, 1285 masl, 22-Sep-14, J. Cáceres: UNAB; 1M#, El Pital, Vda El Carmen, 921 masl, 2-Nov-09, D. Briceño, "Hojarasca", UNAB; **Magdalena:** 2M#, 1F#, PNN Tayrona. Neguanje, 155 masl, 1-Sep-96, Escobar F., IAvH-87345, IAVH; 1F#, Santa Marta, Sierra Nevada, 2 masl, 1-Jun-94, T. Barrantes, UNAB; **Meta:** 1F#, Guamal, 2-Aug-68, S. Bobadilla, UNAB; 1F#, Puerto López, Fca Santana, 184 masl, 6-Nov-02, "Bosque primario", UNAB; 1F#, Puerto López, 40 Km a Puerto Gaitán. Fca Murujuy, 449 masl, 9-Jun-10, J. Jiménez, UNAB; 2M#, Puerto López, Bajo Menegua, 300 masl, 12-Apr-84, Restrepo R., ICN; 1M#, Puerto López, Vda. Menegua. Fca. El Lagunas, 300 masl, 12-Apr-84, Restrepo R., ICN; 1F#, Villavicencio, 367 masl, 13-May-12, D. García, UNAB; 1F#, Villavicencio, 27-Nov-1976, Isaias Arteaga, ICN; 1M#, Villavicencio, 467 masl, 13-Nov-94, R. Marisol, "Matorral", UNAB; **Risaralda:** 1M#, Pereira, Corr Altagracia. Fca El Jazmín, 1430 masl, 23-Sep-11, D. Rincón, UNAB; 1F#, Pereira, Montenegro. Finca La Aurora, 14-Aug-05, M.J. Salazar, ICN; 1M#, Pereira, 1420 masl, 4-Jun-99, F. Ome, UNAB; **Santander:** 1F#, Socorro, Barrio Villa Madrigal, 1200 masl, 7-Feb-15, R. Blanco, "Passiflora edulis (Maracuyá)", UNAB; **Tolima:** 1M#, Coello, Vda Llano de la Vírgen, 339 masl, 17-Oct-98, L. Ortíz, UNAB; 1F#, Espinal, Vda La Morena, 322 masl, 20-Sep-98, J. Mendez, UNAB; 1M#, Espinal, 322 masl, 14-Oct-94, M. Parra, UNAB; 1M#, Espinal, 323 masl, 10-Jan-12, A. Mayorga, UNAB; 1F#, Ibagué, 1285 masl, 16-May-99, M. Vasquez, UNAB; 1F#, Ibagué, Juntas, 2000 masl, 18-Oct-03, O. Guataquirá, "Bosque", UNAB; 1F#, Melgar, 323 masl, 12-Apr-11, R. Barras, "En Anacardiaceae", UNAB; **Valle del Cauca:** 1F#, Cali, 995 masl, 30-Oct-11, C. Rodríguez, "Gliricidia septum (Matarratón)", UNAB; 1M#, Palmira, CIAT, 1003 masl, 26-May-02, J. Martínez, "Cultivo de Maíz", UNAB; 1F#, Restrepo, Vda La Palma, 1400 masl, 24-Feb-01, J. Pérez, UNAB; 1F#, La unión, 11-Oct-92, E. Martínez, UNAB; 1F#, Santa Elena, Fca Villa Ana, 959 masl, 17-Mar-15, P. Espitia, UNAB; **Vichada:** 1M#, Gaviotas, Sabana no inundable, 180 masl, Jun-95, IAvH-87555, IAVH; 4M#, 10F#, Gaviotas, 15-Jun-1972, R. Cortés, ICN; **BRAZIL: AP:** 2M# 1F#, Porto Grande, CODEPA: 17-Sep-1982, UFRG; 2M# 19F#, Porto Platon, 1982, J.I. Lacerda col., UFRG; **PA:** 1 specimen, Cachimbo, Sep-1954, Alvarenga col., MNRJ; 1 specimen, Belém, 01-Mar-1951, Rego col., MNRJ; 3 specimens, Cachimbo, 14 to 21-Sep-1955, Travassos col., FIOC; 9 specimens, Cachimbo, 09-Oct-1956, Travassos col., FIOC; 3 specimens, Mocajuba, 01-Oct-1952, Rego col., MNRJ; 1M#, Natal, 01-Nov-1963, MCNZ; **AM:** 1M#, Borba, Rio Madeira, Dirings col., MCNZ; 1F#, Manaus, Independência, AMNH; 1F#, Manaus, Mamoré. Madeira, AMNH; **CE:** 1 specimen, Marinha, 01-Jan-1964, MNRJ; **RN:** 3 specimens, Natal, 01-Jan-1950, Alvarenga col., MNRJ; **PB:** 1 specimen, Santa Luzia, 01-Aug-1956, Cincinato col., MNRJ; **TO:** 1M# 1F#, Palmas, Serra do Langeado, 17-Nov-1992, UFRG; 1F#, Palmas, Serra do Langeado. Fazenda Céu, Nov-1992, UFRG; **MT:** 1 specimen, Barra do Bugres, Oct-1989, Magno col., MNRJ; 1 specimen, Alto Xingú, 01-Jun-1953, Alencar col., FIOC; 1 specimen, Cuiabá, 15-Oct-1956, Ador col., MNRJ; 1F#, Rio Paraná, “Riacho do Herv.”, 01-Dec-1952, Dirings col., MCNZ; 2 specimens, Salobra, 21 to 27-Jan-1941, De Amico col., FIOC; 6 specimens, Salobra, 01-Nov-1941, FIOC; 1 specimen, Salobra, 22 to 27-Jan-1955, Travassos col., FIOC; **AC:** 1 specimen,

Cruzeiro do Sul, 01-Sep-1956, Gonçalves col., MNRJ; **RO:** 1 specimen, Porto Velho, Guaporé, May-1944, Parko col., MNRJ; **GO:** 1 specimen, Aragarças, 28-Jan-1953, MNRJ; 3 specimens, Aragarças, 14-Oct-1959, Alvarenga col., MNRJ; **MG:** 1 specimen, Passa Quatro, 1955, MNRJ; 10M# 5F#, Sete Lagoas, 04-Nov-1998, J.M Waquil col., UFRG; 1F#, Sapucaí Mirim, 01-Jan-1992, Ferrarezzi M. col., UFRG; 2 specimens, Xavantina, 01-Jan-1953, Oliveira col., MNRJ; **DF:** 1M# 1F#, Brasilia, 20-Oct-1965, M. Becker col., MCNZ; **ES:** 3 specimens, Córrego do Itá, 01-Nov-1954, Zikán col., MNRJ; 16 specimens, Barra de São Francisco, Córrego do Itá, Oct-1954, Zikán col., MNRJ; 1 specimen, Linhares, Parque Sooretama, 15-Oct-1958, Zajciw col., MNRJ; 8 specimens, Linhares, Parque Sooretama, Oct-1959, MNRJ; **RJ:** 1 specimen, Estrada RJ-SP Km 47, 22-Oct-1942, Braja col., MNRJ; 1 specimen, Estrada RJ-SP Km 48, 18-Jan-1943, Wygodzinsky col., MNRJ; 1 specimen, Estrada RJ-SP Km 49, 20-Jan-1943, Braja col., MNRJ; 1 specimen, Estrada RJ-SP Km 50, 14-Oct-1943, MNRJ; 2 specimens, Estrada RJ-SP Km 51, 11-Jan-1944, MNRJ; 1 specimen, Estrada RJ-SP Km 52, 31-Oct-1944, Wygodzinsky col., MNRJ; 1 specimen, Estrada RJ-SP Km 53, 07-Dec-1945, Miranda col., MNRJ; 1 specimen, Estrada RJ-SP Km 54, 20-Oct-1949, Mendes col., MNRJ; 1 specimen, Estrada RJ-SP Km 55, 10-Oct-1958, MNRJ; 2 specimens, Deodoro, 10-Sep-1934, Zikán col., MNRJ; 1 specimen, Deodoro, 24-Jan-1941, Zikán col., MNRJ; 4 specimens, Iguaba Grande, 01-Nov-1996, MNRJ; 1 specimen, Itatiaia, Estação Biologica, 01-Nov-1947, Zikán col., MNRJ; 2 specimens, Magé, Gonçalves col., MNRJ; 2M#, Petrópolis, Oct-1979, Costa col., FIOC; 2 specimens, Rio de Janeiro, Ilha Grande, Apr-1956, Santos col., MNRJ; 3 specimens, Ins Oswaldo Cruz. Zona de NOB, 18 to 29-Oct-1938, FIOC; 1 specimen, Rio de Janeiro, Parque do Museu da República, Nov-10, Moreira col., MNRJ; 1 specimen, Rio de Janeiro, Parque do Museu da República, 14-Sep-2011, Balon col., MNRJ; 2 specimens, Rio de Janeiro, Tijuca, Zajciw col., MNRJ; 3 specimens, Teresópolis, Serra dos Órgãos, 01-Jan-1954, Zajciv col., MNRJ; 1 specimen, Coroa Grande, Feb-1957, Freitas col., FIOC; 1 specimen, Guaratiba, 24-Nov-1952, Silva col., MNRJ; 4 specimens, Itatiaia, 14-Oct-1943, Zikán col., FIOC; 1 specimen, Jacarepaguá, 02-Mar-1952, Rego col., MNRJ; 1 specimen, Jacarepaguá, 24-Aug-1952, Rego col., MNRJ; 1 specimen, Jacarepaguá, 26-Oct-1974, FIOC; 1 specimen, Vassouras, 01-Jan-1940, Machado col., FIOC; **MS:** 1 specimen, Campo Grande, Feb-1941, MNRJ; 3 specimens, Corumbá, Nhecolandia, 17-Oct-1953, Gonçalves col., MNRJ; **SP:** 1M#, Assis, Dirings col., MCNZ; 1 specimen, Campinas, Rezende col., MNRJ; 1M#, Cantareira, Dirings col., MCNZ; 5 specimens, Monte Alegre do Sul, Fazenda Santa Maria, 24 to 30-Nov-1942, Zoppel col., FIOC; 1 specimen, Pirassununga, 10-Oct-1946, Travassos col., FIOC; 1F#, Pradópolis, 01-Dec-1976, P.M.S. Botelho col., MCNZ; 1M#, Ribeirão Preto, Faz Restinga, Nov-1997, AM de Faria col., UNIFESP; 1 specimen, Ribeirão Preto, Rio Tamanduá, 07-Dec-1953, Travassos col., FIOC; 1M#, São Paulo, 1940, MCNZ; 1 specimen, Ypiranga, 10-Oct-1925, Luderwaldt col., MNRJ; 1 specimen, Ypiranga, 02-Apr-1936, FIOC; 1F#, Balsamo, Seringueira, 29-Oct-1987, EC Bergmann col., UNIFESP; 2F#, Balsamo, 15-Sep-1989, EC Bergmann col., UNIFESP; 2 specimens, Grajaú, 01-Apr-1946, MNRJ; 3F#, Mogi-Mirim, ca. 9 km W, 02-Feb-2009, MCNZ; 1 specimen, Pirassununga, 10-Dec-1946, Travassos col., FIOC; 2M# 1F#, Pradópolis, Oct-1976, P.M.S. Botelho col., MCNZ; 1F#, Registro, Petropen, 02-Feb-1992, Fernandes J.A.M. col., UFRG; **PR:** 3 specimens, Rolândia, 01-Feb-1954, Maler col., MNRJ; **SC:** 1F#, Florianópolis, Bal. Canasvieiras, 19-May-1996, Schwertner C.F. col., UFRG; 3M# 2F#, Itapiranga, Feb-1954, P. Buck col., MCNZ; **RS:** 1F#, Erechim, 20-Nov-1975, J. Balden col., MCNZ; 3M#, Pelotas, 01-Jan-1962, P. Buck col., MCNZ; Santa Maria, 22-Jun-1955, MCNZ; 1M# 2F#, Santa Maria, 12-Jan-1971, M. Tarra col., MCNZ; 1M#, Santa Maria, 11-Oct-1971, A. Trentini col., MCNZ; 7M# 14F#, Santa Maria, 17-Dec-1971, D. Link col., MCNZ; 12M# 13F#, Santa Maria, 21-Dec-1971, D. Link col., MCNZ; 9M# 15F#, Santa Maria, 21-Jan-1972, D. Link col., MCNZ; 1M# 1F#, Santa Maria, 11-May-1973, MCNZ; 1F#, Santa Maria, 21-Sep-1975, R. Sand col., MCNZ; 2F#, Santa Maria, 10-May-1976, R.Trevisan col., MCNZ; 1F#, Santa Maria, 20-Oct-1978, J. Thomas col., MCNZ; 1F#, Santa Maria, 10-May-1979, N. Schneider col., MCNZ; 1F#, Santa Maria, 19-May-1971,

M. Tarra col., MCNZ; 1F#, Santa Maria, 16-Dec-1971, D. Link col., MCNZ; 12M#, Santa Maria, 17-Dec-1971, D. Link col., MCNZ; 1F#, Santa Maria, 22-Dec-1972, D. Link col., MCNZ; 1F#, Santa Maria, 13-Feb-1973, D. Link col., MCNZ; 1M# 1F#, Santa Maria, 19 to 20-Jun-1979, MCNZ; 1M# 2F#, Vila Gaúcha, 01-Feb-1967, P. Buck col., MCNZ. 1M#, Frederico Westphalen, 17-Oct-2005, Massolino & Mansur col., UFRG; 1F#, Guaíba, 10-Apr-1975, H.A. Gastal col., MCNZ; 4M# 4F#, Guaíba, 14-Mar-1976, M.H. Galileo col., MCNZ; 2F#, Itaúba, 06-Apr-1978, L. Buckup col., MCNZ; 1M# 2F#, Pinhal, 03-Apr-1965, M. Becker col., MCNZ; 2M#, Porto Alegre, Oct-1956, L. Buckup col., MCNZ; 2M# 2F#, Porto Alegre, Vila Assunção, 27-Feb-1965, L. Buckup col., MCNZ; 1F#, São Salvador, 29-Apr-1964, P. Buck col., MCNZ; 1M#, Sapucaía do Sul, 17-Jul-1953, L. Buckup col., MCNZ; 2M# 1F#, Sapucaía do Sul, 19-Jul-1953, L. Buckup col., MCNZ; 1F#, Torres, Nov-1953, L. Buckup col., MCNZ; 1M#, Triunfo, 23-Jun-1977, H. Bischoff col., MCNZ; **PERÚ**: **Huánuco**: 1M#, Leoncio Prado, Tingo María, 19-Oct-46, J. Pallister, alt. 2200 ft, AMNH; **San Martín**: 1F#, San Martín, Achinamiza, 13-Sep-27, H. Bassier, 33591, AMNH; **Cusco**: 1M#, 1F#, Paucartambo, Calanga, 1300, 23-Feb-53, F. Woytkowski, 1961, NMNH; **Junín**: 1M#, Chanchamayo, Rosenberg, NMNH; **Madre de Dios**: 1F#, Río Tambopata, 30 air km SW, 290, 6 to 10-Nov-79, J.B. Heppner, "Subtropical moist forest", NMNH; 1M#, Río Tambopata, 30 air km SW, 290, 16 to 20-Nov-79, J.B. Heppner, "Subtropical moist forest", NMNH; 1M#, 7-Mar-56, J.M. Sehunke, NMNH; **BOLIVIA**: **El Beni**: 1M#, Rurrenabaque, 1-Nov-21, Mulford, NMNH; **Santa Cruz**: 4M#, Villa Yapacaní, E. Pizarro, UFGR; **La Paz:** 1M#, 2F#, Yungas, 1200 masl, 4-Dec-55, 20-Dec-55, L.E. Pena, NMNH; **PARAGUAY: Asunción**: 1F#, 15-Dec-35, MLPA; 12 specimens, 1-Oct-44, Mis.Cient.Brasil, FIOC; **Concepción**: 1M#, Horqueta, 8-Nov-35, A. Schulze, 91-1961, NMNH; 1F#, Horqueta, 5-Sep-34, A. Schulze, 1956, NMNH; **ARGENTINA: Buenos Aires:** 1F#, Buenos Aires, Flores, 29-Jan-19, MLPA; 1M#, J. Boso, MLPA; 1M#, 16, MACN; 3 specimens, Bahía Blanca, 18-Nov-61, AA Pirán, MACN; 1M#, MLPA; 1 specimen, General Pacheco, 21-Jan-28, MACN; 1F#, La Plata, Spegazzini, AMNH; 2 specimens, San Isidro, N. Kormilev, MACN; **Catamarca**: 1M#, 4F#, MACN; 1M#, MLPA; **Chaco**: 4F#, Fontana, MLPA; 1F#, Resistencia, 2-Dec-39, Biraben, MLPA; **Córdoba**: 1M#, 2F#, Alta Gracia, La Granja, 1-Jan-38, Bruch, MLPA; 3F#, Alta Gracia, Bruch, MLPA; 1F#, Unquillo, Cabana, 25-Dec-25, MLPA; **Corrientes:** 2F#, Corrientes, 1-Nov-45, MLPA; 1M#, 2F#, 1-Jan-21, MLPA; 3F#, 1-Nov-45, MLPA; 1M#, Santo Tomé, 1-Dec-25, MACN; 1F#, cod 13555, 1F#, cod 7119, MACN; **Formosa**: 3F#, Formosa, El Refugio, 20-Feb-39, P. Denier, MLPA; 1F#, Formosa, El Refugio, 28-Feb-39, P. Denier, MLPA; 2M#, 2F#, Formosa, El Refugio, 5-Nov-39, Denier, MLPA; 3M#, 17F#, Formosa, El Refugio. Laguna Oca, 8-Jan-39, MLPA; **Jujuy:** 1F#, cod.7271, MACN; **Misiones:** 2F#, MLPA; **Salta**: 1F#, Rosario de la Frontera, 1-Jan-44, MLPA; **Santa Fe**: 1M#, 2F#, Las Colonias, San José, 1-Nov-88, MLPA; 1 specimen, Rosario, MACN; 1F#, MLPA; **Santiago del Estero:** 1 specimen, Río Salado, MACN; 1M#, 1-Dec-55, MLPA; **Tucumán:** 3M#, 1F#, MACN; 10 specimens, MACN.

Diagnosis: Metatibia compressed and curve; lack of lobe in labial II; mesopleural evaporatorium entire; sternites III to VI glabrous.

Redescription. Total length: 6.2-9.4 mm.

Head: Flattened, surface polished; anterior outline semicircular; mandibular plates with radiating rugae and minute punctures, apices surpassing and sometimes converging in front of clypeus (Fig. 19A); bucculae about half as high as labial II, latter without semicircular foliaceus lobe; labium apex reaching between meso and metacoxae (Fig. 19D).

Thorax: Pronotum with 8 to 20 lateral submarginal setigerous punctures; transverse impression weak, marked by irregular, medially interrupted row of coarse punctures; anterior lobe with broad subapical impression and several coarse punctures laterally and in subapical band; posterior lobe with few

widely scattered punctures, especially in middle third (Fig. 19A). Propleuron variable, from polished and impunctate to roughen by crowded, fine, longitudinal rugae and small punctures (Fig. 19D). Scutellum disc polished, with widely scattered, coarse punctures. Hemelytron polished; clavus with one row of punctures medially; mesocorial punctures arranged in two rows paralleling claval suture, outer row often incomplete, discal punctures numerous, well-separated, often absent along radial vein; exocorium usually more sparsely punctate than mesocorium; costa with four to eight setigerous punctures (Fig. 19A). Mesopleural evaporatorium not interrupted by pseudoperitreme; lateral area shining, impunctate with few obsolete rugae (Fig. 19C). Metatibia compressed, very weakly expanded toward apex (Fig. 19D).

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments (Fig. 19D).

Distribution: Mexico, Guatemala, Granada, Trinidad, Nicaragua, Costa Rica, Panama, Venezuela, Colombia, British Guiana, Suriname, Brazil, Peru, Bolivia, Paraguay, Argentina.

Type data: The type specimens of *C. bergi* and *C. mirabilis* are lost, however they are reported in their respective descriptions as from Argentina. The holotype of one previous synonym *Macroscystus umbonatus* from Argentina and deposited in MLPA, was designed as lectotype by Froeschner (1960).

Remarks: This species is the most common and widely distributed of genus, has been repeatedly reported as pest in different crops.

Clade 1: (C. ciliatus + C.crassus + C.teter + C.emarginatus + C.grossus + C.marginalis).

Suported by the interocular space smaller than length of head and the dorsal margin of the gonocoxites VIII, elevated towards the sternum X.

Clade 2: (C. ciliatus + C.crassus).

Suported by the sparse punctuation on the exocorium surface; the conspicuous row of setae on the Sternite IV to VI surface; and the apical surface of the pygophore, punctate.

***Cyrtomenus ciliatus* (Palisot de Beauvois)**

(Figs. 10M, 12N, 20, 21)

Pentaloma ciliata Palisot de Beauvois 1805: 186.

Cyrtomenus castaneus Amyot and Serville 1843: 91; Walker: 1867: 147; Stål: 1876: 18.

Cydnus ciliatus Amyot and Serville 1843: 62.

Cyrtomenus mutabilis Walker 1867: 147; Uhler: 1877: 367.

Pentaloma ciliata "loc. incert." Stål 1876: 26.

Cyrtomenus ciliatus Berg 1879, 9.

Cyrtomenus mirabilis Berg 1879, 9; Distant 1880, 3; Signoret 1881b, 199; Uhler 1886, 3; Lethierry

and Severin 1893, 62; Banks 1910, 99; Van Duzee 1917, 18; Torre Bueno 1939, 177.

Cyrtomenus (Cyrtomenus) ciliatus Froeschner 1960, 530.

Material examined: USA: **AL:** 1F#, Mobile co., Mobile, 11-Jun-27, 245282, AMNH; **AZ**: 1F#, Gila, Base Pinal Mts, 1-Jul-30, Parker, 1961, NMNH; 1M#, Gila co., Globe, D.K. Duncan, AMNH; 2M#, 2F#, Santa Cruz co., Patagonia. Sonoita River, 18-Jul-48, C. & P. Vaurie, AMNH; **FL:** 1F#, Tallahassee, 17 Mi N. Tall Timbers. Res. Sta., 16-Jun-67, 24-Jun-67, L. Collins, NMNH; 1F#, Tallahassee, 17 Mi N. Tall Timbers. Res. Sta., 18-Jun-67, 24-Jun-67, P. Jinright, NMNH; 1M#, 1F#, Columbia co., Lake City, 09/26/1957, Kistler, AMNH; 1F#, Dade co., N Miami, 14-Jul-53, R. Schrammel, 245208, AMNH; 1F#, Marion co., Dunnellon, 17-Jul-33, Packard, 253880, AMNH; **GA**, 1M#, Grady co., Sherwood Plant., 11-Jul-67, J. Neel, NMNH; **NC,** 1F#, Halifax, 12 km W Enfield., 8-Jul-83, Steiner, NMNH; 1F#, Moore co., Southern Pines, 13-Jul-15, A. Manee, 253845, AMNH; **NJ:** 1M#, Ocean co., Stafford. Manahawkin, 16-Aug-43, L. Sanford, 253854, AMNH; **SC:** 1F#, Charleston, JL Rogers, 52801, MACN; 1F#, Beaufort, Parris Island, 25-Sep-37, M.S. Stevenson, NMNH; **TX:** 1M#, Hartley co., Brasso Well, 225548, AMNH; 1F#, Wichita co., Burkburnett. Red River, 26-Jun-48, C. & P. Vaurie, 253842, AMNH; **MÉXICO**: **Chihuahua**: 1F#, Meoqui, 6 mi NE Meoqui, 2-Sep-50, R. Smith, AMNH; **Oaxaca:** 1M#, Tehuantepec, Santo Domingo Tehuantepec, 12-Jul-55, C. & P. Vaurie, AMNH; **Tamaulipas**: 1F#, Antiguo Morelos, San Luis de Potosi. El Salto, 28-Jun-53, C. & P. Vaurie, AMNH; 1F#, Antiguo Morelos, San Luis de Potosi. El Salto, 21-Jun-55, C. & P. Vaurie, AMNH; **Nuevo León**: 1M#, Aramberri, 24-Sep-83, A. Ibarra, UNAM; **San Pedro:** 1M#, 2F#, Coattuila, 1-Sep-75, H. Brailovsky, UNAM; **ARGENTINA**: **Buenos Aires:** 1F#, Buenos Aires, Flores, 6-Feb-19, MLPA; 1F#, 1-Feb-18, MLPA; 2M#, 2F#, J. Boso, MLPA; **La Rioja**:1M#, MLPA.

Diagnosis: Half width of the eye surpassing the mandibular plate margin.

Redescription. Total length: 7.6-9.0 mm.

Head: Surface noticeably convex (Fig. 21B), shining, with prominent coarse rugae radiating from base of clypeus, minutely punctate; anterior outline somewhat triangular, mandibular plates slightly longer than clypeus and convergent beyond it; eyes projecting by about one-half their width (Fig. 21B); bucculae less than half as high as labial II, latter without semicircular foliaceus lobe; labium apex reaching between meso and meta coxae (Fig. 21D).

Thorax: Pronotum with lateral submarginal row of 12 to 14 setigerous punctures; transverse impression weak, marked by regular, sometimes medially interrupted row of coarse punctures; anterior lobe with punctures confined to subapical band and lateral patch; posterior lobe almost impunctate with few scattered, coarse punctures medially. Scutellum disc with few to several widely scattered, coarse punctures (Fig. 21B). Hemelytron polished; clavus with one submedian row of punctures; mesocorium with two rows paralleling claval suture, punctation moderate and abundant; costa with six to eight setigerous punctures (Fig. 21A, D). Propleuron shining, with few coarse punctures in depression. Mesopleural evaporatorium not interrupted by pseudoperitreme (Fig. 21C), lateral margin bisinuate; lateral area shining, impunctate. Legs densely covered by long setae; metatibia with greatest diameter equaling that of protibia (Fig. 21D).

Abdomen: Sternites III to VI polished, with rows of setigerous punctures across segments (Fig. 21D).

Distribution: United States, Mexico, Honduras, Costa Rica.

Remarks: This species is very close to *C. crassus* differing only by the outline form of the head and for the part of the eyes projected out of the head. The morphological similarity of these two species

and even with *C. mirabilis*, makes doubt about their status, that it has been discussed and their relations remain unclear. However, *C. mirabilis* shows features different enough to distinguish from the other two species and presents a wide distribution in central and South America while *C. crassus* do not reach far than north of South America, but is common along with *C. ciliatus*, in southern North America. Despite the blurred boundaries between *C. ciliatus* and *C. crassus* there is no strong evidence to believe that is necessary make changes in the actual classification, but probably molecular analysis could bring enlighten on this matter.

***Cyrtomenus crassus* Walker**

(Figs. 10N, 12O, 20, 22)

Cyrtomenus crassus Walker 1867: 147.

Cyrtomenus obtusus Uhler 1877: 369.

Cyrtomenus mirabilis Distant 1880: 3; Signoret 1881: 199; Uhler 1886: 3; Van Duzee 1917: 18.

Cyrtomenus castaneus Lethierry and Severin 1893: 62.

Cyrtomenus vestigiatus Distant 1903: 525.

Cyrtomenus (Cyrtomenus) crassus Froeschner 1960: 533.

Material examined: USA: **AZ:** 1M#, 1F#, Gila co., Globe, D.K. Duncan, AMNH; 1F#, Santa Cruz co., Nogales, 28-Jul-56, C. & M. Cazier, AMNH; 1M#, Santa Cruz co., Patagonia. Sonoita River, 18-Jul-48, C. & P. Vaurie, 245268, AMNH; **MÉXICO**: **Chihuahua**, 1F#, Matachí, Matachí, 7-Jul-47, D. Rockefeller, 245246, AMNH; **Jalisco**: 1M#, Guadalajara, 5 Mi W La Venta, 4-Jul-53, C. & P. Vaurie, 245262, AMNH; **Nayarit:** 1M#, 1F#, Compostela, 3 mi NW Las Varas, 11-Nov-50, R. Smith, AMNH; 1M#, Tepic, Tepic, 28-Jul-53, C. & P. Vaurie, AMNH; 1F#, Tepic, Tepic, 2-Aug-47 to 7-Aug-47, B. Malkin, AMNH; **Sinaloa**, 1M#, Mazatlán, Mazatlán, 2-Aug-53, C. & P. Vaurie, 246717, AMNH; 1M#, 1F#, Mazatlán, Mazatlán, 22-Jul-54, M. Casier, AMNH; **Veracruz,** 2F#, San Andrés Tuxtla, Volcán San Martín, 29-May-51, I. Bassols, UNAM; 1F#, San Andrés Tuxtla, 26-May-51, A. Barrera, UNAM; 1M#, Córdoba, 4-Aug-65, A.B. Lau, NMNH; **CUBA**: **Soledad,** 1M#, 3-Jul-25, AMNH; **HONDURAS**: **El Paraiso**: 1M#, Danlí, 110 Km E Tegucigalpa. San Juan de Linaca, 6-Jul-83, Andrews, "Raiz de Zea maiz", NMNH; **COLOMBIA**: **Bolívar,** 1F#, Zambrano, Hda Monterrey, 70 masl, 8-May-93, Fernández F., IAvH-87270, IAVH; 1F#, Zambrano, Hda Monterrey, 70 masl, 12-Aug-93, Fernández F., IAvH-05078, IAVH; 1F#, Zambrano, Hda Monterrey, 70 masl, 2-Sep-93, Fernández F., IAvH-87165, IAVH; 1F#, Zambrano, Hda Monterrey, 70 masl, 9-Sep-93, Fernández F., IAvH-87180, IAVH; 1M#, Zambrano, Hda Monterrey, 70 masl, 28-Oct-93, Fernández F., IAvH-88119, IAVH; **Tolima:** 1F#, Mariquita, 30-Oct-05, R, Garzón, ICN; 1M#, Melgar, 11-Oct-95, F. Cárdenas, "en suelo", ICN; 1M#, Melgar, 323 masl, 24-Apr-1976, M.R. León, ICN.

Diagnosis: Dorsal surface of the mandibular plates, smooth; Gonocoxites VIII longer than broad; and oval seminal receptacle of the spermatheca.

Redescription. Total length: 7.6-9.0 mm.

Head: surface noticeably convex (Fig. 22A, B), shining, with prominent rugae radiating from base of clypeus, minutely punctate, anterior outline rounded; mandibular plates longer than clypeus and nearly

or quite contiguous in front of it, apices recurved; eyes projecting beyond sides of head by not more than one-third their width (Fig. 22B); bucculae less than half as high as labial II, latter without semicircular foliaceus lobe; labium apex reaching between meso and meta coxae (Fig. 22D).

Thorax: Pronotum with lateral submarginal row of 15 to 18 setigerous punctures; transverse impression weak, with medially interrupted, irregular row of coarse, close-set punctures; anterior lobe impunctate except for moderate punctures laterally and in subapical band, median subapical impression broad, very shallow; posterior lobe impunctate or with a few coarse punctures anteriorly (Fig. 22A). Scutellum disc with few to several widely scattered, coarse punctures. Hemelytron shining, uniformly punctate; clavus with one row of punctures; mesocorium with two rows of punctures paralleling claval suture; exocorium sparsely punctate; costa with six to ten setigerous punctures (Fig. 22A, D). Propleuron shining, with few distinct punctures in depression. Mesopleural evaporatorium not interrupted by pseudoperitreme; lateral area polished, impunctate, with few oblique rugae. Metapleural lateral area polished, impunctate (Fig. 22C). Legs densely covered by long setae; metatibia strongly dilated toward apex, greatest diameter there equal to that of protibia (Fig. 22D).

Abdomen: Sternites III to VI polished, with rows of setigerous punctures across segments (Fig. 22D).

Distribution: United States, Mexico, Cuba, Guatemala, Honduras, Costa Rica.

Remarks: See remarks of *C. ciliatus.*

Clade 3: (C.teter + C.emarginatus + C.grossus + C.marginalis).

Supported by the presence of pseudoperitreme on the mesopleural evaporatorium.

***Cyrtomenus teter* (Spinola)**

(Figs. 10R, 12R, 20, 23)

Cydnus teter Spinola, 1837: 332.

Cyrtomenus teter Dallas, 1851: 111; Walker, 1867: 147; Stål, 1876: 18; Distant, 1880: 2; Signoret, 1881: 197; Uhler, 1886: 3; Van Duzee, 1917: 18; Torre Bueno, 1939: 177.

Cyrtomenus (Syllobus) teter Froeschner, 1960: 523.

Cyrtomenus excavates Distant, 1880: 2.

Material examined: GUATEMALA: Alta Verapaz: 1F#, Cobán, Cobán, 9-Jul-47, F. Johnson, alt. 4000 ft, AMNH; **COLOMBIA: Cundinamarca:** 1M#, Pacho, Vda La Cabrera. Chilacas. Est Exp Agroforestal, 3037 masl, 18-Jul-12, Melo, UNAB; 1F#, Cundinamarca: San Francisco, Vda San Miguel. Fca El Tesoro, 1807 masl, 5-Apr-12, C. Chitivo, UNAB; **BRAZIL**: **MG:** 2F#, Rio José Pedro, Zikán col., FIOC; **ES:** 1F#, Linhares, S: Parque Sooretama, 20-Oct-1958, Zajciw col., MNRJ; **RJ:** 3 specimens, Itatiaia, Jul-1924, Zikán col., FIOC; 5 specimens, Itatiaia, 04-Dec-1928, Zikán col., FIOC; 2 specimens, Itatiaia, 04-Feb-1945, Zikán col., FIOC; 5M#, 3F#, Itatiaia, Nov-1950, Travassos col., MNRJ; 7 specimens, Itatiaia, Zikán col., FIOC; Itatiaia, Estação Biologica, 14-Dec-1930, Zikán col., MNRJ; 2 specimens, Petrópolis, Apr-2014, Moreira col., MNRJ; 1F#, Rio de Janeiro, Corcovado,

Nov-1958, Alvarenga col., MNRJ; 2 specimens, Rio de Janeiro, Zajciw col., MNRJ; 1 specimen, Teresópolis, 01-Jan-1940, Travassos col., FIOC; 2 specimens, Teresópolis, Barreira, 01-Mar-1957, FIOC; 1F#, Teresópolis, Serra dos Órgãos, 1940, Parko col., MNRJ; 2 specimen, Vassouras, 1940, Machado col., FIOC; **SP:** 2 specimens, 18-Dec-2016, Costa-Lima col., MNRJ; 2M#, Pirassununga, 13-Mar-1948, Schubart col., FIOC; 1F#, Ypiranga, Lange de Morretes, 12-Oct-1936, FIOC; **SC:** 8 specimens, Corupá, Dec-1951, Maller col., MNRJ; 1M#, Corupá, Dec-1953, A. Mallor col., MCNZ; 1M#, Itapiranga, 1954, MCNZ; 1 specimen, Seará, Nova Teutonia, 01-Sep-1994, Plaumann col., MNRJ; **RS:** 1F#, Cachoeirinha, 14-Jan-1981, H.A. Gastal col., MCNZ; **ARGENTINA: Misiones:** 1F#, San Ignacio, 11-Dec-29, MLPA.

Diagnosis: Second antennal segment shorter than third; labium apex surpass metacoxae; surface of the scutellum disc rugose and punctate; Gonocoxites VIII almost as long as broad.

Redescription. Total length: 10.4-11.6 mm.

Head flattened, anterior outline a semicircle, clypeus nearly as long as mandibular plates; surface shining, with moderate, radiating rugae, punctation fine or absent (Fig. 23B); labium reaching between or slightly beyond metacoxae, labial segment II without semicircular foliaceous lobe (Fig. 23D).

Thorax: Lateral margin of the pronotum with 16 to 18 setigerous punctures submarginally; transverse impression weak, more strongly impressed laterally than medially, marked with irregular, medially interrupted row of coarse punctures; anterior lobe impunctate except for few punctures laterally and irregular, transverse row of coarse punctures subapically; posterior lobe polished, with few widely scattered punctures (Fig. 23A). Scutellum disc impunctate or with few widely scattered punctures. Hemelytron polished; clavus with one complete row of punctures; mesocorium with two rows of punctures paralleling claval suture, elsewhere closely punctate; exocorium with punctation much sparser than on mesocorium; costa with five to seven setigerous punctures (Fig. 23A). Mesopleural evaporatorium with pseudoperitreme; lateral area impunctate (Fig. 23C). Metatibia distinctly compressed, not expanding toward apex (Fig. 23D).

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments (Fig. 23D).

Type data: The holotype specimen has not clear location, but the locality is reported from Brazil. The type specimen of *Cyrtomenus excavates* previously synonymized and deposited in the British Museum is from Costa Rica.

Distribution: Guatemala, Costa Rica, Panama, Colombia new rec., Ecuador, Brazil, Argentina new rec.

Remarks: Morphological similarities with *C. grossus* could sometimes lead to misidentification, but the interocular length is the best feature to separate these two species.

Clade 4: (C.emarginatus + C.grossus + C.marginalis).

Supported by the surface of clypeus rugose.

***Cyrtomenus emarginatus* Stål**

(Figs. 10O, 12P, 24, 25)

Cyrtomenus emarginatus Stål, 1862: 95; 1876: 27; Walker, 1867: 147.

Syllobus emarginatus Signoret, 1879: CLXXIII; 1881: 322; Distant, 1880: 4; Uhler, 1886: 3; Lethierry & Severin, 1893: 64; Torre Bueno, 1939: 177.

Cyrtomenus (Syllobus) emarginatus Froeschner, 1960: 518.

Material examined: MÉXICO: **Chiapas:** 1F#, Agua Azul, 1-May-78, E. Barreño, UNAM; 1M#, Frontera Corozal, 130, 20-Mar-04, A. Ibarra, UNAM; 1M#, Ocosingo,: Montes Azules, 2-Jun-99, L. Cervantes, UNAM; 2M#, Palenque, 19-May-84, M. García, UNAM; **Oaxaca:** 1F#, San José el Paraíso, 350, 18-Jun-09, 28-Jun-09, D. Curoe, N17°07' W96°27', UNAM; **Veracruz:** 1F#, Jalapa, 1-Feb-85, J. Peña, UNAM; **GUATEMALA**: **Petén:** 1M#, P.N. Ixpanpajul, RI CA-13, nr Santa Ana, 180, 22-Jul-07, RS Zack, UNAM; **HONDURAS: Roatán:** 1F#, Punta Gorda, 1-Jul-34, J. White, AMNH; **COLOMBIA: Amazonas:** 1F#, Puerto Alegría, 120 masl, 3-Sep-12, C. Rodríguez, UNAB; **BRAZIL**: **AP:** 1M#, Porto Platón, 06-Dec-1982, J.I. Lacerda col., UFRG; **PA:** 2 specimens, Belém, Casa da Bomba, 04-Nov-1959, Travassos col., FIOC; 6 specimens, Cachimbo, 14 to 21-Sep-1955, Travassos col., FIOC; **AM:** 1M#, Manaus, Uypiranga. Rio Negro, Dirings col., MCNZ; **PI**: 4 specimens, Teresina, 1953, Oliveira col., MNRJ; **TO:** 1M# 1F#, Palmas, Serra do Langeado. Fazenda Céu, 01-Nov-1992, UFRG; **MT:** 3 specimens, Alto Xingú, Sep-1955, Vilasboas col., FIOC; 2F#, Nova Xavantina, 20-Oct-1999, UNIFESP; 1 specimen, Vale de São Domingos, Nov-1949, Weener col., MACN; 4M# 8F#, Xingú, Sep-1955, O. Vilas col., MCNZ; **RO:** 1M#, Porto Velho, Rio Madeira, Dirings col., MCNZ; **GO:** 1F#, Alto Paraiso, Cerrado, 10-Oct-1999, AM de Faria col., UNIFESP; 2 specimens, Aragarças, 14-Oct-1959, Alvarenga col., MNRJ; 1 specimen, Pires do Rio, 1956, Pacheco col., MNRJ; **MG:** 3 specimens, Xavantina, 1955, Alencar col., MNRJ; **DF:** 4M# 4F#, Brasilia, 20-Oct-1965, M. Becker col., MCNZ; 1 specimen, Brasilia, Sep-1961, Guimarães col., FIOC; **RJ:** 1F#, Itatiaia, 1937, FIOC; 4 specimens, Itatiaia, 02-Nov-1946, Zikán col., FIOC; 2 specimens, Itatiaia, 24-Nov-1947, Zikán col., FIOC; 2 specimens, Itatiaia, 09-Oct-1948, Zikán col., FIOC; 2 specimens, Itatiaia, Estação Biologica, Nov-1941, Zikán col., MNRJ; **SP:** 1F#, Pirassununga, CIEIP-USP: 17-Oct-1992, F. Cordeiro col., UFRG; **SC:** 4M# 7F#, Itapiranga, Sep-1953, MCNZ; **RS:** 1M#, Derrubadas, Campus UnB, 13-Nov-1965, M. Becker col., MCNZ; 3M#, Frederico Westphalen, 17-Oct-2005, Massolino & Mansur col., UFRG; 2M#, P.E. Turvo, 29-Oct-2003, A. Barcellos col., MCNZ; 1M# 1F#, Porto Alegre, Museu Anchieta. Serro Azul, Feb-1950, MCNZ; **PERÚ**: **Huánuco:** 1M#, Leoncio Prado, Tingo María, 26-May-47, J. Pallister, alt. 2200 ft, AMNH; **ARGENTINA: Buenos Aires:** 1F#, Buenos Aires, Puente Victorino de la Plaza, Jan-38, Denier, MLPA; **Misiones:** 1F#, Loreto, Ogleblin, MLPA; **Santa Fe**: 1M#, Gral Obligado, Lanteri, 5-Jan-46, Bruzzone, MLPA.

Diagnosis: Apices of the mandibular plates longer than clypeus forming triangular projections; lateral surface of the eyes without setae.

Redescription. Total length: 10.8-13.3 mm.

Head: Flattened dorsally, surface polished; mandibular plates with radiating rugae and punctures, submarginal row of setigerous punctures, apices forming blunt to acute triangles towards front, clypeus shorter than mandibular plates, apex strongly narrowed (Fig. 25B); labium reaching mesocoxae, labial segment II without semicircular foliaceous lobe (Fig. 25D).

Thorax: Pronotum with scattered coarse punctures on the anterior submargin, lateral surfaces and posterior half; lateral submarginal row of six to nine setigerous punctures; transverse impression weak,

marked by irregular, interrupted row of punctures (Fig. 25A). Propleuron polished, with numerous fine punctures in depression. Scutellum impunctate across base and apex, disc with widely scattered, coarse punctures. Hemelytron: Clavus and corium polished; clavus with single row of large punctures; mesocorial punctures forming two more or less distinct rows paralleling claval suture, elsewhere with scattered punctures; exocorium densely punctate; costa with 0-3 setigerous punctures (Fig. 25A, D). Mesopleural evaporatorium with pseudoperitreme; lateral area impunctate. Metatibia curved and compressed but not expanded near apex (Fig. 25D).

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments (Fig. 25D).

Type data: The type specimen is lost, original description indicate that the type locality is Mexico.

Distribution: Mexico, Guatemala, Honduras, Costa Rica, Colombia new rec., French Guiana, Brazil, Peru, Argentina.

Remarks: One of the biggest representatives of *Cyrtomenus* and easily recognizable by the projection of the mandibular plates, its biology and ecology remains unknown.

Clade 5: (C.grossus + C.marginalis).

Supported by the interocular space larger length than length of the head; anterior and posterior convexity of the propleuron smooth; dorsal margin of the gonocoxites VIII, straight.

***Cyrtomenus grossus* Dallas**

(Figs. 10P, 24, 26)

Cyrtomenus grossus Dallas, 1851: 111; Walker, 1867: 148; Stål, 1876: 18; Distant, 1880: 2; Signoret, 1881: 198; Uhler, 1886: 3; Lethierry & Severin, 1893: 62.

Cyrtomenus (Syllobus) grossus Froeschner, 1960: 520.

Material examined: VENEZUELA(?): 1M#, “Miranda”, 1-Nov-94, 1-Feb-95, NMNH; **COLOMBIA**: **Boyacá:** 1F#, Buenavista, Patiño. Las Lomas, 1989 masl, 4-Apr-04, W. Ávila, "Arroyo", UNAB; 1M#, Sotaquirá, 2680 masl, 13-Oct-97, C. Bejarano, UNAB; **Cauca:** 1F#, Inzá, Parte baja par. Guanacas. Crr 51-52, 3270, 24-Mar-82, Grupo 5, ICN; **Cundinamarca:** 1F#, Agua de Dios, 400 masl, 1-Nov-96, F. Ballón, UNAB; 1M#, Anolaima, La Florida. Los Balsos. Fca Las Palmas, 1647 masl, 24-Oct-09, L. Bermúdez, UNAB; 1F#, Anolaima, Vda Santa Ana. Fca Betania, 1950 masl, 14-Mar-10, R. Sandoval, "Zona Riparia", UNAB; 1F#, El Rosal, Vda. La Hondura. Fca San Luis, 2700 masl, 5-Nov-00, H. Gasca, ICN; 1M#, La Palma, 30-Aug-93, C. Perez, "Tronco de durazno", UNAB; 1F#, San Antonio del Tequendama, 1503 masl, 14-Nov-93, Preichmann, UNAB; 1M#, Sasaima, Santa Ana, 1221 masl, 19-Sep-96, C. Gómez, UNAB; 1F#, Tena, Laguna Pedro Palo, 1384 masl, 15-Feb-97, V. González, UNAB; 1F#, Ubaté, 2566 masl, 10-Jan-97, Garzón, UNAB; 1M#, Vianí, 1498 masl, 20-Oct-89, G. Vega, UNAB; 1F#, La Vega, 1230 masl, 13-Nov-89, E. Rodríguez, UNAB; **BRAZIL**: **RJ:** 2 specimens, Itatiaia, Estação Biologica, 25-Jan-1932, Zikán col., MNRJ; 1 specimen, Itatiaia, Aug-1933, Zikán col., MNRJ; **RS:** 1F#, Porto Alegre, Serro Azul, MCNZ.

Diagnosis: Labium apex surpass metacoxae; two well-defined rows of punctures parallel to clavo-corial suture on the corium Corium; Laterotegites IX attaining sternum VII.

Redescription. Total length: 10.9-11.1 mm.

Head: Flattened dorsally, surface shining, with faint, radiating rugae and minute, widely scattered punctures; clypeus shorter than mandibular plates, apex narrower than the base; interocular lenght greater than the length of the head (Fig. 26B); labium surpassing posterior coxae, sometimes reaching to sternite IV, labial segment II without semicircular foliaceous lobe (Fig. 26D).

Thorax: Pronotum surface with very scattered coarse punctures, disc impunctate; lateral margin with submarginal row of twelve setigerous punctures; transverse impression weak, marked by very irregular interrupted row of punctures; anterior lobe with intermixed coarse and fine punctures laterally and in subapical band paralleling anterior margin; posterior lobe with few minute and fewer scattered coarse punctures (Fig. 26A). Propleuron polished, with few small punctures in depression (Fig. 26D). Scutellum disc polished, with about half dozen coarse punctures and several fine ones widely scattered. Hemelytron shining; clavus with single row of coarse punctures and several finer scattered ones (Fig. 26A); mesocorium with one complete and one partial row of punctures paralleling claval suture; exocorium less densely punctured than mesocorium; costa with four to six setigerous punctures. Mesopleural evaporatorium with pseudoperitreme; lateral area of the latter with few oblique rugae. Metapleural lateral and posterior area impunctate. Metatibia distinctly compressed (Fig. 26C).

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments (Fig. 26D).

Type data: Type specimen deposited in the British Museum, labeled with the locality “Columbia”, based on its distribution; the type locality should be Colombia.

Distribution: Mexico, Guatemala, Colombia Brazil, Ecuador.

Remarks: See remarks of *C. teter*.

***Cyrtomenus marginalis* Signoret**

(Fig. 27)

Crytomenus marginalis Signoret, 1881: 201; Lethierry & Severin, 1893: 62.

Cyrtomenus (Syllobus) marginalis Froeschner, 1960: 521.

Material examined: Photos provided by Harald Bruckner from the holotype.

Diagnosis: Dorsal surface of the mandibular plates, punctate; mandibular plates of the same length than clypeus; second antennal segment as long as third; 25-30 lateral submarginal setigerous punctures of the pronotum; Transverse impression marked by a band of punctures; Posterior lobe of the pronotum and disc of the scutellum densely punctate; 21-25 setigerous punctures on the costa.

Redescription. Total length: 7.07 mm

Head flattened dorsally, anterior outline broadly semicircular, surface shining, mandibular plates with prominent radiating rugae and numerous close-set, intermixed moderate and fine punctures; clypeus

shorter than mandibular plates (Fig. 27B); labium broken, only first segment present.

Thorax: Pronotum surface shinning almost totally covered by crowded moderate and minute punctures, disc impunctate; lateral margin with submarginal row of 25 setigerous punctures; transverse impression weak. Scutellum punctured uniformly. Hemelytron surface shining, clavus with two incomplete rows of punctures; mesocorium and exocorium with several moderate punctures sparser than in scutellum; costa with 21 to 23 setigerous punctures (Fig. 27A). Mesopleural evaporatorium with pseudoperitreme. Metatibia compressed (Fig. 27D).

Abdomen: Sternites III to VI with irregular, postmedian row of setigerous punctures across segments (Fig. 27D).

Type data: The holotype specimen is a female deposited in NHM Wien, labeled: “Brasil”, coll. Signoret.

Distribution: Brazil.

Remarks: The species is only known from the type specimen.

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Table 1. Consistency index (CI) and retention index (RI) for each character of the EW consensus tree. * Autapomorphies

Char	CI	RI	Char	CI	RI	Char	CI	RI	Char	CI	RI
1	0.25	0.333	28	0.667	0.857	*55	1	1	82	0.2	0.2
2	0.167	0	29	0.286	0.286	56	0.5	0	83	0.571	0.625
3	0.2	0.333	30	0.333	0.333	57	0.4	0.625	84	0.222	0.222
4	0.2	0.273	31	0.2	0.385	58	0.25	0.5	85	0.167	0.444
5	0.5	0.5	32	0.333	0	59	0.2	0.2	86	0.2	0.429
6	0.333	0.6	*33	1	1	60	0.333	0.333	*87	1	1
7	0.5	0.5	34	0.167	0.375	61	0.5	0.5	88	1	1
*8	1	1	35	0.429	0.6	62	0.333	0.75	89	0.8	0.667
9	0.667	0.667	36	0.5	0	*63	1	1	*90	1	1
10	0.333	0.5	37	0.25	0.667	*64	1	1	91	0.5	0.667
11	0.25	0.25	38	0.5	0	65	0.667	0.833	92	1	1
12	0.2	0.2	39	0.4	0.25	*66	1	1	93	0.667	0.875
13	0.273	0.385	40	0.125	0.3	67	0.333	0.333	94	0.333	0.75
14	0.333	0.8	41	0.2	0.429	68	0.333	0.714	95	0.333	0.6
15	0.143	0.455	42	0.333	0	69	0.25	0.727	96	0.667	0.667
16	1	1	43	0.333	0	70	0.333	0.429	97	0.167	0.167
*17	1	1	44	1	1	*71	1	1	98	0.5	0.5
18	0.2	0.2	45	0.5	0.5	72	0.5	0.889	99	0.222	0.222
19	0.222	0.3	46	0.25	0.571	73	1	1	100	0.5	0
20	0.5	0.5	47	0.25	0	74	1	1	101	0.25	0.625
21	0.25	0.4	48	0.25	0.4	75	0.5	0.5	102	0.8	0.8
22	0.4	0.4	49	0.333	0.6	*76	1	1	103	0.333	0.333
23	0.333	0.333	50	0.5	0	77	0.333	0.333	104	0.25	0.4
24	1	1	51	0.5	0.833	78	0.571	0.4	105	0.333	0.5
25	0.667	0	52	0.333	0.333	79	0.5	0	106	0.333	0.6
26	0.286	0.375	53	0.667	0	80	0.429	0.429	107	0.333	0.5
27	0.25	0.4	54	0.5	0.5	81	0.333	0	108	0.5	0.875

Table 2. Character matrix for the phylogenetic analysis of *Cyrtomenus*. Missing data ?, Inaplicable **-**.

25 \ 108	1 2 3 4 5 6 7 8 9	(1)0 1 2 3 4 5 6 7 8 9	(2)0 1 2 3 4 5 6 7 8 9	(3)0 1 2 3 4 5 6 7 8 9	(4)0 1 2 3 4 5 6 7 8 9	(5)0 1 2 3 4 5 6 7 8 9	(6)0 1 2 3 4 5 6 7 8 9	(7)0 1 2 3 4 5 6 7 8 9	(8)0 1 2 3 4 5 6 7 8 9	(9)0 1 2 3 4 5 6 7 8 9	10)0 1 2 3 4 5 6 7 8
Sehirus cinctus	0 0 0 0 0 0 0 0 0	0 - 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0 -	- 0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 0 0
Scaptocoris minor	1 1 1 1 0 1 0 0 0	2 0 0 0 0 0 2 1 0 1	1 1 0 1 1 1 2 0 1 2	1 0 0 1 0 2 1 0 1 0	0 0 0 0 0 1 1 1 1 0	0 1 0 2 1 1 0 0 1 0	1 1 1 1 1 1 1 1 1 1	2 1 0 2 0 2 1 1 3 0	1 1 1 3 0 0 0 0 1 0	0 0 2 2 1 1 1 1 1 0	0 0 0 0 0 1 1 1 0
Cydnus aterrimus	0 0 0 0 0 0 0 0 0	0 - 0 3 1 0 0 0 0 2	0 1 0 0 0 1 0 1 0 0	0 1 1 0 1 0 1 1 0 0	1 0 0 1 0 0 0 1 0 0	1 0 0 1 0 0 0 1 1 1	1 0 0 0 0 0 0 1 0 1	1 1 0 0 0 1 0 0 2 1	1 1 0 2 2 0 0 0 0 -	- 0 0 1 0 0 0 1 0 1	1 0 ? ? ? ? ? ? ?
Dallasiellus alutaceus	2 0 0 1 1 2 1 0 3	2 0 1 2 0 0 1 0 1 1	0 1 0 0 1 1 1 0 2 1	1 0 0 0 0 0 1 0 0 1	0 1 0 0 0 1 1 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 0 0 0 0 0 1 0 0	0 1 0 0 0 1 0 0 0 1	0 1 1 0 2 1 1 0 1 4	2 1 1 2 1 0 0 1 0 0	0 1 2 1 1 1 1 1 0
Dallasiellus longulus	2 0 0 0 1 2 1 0 3	2 0 1 2 0 0 1 0 1 1	0 2 0 0 1 1 1 0 2 1	1 0 0 0 0 0 1 1 0 1	0 1 0 0 0 1 1 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 0 0 0 0 0 1 0 0	0 1 0 0 0 1 0 0 0 1	0 1 1 0 2 1 1 0 1 4	2 1 1 2 1 0 0 1 0 1	0 1 2 1 1 1 1 1 0
Ectinopus rugoscutum	2 0 1 1 1 2 1 0 2	0 - 0 2 0 0 0 0 1 1	0 2 0 0 1 1 0 0 0 1	1 2 1 0 0 0 1 1 0 1	0 0 0 1 0 1 0 1 0 0	1 0 0 2 1 0 0 1 0 0	1 0 0 0 0 0 0 1 0 0	1 1 0 0 0 1 0 0 0 1	2 0 1 2 2 0 1 1 1 1	1 0 3 2 0 1 2 0 0 1	0 1 4 0 1 0 0 1 0
Macroporus repetitus	2 1 1 0 1 2 1 0 2	1 1 1 2 0 1 0 0 0 0	0 1 1 0 1 1 1 0 0 2	2 1 1 0 0 0 1 1 0 0	1 1 0 1 0 0 0 0 1 1	1 0 0 2 1 0 1 1 1 1	1 1 0 0 0 0 0 1 0 0	1 1 0 0 0 1 0 0 4 1	3 0 1 4 1 1 0 ? ? ?	? ? ? ? ? ? ? ? ? ?	? ? ? ? ? ? ? ? ?
Melanaethus dunensis	2 0 1 0 1 2 1 0 2	0 - 1 1 0 1 0 0 0 1	0 1 2 0 1 1 2 1 0 1	1 0 0 0 1 0 1 1 0 1	0 1 0 0 0 1 0 0 0 0	1 0 0 2 1 0 0 1 1 1	0 1 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 1 1	0 1 1 1 1 1 0 0 1 2	2 1 1 2 1 1 1 1 0 0	0 0 1 1 0 0 0 0 0
Melanaethus spinolae	0 0 1 0 1 2 1 0 2	0 - 1 1 0 1 0 0 1 1	0 1 2 0 1 1 2 1 0 1	1 0 0 0 1 0 1 1 0 1	0 0 0 0 0 1 0 0 0 0	1 0 0 2 1 0 0 1 1 1	0 1 0 0 0 0 0 0 0 0	0 1 0 0 0 0 0 0 1 1	0 1 0 1 1 1 0 0 1 2	2 1 1 2 1 1 1 1 0 0	0 0 1 1 0 0 0 0 0
Microporus obliquus	1 1 0 1 1 1 1 0 2	1 1 1 1 0 1 0 0 1 1	0 1 0 0 1 2 2 0 0 2	2 1 0 0 1 2 0 1 1 2	1 0 1 0 0 1 0 1 1 1	1 0 0 1 0 0 0 1 1 1	1 1 0 0 0 0 0 1 0 1	1 1 0 0 0 1 0 1 2 1	2 1 0 2 1 0 0 0 ? ?	? ? ? ? ? 1 1 1 0 1	1 0 ? ? ? ? ? 1 0
Onalips completus	2 1 1 2 1 2 1 0 2	1 0 0 3 1 1 1 0 1 0	0 0 2 0 1 1 2 0 2 1	1 2 0 0 0 3 1 1 0 1	1 1 0 0 0 1 0 0 0 1	1 1 0 2 1 0 0 1 1 1	0 1 1 0 0 0 0 1 0 0	1 1 0 0 0 1 0 0 1 1	1 1 0 1 1 0 1 ? ? ?	? ? ? ? ? ? ? ? ? ?	? ? ? ? ? ? ? ? ?
Pangaeus serripes	2 0 0 2 1 2 1 0 2	2 0 1 2 0 0 1 0 1 0	0 0 1 1 1 1 1 0 2 1	1 2 0 0 1 1 1 0 0 1	1 1 1 0 1 1 1 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 0 0 1 0 0	1 1 0 0 0 1 0 0 0 1	1 1 1 1 2 0 1 0 1 4	2 1 1 2 1 0 1 1 0 1	2 0 2 0 1 1 0 1 1
Pangaeus xanthopus	2 0 0 1 1 2 1 0 2	2 0 1 1 0 0 1 0 1 0	0 1 1 1 1 1 1 0 2 1	1 2 0 0 1 1 1 0 0 1	0 1 0 0 1 1 1 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 0 0 1 0 0	1 1 1 0 0 1 0 0 0 1	1 1 1 1 1 0 1 0 1 4	2 1 1 2 1 0 1 0 0 1	1 0 6 1 1 0 0 1 1
Prolobodes giganteus	1 0 0 1 1 1 1 0 2	1 0 1 3 1 1 1 0 1 0	1 0 0 0 1 1 1 0 2 2	2 1 0 0 0 1 1 0 0 1	1 1 0 0 0 1 0 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 0 0 1 0 1	1 1 1 1 1 1 0 0 0 1	0 1 1 0 1 0 1 0 1 3	2 1 1 1 0 1 1 1 0 1	0 1 0 1 0 1 1 0 1
Prolobodes gigas	1 0 0 1 1 1 1 0 2	1 0 1 2 1 1 1 0 1 0	1 0 0 0 1 1 1 0 2 2	2 1 0 0 0 1 1 0 0 1	1 0 0 0 0 1 0 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 0 0 1 0 1	1 1 1 1 1 1 0 0 ? 1	? ? ? ? ? ? ? 0 1 ?	2 1 1 1 0 1 1 1 0 1	0 1 0 1 0 1 1 0 1
Rythidoporus indentatus	2 1 1 2 1 2 1 0 2	1 1 1 1 0 0 1 0 0 1	0 0 2 1 1 1 2 1 2 1	1 2 0 0 1 1 1 0 0 1	1 1 0 0 0 1 1 0 1 1	1 1 0 2 1 0 1 1 0 0	1 1 1 0 0 0 0 0 0 0	0 1 0 0 0 1 0 0 0 1	0 1 1 0 1 1 1 ? ? ?	? ? ? ? ? ? ? ? 0 0	0 0 ? ? ? ? ? ? ?
Tominotus inconspicuus	2 0 0 0 1 2 1 0 2	1 1 1 2 0 1 1 0 1 1	0 0 0 0 1 1 1 1 2 1	1 0 0 0 1 1 1 1 0 1	0 1 0 0 0 1 0 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 0 0 1 0 0	0 1 0 0 0 0 0 0 1 1	1 1 1 1 2 0 0 0 1 2	2 1 1 2 1 1 1 0 0 0	0 1 2 1 1 1 1 1 0
Tominotus laeviculus	2 1 0 0 1 2 1 0 2	1 1 1 2 0 1 1 0 1 0	0 0 0 0 1 1 1 1 2 1	1 0 0 0 1 1 1 1 0 1	0 1 0 0 0 1 0 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 0 0 1 0 0	0 1 0 0 0 0 0 0 1 1	1 1 1 1 2 0 0 0 1 2	2 1 1 2 1 1 1 0 0 0	0 1 2 1 1 1 1 1 0
Cyrtomenus ciliatus	1 0 0 1 1 1 1 0 2	1 0 1 2 1 0 1 0 1 0	0 0 0 0 1 1 1 0 2 1	1 2 0 0 0 1 1 0 0 1	1 1 0 0 0 1 1 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 2 0 1 1 1	1 1 1 1 1 1 0 1 0 1	0 1 1 0 1 1 0 0 1 2	2 1 1 1 0 1 1 1 1 2	0 1 0 1 1 1 1 1 1
Cyrtomenus crassus	1 0 0 2 1 1 1 0 2	1 0 1 3 1 0 1 0 1 0	0 0 0 0 1 1 1 0 2 1	1 2 0 0 0 1 1 0 0 1	1 1 0 0 0 1 1 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 2 0 1 1 1	1 1 1 1 1 1 0 1 0 1	0 1 1 0 2 1 0 0 1 2	2 1 1 1 0 1 1 0 1 1	0 1 0 1 0 1 1 1 1
Cyrtomenus emarginatus	2 0 0 1 1 0 1 1 2	1 0 0 3 1 0 1 0 1 0	0 0 0 0 1 1 1 0 2 1	1 2 0 0 0 1 1 0 0 1	1 1 0 0 0 1 0 0 1 1	1 1 1 2 1 0 0 2 0 0	1 1 1 0 0 2 0 1 1 1	1 1 1 1 1 1 0 0 0 1	0 1 1 0 1 1 0 0 1 2	2 1 1 1 0 1 1 1 0 1	0 1 0 1 0 1 1 1 1
Cyrtomenus grossus	2 0 0 1 1 1 1 0 2	1 0 1 3 1 1 1 0 1 0	0 2 0 0 1 1 1 0 2 2	2 0 0 0 0 1 1 0 0 1	1 1 1 0 0 1 0 0 1 1	1 1 1 2 1 0 0 2 0 0	1 1 1 0 0 2 0 1 1 1	1 1 1 1 1 1 0 0 0 1	0 1 0 0 1 0 0 0 1 2	2 1 1 1 0 1 1 0 ? ?	? ? ? ? ? ? ? ? ?
Cyrtomenus marginalis	2 0 0 0 1 2 1 0 2	1 0 1 3 1 1 1 0 1 1	0 0 0 0 1 2 0 0 0 2	2 1 0 0 0 0 1 0 0 2	0 0 0 0 0 1 0 0 1 1	1 1 1 2 1 0 0 2 0 0	1 1 1 0 0 2 0 1 1 1	1 1 1 1 1 1 0 0 0 1	0 1 1 0 1 0 0 ? ? ?	? ? ? ? ? ? ? ? ? ?	? ? ? ? ? ? ? ? ?
Cyrtomenus mirabilis	1 0 0 1 1 1 1 0 2	1 0 1 3 1 1 1 0 1 0	0 0 0 0 1 1 1 0 2 1	1 2 0 0 0 1 1 0 0 1	1 1 0 0 0 1 0 0 1 1	1 1 0 2 1 0 0 2 0 0	1 1 1 0 0 2 0 1 1 1	1 1 1 1 1 1 0 0 0 1	0 1 1 0 1 0 0 0 1 2	2 1 1 1 0 1 1 1 0 2	0 1 0 1 0 1 1 1 1
Cyrtomenus teter	1 0 0 1 1 1 1 0 2	1 0 1 3 1 0 1 0 1 1	0 2 0 0 1 1 1 0 2 1	1 2 0 0 0 3 1 0 0 1	1 1 0 0 0 1 0 0 1 1	1 1 1 2 1 0 0 2 0 0	1 1 1 0 0 2 0 1 1 1	1 1 1 1 1 1 0 0 0 1	0 1 1 0 2 1 0 0 1 2	2 1 1 1 0 1 1 1 0 2	0 1 0 1 0 1 1 1 1

Table 3. Results under IW analyses with different K, defined following Mirande (2009). The results of the IW analysis is the strict consensus of all topologies found (see text for explanation).

Analysis	Distref	Kref	Steps	# trees	fit	Agree	Nodcons
k0	50	1.365	370	1	49.040	0	0
k1	54	1.603	370	1	46.145	25	23
k2	58	1.886	370	1	43.158	25	23
k3	62	2.228	370	1	40.065	25	23
k4	66	2.650	370	1	36.850	25	23
k5	70	3.186	370	1	33.495	25	23
k6	74	3.886	370	1	29.976	25	23
k7	78	4.841	369	1	26.260	21	18
k8	82	6.220	369	1	22.300	25	23
k9	86	8.387	369	1	18.072	25	23
k10	90	12.288	369	1	13.512	22	21

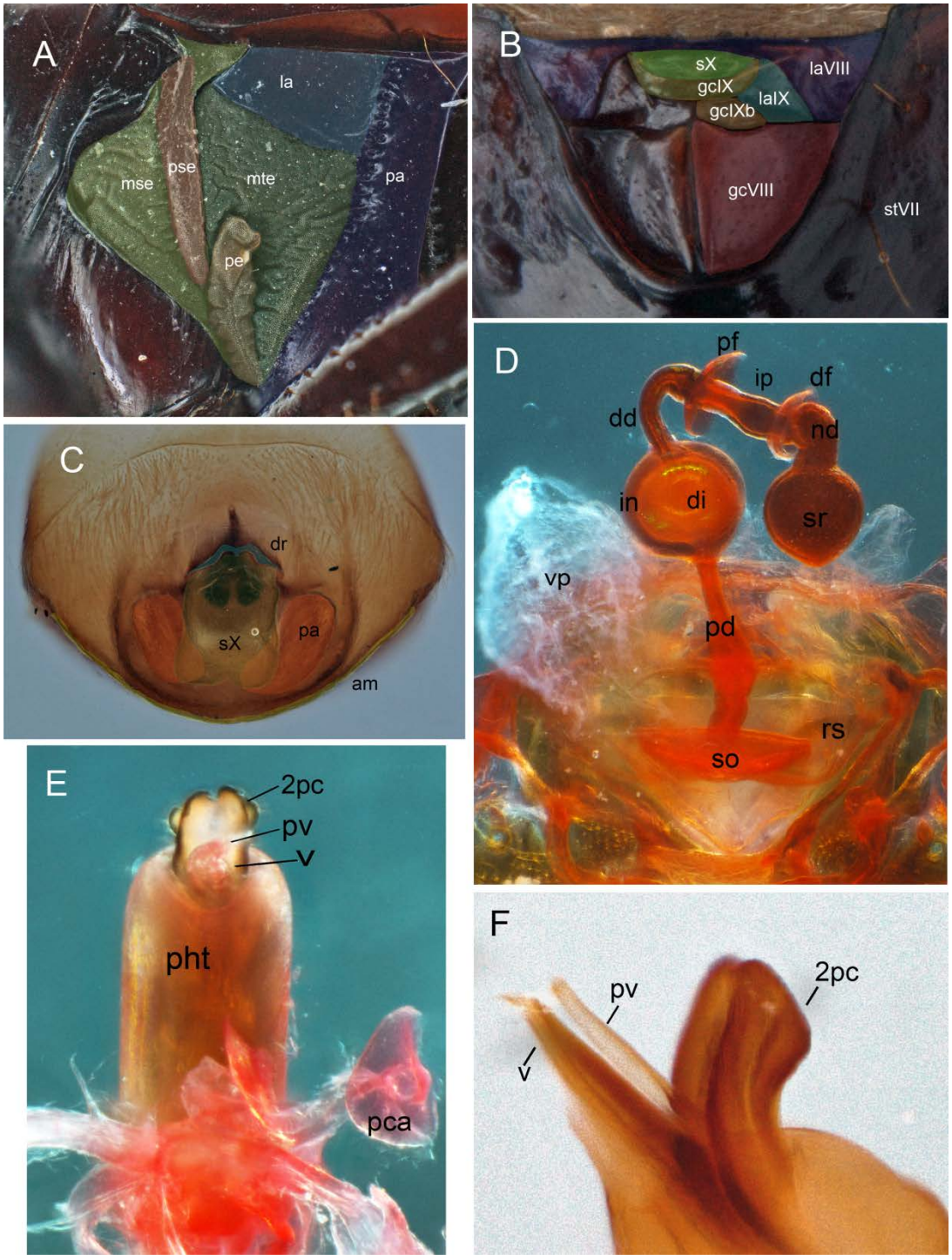

FIGURE 1. Terminology used: (A) evaporatorium, (B) female external genitalia, (C) pygofore dorsal view, (D) spermatheca, (E) phallus ventral view, (F) phallus apex lateral view. mse, mesopleural evaporatorium; pse; pseudoperitreme; pe, peritreme; la, lateral area; pa, posterior area; mte metapleural evaporatorium sX, segment X; am, apical margin; as, apical surface; gcVIII, gonocoxite VIII; gcIX, gonocoxite IX; laVIII, laterotergite VIII; laIX, laterotergite IX; stVII, sternum VII; so, spermathecal opening; rs, ring sclerites; pd, proximal duct; vp, vaginal pouche; di, dilation; in, invagination; dd, distal duct; pf, proximal flange; ip, intermediate part; df, distal flange; nd, “neck” duct; sr, seminal receptacle; dr, dorsal rim; pa, paramere; v, vesica; pv, processus vesicae; 2pc, second conjunctival appendage; pht, phallotheca; pca, processus capitati.

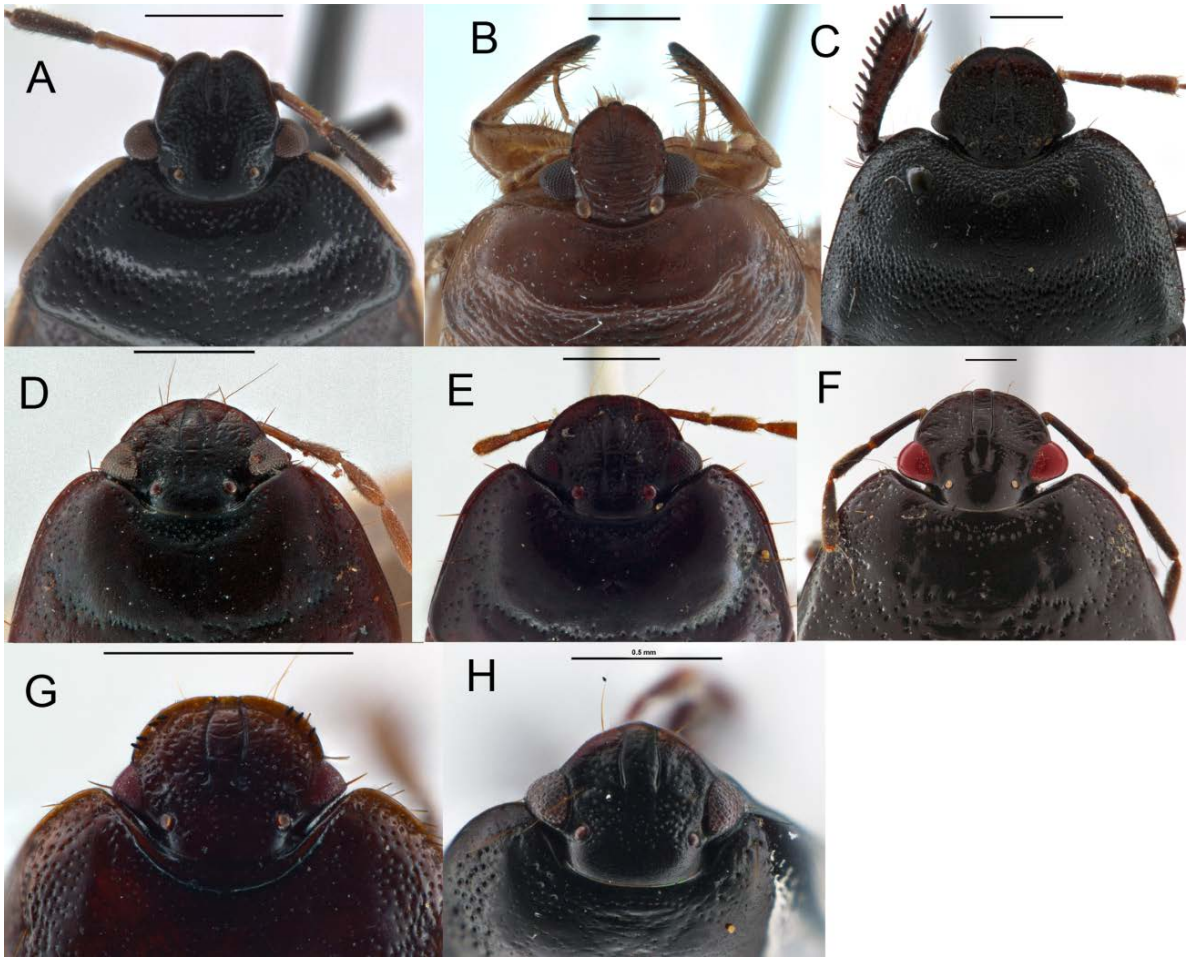

FIGURE 2. Head, dorsal view; (A) *Sehirus sinctus*, (B) *Scaptocoris minor*, (C) *Cydnus aterrimus*, (D) *Dallasiellus alutaceus*, (E) *Dallasiellus longulus*, (F) *Ectinopus rugoscutum*, (G) *Macroporus repetitus*, (H) *Melanaethus dunesis*. Scale bar: 1 mm.

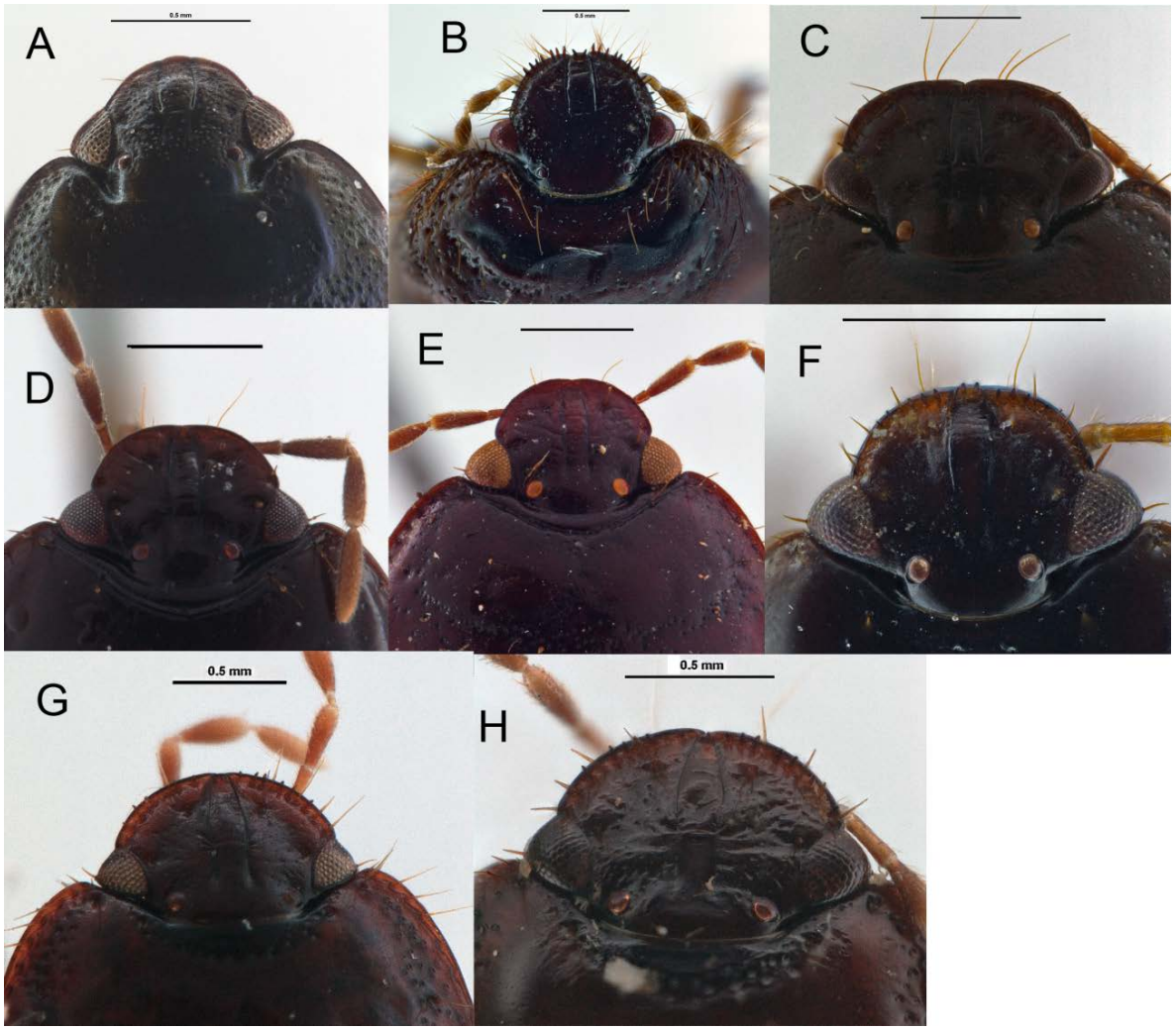

FIGURE 3. Head dorsal; (A) *Melanaethus spinolae*, (B) *Microporus obliquus*, (C) *Onalips completus*, (D) *Pangaeus serripes*, (E) *Pangaeus xanthopus*, (F) *Rhytidoporus indentatus*, (G) *Tominotus inconspicuus*, (H) *Tominotus laeviculus*. Scale bar: 1 mm.

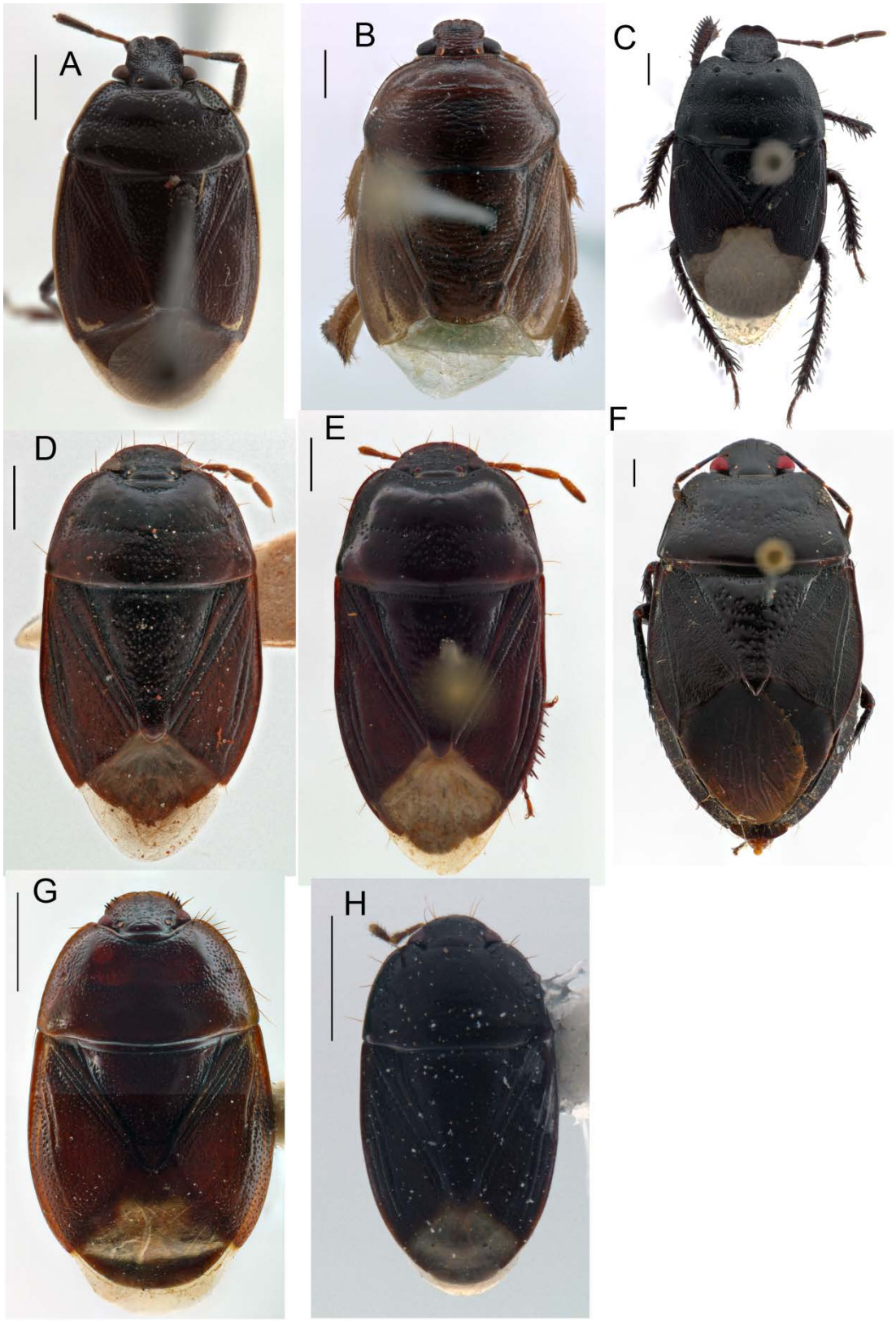

FIGURE 4. Dorsal view; (A) *Sehirus sinctus*, (B) *Scaptocoris minor*, (C) *Cydnus aterrimus*, (D) *Dallasiellus alutaceus*, (E) *Dallasiellus longulus*, (F) *Ectinopus rugoscutum*, (G) *Macroporus repetitus*, (H) *Melanaethus dunesis*. Scale bar: 1 mm.

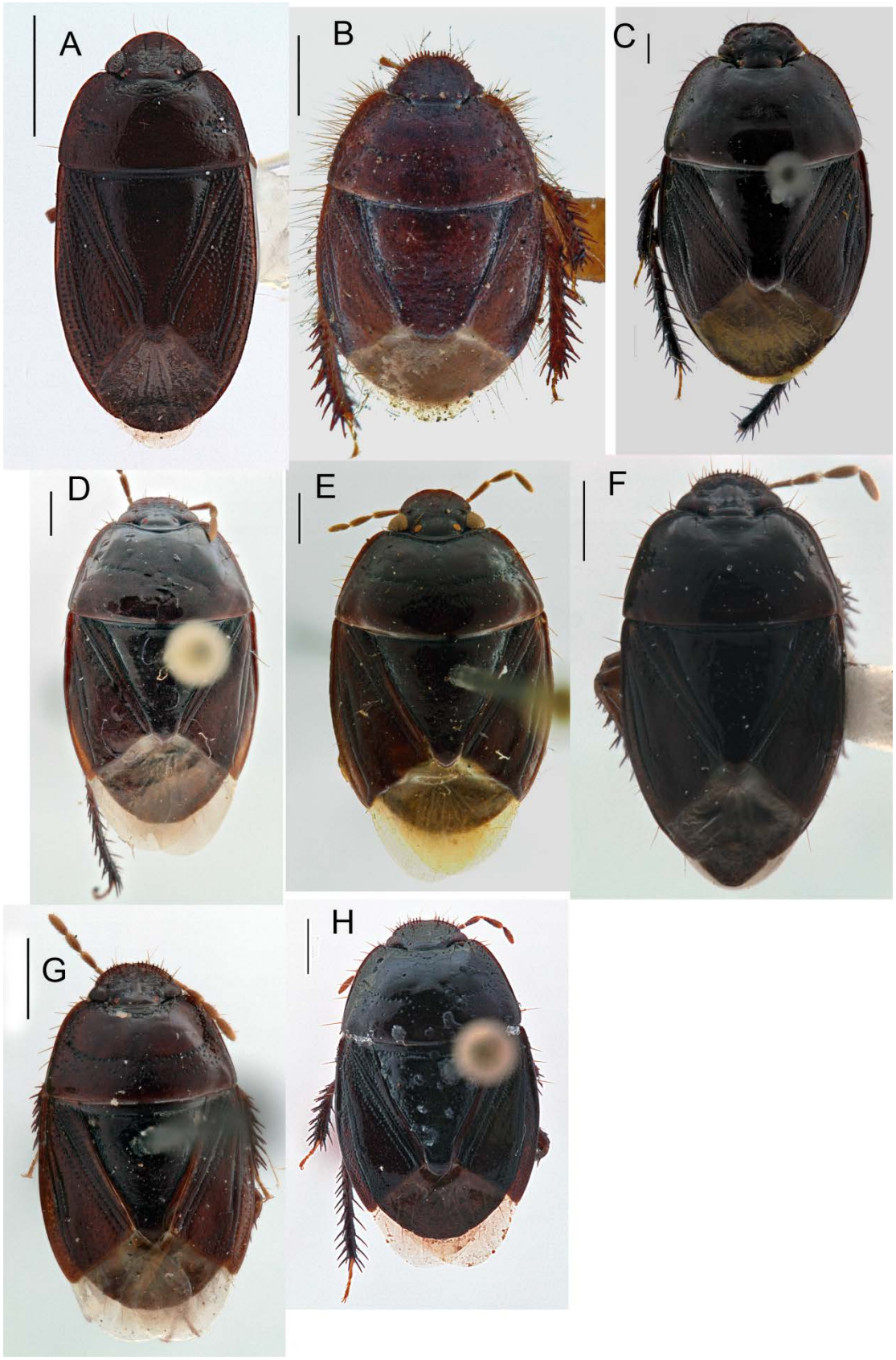

FIGURE 5. Dorsal view; (A) *Melanaethus spinolae*, (B) *Microporus obliquus*, (C) *Onalips completus*, (D) *Pangaeus serripes*, (E) *Pangaeus xanthopus*, (F) *Rhytidoporus indentatus*, (G) *Tominotus inconspicuus*, (H) *Tominotus laeviculus*. Scale bar: 1 mm.

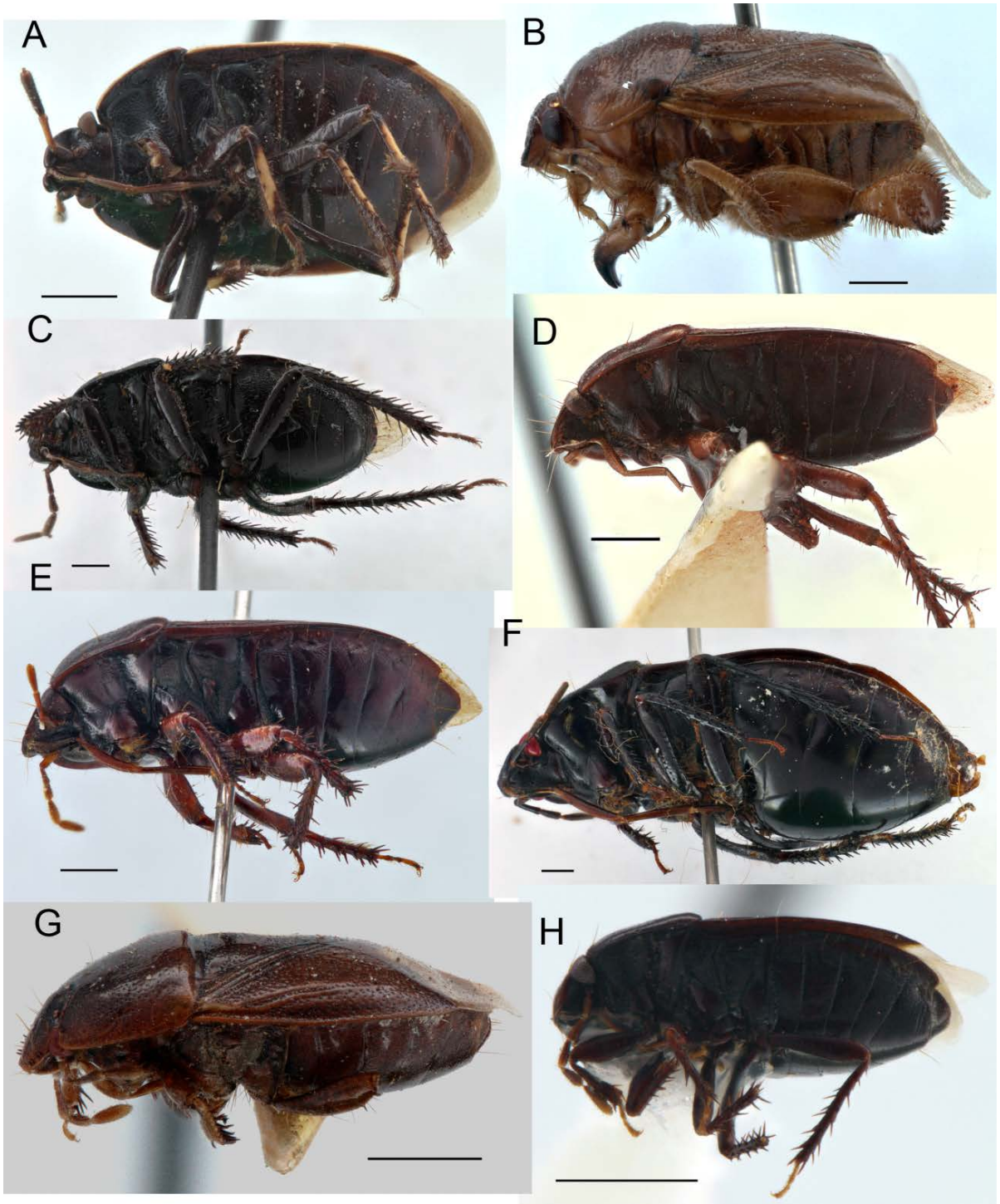

FIGURE 6. Lateral view; (A) *Sehirus sinctus*, (B) *Scaptocoris minor*, (C) *Cydnus aterrimus*, (D) *Dallasiellus alutaceus*, (E) *Dallasiellus longulus*, (F) *Ectinopus rugoscutum*, (G) *Macroporus repetitus*, (H) *Melanaethus dunesis*. Scale bar: 1 mm.

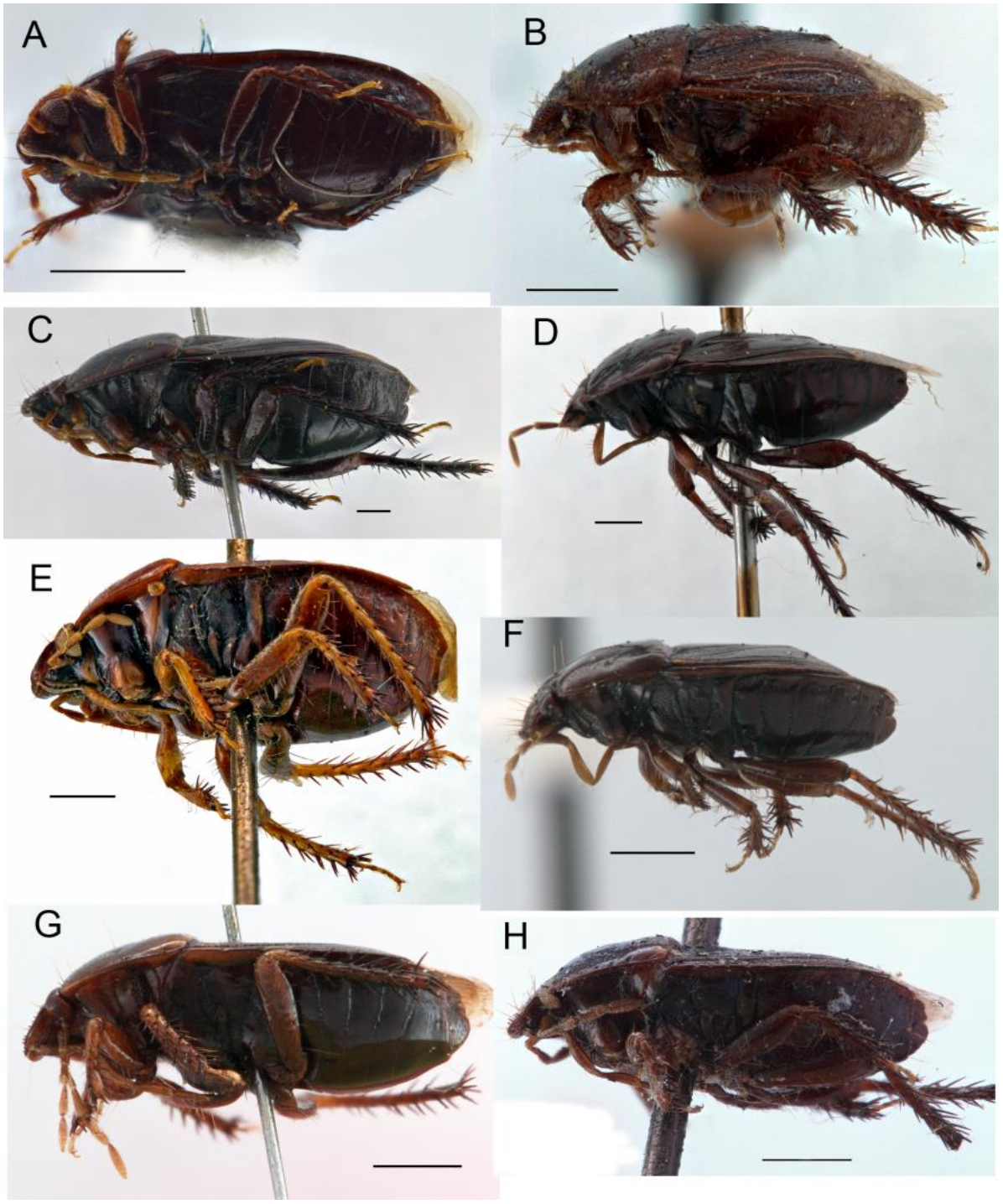

FIGURE 7. Lateral view; (A) *Melanaethus spinolae*, (B) *Microporus obliquus*, (C) *Onalips completus*, (D) *Pangaeus serripes*, (E) *Pangaeus xanthopus*, (F) *Rhytidoporus indentatus*, (G) *Tominotus inconspicuus*, (H) *Tominotus laeviculus*. Scale bar: 1 mm.

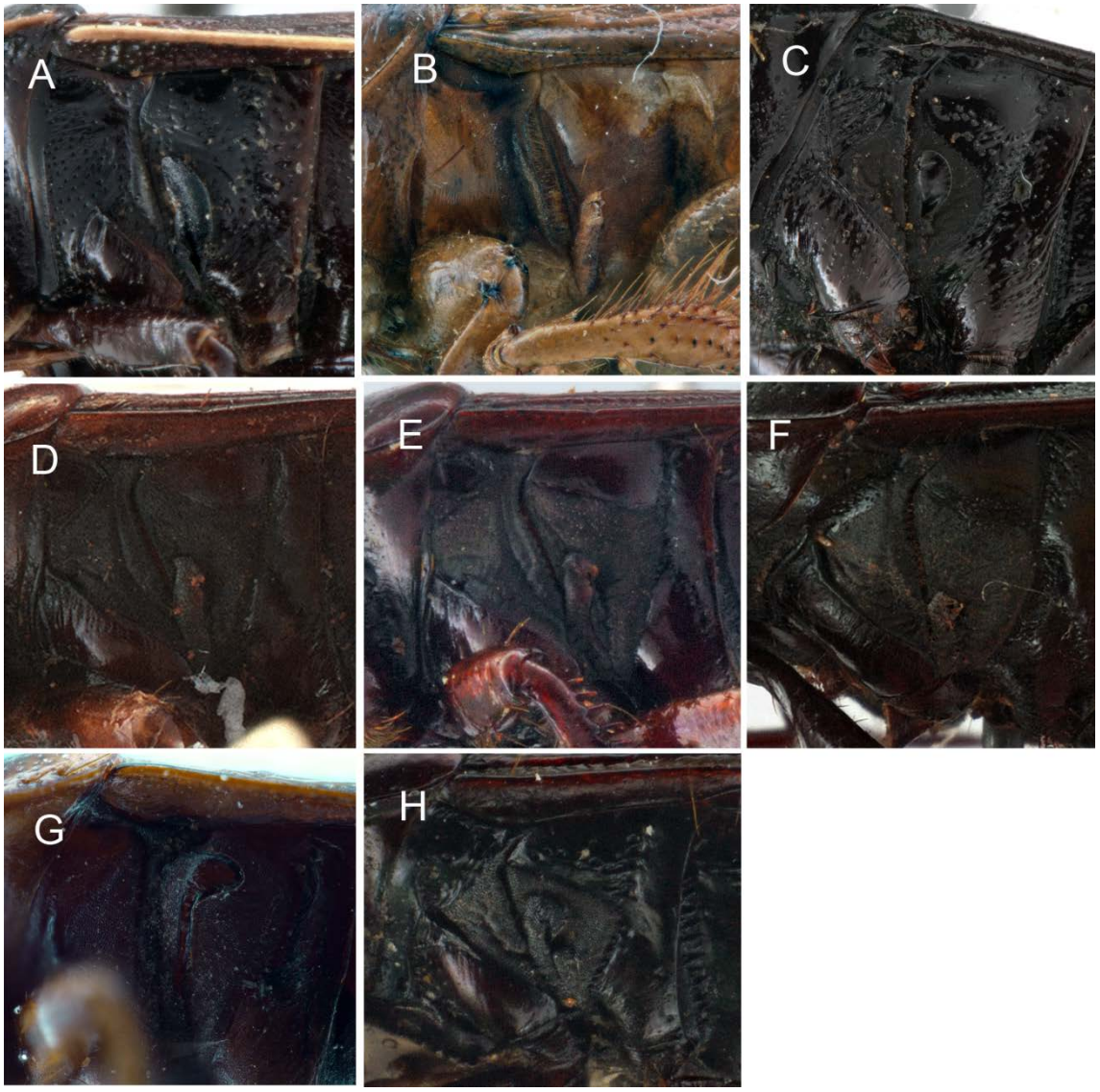

FIGURE 8. Evaporatorium; (A) *Sehirus sinctus*, (B) *Scaptocoris minor*, (C) *Cydnus aterrimus*, (D) *Dallasiellus alutaceus*, (E) *Dallasiellus longulus*, (F) *Ectinopus rugoscutum*, (G) *Macroporus repetitus*, (H) *Melanaethus dunesis*. Scale bar: 1 mm.

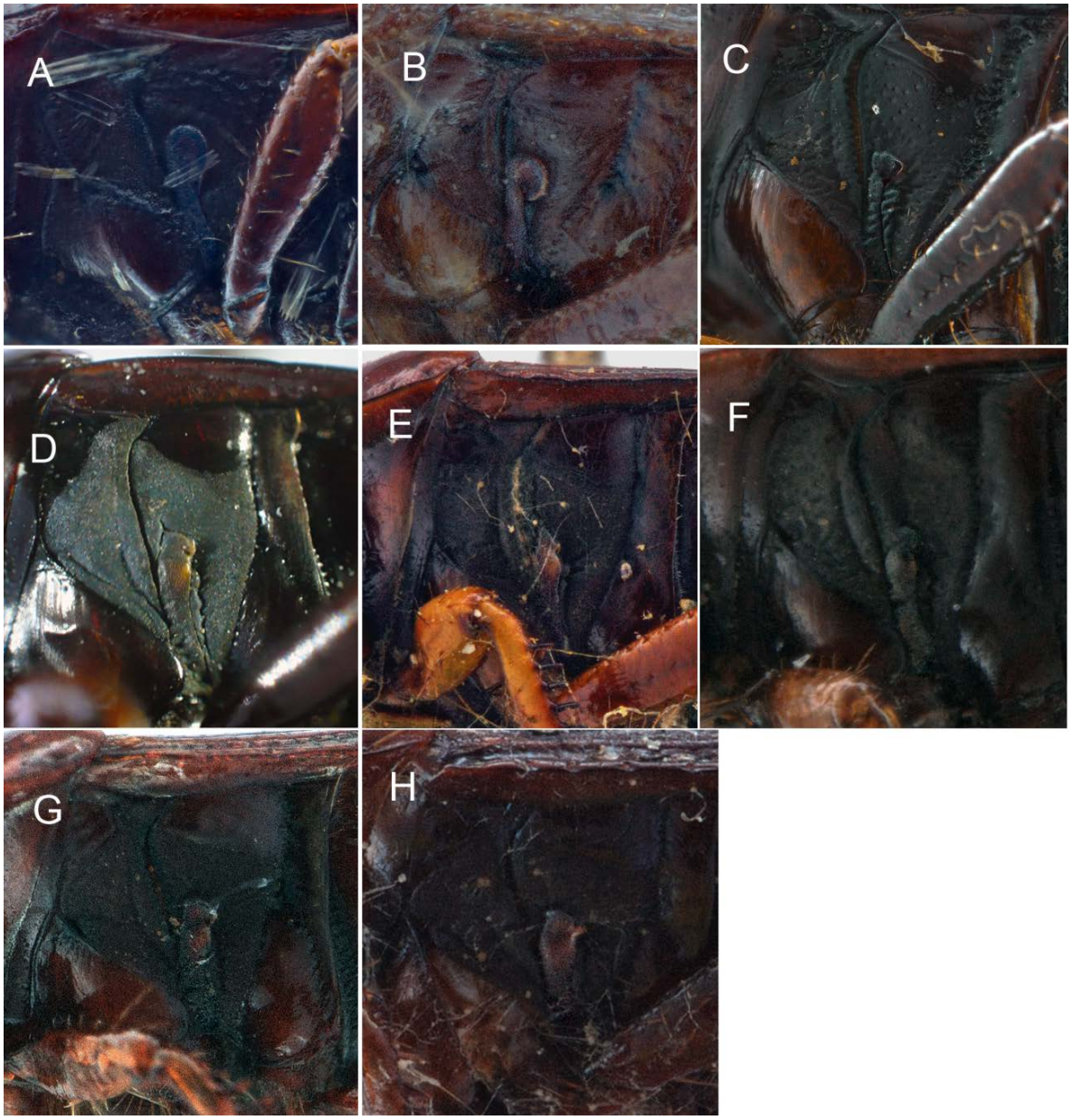

FIGURE 9. Evaporatorium; (A) *Melanaethus spinolae*, (B) *Microporus obliquus*, (C) *Onalips completus*, (D) *Pangaeus serripes*, (E) *Pangaeus xanthopus*, (F) *Rhytidoporus indentatus*, (G) *Tominotus inconspicuus*, (H) *Tominotus laeviculus*. Scale bar: 1 mm.

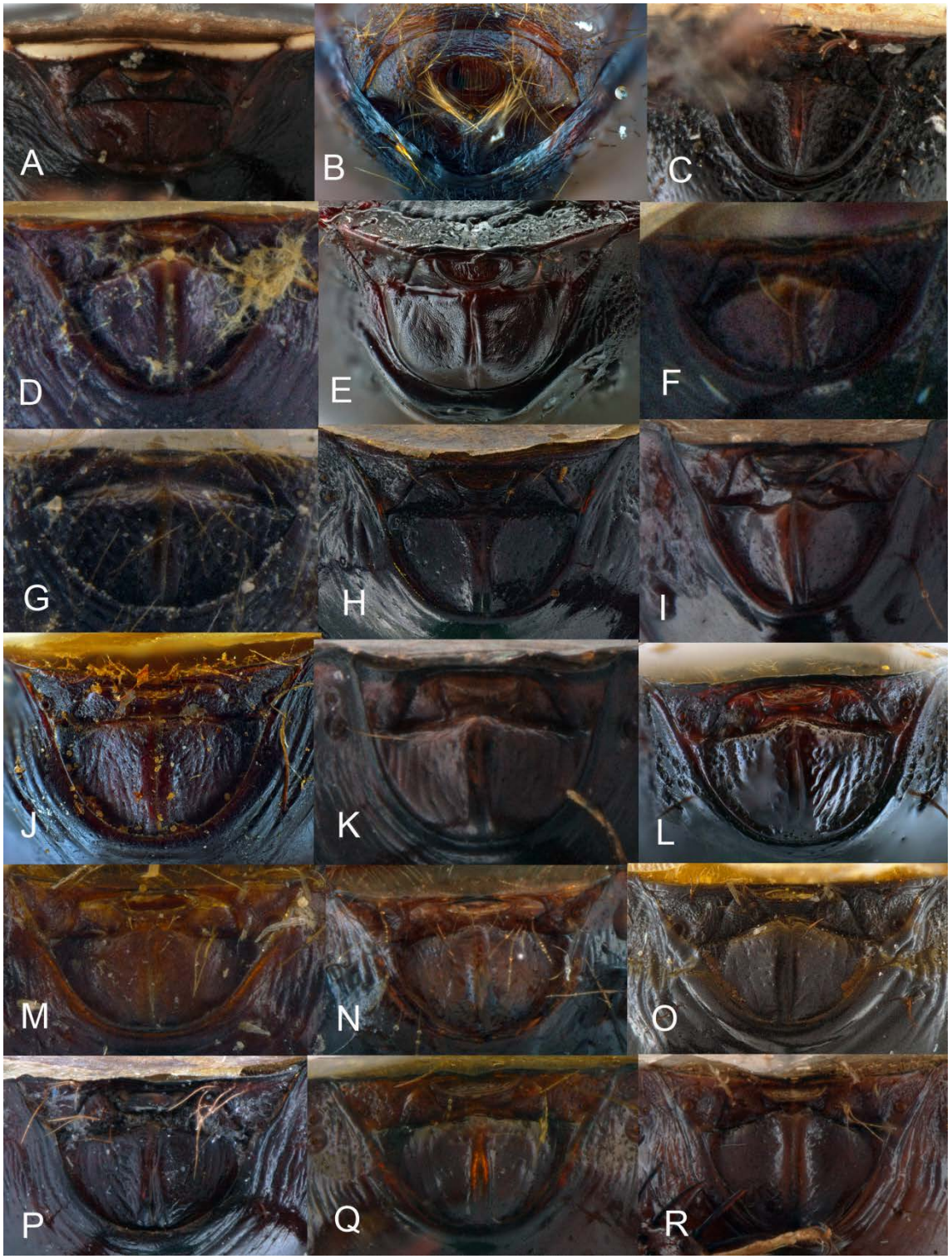

FIGURE 10. Female genitalia external; (A) *Sehirus sinctus*, (B) *Scaptocoris minor*, (C) *Cydnus aterrimus*, (D) *Dallasiellus longulus*, (E) *Ectinopus rugoscutum*, (F) *Melanaethus spinolae*, (G) *Microporus obliquus*, (H) *Onalips completus*, (I) *Pangaeus serripes*, (J) *Prolobodes giganteus*, (K) *Rhytidoporus indentatus*, (L) *Tominotus laeviculus*, (M) *Cyrtomenus ciliatus*, (N) *Cyrtomenus crassus*, (O) *Cyrtomenus emarginatus*, (P) *Cyrtomenus grossus*, (Q) *Cyrtomenus mirabilis*, (R) *Cyrtomenus teter*.

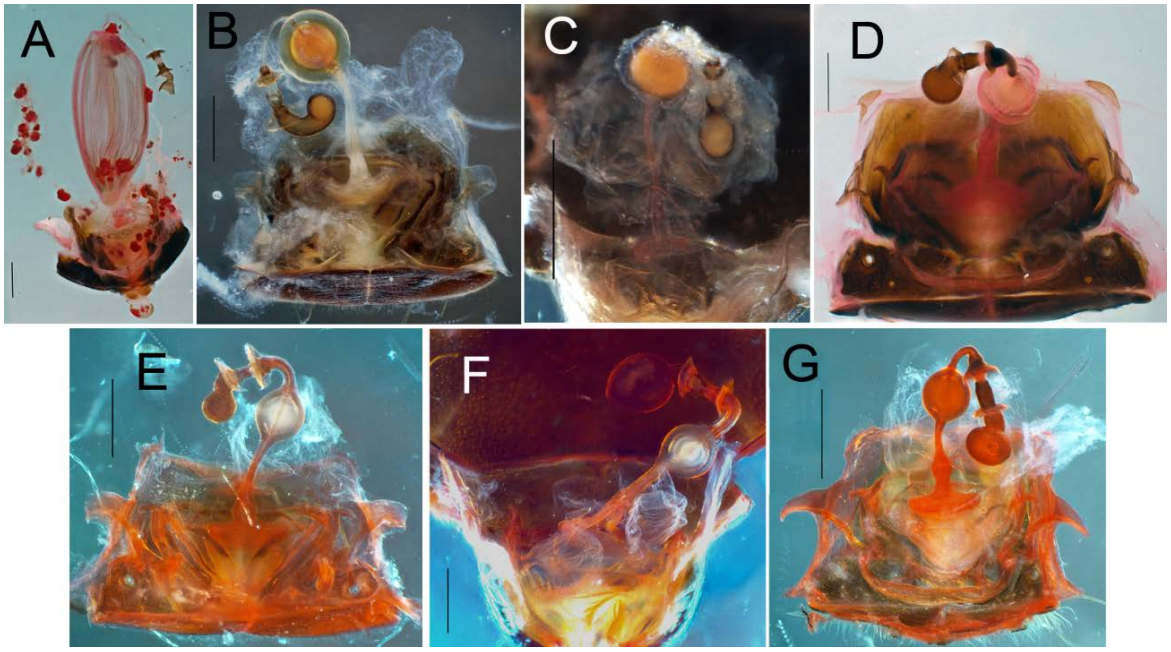

FIGURE 11. Female genitalia: spermatheca (A) *Ectinopus rugoscutum*, (B) *Pangaeus serripes*, (C) *Tominotus laeviculus*, (D) *Prolobodes giganteus*, (E) *Cyrtomenus emarginatus*, (F) *Cyrtomenus grossus*, (G) *Cyrtomenus mirabilis*. Scale bar: 0.5 mm.

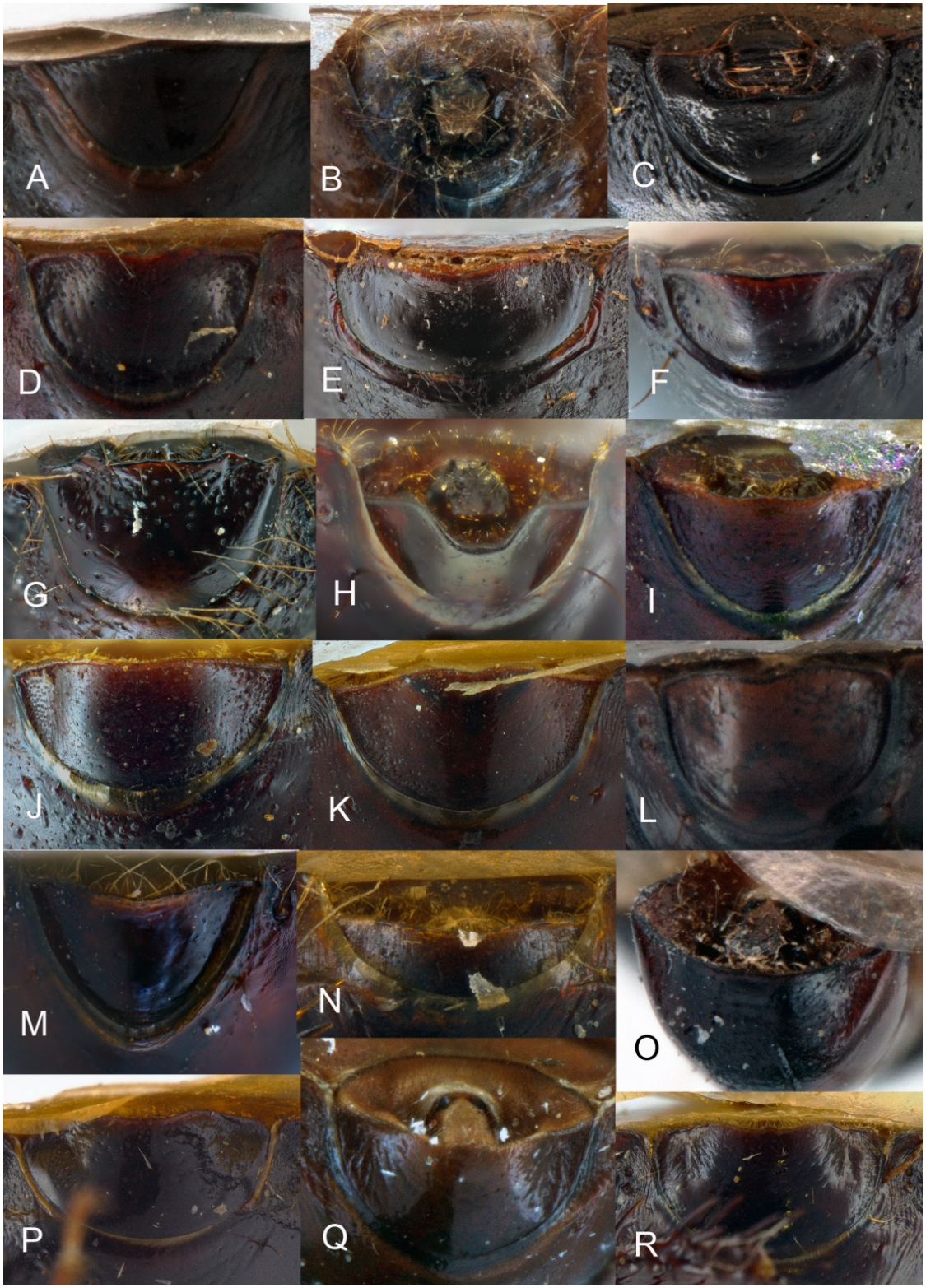

FIGURE 12. Male genitalia external; (A) *Sehirus sinctus*, (B) *Scaptocoris minor*, (C) *Cydnus aterrimus*, (D) *Dallasiellus longulus*, (E) *Ectinopus rugoscutum*, (F) *Melanaethus dunesis*, (G) *Microporus obliquus*, (H) *Pangaeus serripes*, (I) *Pangaeus xanthopus*, (J) *Prolobodes giganteus*, (K) *Prolobodes gigas*, (L) *Rhytidoporus indentatus*, (M) *Tominotus laeviculus*, (N) *Cyrtomenus ciliatus*, (O) *Cyrtomenus crassus*, (P) *Cyrtomenus emarginatus*, (Q) *Cyrtomenus mirabilis*, (R) *Cyrtomenus teter*.

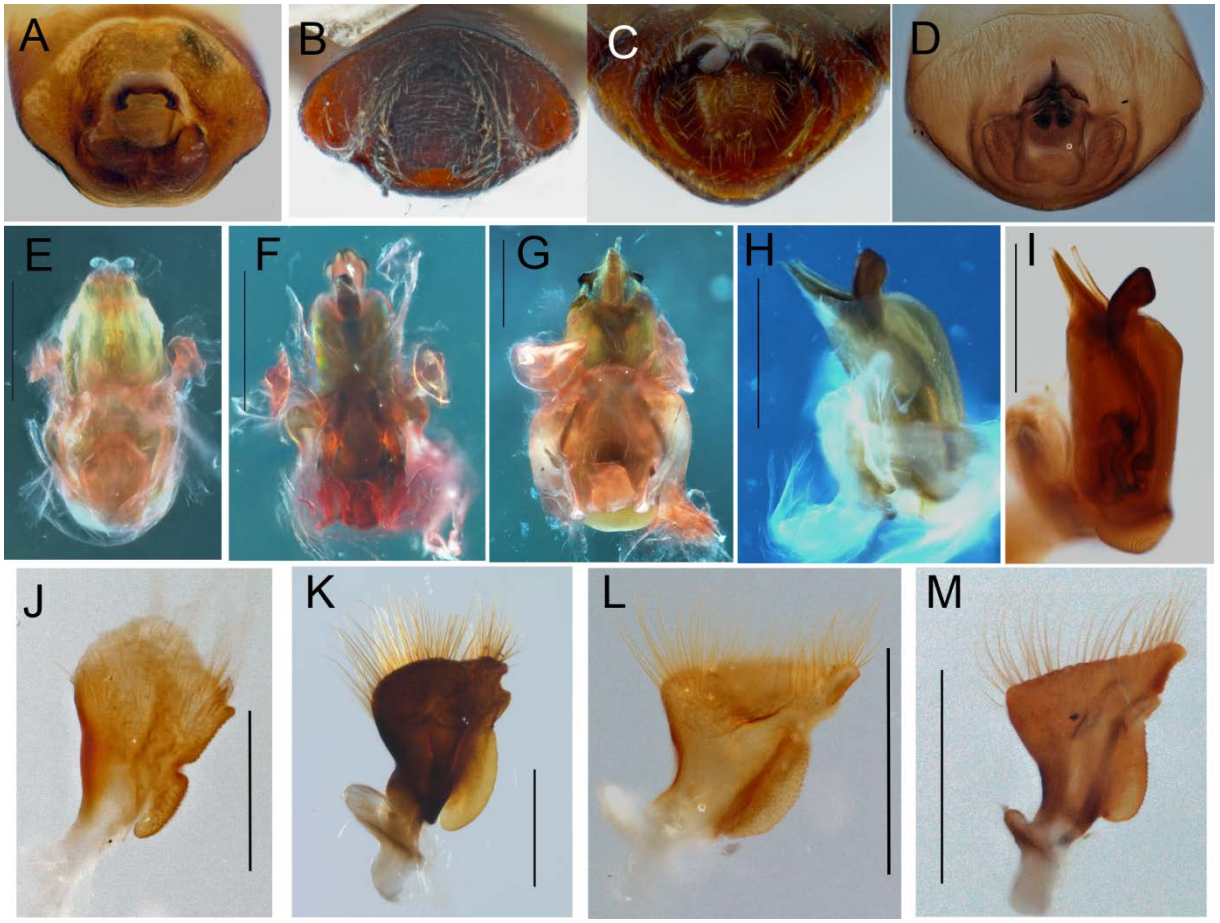

FIGURE 13. Male genitalia: pygophore dorsal (A) *Ectinopus rugoscutum*, (B) *Microporus obliquus*, (C) *Rhytidoporus indentatus*, (D) *Cyrtomenus mirabilis*. Phallus dorsal (E) *Ectinopus rugoscutum*, (F) *Cyrtomenus crassus*, (G) *Prolobodes giganteus*. Phallus Lateral, (H) *Ectinopus rugoscutum*, (I) *Cyrtomenus ciliatus*. Left paramere (J) *Ectinopus rugoscutum*, (K) *Prolobodes giganteus* (Photo by María Cristina Mayorga), (L) *Cyrtomenus ciliatus*, (M) *Cyrtomenus mirabilis*. Scale bar: 0.5 mm.

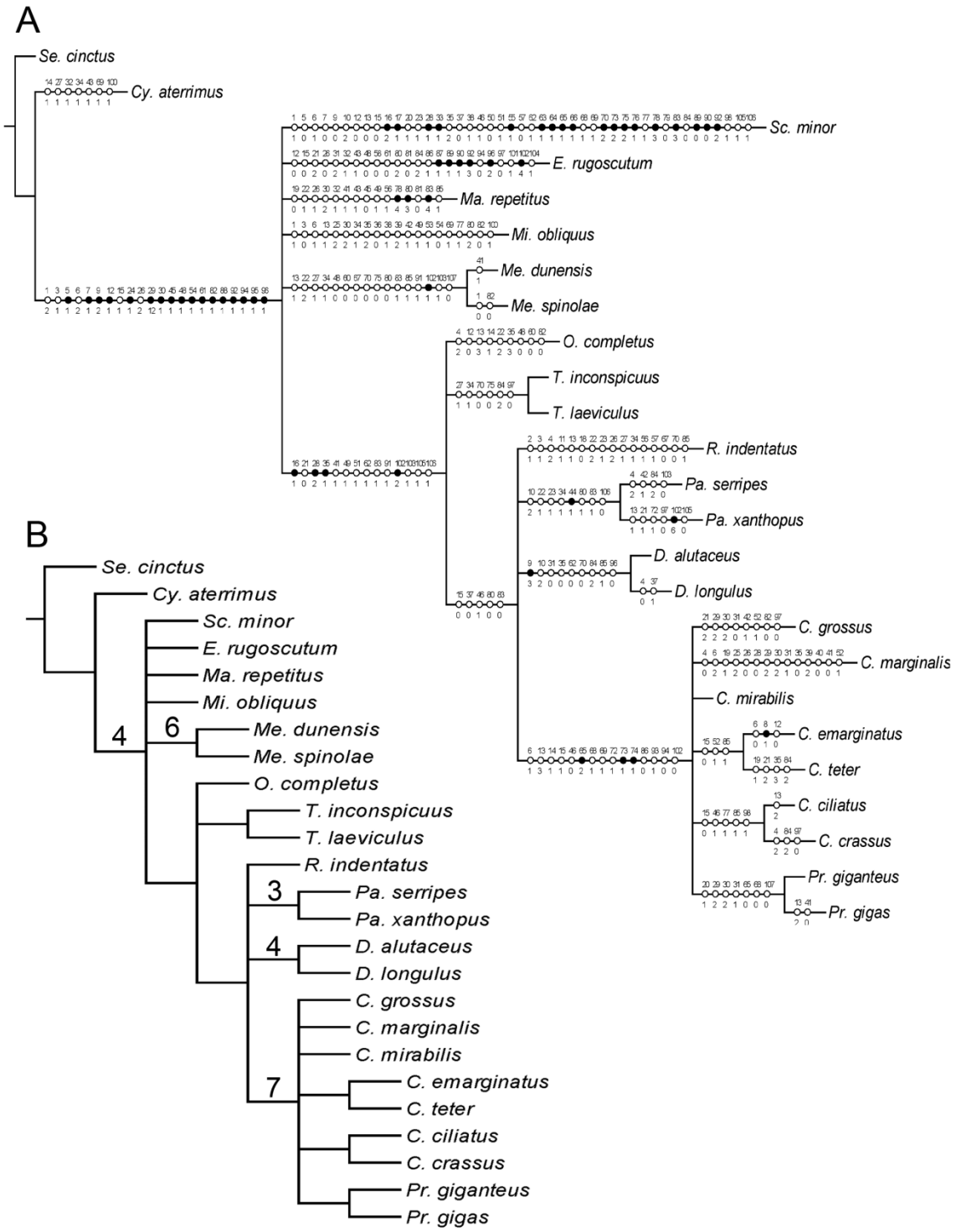

FIGURE 14. Strict consensus of 27 most parsimonious trees (A). Bremer supports values (B) White circle corresponds to homoplasy, the characters occurring in two or more clades. Black circle corresponds to apomorphy, the character unique for the clade, even if it is lost in some its members. The characters were mapped using unambiguous optimization Support numbers below 2 are omitted..

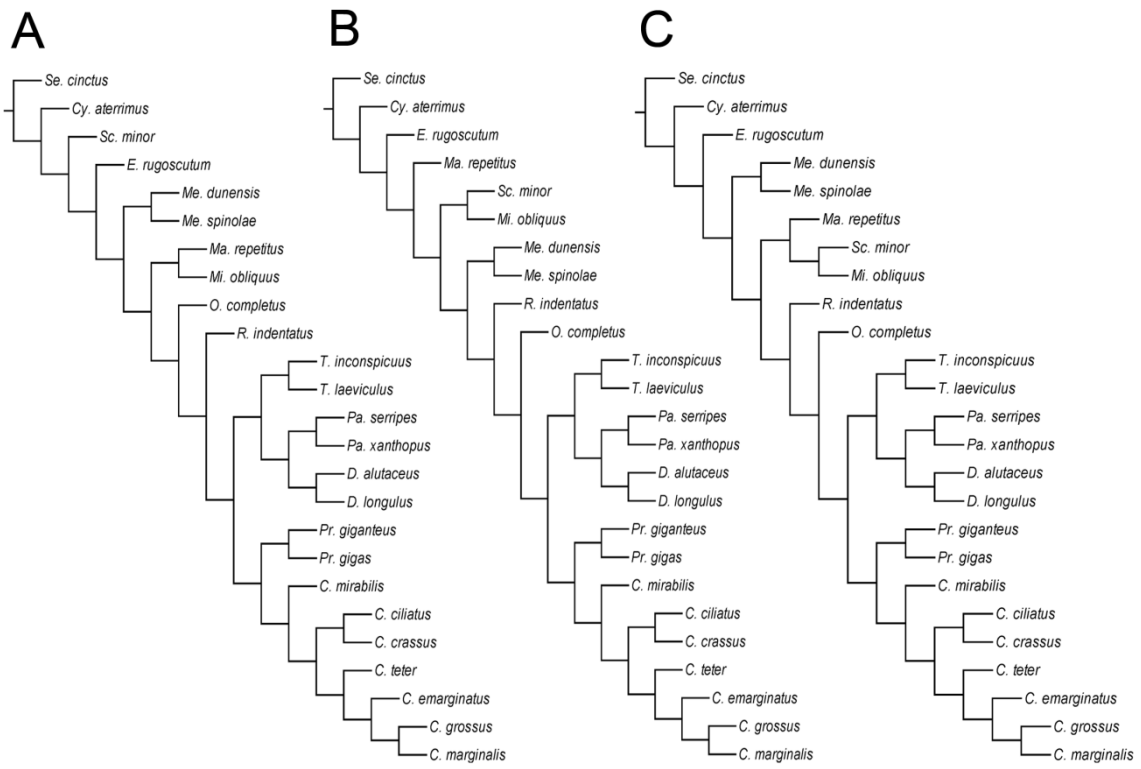

FIGURE 15. Topologies of the implied weights analisys for (A) K0 – K6; (B) K7 – K9 and (C) K10.

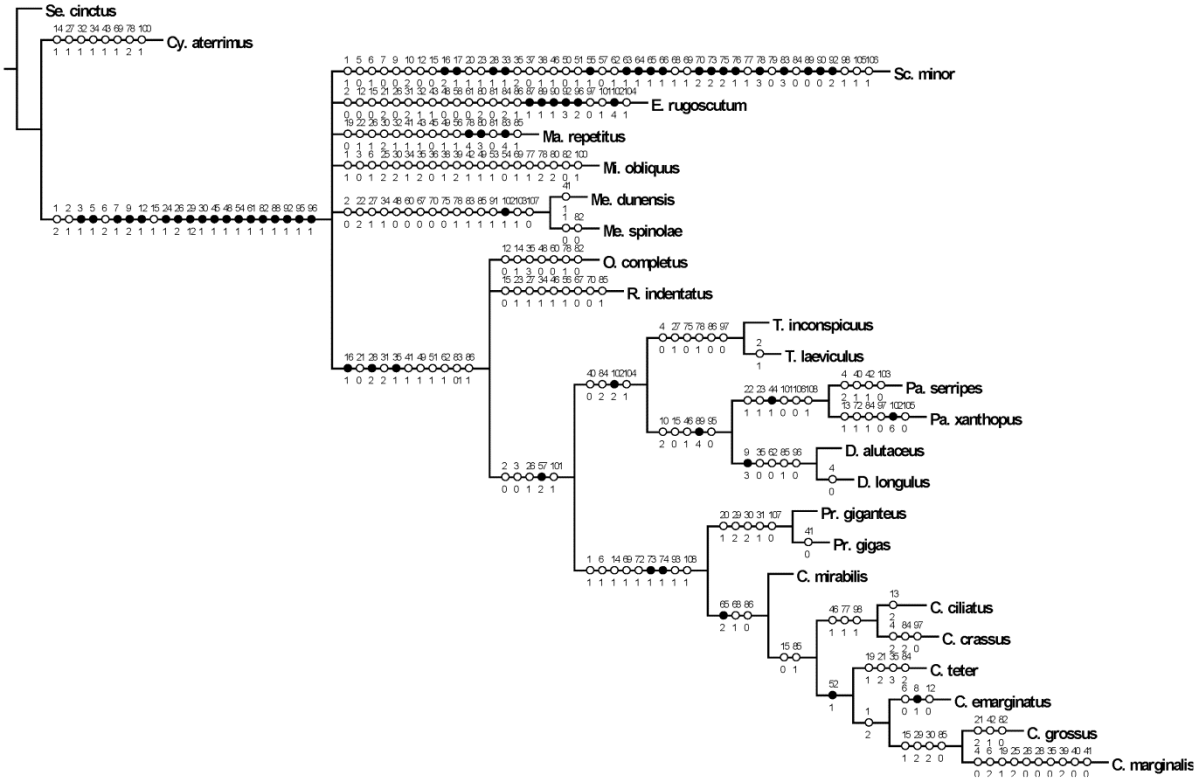

FIGURE 16. Strict consensus of three trees derived from implied weighting analysis. White circle corresponds to homoplasy, the characters occurring in two or more clades. Black circle corresponds to apomorphy, the character unique for the clade, even if it is lost in some its members. The characters were mapped using unambiguous optimization.

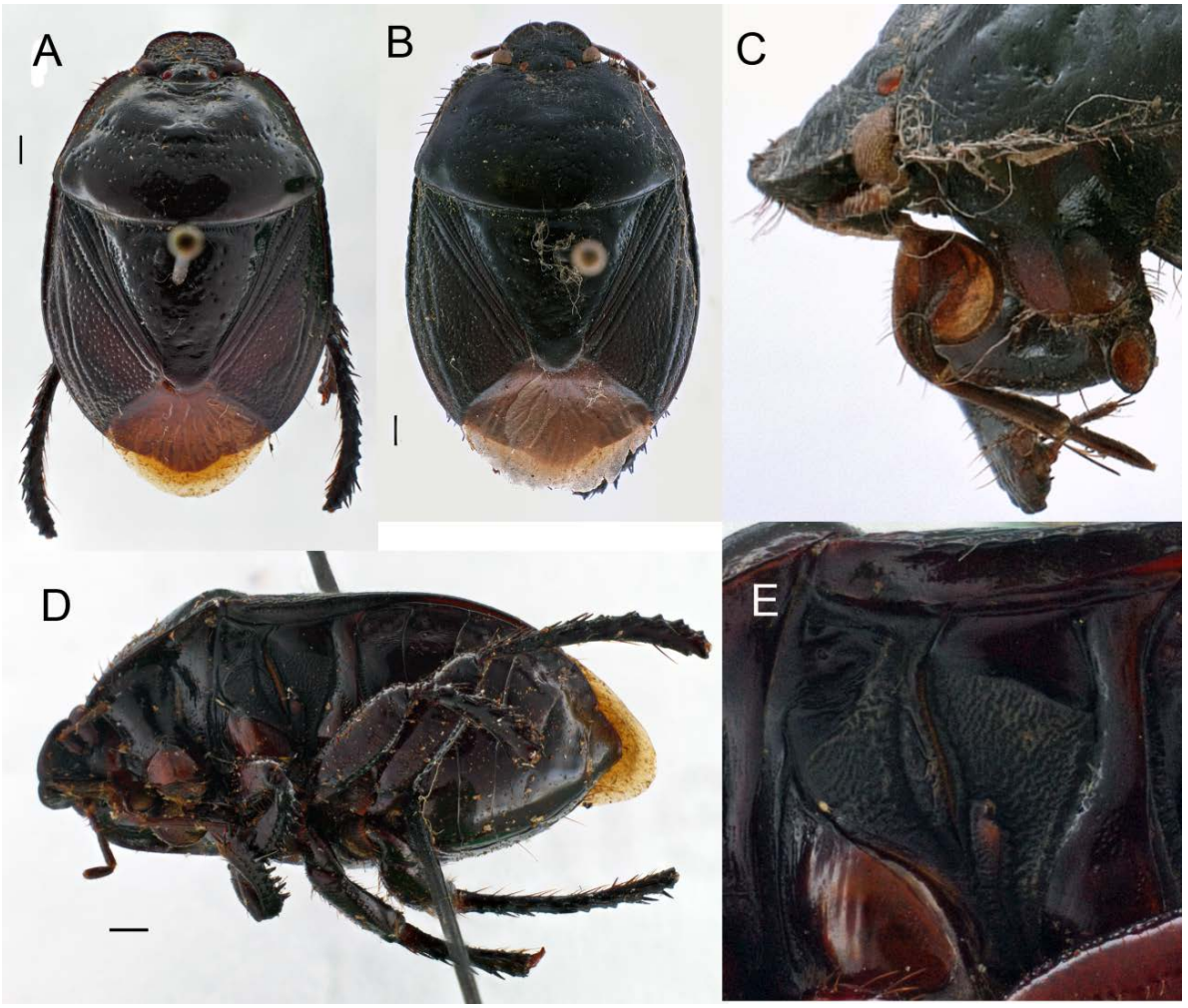

FIGURE 17. Morphological features of *Cyrtomenus* sister group, *Prolobodes*; (A) *P. giganteus* dorsal view, (B) *P. gigas* dorsal view, (C) *P. gigas* dorsal view head and labium lateral, (D) *P. giganteus* latero-ventral view, (E) *P. gigas* evaporatoria. Scale bar: 1 mm.

FIGURE 18. Distribution map of *Cyrtomenus mirabilis*.

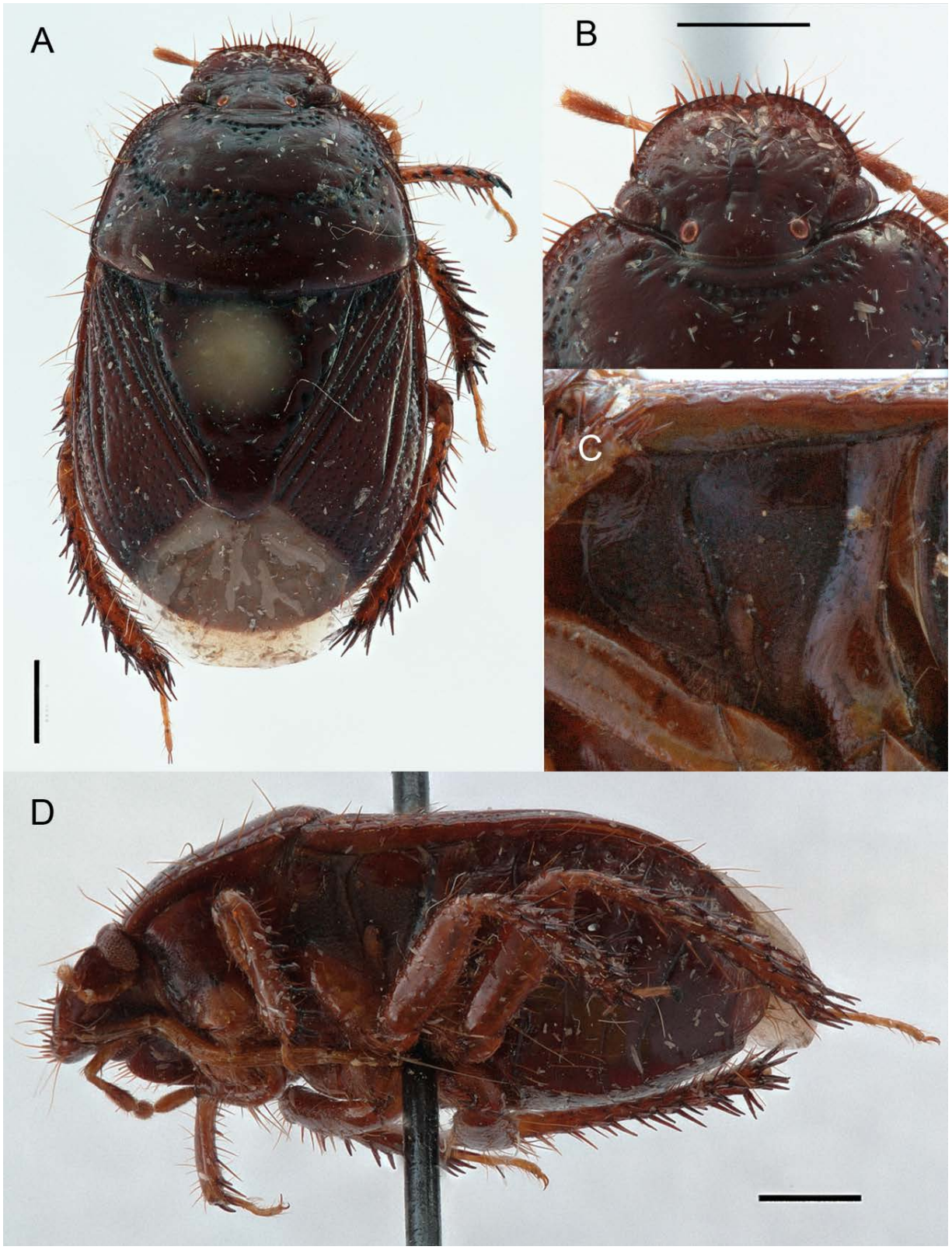

FIGURE 19. *Cyrtomenus mirabilis*; (A) dorsal view, (B) head dorsal, (C) evaporatoria (D) latero-ventral view. Scale bar: 1 mm.

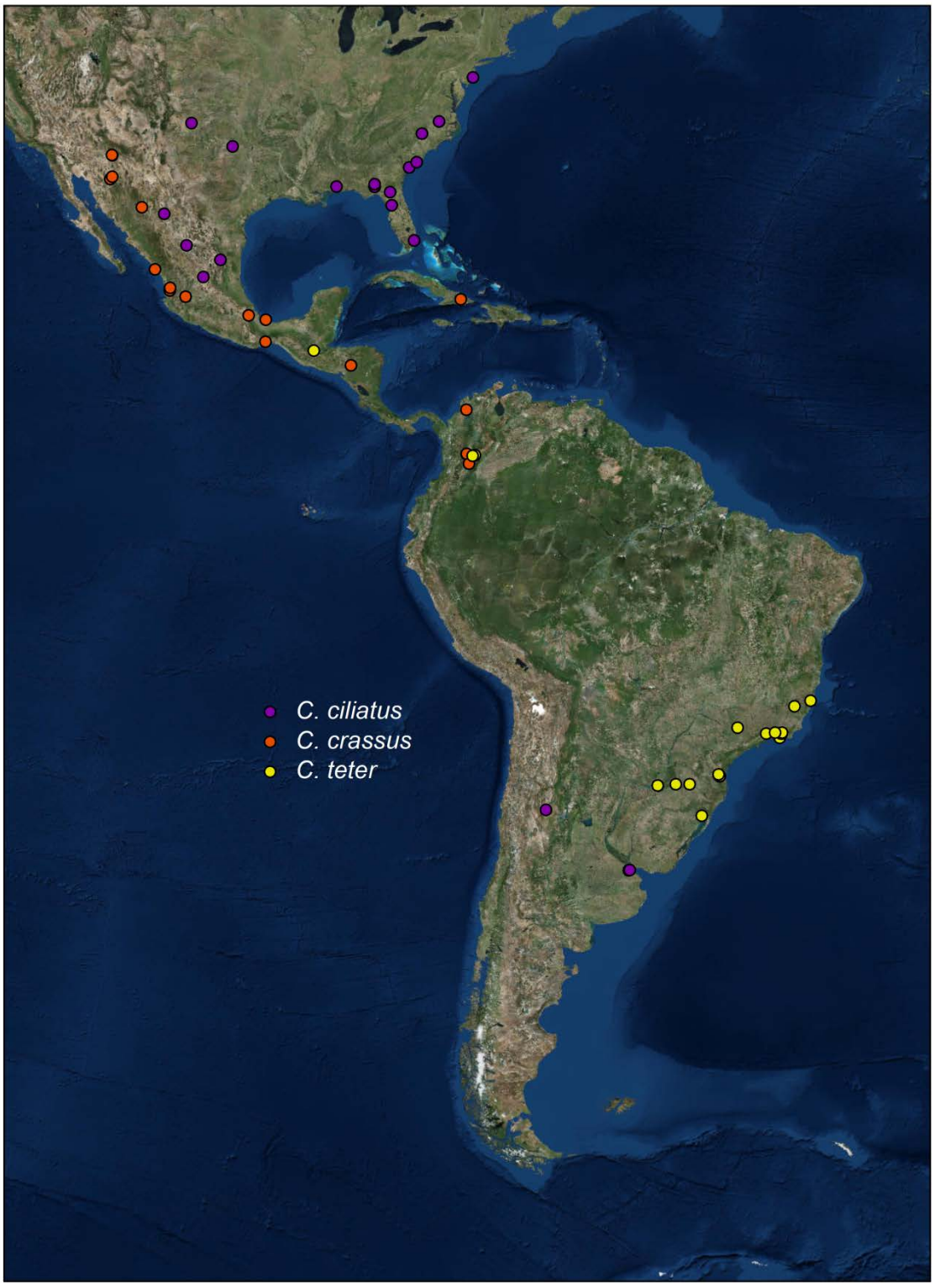

FIGURE 20. Distribution map of *Cyrtomenus ciliatus*, *C. crassus* and *C. teter*.

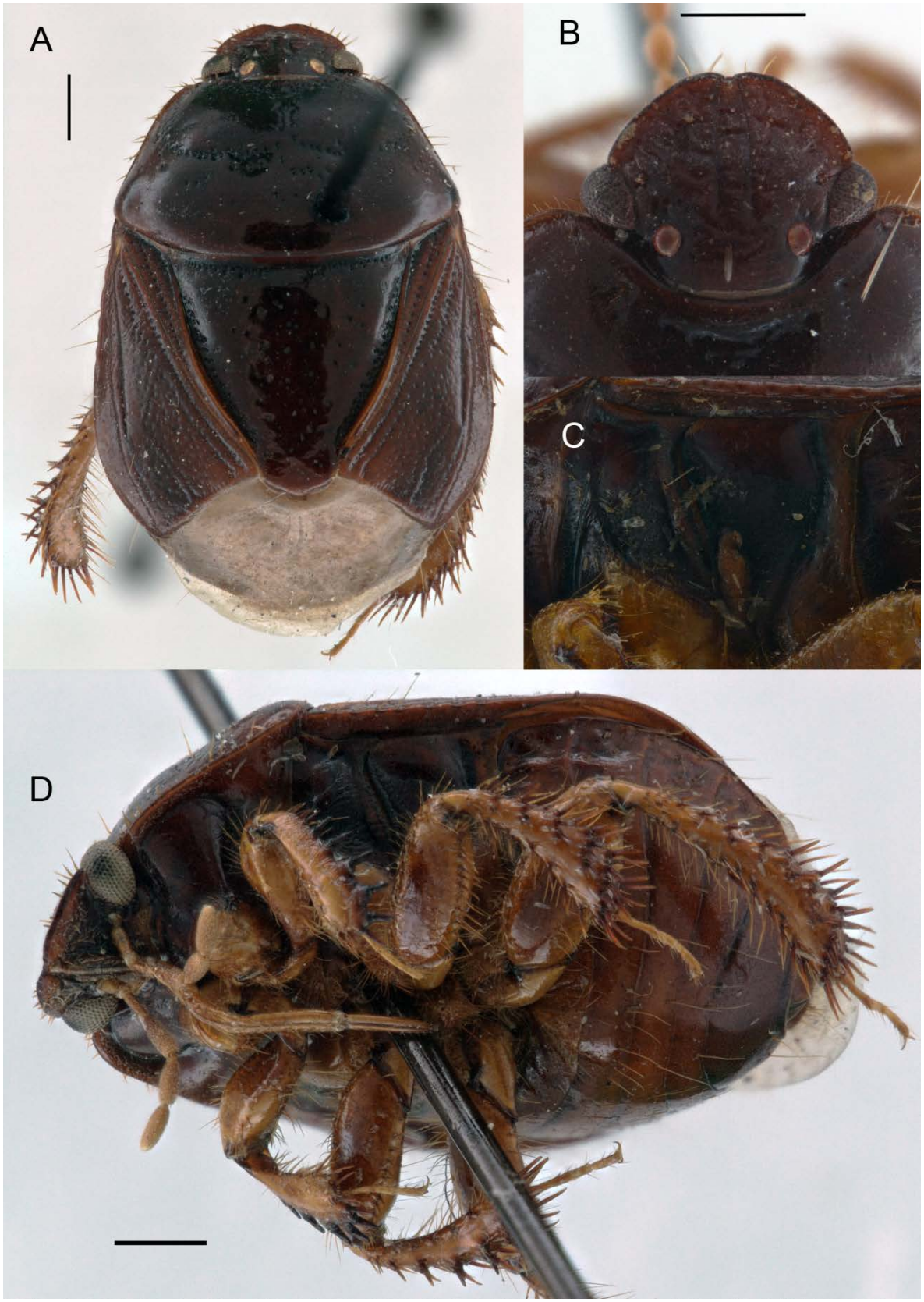

FIGURE 21. *Cyrtomenus ciliatus*; (A) dorsal view, (B) head dorsal, (C) evaporatoria (D) latero-ventral view. Scale bar: 1 mm.

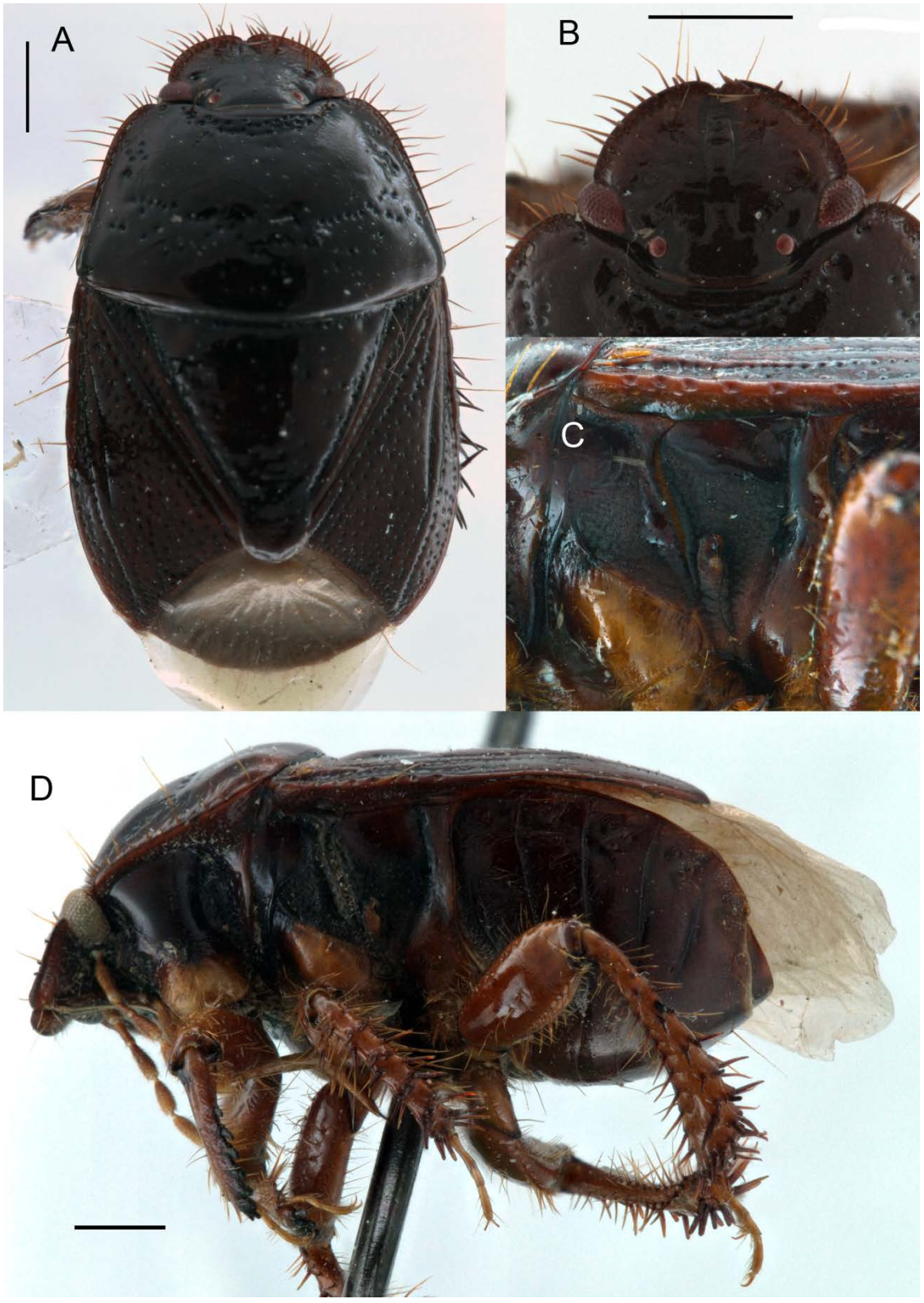

FIGURE 22. *Cyrtomenus crassus*; (A) dorsal view, (B) head dorsal, (C) evaporatoria (D) latero-ventral view. Scale bar: 1 mm.

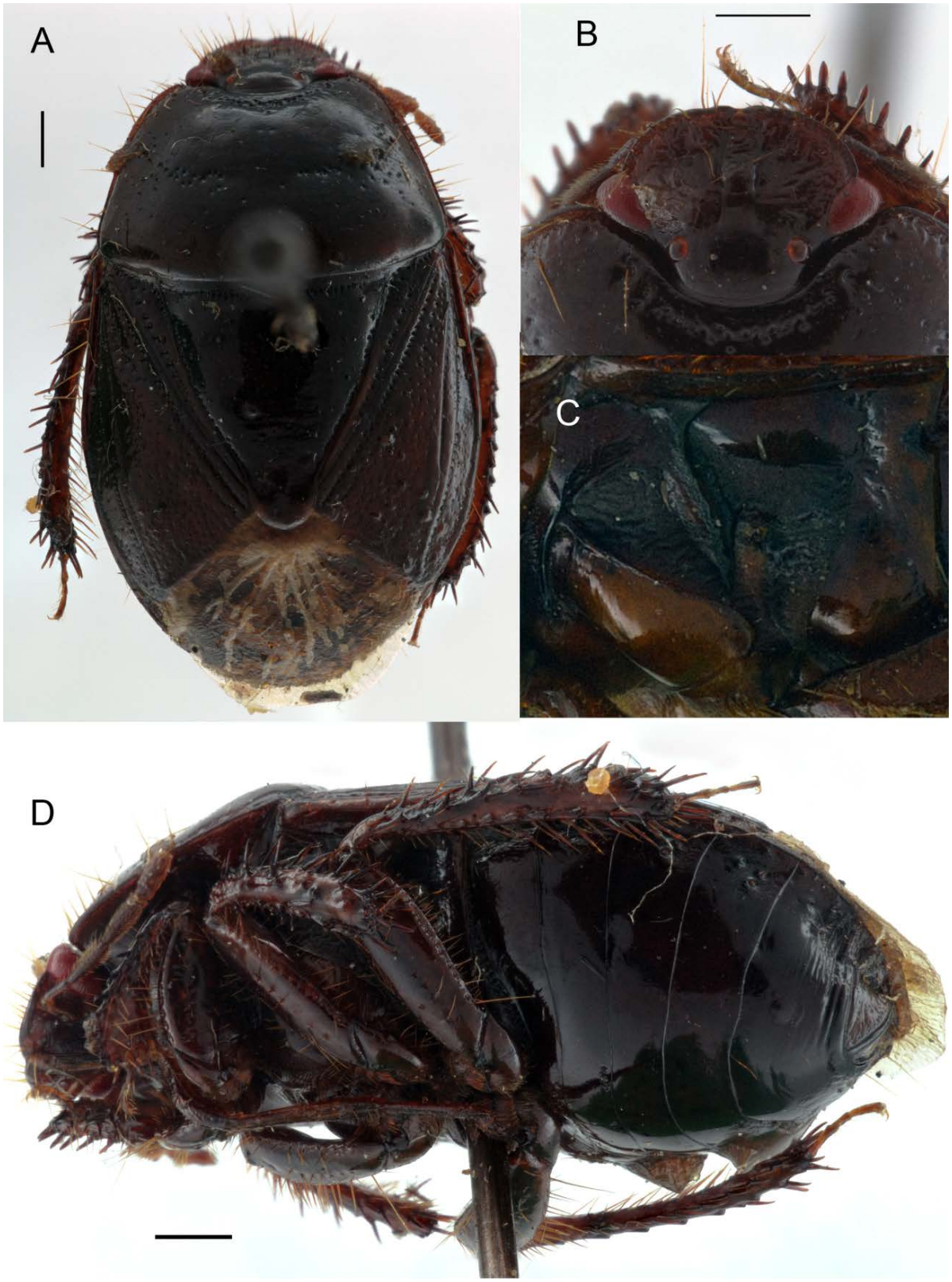

FIGURE 23. *Cyrtomenus teter*; (A) dorsal view, (B) head dorsal, (C) evaporatoria (D) latero-ventral view. Scale bar: 1 mm.

FIGURE 24. Distribution map of *Cyrtomenus emarginatus* and *C. grossus*.

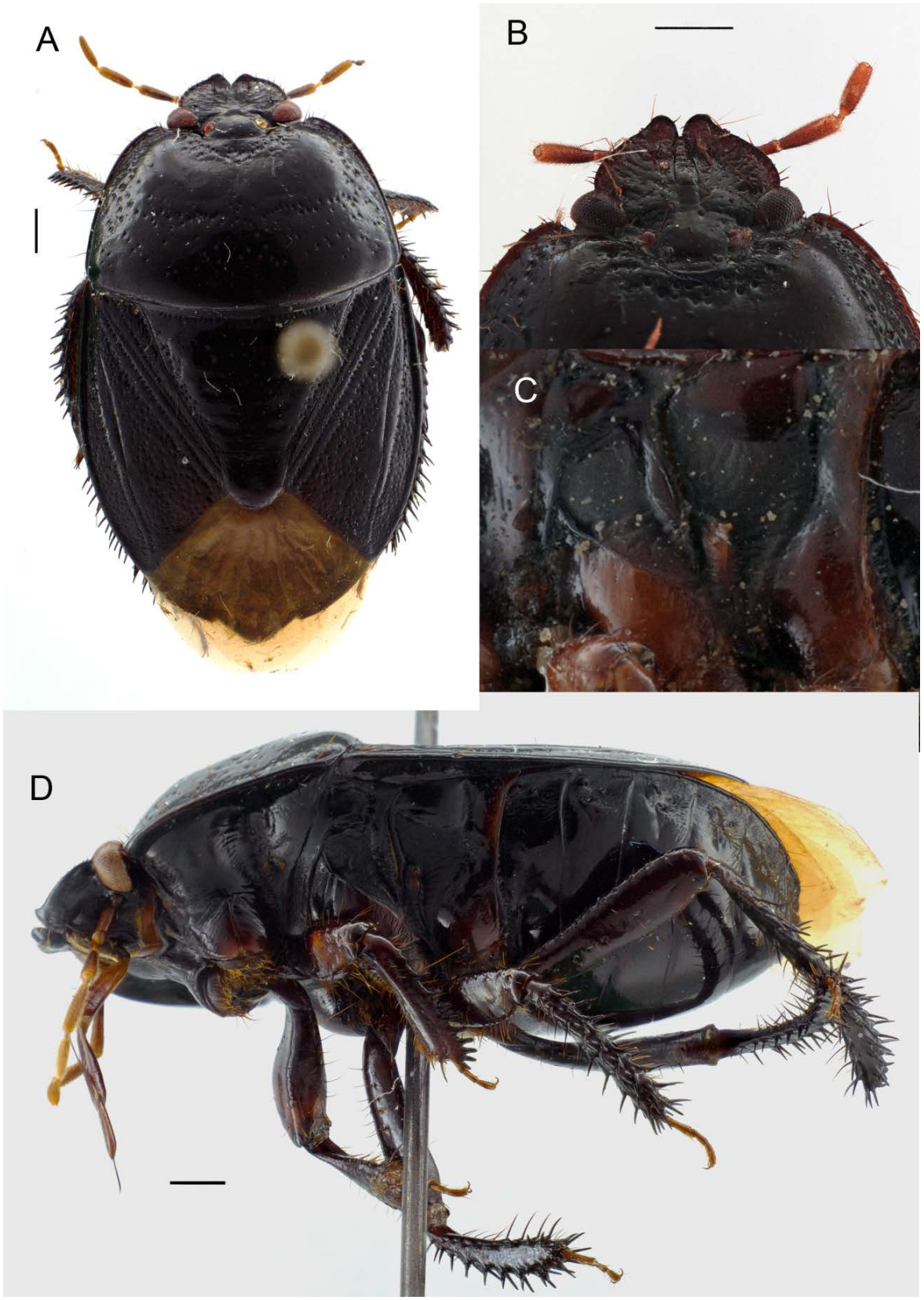

FIGURE 25. *Cyrtomenus emarginatus*; (A) dorsal view, (B) head dorsal, (C) evaporatoria (D) latero-ventral view. Scale bar: 1 mm.

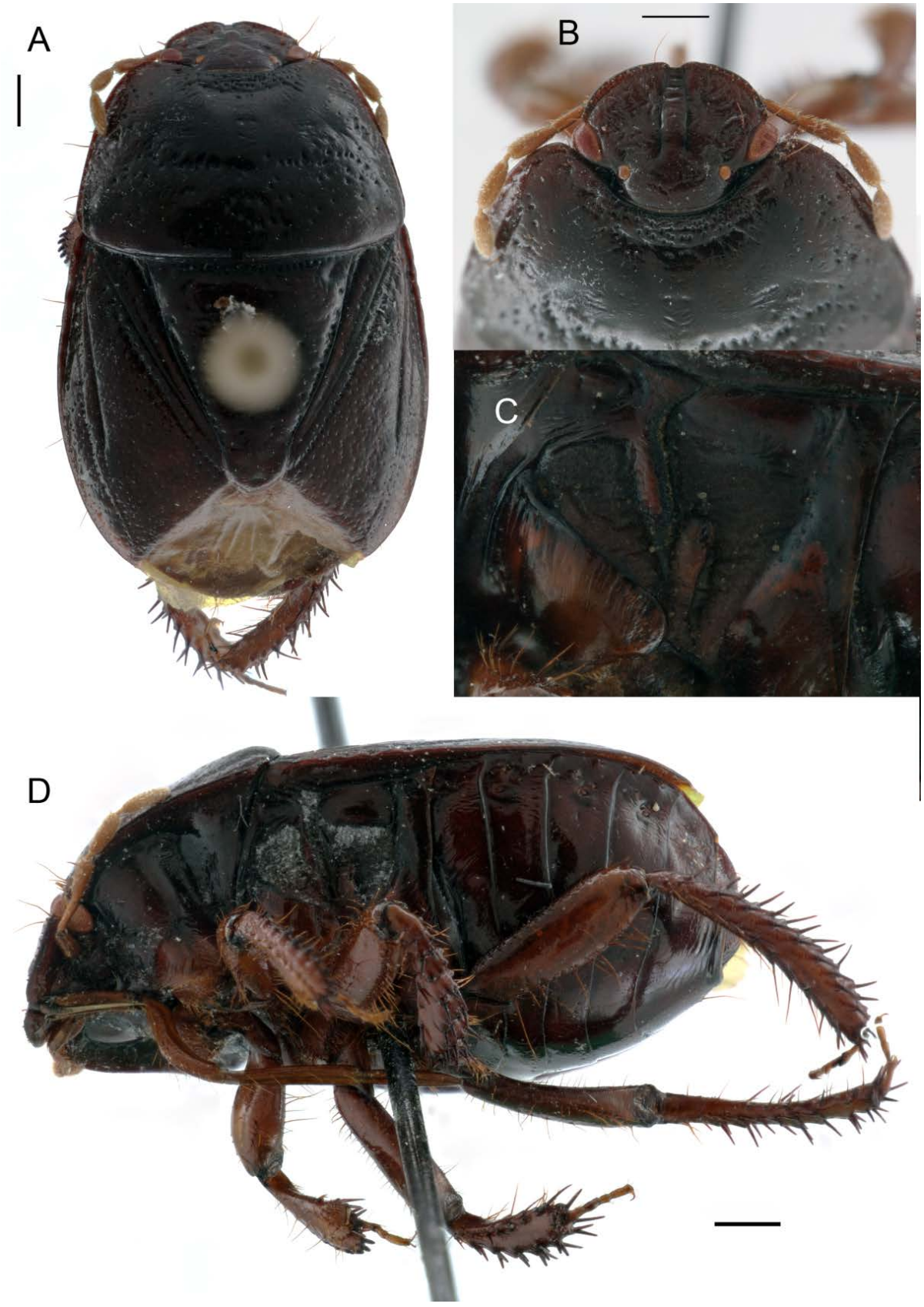

FIGURE 26. *Cyrtomenus grossus*; (A) dorsal view, (B) head dorsal, (C) evaporatoria (D) latero-ventral view. Scale bar: 1 mm.

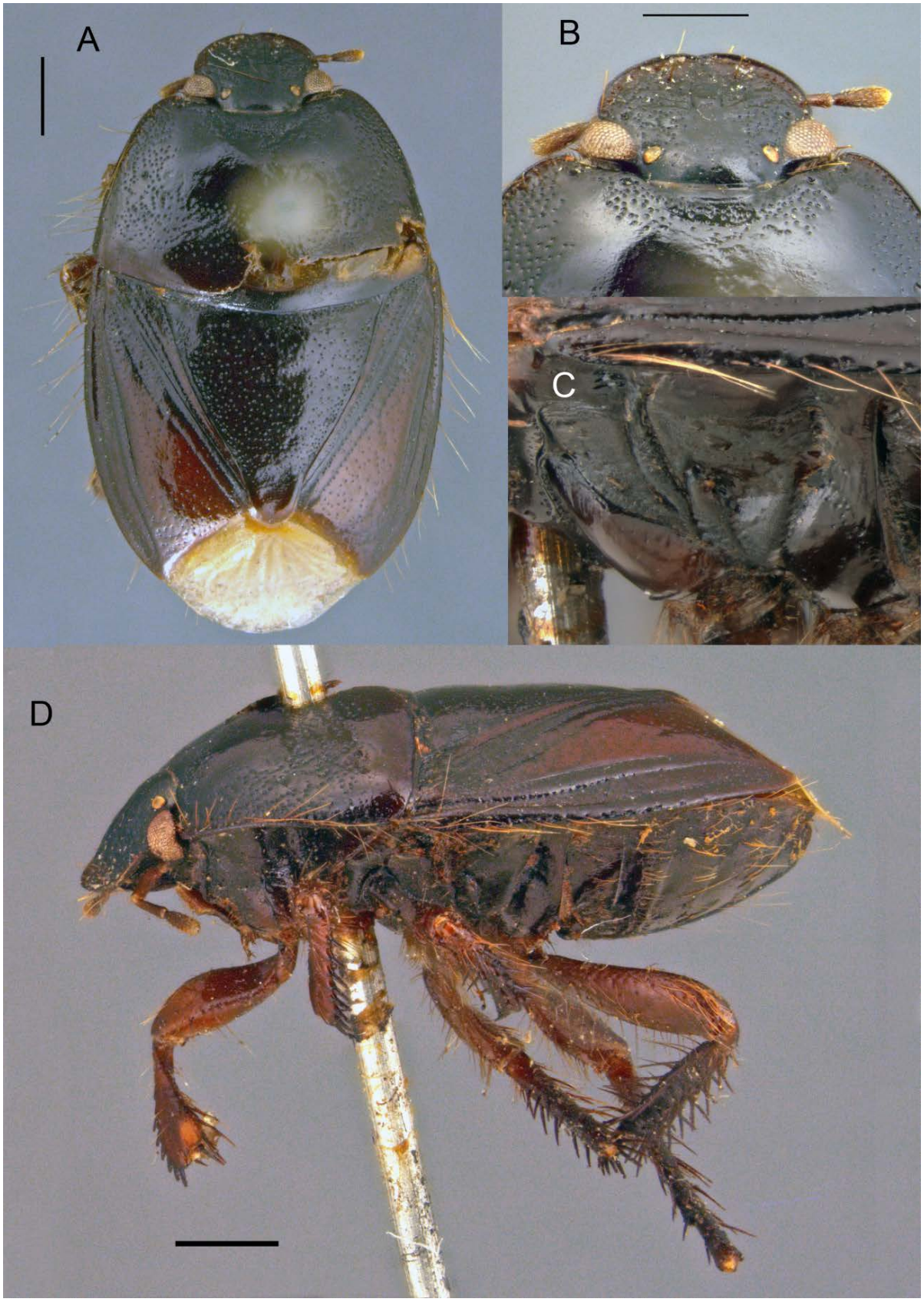

FIGURE 27. *Cyrtomenus marginalis*; (A) dorsal view, (B) head dorsal, (C) evaporatoria (D) lateral view. Scale bar: 1 mm.

CONCLUSÕES

No capítulo I apresentamos uma lista atualizada da fauna de Cydninae do Brasil, amplindo em oito o número de espécies para, total de 47, mais da metade do número de espécies reportadas para o neotrópico. A distribuição da subfamília inclui registros em todos os biomas e ecoregiões. Espécies como *Cyrtomenus mirabilis*, *Dallasiellus lugubris* e *Prolobodes giganteus* têm ampla distribuição ao longo do território enquanto, outras como *Pangaeus neogeus* e *Ectinopus rugoscutum* estão restritas a um ou poucas ecoregiões.

Os padrões de distribuição indicam um viés de coleta e pesquisa, nos locais próximos de universidades e coleções entomológicas, principalmente nas regiões sudeste e sul. Além disso, muito pouco se conhece da biologia e ecologia do grupo. Conehcer a sua biodiversidade é o primeiro avanço para conduzir estudos mais amplos sobre as espécies, particularmente aquelas que atualmente danificam culturas. Para isso, é preciso focar em coletas nas regiões menos estudadas para dar suporte as instuições que matém coleções dedicadas à pesquisa.

No capítulo II abordamos um problema taxonômico a partir de uma perspectiva multidisciplinar para testar a identidade de *C. mirabilis* e *C. bergi*, espécies reconhecidas como pragas de amendoim e mandioca na América do Sul, potencialmente de outros tubérculos e frutos do solo. Os resultados das análises de morfometria linear e geométrica, comparação da distribuição e da morfologia da genitália permitem estabelecer que *C. bergi* é o sinônimo júnior de *C. mirabilis.*

No capítulo III investigamos as relações filogenéticas e revisamos o gênero *Cyrtomenus*. A análise com pesos iguais não recupera o gênero como monofilético, todas as espécies são incluídas em um clado juntamente com o gênero *Prolobodes*. O resultado da análise com pesos implícitos recupera *Cyrtomenus* como monofilético, com *Prolobodes* como grupo irmão; em nenhuma das análises a divisão em dois subgêneros é corroborada.

Futuros estudos com dados moleculares poderão testar as hipóteses aqui estabelecidas e consequentemente o entendimento das relações entre as espécies de *Cyrtomenus* e grupos relacionados, além do estudo comparado entre as populações das espécies com ampla distribuição como *C. mirabilis* e *C. ciliatus.*

APENDICE I

Review of *Prolobodes* Amyot & Serville (Hemiptera: Cydnidae: Cydninae)

***Prolobodes* Amyot & Serville.**

(Figs. 1-5)

Lobostoma Amyot and Serville, 1843: 87.

Prolobodes Amyot and Serville, 1843: 676.

Discostoma Scudder, 1890: 452.

Diagnosis: The semicircular foliaceous lobe on the labial segment II and the compressed posterior tibia allows the recognition of the genus among others in the subfamily.

Redescription. Body oval, length 11 to 17 mm, uniformly black, dorsum convex.

Head flat to convex dorsally; mandibular plates equal to longer than clypeus, rounded marginally, surface rugose, finely punctate or smooth and with a submarginal complete row of secondary setigerous punctures each bearing a single hair-like setae; clypeus narrowed apically, surface rugose to punctate; eyes variable, projecting half of their width and showing a stout setae on the distal margin; ocelli present, large and well developed; antennae 5-segmented, short; bucculae almost as high as labial segment II, latter compressed bearing a semicircular foliaceous lobe; labium reaching between meso and meta coxae.

Thorax: Anterior margin of the pronotum moderately emarginated, submargin punctured without impressed line, anterior pronotal lobe smooth to scarsely punctured, transverse impression marked variable, posterior lobe impunctate to densely covered with fine punctures. Lateral margins carinate, submarginal row of 14 to 19 setigerous punctures, posterior margin rounded. Propleuron polished to sparsely punctate. Scutellum disc with widely, irregularly scattered coarse punctures, apex projected with apical edge rounded, distinctly less than half as wide as membranal suture. Hemelytron polished, punctured, with corial areas well defined, costa with six to eight setigerous punctures, clavus usually with single row of punctures; membranal suture straight. Evaporatorium not interrupted by pseudoperitreme, peritreme conspicuous, abruptly terminated not showing any kind of expansion or lobe, areas surrounding evaporatorium polished and impunctated. Protibia moderately compressed and modified, femora compressed, metatibia strongly compressed, curved, with rows of spines restricted to dorsal and ventral margin, spines of posteroventral margin much longer and more slender than those of dorsal margin, tarsi present.

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments.

Male genitalia: Genital capsule globose and simple, apical margin straight, dorsal rim sinuate (Fig. 1B-C); parameres dorso-ventrally compressed, apex rounded and broad (Fig. 1G); phallotheca tubular, dorsal margin longer than ventral margin; only the second conjunctival appendage present, bilobulate and sclerotized, processus capitati mushroom-like, vesica longer than ejaculatory reservoir, processus vesicae as long as vesica, both projected outside the phallotheca (Fig. 1H-I).

Female genitalia: Laterotergites VIII with two setigerous punctures, fused medially by a very narrow section, about twice the size of laterotergites IX, latter punctate with two to three setigerous punctures, triangular; segment X semicircular, rugose and entire; gonocoxites IX punctate, divided medially, bases not visible externally; gonocoxites VIII smooth with fine scattered punctures, larger than laterotergites VIII, dorsal outline straight (Fig. 1A).

Distribution: Restricted to Western Hemisphere from Colombia to South Brazil.

Discussion: *Prolobodes* were placed as sister group of *Cyrtomenus*, in the phylogeny of the latter, as was espected by the observations on the morphology of these two close related genera (Becker & Galileo 1982; Froeschner 1960).

Key to the species of *Prolobodes*

1. Anterior pronotal lobe with no more than five or six coarse punctures laterally, usually with none (Fig. 4A, B) .....***P. gigas*** (Signoret). Anterior pronotal lobe with 15 or more coarse, deep punctures laterally. 2
2. Pronotum with a weak, transverse impression near midlength, this with numerous crowded, coarse, deep, impressed punctures which often show longitudinal rugae between them (Fig. 3A, B) ..... ***P. giganteus*** (Burmeister). Pronotum without a transverse impression near midlength, punctures in that area coarse, deep, but neither crowded nor impressed nor with rugae between them (Fig. 5A, B) .....***P. reductum*** (Amyot and Serville)

***Prolobodes giganteus* (Burmeister)**

(Figs. 1-3)

Cydnus giganteus Burmeister, 1835: 375.

Lobostoma giganteus Amyot & Serville, 1843: 88.

Prolobodes giganteus Amyot & Serville, 1843: 676; Lethierry & Severin, 1893: 62; Froeschner, 1960: 510.

Lobostoma gigantea Walker, 1867: 147; Stål, 1876: 18; Distant, 1880: 1.

Lobostoma giganteum Dallas, 1851: 111; Signoret, 1881: 194.

Material examined: COLOMBIA: **Meta:** 1F#, Acacias, Alto Acacias, 660 masl, 06-Dec-1985, I. Arévalo, col., ICN; 1M#, "Llanos orientales", Jun-1950, L. Richter, col., ICN; 1F#, Vista Hermosa, Fca. El Esfuerzo, 200 masl, Mar-1997, Amézquita S., col., IAvH-87675, IAvH; 2F#, Vista Hermosa, Fca. El Esfuerzo, 200 masl, Mar-1997, S. Amézquita & A. Lopera, col., ICN; **Vichada:** 1F#, La Venturosa, margen derecho río Meta, 15-May-1980, F. Castillo, col., ICN; **BRAZIL**: **PA:** 1 specimen, Mocajuba, Mangabeira, Feb-1953, Rego col., MNRJ; 3 specimens, Óbidos, Nov-1953, Brazilino col., MNRJ; **AM:** 1M#, Benjamin Constant, rio Javary, alto Amazonas, 02-Sep-1942, Dirings col., MCNZ; **PI**: 6 specimens, Teresina, 1953, Oliveira col., MNRJ; **TO:** 1M#, Palmas, Serra do Langeado. Fazenda Céu, Nov-1992, UFRG; **MT:** 1M#, Alto Xingú, 01-Dec-1954, Arlé col., MNRJ; 1F#, Rio Paraná, "Riacho do Herv.", Dec-1952, Dirings col., MCNZ; **DF:** 1M#, Brasilia, 18-Oct-1965, M. Becker col., MCNZ; 1F#, Brasilia, 20-Oct-1965, M. Becker col., MCNZ; **SP:** 1 specimen, Angatuba, 1922,

Marques col., MNRJ; 1M#, Barra Bonita, Oct-1977, P.M.S. Botelho col., MCNZ; 1 specimen, Barueri, 10-Dec-1955, Lenko col., MNRJ; 1F#, Itirapina, Cerrado, 23-Nov-00, Machado col., MNRJ; 1F#, Pradópolis, Oct-1971, P.M.S. Botelho col., MCNZ; 1M#, São Carlos, 14-Oct-1981, K. Zanoe col., MCNZ; 3M#, **SC:** Ipumirim, Feb-1956, MCNZ; 6F#, Itapiranga, Sep-1953, MCNZ; **RS:** 1M#, Barra do Ribeiro, Fazenda Boa Vista, 16-Dec-2003, Equipe Probio col., MCNZ; 1M#, Faxinal do Soturno, 22-Oct-1978, MCNZ; 2F#, Porto Alegre, Museu Anchieta, 1954, MCNZ; 1F#, Santa Maria, 16-Nov-1973, D. Link col., MCNZ; 1F#, Santa Maria, 02-Apr-1975, MCNZ.

Diagnosis: Semicircular lobe in the labial II; marked pronotal punctation, especially on the sides of the anterior lobe.

Redescription. Total length: 14.4-15.7 mm.

Head polished, interocular area swollen, mandibular plates reflexed with distinct, radiating rugae and numerous minute punctures; labial segment II with semicircular foliaceous lobe (Fig. 3C).

Thorax: Dorsum strongly convex. Pronotum laterally with submarginal row of 14 to 19 setigerous punctures; anterior lobe with 20 or more minute to moderate punctures laterally; transverse impression weak but evident across entire width and with numerous crowded coarse punctures; posterior lobe on anterior half with several punctures sparser and slightly finer than those of transverse impression (Fig. 3A, B). Propleuron finely punctate in depression. Scutellum disc with several coarse punctures (Fig. 3A). Hemelytron opaque; clavus with one complete row of punctures and a few additional punctures on the basal part; mesocorium with two rows of punctures paralleling claval suture, elsewhere closely punctate (Fig. 3A); costa with six to eight setigerous punctures. Mesopleural evaporatorium attaining lateral margin of the segment, not interrupted by pseudoperitreme (Fig. 3D). Metatibia strongly compressed and curved (Fig. 3A, D).

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments (Fig. 3D).

Spermatheca (Fig. 1D): seminal receptacle sclerotized and pigmented, spherical, connected by basal neck-like duct. Intermediate part long, delimited apically and proximally by two cuticular, well-developed flanges, the area between the flanges sclerotized and pigmented as the receptacle, flexible zone basal. Spermathecal duct short, distal duct twice length of intermediate part and proximal duct almost as long as intermediate part, dilation spherical with a strongly pigmented central core and longitudinal projections, latter surrounded by a thick wall of tissue (intima) with external layer translucent and internal pigmented and serrated, spermathecal opening not sclerotized. Ring sclerites present, associated with a pair of lateral vaginal pouches.

Type data: The type specimens described from Brazil are lost.

Distribution: Colombia, Brazil, Bolivia, Paraguay.

Remarks: Along with *P. gigas* and *P. reductum* comprises a group of closely related species characterized by its great size and the semicircular lobe in the labium II. The differences between each one, are in the disposition and number of pronotal punctures.

***Prolobodes gigas* (Signoret)**

(Fig. 1, 2, 4)

Lobostoma gigas Signoret, 1881: 195.

Prolobodes gigas Lethierry & Severin, 1893: 62; Froeschner, 1960: 512.

Material examined: COLOMBIA: **Boyacá:** 1F#, Moniquirá, 29-Mar-2010, D. Suaréz, col., UNAB; **Chocó:** 1M#, Coredo, Jun-1950, L. Richter, col., ICN; **Cundinamarca:** 1M#, Anapoima, Vda Las Mercedes, 680 masl, 28-Mar-2010, F. Melo, col., UNAB; 1F#, Nilo, 336 masl, D. Cleves, col., UNAB; **Meta:** 1F#, Acacias, Alto Acacias, 660 masl, 06-Dec-1985, I. Arévalo, col., ICN; **Meta:** 1F#, Acacias, Vda. La Esmeralda. Fca. El Palmar, 514 masl, 25-Apr-2004, Sist. Animal, col., ICN; 1M#, 1F#, Macarena, PNN Tinigua. Río Duda. CIEM. Borde Bo-Po, 300 masl, IAvH-87735, IAvH-87645, IAvH; 1M#, Villavicencio, La Libertad, 460 masl, 11-May-2010, L. Mordhorst, col., UNAB; 1M#, Villavicencio, 467 masl, 13-Nov-1994, R. Nabol, col., UNAB; 1F#, Vista Hermosa, Fca El Esfuerzo, 200 masl, 01-Mar-1997, Amézquita S., col., IAvH-87615, IAvH; 1M#, 3F#, Vista Hermosa, Fca. El Esfuerzo, 200 masl, Mar-1997, S. Amézquita & A. Lopera, col., ICN; 1F#, PNN Tinigua. CIEM, 350 masl, 01-May-1994, Alvarez M, col., IAvH-87705, IAvH; **Nariño:** 1M#, 1F#, Orito, Territorio Kofan. Bosque, 1000 masl, 20-Sep-1998, González E.L., col., IAvH-88073, IAvH; **Tolima:** 1F#, Ataco, 446 masl, 25-Sep-2010, D. Tovar, col., UNAB; 1F#, Cunday, 475 masl, 16-Jan-2010, L. Lozano, col., UNAB; 1M#, Melgar, Barrio Balcones de Sumapaz, 377 masl, 16-Mar-2012, L. López, col., UNAB; 1F#, W Melgar-Bogotá, Finca Piamonte (Salero), 26-Apr-2004, O. Alonso, col., ICN; **Vichada:** 1M#, Gaviotas, 167 masl, 15-Aug-1977, R. Cortés, col., ICN; **BRAZIL**: **PA:** 1M#, Monte Alegre, Malata, 27-Jan-1949, C.R. Gonçalves col., MCNZ; **MG:** 1M#, Mirabela, Fazenda Baixa, 07-Dec-2006, Silva PAD col., UFRG; **SC:** 1M#, Itapiranga, Sep-1953, MCNZ.

Diagnosis: Semicircular lobe in the labial II; anterior and posterior pronotal lobes with fine and very scarce punctures.

Redescription. Total length: 13.9-15.9 mm.

Head polished, interocular area swollen, mandibular plates reflexed with weak, radiating rugae and minute punctures; labial segment II with semicircular foliaceous lobe (Fig. 4C).

Thorax: Dorsum strongly convex. Pronotum laterally with submarginal row of 14 to 19 setigerous punctures; anterior lobe scarcely punctured; transverse impression weak marked by a band of several, usually well separated punctures; posterior lobe almost impunctate (Fig. 4A, B). Propleuron finely punctate in depression. Scutellum disc with numerous moderate punctures; costa with six to eight setigerous punctures (Fig. 4D). Mesopleural evaporatorium attaining lateral margin of the segment, not interrupted by pseudoperitreme (Fig. 4D). Metatibia strongly compressed and curved (Fig. 4A, D).

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments (Fig. 4D).

Type data: The type locality is Bogotá, Colombia and the female specimen designed as holotype is deposited in the NMH-Wien.

Distribution: Mexico, Nicaragua, Panama, Colombia, Brazil.

Remarks: See remarks of *P. giganteus.*

***Prolobodes reductum* (Amyot & Serville)**

(Fig. 2, 5)

Lobostoma reductum Amyot & Serville, 1843: 88; Signoret, 1881: 195.

Prolobodes reductus Amyot & Serville, 1843: 676; Lethierry & Severin, 1893: 62.

Lobostoma reducta Stål, 1876: 18.

Prolobodes reductum Froeschner, 1960: 513.

Material examined: BRAZIL: **PA**, 1 specimen, Mocajuba, Mangabeira, Jan-1953, Rego col., MNRJ; Mocajuba, Mangabeira, Apr-1953, O.M. Rego col., MCNZ; 1 specimen, Santarém, Taperinha, Hagmann col., MNRJ; **RN**, 1 specimen, Natal, May-1950, Alvarenga col., MNRJ; **ES**, 1F#, Barra de São Francisco, Córrego do Itá, Nov-1958, Zikán col., MNRJ.

Diagnosis: Semicircular lobe in the labial II; lateral surface of the pronotum with scattered coarse punctures; mandibular plates without clear radiating rugae.

Description Total length: 13.3-14.6 mm.

Head polished, interocular area swollen, mandibular plates reflexed, surface scarcely punctured; weak rugae restricted to the clypeus surface; labial segment II with semicircular foliaceous lobe (Fig. 5B, C).

Thorax: Dorsum strongly convex. Pronotum laterally with submarginal row of 14 to 19 setigerous punctures; anterior lobe with 15 or more moderate punctures laterally; transverse impression weak; posterior lobe with few widely scattered punctures on anterior half (Fig. 5A). Propleuron finely punctate in depression. Scutellum disc with several coarse punctures (Fig. 5A). Hemelytron opaque; clavus with one complete row of punctures and a few additional punctures on the basal part; mesocorium with two rows of punctures paralleling claval suture, uniformly covered by fine punctures (Fig. 5A); costa with six to seven setigerous punctures. Mesopleural evaporatorium attaining lateral margin of the segment, not interrupted by pseudoperitreme. Metatibia strongly compressed and curved (Fig. 5D).

Abdomen: Sternites III to VI polished, without rows of setigerous punctures across segments (Fig. 5D).

Type data: The holotype is lost; the locality reported in the original description is from French Guyana.

Distribution: Trinidad, British Guiana, French Guiana, Brazil, Peru, Bolivia, Paraguay.

Remarks: See remarks of *P. giganteus.*

References

Becker, M. & Galileo, M.H.M. (1982) A genitália de macho em cinco gêneros neotropicais da subfamilia Cydninae (Heteroptera: Cydnidae). *Revista Brasileira de Biologia* 42, 21–30.

Froeschner, R.C. (1960) Cydnidae of the Western Hemisphere. *Proceedings of the United States National Museum* 111, 337–680.

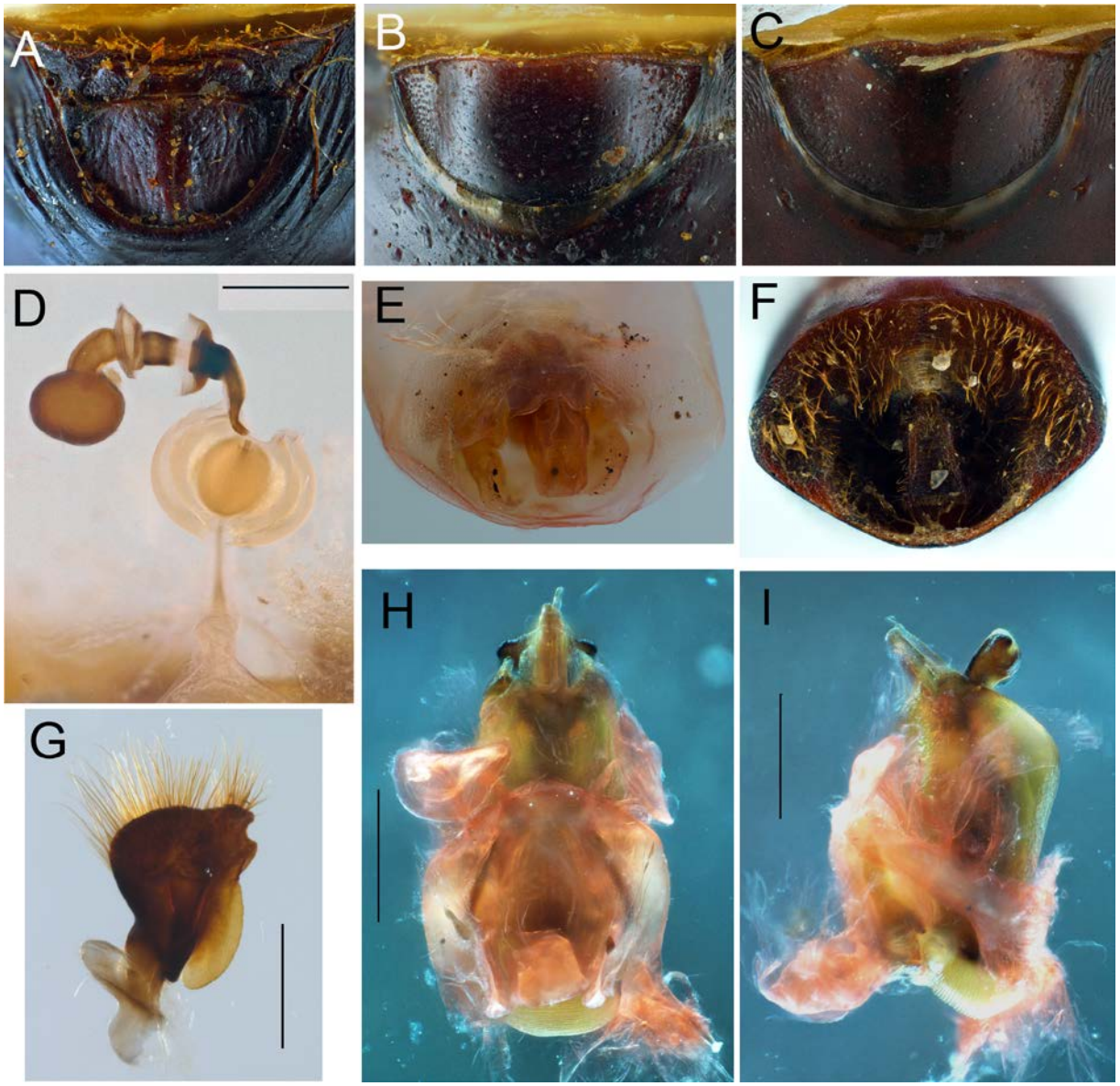

FIGURE 1. Genital structures; (A) external female genitalia *P. giganteus*, (B) external male genitalia *P. giganteus*, (C) external male genitalia *P. gigas*, (D) apermatheca *P. giganteus*, (E) pygophore dorsal view *P. giganteus*, (F) pygophore dorsal view *P. gigas*, (G) paramere *P. giganteus* (Photo by María Cristina Mayorga), (H) phallus dorsal view *P. giganteus*, (I) phallus lateral view *P. giganteus.* Scale bar: 0,5 mm.

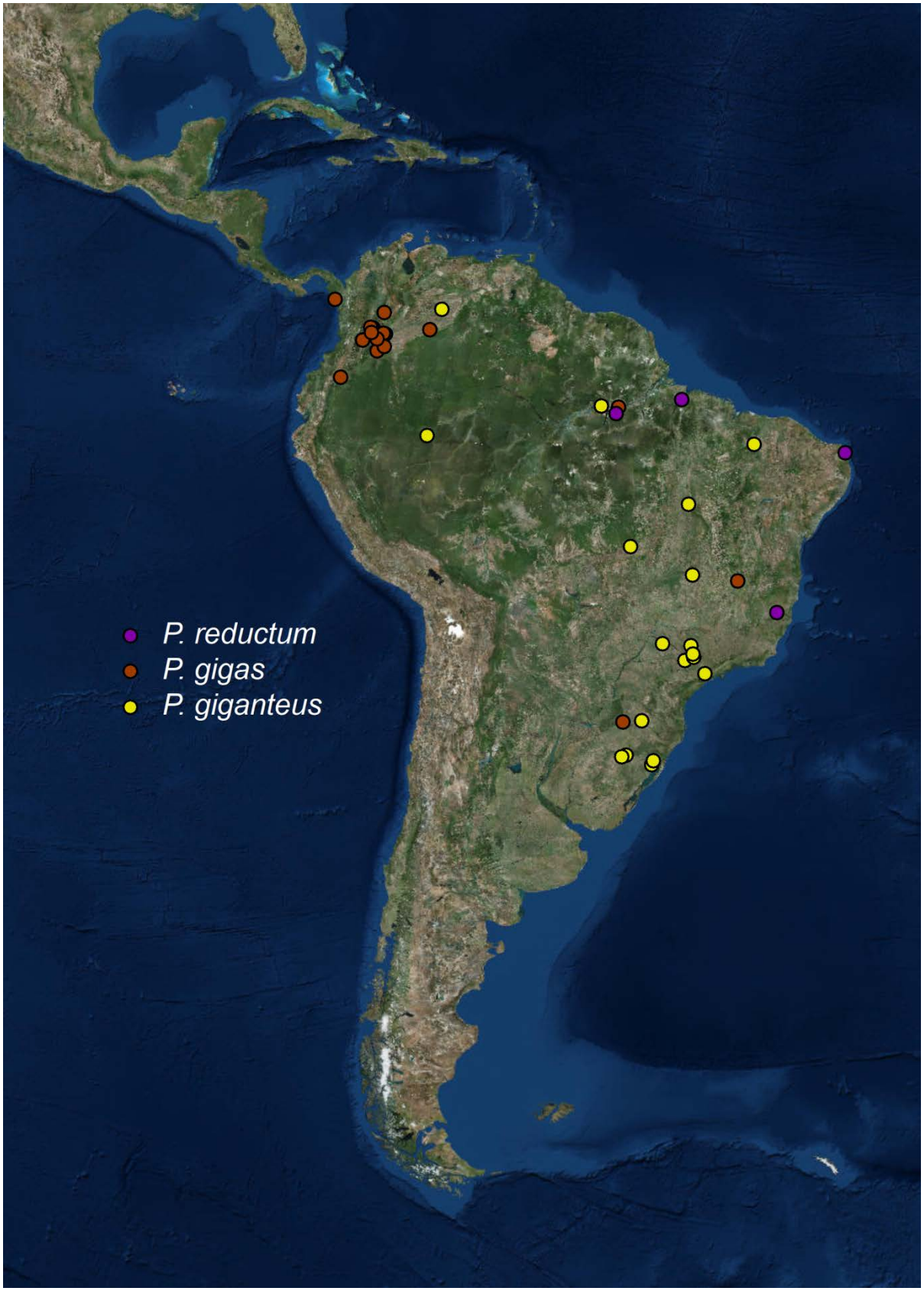

FIGURE 2. Distribution map of *Prolobodes giganteus*, *P. gigas* and *P. reductum*.

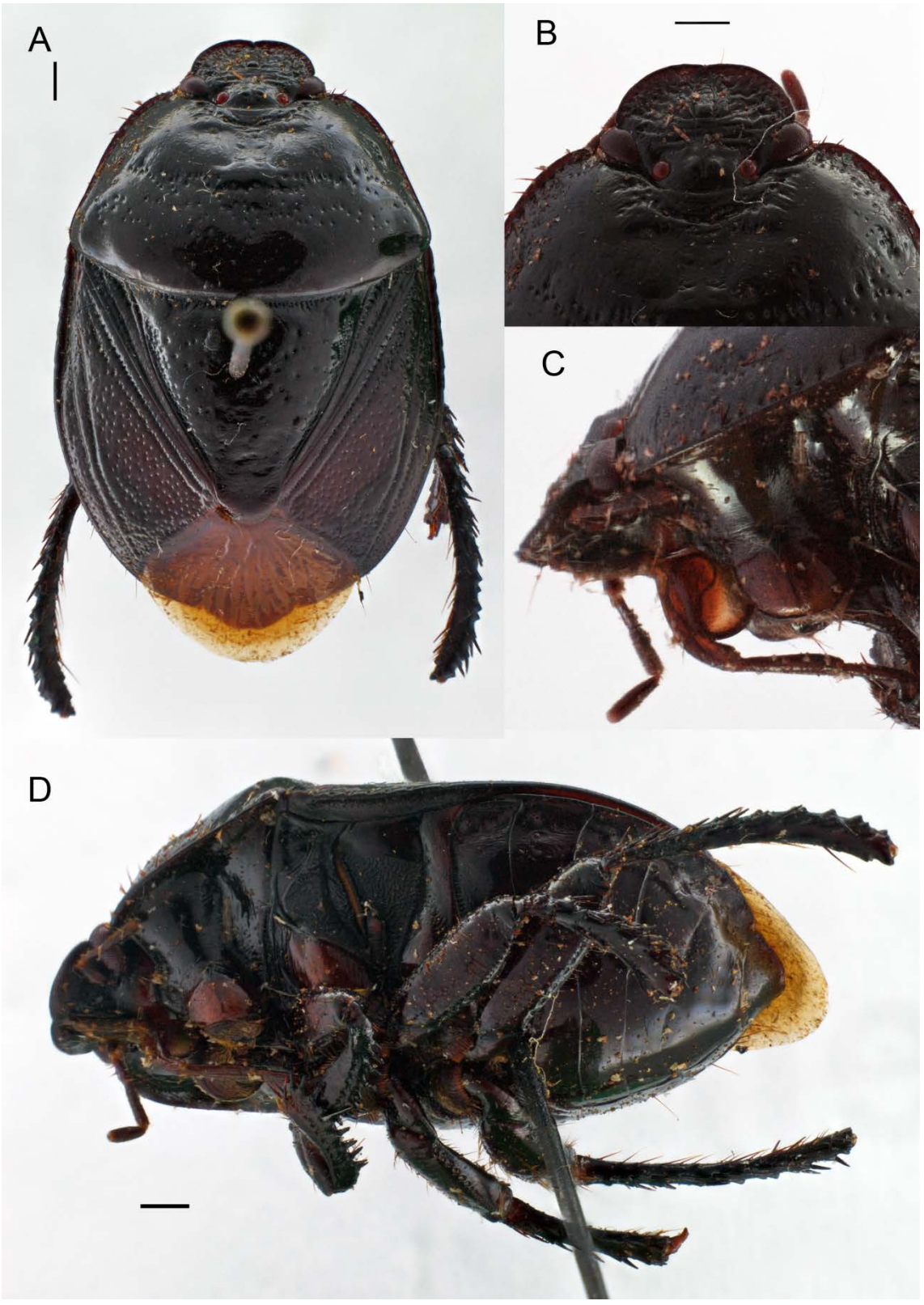

FIGURE 3. *Prolobodes giganteus*; (A) dorsal view, (B) head dorsal, (C) head and labium lateral, (D) latero-ventral view. Scale bar: 1 mm.

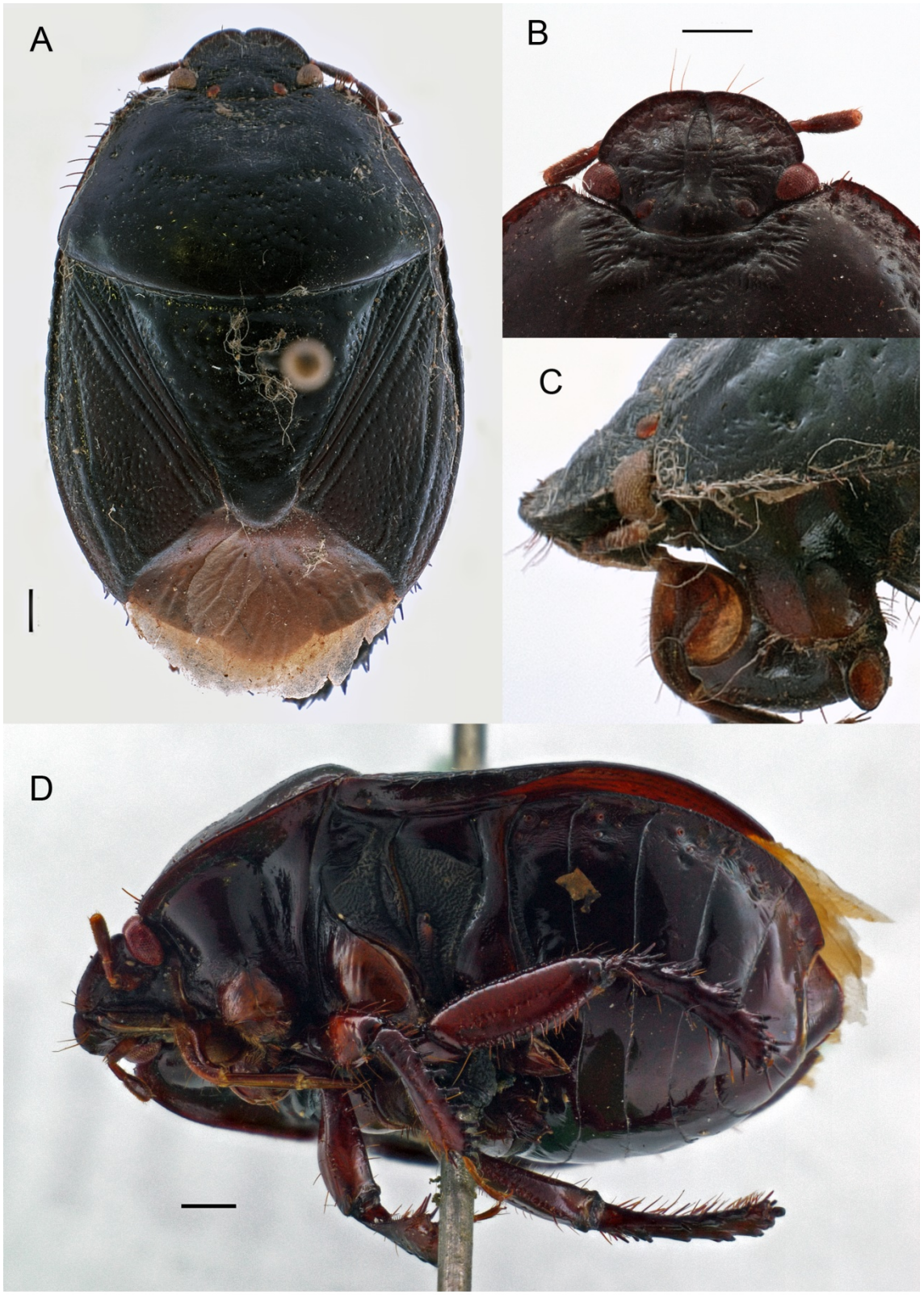

FIGURE 4. *Prolobodes gigas*; (A) dorsal view, (B) head dorsal, (C) head and labium lateral, (D) latero-ventral view. Scale bar: 1 mm.

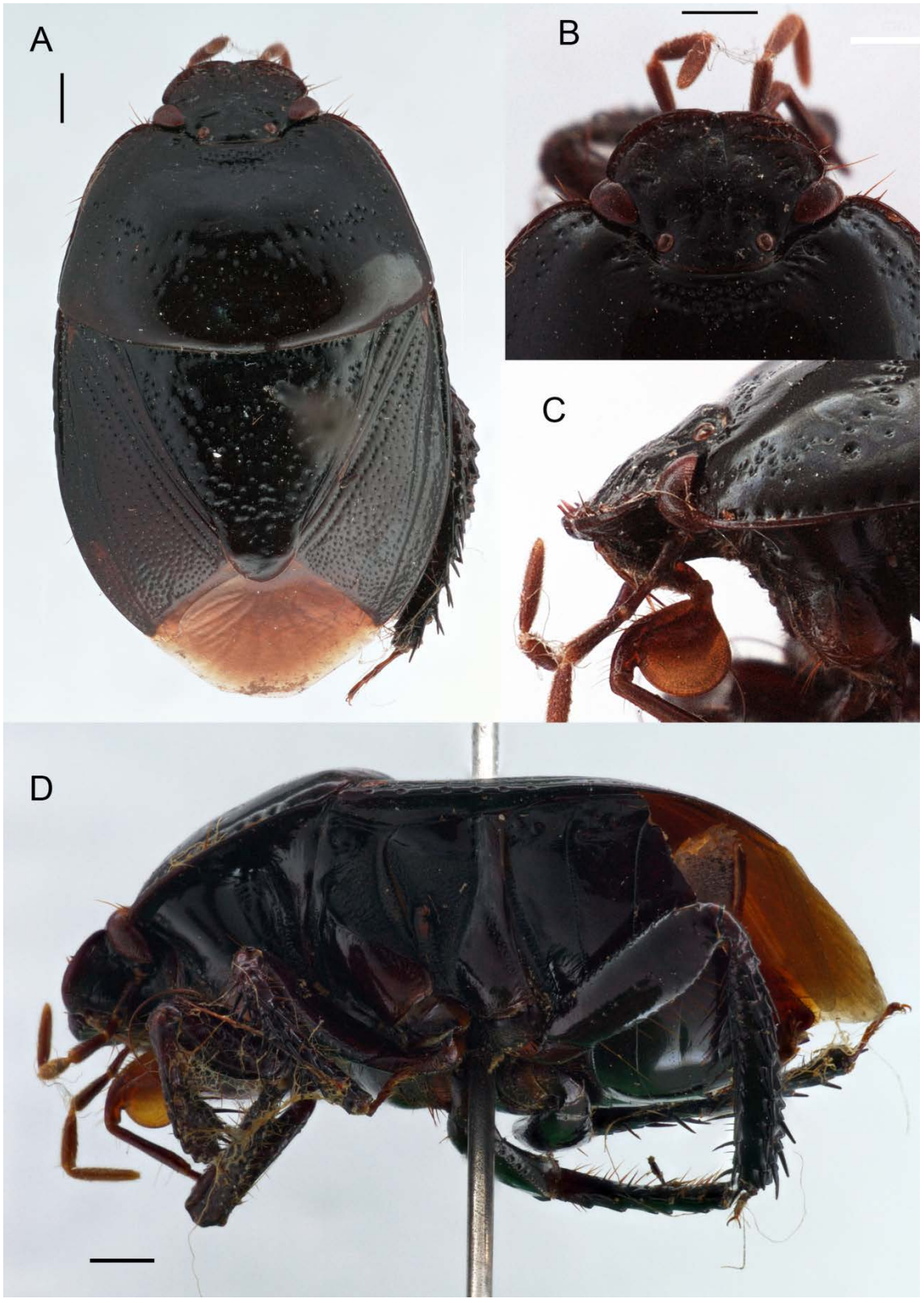

FIGURE 5. *Prolobodes reductum*; (A) dorsal view, (B) head dorsal, (C) head and labium lateral, (D) latero-ventral view. Scale bar: 1 mm.

ANEXO I

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