

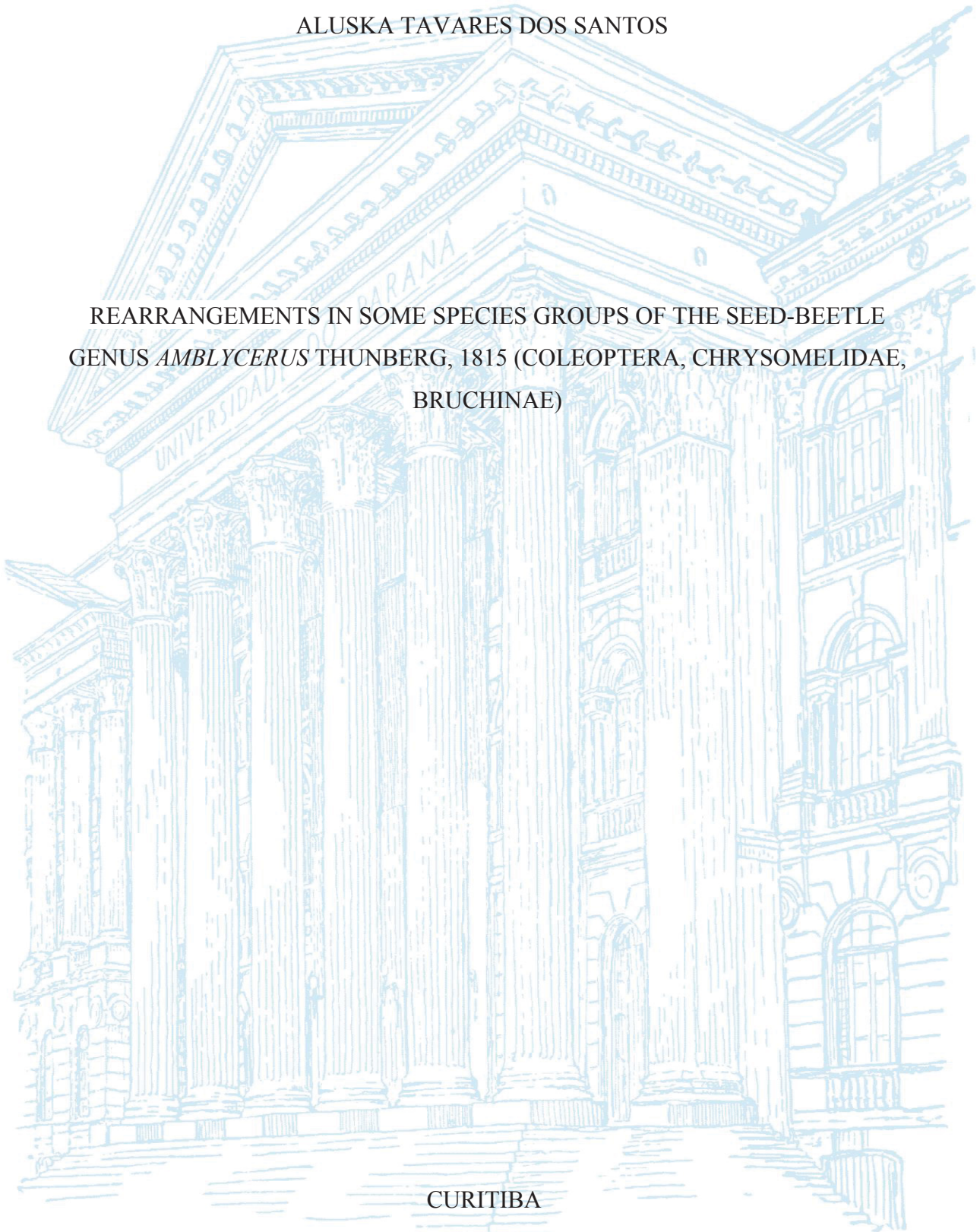
UNIVERSIDADE FEDERAL DO PARANÁ

ALUSKA TAVARES DOS SANTOS

REARRANGEMENTS IN SOME SPECIES GROUPS OF THE SEED-BEETLE  
GENUS *AMBLYCERUS* THUNBERG, 1815 (COLEOPTERA, CHRYSOMELIDAE,  
BRUCHINAE)

CURITIBA

2018



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GENUS *AMBLYCERUS* THUNBERG, 1815 (COLEOPTERA, CHRYSOMELIDAE,  
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Dissertação apresentada à Coordenação do Programa de Pós-Graduação em Ciências Biológicas, Setor de Ciências Biológicas, Área de concentração em Entomologia, da Universidade Federal do Paraná, como requisito parcial à obtenção do título de Mestre em Ciências.

Orientadora: Prof.<sup>a</sup> Dr.<sup>a</sup> Cibele Stramare Ribeiro-Costa

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Os membros da Banca Examinadora designada pelo Colegiado do Programa de Pós-Graduação em CIÊNCIAS BIOLÓGICAS (ENTOMOLOGIA) da Universidade Federal do Paraná foram convocados para realizar a arguição da dissertação de Mestrado de **ALUSKA TAVARES DOS SANTOS** intitulada: "REARRANGEMENTS IN SOME SPECIES GROUPS OF THE SEED-BEETLE GENUS *AMLYCERUS* THUNBERG, 1815 (COLEOPTERA, CHRYSOMELIDAE, BRUCHINAE)", após terem inquirido a aluna e realizado a avaliação do trabalho, são de parecer pela sua Aprovação no rito de defesa.

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ADELITA MARIA LINZMEIER  
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“If all mankind were to disappear, the world would regenerate back to the rich state of equilibrium that existed ten thousand years ago. If insects were to vanish, the environment would collapse into chaos.”

Edward O. Wilson

## RESUMO

*Amblycerus* Thunberg é o segundo gênero mais diverso das Américas com 39 grupos, contudo alguns deles apresentam incongruências quanto a sua delimitação. Assim, o presente estudo tem como objetivo analisar o agrupamento *dispar* que compartilha espécies com outros dois grupos, *spondiae* e *alternatus*. Como resultado deste trabalho, foram alocadas no grupo *dispar*, seis espécies, *A. dispar* (Sharp, 1885), *A. crassipunctatus* Ribeiro-Costa, 1999, *A. insuturatus* (Pic, 1902), *A. schwarzi* Kingsolver, 1970, *A. taeniopygus* Ribeiro-Costa, 1999 e *A. sp. nov.* e, no grupo *spondiae*, quatro espécies, *A. alternatus* (Pic, 1954), *A. cuernavacensis* Romero, Johnson & Kingsolver, 1996, *A. spondiae* Kingsolver, 1980 e *A. vitis* (Schaeffer, 1907). Três espécies foram excluídas de seus grupos originais, *A. eustrophoides* (Schaeffer, 1904), *A. serieguttatus* (Chevrolat, 1877), ambas do grupo *alternatus* e *A. simulator* (Jacquelin DuVal, 1857) do grupo *dispar*. Apresentamos diagnoses para as 13 espécies estudadas, três espécies foram redescritas e uma foi descrita. Foram incluídas ilustrações coloridas, desenhos da genitália masculina e mapas de distribuição geográfica, além de chaves de identificação para os dois grupos de espécies, *dispar* e *spondiae*. Quatro espécies de *Amblycerus* apresentaram novos registros de plantas, *A. eustrophoides*, *A. insuturatus*, *A. spondiae* e *A. vitis* e novos registros de distribuição geográfica, *A. alternatus*, *A. dispar*, *A. schwarzi*, *A. serieguttatus* e *A. spondiae*. As espécies de plantas *Sarcomphalus mistol* (Griseb.) Havenschild, *Terminalia corrugata* (Ducke) Gere & Boatwr., *T. tetraphylla* (Aubl.) Gere & Boatwr e *Rhus virens* var. *choriophylla* (Wooton & Standl.) L. D. Benson, foram aqui registradas pela primeira vez como hospedeiras de *Amblycerus*. Quatro novos registros ao nível de gênero, *Capparis*, *Neopringlea*, *Rhus* e *Sarcomphalus* e dois novos registros ao nível de família, Capparaceae e Salicaceae, sendo a última também um novo registro para Bruchinae.

**Palavras-chave:** Besouro de sementes. Espécie nova. Taxonomia. Chave. Hemisfério ocidental.

## ABSTRACT

*Amblycerus* Thunberg is the second most diverse genus in the Americas with 39 groups, but some of them have incongruities as to their delimitation. Thus, the present study aims to analyze the *dispar* group that shares species with two other groups, *spondiae* and *alternatus*. As a result of this work, were allocated to the *dispar* group, six species, *A. dispar* (Sharp, 1885), *A. crassipunctatus* Ribeiro-Costa, 1999, *A. insuturatus* (Pic, 1902), *A. schwarzi* Kingsolver, 1970, *A. taeniopygus* Ribeiro-Costa, 1999 and *A. sp. n.*, and in the *spondiae* group, four species, *A. alternatus* (Pic, 1954), *A. cuernavacensis* Romero, Johnson & Kingsolver, 1996, *A. spondiae* Kingsolver, 1980 and *A. vitis* (Schaeffer, 1907). Three species were excluded from their original groups, *A. eustrophoides* (Schaeffer, 1904), *A. serieguttatus* (Chevrolat, 1877), both from the *alternatus* group, and *A. simulator* (Jacquelin DuVal, 1857) from the *dispar* group. We present diagnoses for the 13 species studied, three species were redescribed and one was described. Colored illustrations of dorsum and pygidium, drawings of the male genitalia and geographic distribution maps were included. Identification keys were also added for the groups *dispar* and *spondiae*. Four species of *Amblycerus* presented new records of plants, *A. eustrophoides*, *A. insuturatus*, *A. spondiae* and *A. vitis*, and new records of geographical distribution, *A. alternatus*, *A. dispar*, *A. schwarzi*, *A. serieguttatus* and *A. spondiae*. The species of plants *Sarcomphalus mistol* (Griseb.) Havenschild, *Terminalia corrugata* (Ducke) Gere & Boatwr., *T. tetraphylla* (Aubl.) Gere & Boatwr and *Rhus virens* var. *choriophylla* (Wooton & Standl.) L. D. Benson, were first registered here as hosts of *Amblycerus*. Four new records at the genus level, *Capparis*, *Neopringlea*, *Rhus* and *Sarcomphalus*, and two new records at the family level, Capparaceae and Salicaceae, the latter also being a new record for Bruchinae.

**Keywords:** Seed-beetles. New species. Taxonomy. Key. Western hemisphere.



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## 1 INTRODUCTION

Insects are the largest group of known organisms, with approximately 1.000.000 species (Stork, 2018), with the holometabolous orders Coleoptera, Diptera, Hymenoptera and Lepidoptera representing about 80% of that number (Grimaldi & Engel, 2005). Two large plant-feeding lineages evolved among the holometabolous, namely Lepidoptera and the Phytophaga clade of beetles, the latter accounting for about 30% of all beetles (Reid, 2000; Grimaldi & Engel, 2005).

Phytophaga is composed of Chrysomeloidea, with seven families, Chrysomelidae, Cerambycidae, Megalopodidae, Vesperidae, Oxypeltidae, Disteniidae and Orsodacnidae, plus Curculionoidea, with eight families (Mckenna & Farrell, 2009; Bouchard *et al.*, 2011; Ślipiński *et al.*, 2011; Haddad & Mckenna, 2016), numbering more than 130.000 described species (Marvaldi *et al.*, 2009). Curculionidae constitute the second largest family of Coleoptera with 51.000 species following only the predators and detritivorous Staphylinidae, with 56.000 species. Chrysomelidae is the fourth largest Coleoptera family, with approximately 45.000 species, divided into 13 subfamilies, being Protoscelidinae known only from fossil remains (Gómez-Zurita *et al.*, 2008; Jolivet, 2015).

Among the subfamilies of the Chrysomelidae, Bruchinae Latreille, 1802, stands out for the consumption of seeds during the larval stage, which is why they are commonly known as seed-beetles. Bruchinae larvae have been recorded feeding on 35 families of plants (Johnson, 1981; Johnson, 1989; Johnson *et al.*, 2001), but show a specialization in the consumption of Fabaceae seeds, which account for about 85% of the records, according to Johnson (1981), the other 10% being distributed among Arecaceae (4%), Convolvulaceae (4%), Malvaceae (2%) and the remaining 5% in miscellaneous flowering-plant families (Johnson, 1981).

Bruchinae present great economic importance since some of their species are pests of stored grain, while others control invasive weeds (Kingsolver, 2004). Although their relevance is widely recognized, systematics studies are still lacking, especially in the Neotropical region (Ribeiro-Costa & Almeida, 2012). The group is not attractive to taxonomists, since the identification of species and even of some genera is not always an



easy task due to similarities among species, small size (1.0 to 6.0 mm in length) and the occurrence of intraspecific variability (Ribeiro-Costa & Almeida, 2012).

Bruchinae are distributed throughout the world, with the exception of Antarctica and New Zealand (Kingsolver, 2002). Most of the species are endemic to the Americas, and the distribution generally corresponds to the distribution of their host plants. There are currently more than 1,650 species organized in 69 genera and six tribes, namely Amblycerini, Bruchini, Eubaptini, Kytorhinini, Pachymerini and Rhaebini (Morse, 2014; Viana, 2016).

Bruchini concentrate about 80% of the subfamily's species and are followed by Amblycerini, with 10% of the species, then Pachymerini with 9%, the remaining 1% being distributed in the other three tribes (Johnson & Romero, 2004). Recent molecular studies did not find evidence supporting the monophyly of the three major tribes and the subtribe Acanthoscelidina in particular, was found paraphyletic. At the genus level, *Acanthoscelides* Schilsky, 1905, *Bruchidius* Schilsky, 1905, *Conicobruchus* Decelle, 1951 and *Merobruchus* Bridwell, 1946 were also found to be paraphyletic (Kergoat *et al.*, 2008).

Amblycerini are divided into two subtribes, Amblycerina, with 120 species in *Amblycerus* Thunberg, 1815 (Ribeiro-Costa *et al.*, 2018), and Spermophagina, with *Zabrotes* Horn, 1885 and *Spermophagus* Schoenherr, 1833, the first with about 35 New World species and the second with 118 species in the Old World (Romero & Johnson, 2000; Kergoat *et al.*, 2015).

Species belonging to the Amblycerini can be easily differentiated from the other Bruchinae by having two spurs in the posterior tibia and a prominent pronotal lateral carina. *Zabrotes* and *Spermophagus* are morphologically closer as they share characters such as deeply emarginate eyes, shortened prosternal process, partly reduced parasutural rows, and a median lobe and parameres of a special structure (Borowiec, 1987; Kingsolver, 1970; Kingsolver, 2004). *Spermophagus*, however, differs from *Zabrotes* by the presence of supracoxal carina and the 10<sup>th</sup> striae of the elytra extending near to the apex of elytra (Kingsolver, 1970; Kergoat *et al.*, 2015). *Amblycerus*, on the other hand, can be differentiated from the other genera mainly by the oval body, slightly emarginate eyes and posterior tibia without prominent lateral carinae (Kingsolver, 1970).

In addition to the high diversity of species in *Amblycerus*, the second largest genus with distribution in the Americas after *Acanthoscelides* (Morse, 2014; Ribeiro-Costa *et al.*, 2014), the number of host families is also considerably high compared to other genera, which are usually associated with solely one or a few families. In *Amblycerus*, at least 16 plant families have already been recorded as host (Ribeiro-Costa *et al.*, 2018): Amaranthaceae, Myrtaceae, Sapindaceae, Malpighiaceae, Rhamnaceae, Boraginaceae, Combretaceae, Sterculiaceae, Tiliaceae, Vitaceae, Euphorbiaceae, Anacardiaceae, Verbenaceae, Poaceae, Humiriaceae and Malvaceae. The preference for Fabaceae, which is so characteristic of the subfamily, is also observed in this genus which feed on about 41 legume species (Johnson, 1981, 1989; Romero *et al.*, 1996).

*Amblycerus* is widely distributed from southern Canada to southern Argentina (Romero *et al.*, 1996), with two species recorded from the Galapagos Islands, *Amblycerus piurae* (Pierce, 1915) and *A. galapagoensis* (Blair, 1928); these insular records, however, are not the case of endemism, but instead of introduced species from the American continent (Kingsolver & Ribeiro-Costa, 2001). Due to this high longitudinal distribution, taxonomic studies have focused on specific geographic areas, according to the location where researchers are based, such as Mexico, the United States and Canada (Romero *et al.*, 1996; Romero *et al.*, 2002; Kingsolver, 2004; Romero & Johnson, 2004), the Caribbean Islands (Wilcox, 1975; Johnson & Kingsolver, 1981), Chile (Kingsolver, 1990), Honduras (Turnbow *et al.*, 2003), Brazil (Ribeiro-Costa, 1992a, 1992b, 1998, 1999a, 1999b, 1999c, 2000; Ribeiro-Costa & Kingsolver, 1992, 1993; Ribeiro-Costa & Marinoni, 1992; Ribeiro-Costa *et al.*, 2014; Ribeiro-Costa *et al.*, 2018) and Argentina (Terán, 1984; Terán & Muruaga de L'Argentier, 1979, 1981).

The first author to propose a formal species group within *Amblycerus* was Kingsolver (1975), who established an assemblage composed of three species, *A. robiniae* (Fabricius, 1781), *A. acapulcensis* Kingsolver, 1975 and *A. taeniatus* (Suffrian, 1870). The *robiniae* group was defined by only three characters of the external morphology: scutellum shape, the contour of the apical margin of the pygidium and black spots in the tegument; the morphology of the male genitalia was used as an identification key provided only to distinguish the species in the group among themselves.

In 1992, another group of species was suggested by Ribeiro-Costa & Marinoni (1992), which comprised four species, namely *A. hoffmanseggi* (Gyllenhal, 1833), *A. submaculatus* (Pic, 1927), *A. nigromarginatus* (Motschulsky, 1874) and *A. obscurus*

(Sharp, 1885). The *hoffmanseggi* group was defined based on external characters and male genitalia. In addition, Ribeiro-Costa (1992a) redescribed the four species and included an identification key and collated biological data.

In the years that followed, new South American species were described (Ribeiro-Costa, 1992a; Ribeiro-Costa & Kingsolver, 1992, 1993). In 1995, Ribeiro-Costa, studying 56 species of *Amblycerus* with distribution to Brazil, and based on a phenetic analysis performed using Group Analysis Techniques (Fig. 1) and Principal Component Analysis, suggested 22 groups and a new genus. But Ribeiro-Costa (1995) neither described groups nor presented an identification key to their species. Six of the 22 groups were considered to belong to a new genus, namely *virescens*, *megalobus*, *chapadicola*, *canescens*, *gounellei* and *danunciae* (Fig. 1). It is worth mentioning that, in future works, mainly in the catalog (Ribeiro-Costa *et al.*, 2018) the author took a more conservative position and kept all species in a single genus, *Amblycerus*, calling for a phylogenetic analysis to corroborate the previous hypothesis.

Almost at the same time, Romero *et al.* (1996) reviewed the *Amblycerus* species with distribution to the United States and Mexico and proposed 15 groups for 40 species. The groups were described and keys presented for identification of the species. Given the near concomitance of the studies carried out by Ribeiro-Costa (1995) and Romero *et al.* (1996) for the genus, and the fact that they have been delimited by political-geographical boundaries, it is certain that there is a need for reformulation in the species group scheme proposed by both authors, especially because their classifications are conflicting at some extend.

In 2002, Romero *et al.* carried out the first and only cladistic analysis for the genus with the species previously treated in his aforementioned taxonomic revision (Romero *et al.*, 1996) and 29 external and internal morphological characters (Fig. 2). Despite the high number of new species described for South America in recent decades (Kingsolver, 1991; Ribeiro-Costa, 1992a; 1998; 1999a; 1999b; 1999c; 2000; Ribeiro-Costa & Kingsolver, 1992, 1993), which now harbors 61 species (Ribeiro-Costa *et al.*, 2018), were not included in Romero *et al.*'s analysis. Taking into account the high diversity of *Amblycerus*, about 120 valid species (Ribeiro-Costa *et al.*, 2018), only 33.33% of the genus was sampled in Romero *et al.*'s study. Even so, it is noteworthy that Romero *et al.* (2002) suggested *Amblycerus* as a possibly monophyletic genus.

In 2014, another group of *Amblycerus* was proposed for Ribeiro-Costa *et al.* composed by five species, *A. virens* (Jekel, 1855), *A. virescens* Ribeiro-Costa, 1998, *A. viridans* Ribeiro-Costa, 1998, *A. viridis* Ribeiro-Costa, 1998 and *A. medialis* Ribeiro-Costa, Vieira & Manfio, 2014, thus totaling 39 groups of species.

Among the groups proposed in the literature, the *dispar* group (Ribeiro-Costa, 1995) includes the following species: *Amblycerus dispar* (Sharp, 1885), *A. crassipunctatus* (Ribeiro-Costa, 1999), *A. taeniopygus* (Ribeiro-Costa, 1999), *A. simulator* (Jacquelin DuVal, 1857), *A. insuturatus* (Pic, 1902) and possibly *A. alternatus* (Pic, 1954), *A. spondiae* (Kingsolver, 1980), and *A. schwarzi* (Kingsolver, 1970). The latter three species, although not included in Ribeiro-Costa's (1995) analyses for not being registered in Brazil (Figs 1, 3), were hypothesized by her to belong to that group for they share the main characters that delimit it, such as the pattern of setae on the dorsum, pygidium with medium strip of setae and metatibial lateral spur twice as long as the median spur. Differently from Ribeiro-Costa's work, these three species were treated in the Romero *et al.* (1996) revision of the North American *Amblycerus*, and two of them, *A. alternatus* and *A. schwarzi*, together with *A. eustrophoides* (Schaeffer, 1904) and *A. serieguttatus* (Chevrolat, 1877), constitute the *alternatus* group (Romero *et al.*, 1996) (Fig. 2). The third species, *A. spondiae*, plus *A. cuernavacensis* (Romero, Johnson & Kingsolver, 1996) and *A. vitis* (Schaeffer, 1907), compose the *spondiae* group (Romero *et al.*, 1996) (Fig. 3). In the phylogenetic analysis of Romero *et al.* (2002), the results were not congruent, however. There, *A. alternatus* and *A. schwarzi*, species of the *alternatus* group (Romero *et al.*, 1996), were each positioned in different clades, whereas *A. spondiae* of the *spondiae* group was found in a clade with *A. alternatus* (Romero *et al.*, 2002) (Fig. 2).

Due to the aforementioned incongruence in the positioning of some species belonging to three different groups in *Amblycerus*, the main objective of this work was to carry out a detailed taxonomic study covering 13 species in order to eliminate the political-geographical bias and constrains present in the previous works that dealt with the systematics of the genus. We also provide an identification key and diagnoses for the species groups and their species and (re)descriptions when appropriate, including full-color plates, as well as new data on geographic distribution and host plants.

## 2 MATERIAL AND METHODS

### 2.1 Material

For this study, 255 specimens of 13 species of *Amblycerus* were examined. The material was borrowed from the museums/collections listed below (abbreviations of museums/collections and curators' names are also provided).

**AMNH** American Museum of Natural History, New York, United States of America (L. H. Herman);

**BMNH** Natural History Museum, London, United Kingdom (M. Barclay, M. Geiser);

**CDJ** Clarence Dan Johnson Collection, transferred to the TAMU.

**CNCI** Canadian National Collection of Insects, Arachnids and Nematodes (P. Bouchard);

**DZUP** Coleção Entomológica Pe. J. S. Moure, Departamento de Zoologia, Universidade Federal do Paraná, Curitiba, Paraná, Brasil (C. S. Ribeiro-Costa);

**FSCA** Florida State Collection of Arthropods, Gainesville, Florida, United States of America (P. E. Skelley, M. Thomas);

**IMLA** Fundación Instituto Miguel Lillo, San Miguel de Tucumán, Argentina (A. L. Terán);

**MLP** Museo de La Plata, La Plata, Argentina (N. Cabrera);

**MNHN** Muséum national d'Histoire naturelle, Paris, France (A. Mantilleri);

**MNRJ** Museu Nacional, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil (M. A. Monné, M. L. Monné);

**MPEG** Museu Paraense Emílio Goeldi, Pará, Brazil (O. T. Oliveira);

**MZSP** Museu de Zoologia, Universidade de São Paulo, São Paulo, Brazil (S. Casari);

**TAMU** Texas A & M. University, College Station, Texas, United States of America (E. Riley);

**USMN** United States National Museum of Natural History, Washington, D.C., United States of America (A. Konstantinov, E. Roberts).

**ZMHB** Museum für Naturkunde der Humboldt-Universität, Berlin, Germany (J. Frisch, J. Willers);

## 2. 2 Methods

The methods used for the morphological study followed those of Ribeiro-Costa *et al.* (2014), in which most of the characters were observed from dry pinned insects. For the study of internal characters, dry specimens were softened in water with detergent for five minutes, then the pygidium was opened with a fine forceps, the genitalia was then extracted and boiled in 10% KOH until clear. Dissections were done under a stereoscopic microscope LEICA M165C.

The terminology adopted was that of Ribeiro-Costa *et al.* (2014), including terms for some thoracic and abdominal sclerites from Lawrence *et al.* (2010).

For the species with incomplete original descriptions, usually without description of genitalia we provide a redescription, while for those more recently described, including a more complete list of characters, we provide only a diagnose.

The images of the external morphology were captured with a Nikon D610 camera coupled to a stereoscopic microscope ZEISS Stemi 2000-C. The images of some structures were also made using the Scanning Electron Microscope JEOL JSM 6360 - LV of the *Centro de Microscopia Eletrônica* (CME) at the Universidade Federal do Paraná, Curitiba, Brazil.

Illustrations of male genitalia of *A. crassipunctatus*, *A. dispar*, *A. insuturatus*, *A. simulator* and *A. taeniopygus* were modified from Ribeiro-Costa (1995, 1999). The editing of the images was done in specific software for photographs.

Measurements were obtained from a male and a female from the type material; in cases where no type material was available, however, only one ordinary (i.e., non-type) male in good condition was selected. With a micrometre eyepiece coupled to a Wild-M5 stereomicroscope and following the methodology of Ribeiro-Costa (1992: 140; Figs 1-11), the measures used were: **total length** = greatest distance from the base of the pronotum to the apex of elytra; **total width** = largest width of elytra; **head width** = greatest distance between eyes; **ocular sinus** = longest eye length from the sinus, without the post-ocular lobe; **ocular index** = ratio between the largest and smallest distance between the eyes, in frontal view; **scutellum length** = measured from apex to base; **scutellum width** = greatest width; **posterior femur length** = greatest distance from the point of articulation with the trochanter to the apex; **width of the femur** = its largest width; **lateral spur length** = measured between apex and base; **median spur length** = measured between apex and base; **length of the 1st metatarsomere** = articulation



between the metatibia and the 2nd metatarsomere. The following abbreviations were used: **BL**, body length (from anterior margin of pronotum to elytra apex) and **BW**, body width (the largest width on the subapical region of the elytra).

The literature quoted includes the subjects abbreviated between brackets as follows: **biol.**= biology; **cat.**= catalog; **cit.**= citation; **comb.n.**= new combination; **desc.**= description; **distr.**= distribution; **ecol.**= ecology; **immat.**= immature description; **gen.**= male genitalia; **guild.**= oviposition guild; **host.**= host plant; **n. st.**= new status; **paras.**= parasite; **phen.**= phenetics; **phyl.**= phylogenetics; **spp. groups**= species groups; **syn.**= synonym; **type** = types.

Geographic distribution was listed from north to south, and both already-published and new records are presented. The boundaries of biogeographical areas followed Morrone (2006). Distribution maps were made based on locality information from specimen labels and literature records. Geographical coordinates were obtained from Google Earth Pro 7.1.; maps were generated with QGIS 2.18.4.

Records of host plants were obtained using data of specimen labels and literature. The validity of plant names were checked in the International Database of Vegetables & Information Services (<http://www.catalogueoflife.org/col/details/database/id/15>), US Department of Agriculture Database (<https://plants.usda.gov/java/>), the Reflora Database - Plants of Brazil, (<http://floradobrasil.jbrj.gov.br/reflora/>) and Encyclopedia of Life, (<http://eol.org/>).

For the data of type material and additional material examined, the labels were copied verbatim and semicolon (;) separates different labels, backslashes (\) separates different lines in the same label and text within square brackets [ ] is explanatory.

### 3 RESULTS AND DISCUSSION

We recognize a new species and propose a new arrangement for the described species in the three species groups of *Amblycerus*.

The group *dispar* is composed by six species, *A. crassipunctatus*, *A. dispar*, *A. insuturatus*, *A. schwarzi*, *A. taeniopygus* and the new species. One species, *A. simulator*, was excluded. The two others, *A. alternatus* and *A. spondiae*, were not confirmed as

possibly belonging to the group as commented by Ribeiro-Costa (1995), but *schwarzi* was confirmed.

The group *spondiae* is now composed by *A. alternatus* and the species *A. cuernavacensis*, *A. spondiae* and *A. vitis*. In consequence, the previous concept of the group *alternatus* (Romero *et al.*, 1996) with four species is invalidated. *Amblycerus alternatus* is here placed in the group *spondiae* and its three other species, *A. schwarzi*, *A. eustrophoides* and *A. serieguttatus* are transferred. The first, *A. schwarzi* is now a member of the group *dispar* and *A. eustrophoides*, *A. serieguttatus* and *A. simulator*, the latter from group *dispar*, need to be reallocated to other *Amblycerus* groups (Fig. 4).

The names of the *dispar* and *spondiae* groups were maintained in order to preserve nomenclatural stability.

### **Group *dispar***

**(Figs 4-8, 11-18, 26-31, 39-44, 52-57, 65-74, 82-87, 95-106, 121-123)**

**Included species:** *A. crassipunctatus*, *A. dispar*, *A. insuturatus*, *A. schwarzi*, *A. taeniopygus* and *A. sp. n.*

**Diagnosis.** Group *dispar* is characterized by the following combination of characters: scutellum tridentate with median tooth longer than the lateral ones (Figs 65-74); elytra with uniform pattern of vestiture (Figs 13-18); and pygidium with dense median strip of setae. It can be separate from the *spondiae* group mainly by the elytra with uniform pattern of vestiture (stripes of setae, *spondiae* group) and internal sac of male genitalia with different number and form of sclerites (two pairs and one unpaired sclerite with similar form, group *spondiae*), see Table II.

#### **3. 1 Key to the males of *dispar* group**

1. Pronotum (Fig. 55) and elytra (Fig. 16) covered with grayish setae. Metepisternum with conspicuous coarse punctures (Fig. 42). Hind tibia lateral spur about three times the length of the median spur. Pygidium with sparse coarse moderate punctures (Fig. 85).....*A. schwarzi* Kingsolver, 1980

- 1'. Pronotum and elytra covered with yellowish or orange setae (Figs 15, 17, 18) Metepisternum (Fig. 41) with coarse punctures of smaller size, not so conspicuous. Hind tibia with lateral spur about two times the length of the median spur (Figs 39, 40, 41, 43, 44). Pygidium with dense coarse punctures (Figs 82, 83, 84, 86, 87)..... 2
2. Pronotum with coarse punctures covering only the lateral areas (Figs 52, 54, 56, 57).....3
- 2' Pronotum with coarse punctures covering all the surface (Figs 53, 55).....4
3. Pronotum with setae homogeneously distributed (Fig. 54)....*A. insuturatus* (Pic, 1902)
- 3' Pronotum with setae forming tufts (Fig. 57).....5
4. Eyes approximate at base (ocular index: 9.5) (Fig. 27). Male genitalia with median lobe about 4.5 times its widest at apical region (Fig. 96). Apical region of internal sac without sclerites (Fig. 96).....*A. dispar* (Sharp, 1885)
- 4' Eyes distant at base (ocular index: 3.5) (Fig. 26). Male genitalia with median lobe about 3.7 times its widest at apical region (Fig. 95). Apical region of internal sac with one pair of sclerites (Fig. 95).....*A. crassipunctatus* Ribeiro-Costa, 1999
5. Integument dark brown (Fig. 17). Male genitalia with the apical region of internal sac without sclerites (Fig. 99).....*A. taeniopygus* Ribeiro-Costa, 1999
- 5' Integument light brown (Fig. 18). Male genitalia with the apical region of internal sac with a pair of sclerites (Fig. 100) .....*A. sp. n.*

**Comparative notes.** Within the *dispar* group, *A. dispar*, *A. schwarzi* and *A. crassipunctatus* share the pronotum (Figs 52, 53, 55) entirely covered with coarse punctures while *A. insuturatus*, *A. taeniopygus* and *A. sp. n.* share the pronotum (Figs 54, 56, 57) covered with coarse punctures only in the lateral areas. We recognize two more closely related species in each of these groups: *A. dispar* and *A. schwarzi* that have closer eyes at base (Figs 27, 29), and male genitalia with dorsal valve (Figs 96, 98) subtriangular

and internal sac with unpair “J” sclerites. *A. sp. n.* and *A. insuturatus*, share the male genitalia with a pair of apical sclerites and the presence of unpair median sclerites (Figs 97, 100).

**Distribution (Figs 121-123).** This species group is distributed from the southern of United States to northwestern Argentina.

**Host plants (Tab. I).** Species of the group *dispar* are found in ten plant species, belonging to eight families, Anacardiaceae, Combretaceae, Euphorbiaceae, Fabaceae, Humiriaceae, Rhamnaceae, Verbenaceae, and Rubiaceae.

*Amblycerus crassipunctatus* Ribeiro-Costa, 1999  
(Figs 11, 12, 13, 26, 39, 52, 65, 66, 82, 95, 101, 121)

*Amblycerus crassipunctatus* Ribeiro-Costa, 1999c: 233-236 (desc., distr., gen., type).

For review of literature, see Ribeiro-Costa *et al.* (2018).

**Type material examined.**

Holotype deposited in DZUP, male, with labels: Brasília\ VIII.1997\ F. Ramos leg. [white]; Holotype\ *Amblycerus crassipunctatus*\ Ribeiro-Costa, 1999 det. [red]; DZUP\ 130143 [white]. Paratype deposited in DZUP, 1 male, with labels: Faz. Dr. José Mendes,\ Três Lagoas, MT\ ♂ [symbol handwritten] 15-VI-1964\ Exp. Depto. Zool.; Dep. Zool.\ São Paulo; PARÁTIPO [yellow label with border and black writing]\ *Amblycerus crassipunctatus*\ Ribeiro-Costa, 1999; DZUP\ 130144. Paratype deposited in MZSP, 1 male, with labels: Lagoa Santa MG\ Brasil 26.XI.960\ Araujo e Martins; Dep. Zool.\ São Paulo; PARÁTIPO [yellow label with border and black writing]\ *Amblycerus crassipunctatus*\ Ribeiro-Costa, 1999. Paratypes deposited in CDJ, 2 males, with labels: Arbustal Riwo\ riwo, via Kavanayen\ Gran Sabana, Edo.\ Bolivar, Vzla. VIII. 93; Elena Raimundez\ colector; Reared seeds\ Vantanea minor; *Amblycerus crassipunctatus* R..A.\ Det. Romero N. J. 98; PARÁTIPO [yellow label with border and black writing]\ *Amblycerus crassipunctatus*\ Ribeiro-Costa, 1999. Paratype deposited in USNM, 1 male, with labels: Brazil; L. J. Bottimer\ Collection\ No. 6/C; NMNH [yellow label with border and black writing]; Don't\ recognized\ det.\ J. M. Kingsolver; PARÁTIPO [yellow label

with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999; USNM [symbol handwritten]. Paratype deposited in MPEG, 1 male, with labels: Chapada dos \ Guimarães \ 31.I.1961; Brasil, MT \ J. & B. Bechyné; near or equal \ to mendes \ mss name [underlined in red]; MGPA; 8; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Paratype deposited in NMNH, 1 female, with labels: Paraepeba ♀ [symbol handwritten] \ Minas Gerais Brasil \ E. P. Heringer; IOC; *Amblycerus* \ *crassipunctatus* \ Ribeiro-Costa \ C. S. Ribeiro-Costa det. 19; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Paratypes deposited in MZSP, 2 males and 2 females, with labels: Barra do Tapirapé \ Mt - Brasil ♂ [symbol handwritten] \ 2-16.1.1966 \ B. Malkin col.; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Barra do Tapirapé \ Mt - Brasil ♀ [symbol handwritten] \ 2-16.1.1966 \ B. Malkin col.; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Lagoa Santa MG \ Brasil 26-XI-960 ♀ [symbol handwritten] \ Araujo e Martins; Dep. Zool. \ São Paulo; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Aldeia Coraci ♂ [symbol handwritten] \ (11 km W Canindé, Rio \ Gurupí) - Pará \ xii.964/ B. Malkin col.; PARÁTIPO \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Paratypes deposited in FIOC, 3 males and 4 females, with labels: Paraepeba \ Minas Gerais Brasil \ E. P. Heringer ♂ [symbol handwritten]; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Paraepeba \ Minas Gerais Brasil \ E. P. Heringer; IOC; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Paraepeba \ Minas Gerais Brasil \ E. P. Heringer ♀ [symbol handwritten]; IOC; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999. Paraepeba \ Minas Gerais Brasil \ E. P. Heringer; PARÁTIPO [yellow label with border and black writing] \ *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999.

#### **Additional material examined.**

[1 specimen male]: Brasil, Pará, Belém \ 01.VIII.2011 \ J. E. H. Carvalho col.; Germano \ 0060/2011; CSRC ID N° 45; *Amblycerus crassipunctatus* \ Ribeiro-Costa, 1999 \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. (DZUP). [1 specimen female]: Brasil, Pará, Belém \

01.VIII.2011\ J. E. H. Carvalho col.; Germano\ 0060/2011; CSRC ID N° 45; ♀; *Amblycerus crassipunctatus*\ Ribeiro-Costa, 1999\ Det.: A. T. Santos;\ C. S. Ribeiro-Costa, 2017. (DZUP). [1 specimen female]: Paraepeba\ Minas Gerais Brasil\ E. P. Heringer ♀ [symbol handwritten]; IOC [green label written in black]; crassi\ C. S. Ribeiro-Costa det. 19; *Amblycerus crassipunctatus*\ Ribeiro-Costa, 1999\ Det.: A. T. Santos;\ C. S. Ribeiro-Costa, 2017. (DZUP). [1 specimen male]: Lagoa Santa MG\ Brasil 26.XI.960\ Araujo e Martins; Dep. Zool.; A.\ mendesi mss [in red]\ det.\ J. M. Kingsolver; *Amblycerus crassipunctatus*\ det. Ribeiro-Costa\ J. M. Kingsolver; *Amblycerus crassipunctatus*/ Ribeiro-Costa, 1999/ Det.: A. T. Santos;/ C. S. Ribeiro-Costa, 2017. (FSCA).

**Measurements.** BL: 9.6 mm; BW: 5.2 mm

**Diagnosis (Figs 26, 65, 66, 95, 101).** *A. crassipunctatus* is distinguished mainly by the eyes distant at base, ocular index: 3.5 (Fig. 26) and male genitalia (Figs 95, 101) with median lobe about 3.7 times its widest at apical region; internal sac (Fig. 95) in the apical region with one pair of subtriangular sclerites, with lateral margins serrated. *A. crassipunctatus* can be separated from *A. schwarzi* by having the cervical boss with three setae (two setae, *A. schwarzi*), hind tibia with lateral spur about 2.0 times the length of median spur (about 3.0 times, *A. schwarzi*) and last ventrite almost as long as the 4-ventrite (last ventrite almost two times as long as the 4-ventrite). *A. crassipunctatus* still can be separated from *A. dispar* by the frontal carina absent (present, *A. dispar*), eyes distant at base (Fig. 26) (closer, *A. dispar*) and median sulcus about as half the length of metaventrite (more than a half the length of metaventrite, *A. dispar*).

**Distribution (Fig. 121).** Brazil (Pará, Mato Grosso, Distrito Federal, Minas Gerais) and Venezuela.

**Host plant (Tab. I).** Humiriaceae: *Vantanea minor* Benth.

*A. dispar* (Sharp, 1885)

(Figs 5, 6, 14, 27, 40, 53, 67, 68, 83, 96, 102, 121)

*Spermophagus dispar* Sharp, 1885: 494 (desc., distr.). For review of literature, see Ribeiro-Costa *et al.* (2018).

**Type material examined.**

It was not possible to examine the type material deposited in the BMNH, due to changes in the Brazilian legislation at that moment. The species was recognized through its original description and later works of C. S. Ribeiro-Costa (Ribeiro-Costa, 1995; Kingsolver & Ribeiro-Costa, 1997) that illustrated the male genitalia. The author examined the type material of *A. dispar* as well as the entities synonymous to that, with the exception of *Spermophagus thomasi*. For the synonymical list of *A. dispar*, see Ribeiro-Costa *et al.* (2018).

**Additional material examined.**

[1 specimen male]: Paraiso CZ\ Pan May 9. 11\ E A Schwarz; *Amblycerus\ dispar\* (Sharp)\ Ribeiro-Costa, C. S. det. ~~201~~ [handwritten line]; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T. Santos, 2018. (FSCA). [1 specimen female]: Paraiso CZ\ Pan May 9. 11\ E A Schwarz; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T. Santos, 2018. (FSCA). [1 specimen male]: Curaçao ♂ [handwritten symbol]\ West Indies\ 15 MAY 1968; T. E. Rogers\ Coll.; *Amblycerus\ dispar Shp.\* det. J. M. Kingsolver; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T. Santos, 2018. (FSCA). [1 specimen male]: Curaçao: Hato,\ 4. VIII. 1965\ B. Malkin col; *Amblycerus\ longissimus\* (Pic, 1902)\ Ribeiro, C. S.\ det.; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male]: Curaçao: Hato,\ 4. VIII. 1965 ♂ [handwritten symbol]\ B. Malkin col; MZSP; *Amblycerus\ longissimus\* (Pic, 1902)\ Ribeiro, C. S.\ det.; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [6 specimens female]: Curaçao: Hato,\ 4. VIII. 1965\ B. Malkin col; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen female]: Curaçao: Hato,\ 4. VIII. 1965\ B. Malkin col; *Amblycerus\ longissimus\* (Pic, 1902)\ C. S. Ribeiro-Costa\ det. 1993; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male]: Tabogilla Id\ Feb/6 12 Pan\ Aug. Busck ♂ [handwritten symbol]; *Amblycerus dispar\* (Sharp, 1885)\ Det.: A. T.



Santos, 2018. (FSCA). [1 specimen female]: Obidos. Pará.\ 10. 939; 4, 954\ Bondar; MNRJ; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (MNRJ). [1 specimen male]: Brasil, CE, Crateús\ Serra das Almas\ I. R. Vieira col.; *Amblycerus dispar*\ (Sharp, 1885)\ Ribeiro-Costa, C. S. det. 2000; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimens females]: Brasil, CE, Crateús\ Serra das Almas\ I. R. Vieira col.; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male]: 9; Paraíba\ J. Pessoa\ VII - 955\ Pe. Pereira; *Amblycerus insuturatus*\ (Pic)\ det.\ J. M. Kingsolver; Dep. Zool.\ São Paulo; *A. insuturatus*\ A. wolcottii\ C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [2 specimen female]: PARAIBA\ Corema VI. 1557\ Exp. Dep. Zoologia; *Amblycerus longissimus*\ (Pic, 1902); Dep. Zool.\ São Paulo; *Amblycerus longissimus*\ (Pic, 1902); C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen female]: Petrolina - PE\ 7.VIII.98\ Nilton - leg.; p. h. Umbú\ Spondias\ tuberosa; *Amblycerus dispar*\ (Sharp, 1885); *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [20 specimens females]: Petrolina - PE\ 7.viii.98\ Nilton - leg.; p. h. Umbú\ Spondias\ tuberosa; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male]: Xingu\ Mato Grosso – Brasil\ XI. 1961\ Alvarenga & Werner; Ex. coleção\ M. Alvarenga; Dep. Zool.\ São Paulo; *Amblycerus longissimus*\ (Pic)\ det. J. M. Kingsolver; Dezembro [label handwritten]; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (DZUP). [1 specimen male]: 7; Braz. Mato Grosso\ Barra do Tapi-\ rape 6. 1 - 63\ B. Malkin; CAS; *Amblycerus longissimus*\ (Pic, 1902)\ Ribeiro, C. S.\ det.; des. gen.; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen female]: Braz. Mato Grosso\ Barra do Tapi-\ rape I-1- 63\ B. Malkin; CAS; *Amblycerus longissimus*\ (Pic, 1902)\ C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen female]: DPTº ZOOLOGIA\ UF - PARANÁ; Sobradinho - BA\ 23/IV/1987\ Miranda, A. col; Em\ Zizyphus sp.\ Rhamnaceae; *Amblycerus longissimus*\ (Pic, 1902)\ C. S. Ribeiro-Costa\ det. 1991; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen female]: Sobradinho - BA\ 23/IV/1987\ Miranda, A. col; Em\ Zizyphus sp.\ Rhamnaceae; Joazeiro (Zizyphus sp - Rhamnaceae\ FRUTOS COLHIDOS NO CHÃO\ Faz. Varginha - Mun. Sobradinho (BA)\ A. Miranda col. 23 Abril 1987\ P. Silva cri. Salvador (BA) – Emerg 25/5/87\ 2 exemplares; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos, 2018. (DZUP). [3 specimen female]: INST. BIOLG.\ ENTOMOLOGIA\ AGRARIA\

RIO DE JANEIRO; *Spermophagus* \ longissimus Pic \ Brasil; MNRJ; *Amblycerus* \ longissimus \ (Pic, 1902) \ Ribeiro, C. S \ det.; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male]: INST. BIOLOG. \ ENTOMOLOGIA \ AGRICOLA \ RIO DE JANEIRO; *Spermophagus* \ longissimus Pic \ Brasil [label handwritten]; MNRJ; *Amblycerus* \ longissimus \ (Pic, 1902); *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (MNRJ). [2 specimens males]: Paraguay Concepcion \ Concepcion, 74 msnm, 23° 24' 23,4" S 57° 26' 54,3" W 2- \ 3x2005, fluorescent light, B. \ Garcete Coll.; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (DZUP). [1 specimen female]: Paraguay Concepcion \ Concepcion, 74 msnm, 23° 24' 23,4" S 57° 26' 54,3" W 2- \ 3x2005, fluorescent light, B. \ Garcete Coll.; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male and 1 female]: Coll. Bondar \ 1208; MZSP; *Amblycerus* \ longissimus \ (Pic, 1902) \ Ribeiro, C. S. \ det. 96; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (DZUP). [1 specimen female]: Coll. Bondar \ 1208; Spermophagus 1208 \ longissimus Pic; *Amblycerus* \ longissimus \ Kingsolver det. 86; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (DZUP). [2 specimen male]: CHILE. El \ Transito \ Vallenar \ III region; 5-x-1985 \ J. E. Barriga; in *Geoffrea* \ decorticans \ Fruits; *Amblycerus* \ caryoboriformis \ Pic \ det. J. M. Kingsolver; *Amblycerus* \ longissimus \ (Pic, 1902) \ C. S. Ribeiro-Costa det. 19; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. [1 specimen male]: R. A. TUCUMAN \ 11 km. O. de \ Las Cejas \ 1. 14. x. 67 \ coll. L. Stange; Malaise; COLECCION \ Fundacion M. Lillo \ 4000 S. M. Tucumán \ TUCUMAN-ARGENTINA; *Amblycerus* \ longissimus \ (Pic, 1902) \ C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (FML). [1 specimen male]: SGO DEL ESTERO \ 1964 \ ex. Sem. *Zizyphus* \ mistol \ ? leg.; COLECCION \ Fundacion M. Lillo \ 4000 S. M. Tucumán \ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (FML). [1 specimen female]: ARGENTINA \ MISIONES - Geandro \ Alem - (Ext. ExpINTA) \ viii- / ix – 1967 \ col. D. Havrylenko; ex. sem. \ *Cordia trichotoma* \ “Peteribi”; *Amblycerus* \ sp. 2 \ A. L. Terán det.; COLECCION \ Fundacion M. Lillo \ 4000 S. M. Tucumán \ TUCUMAN-ARGENTINA; FML; ♀; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (FML). [1 specimen male]: R. A. TUCUMAN \ Amaicha \ del Valle \ Rev. 27. III. 67 \ coll. Terán; en sem. \ *Geoffroea* \ decorticans \ (Pl. n° 25); COLECCION \ Fundacion M. Lillo \ 4000 S. M. Tucumán \ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar* \ (Sharp, 1885) \ Det.: A. T. Santos, 2018. (FML). [1 specimen male]: ARGENTINA \ Tucumán. \ Tapia \ xii-1976 \ A. Terán

coll.; ex. sem.\ Geoffrea\ decorticans; Amblycerus\ caryoborifor\ mis (Pic)\ det. A. L. Terán 19....; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; Amblycerus\ longissimus\ (Pic, 1902)\ C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen male]: ARGENTINA\ Tucumán.\ Tapia\ xii-1976\ A. Terán coll.; ex. sem.\ Geoffrea\ decorticans; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen male]: RA. CORDOBA\ Bosque Alegre\ 25-I-955\ Cole: F. Monrós; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; Entomofauna\ Subandina; Amblycerus\ longissimus\ (Pic, 1902)\ C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: ARGENTINA\ SANTIAGO DEL\ ESTERO - Que-\ bracho Coto\ XII. 1971\ Col. Ruiz; ex sem.\ Ziziphus\ mistol; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha del Valle\ 20. II. 67\ coll. Terán; ex sem.\ Geoffrea\ decorticans\ Pl. n° 25 E\ Ver. 6. XI. 67; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: ARGENTINA\ SANTIAGO DEL\ ESTERO - Que-\ bracho Coto\ XII. 1971\ Col. Ruiz; ex sem.\ Ziziphus\ mistol; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; ♀; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen male]: ARGENTINA\ SANTIAGO DEL\ ESTERO - Que-\ bracho Coto\ XII. 1971\ Col. Ruiz; ex sem.\ Ziziphus\ mistol; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus longissimus*\ (Pic, 1902)\ C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen male]: ARGENTINA\ SANTIAGO DEL\ ESTERO\ Les Tigres\ 11. 16. 1. 1970\ Col. R. Golbach; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [2 specimen female]: ARGENTINA\ SANTIAGO DEL\ ESTERO\ Quebracho Coto\ ?. XII. 1971\ Col. Ruiz; Ex. Sem.\ Ziziphus mistol\ pl. n° 13 (1971); Amblycerus\ n°2; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp,

1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [2 specimen female]: ARGENTINA\ SANTIAGO DEL\ ESTERO\ Quebracho Coto\ ?. XII. 1971\ Col. Ruiz; Ex. Sem.\ *Ziziphus mistol*\ pl. n° 13 (1971); *Amblycerus*\ n°2; *Amblycerus*\ sp. 4\ det. A. L. Terán 19....; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus*\ *longissimus*\ (Pic, 1902)\ C. S. Ribeiro-Costa det. 1993; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha del Valle\ 9-I-1969\ A. Willink - A. Terán coll.; Entomofauna\ Subandina; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. CATAMARCA\ Los Natimientos\ de Abajo; Willink, Terán\ Stange (Malaise)\ 16-31.I.1969; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus*\ *longissimus*\ (Pic, 1902)\ C. S. Ribeiro-Costa det. 1996; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [4 specimen female]: R. A. CATAMARCA\ Los Nacimientos\ de Abajo; Willink, Terán\ Stange (Malaise)\ 16-31.I.1969; Entomofauna\ subandina; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha del\ Valle\ Rev. 20.IV.67\ coll. Terán; en sem.\ *Geoffroea*\ *decorticans*\ (Pl. n° 25); COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: ARGENTINA\ TUCUMAN\ Amaicha del Valle\ 20.II.1967\ Col. A. Terán; ex sem. *Geoffroea*\ *ea decorticans*\ Pl. n° 25 (1967)\ Ver. 27.XI.1967; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [2 specimen female]: R. A. TUCUMAN\ Amaicha\ del Valle\ Rev. 20.IV.67\ coll. Terán; en sem.\ *Geoffroea*\ *decorticans*\ (Pl. n° 25); COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ 25. 28. XI. 63\ Coll. Goibach; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [6 specimen female]: REP. ARGENTINA\ TUCUMAN\ Tapia – XII/1997\ Col. A. L. Terán; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.:

A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [5 specimen female]: R. A. CATAMARCA\ Los Nacimientos\ de Abajo; Willink, Terán\ Stange (Malaise)\ 16-31.I.1969; Entomofauna\ subandina; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha\ del Valle\ Rev. 27. III. 67\ coll. Terán; en sem.\ Geoffroea\ decorticans\ (Pl. n° 25); COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha del\ Valle\ 20. II. 67\ coll. Terán; en sem.\ Geoffroea\ decorticans\ (Pl. n° 25); *Amblycerus caryoboriformis*\ (Pic)\ det. J. M. Kingsolver; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha del\ Valle\ Rev. 5. III. 67\ coll. Terán; en sem.\ Geoffroea\ decorticans\ (Pl. n° 22); COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [2 specimen female]: R. A. TUCUMAN\ Amaicha del Valle\ Rev. 31-V-1967\ coll. Terán; en sem.\ Geoffroea\ decorti-\cans\ (Pl. n° 25); COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ S. P. de cololae\ xii. 59\ coll. Terán; ex. sem.\ Geoffroea\ decorti-\cans; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha\ del Valle\ Rev. 27. III. 67\ coll. Terán; en sem.\ Geoffroea\ decorticans\ (Pl. n° 25); COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. TUCUMAN\ Amaicha del Valle\ Rev. 20. IV. 67\ coll. Terán; en sem.\ Geoffroea\ decorticans\ (Pl. n° 25); COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [3 specimen female]: ARGENTINA\ TUCUMAN\ Amaicha del Valle\ 20. II/1967\ Col. A. L. Terán; en sem.\ Geoffro-\ea decorticans\ Pl. n° 25 (1967); Rev. 27. XI. 1967; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\



(Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: RA. CATAMARCA\ Rodeo\ 8. 24. I. 1959\ Coll. R. Golbach; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [2 specimen female]: R. A. SALTA\ Molinos\ 10 kms. S. de Rumibola\ 15-II-1969\ Barrera-Paganini coll.; Entomofauna\ Subandina; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. CORDOBA\ Carios PAZ\ III. 1951\ Coll. Foerster; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: R. A. SALTA\ Cachi\ 14-II-1969\ Barrera-Paganini coll.; Entomofauna\ Subandina; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen female]: 1362; Spermopha-\ gus\ J. M. Bosq det. 1946; 1362; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML). [1 specimen male]: Villa Guilhermina [illegible word]\ [illegible words]\ 18-25 FEBR. 1946\ HAYWARD Y WILLINK; COLECCION\ Fundacion M. Lillo\ 4000 S. M. Tucumán\ TUCUMAN-ARGENTINA; FML; *Amblycerus dispar*\ (Sharp, 1885)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FML).

**Redescription.** BL: 7.9 mm; BW: 4.0 mm.

**Diagnosis.** *A. dispar* is characterized by the following characters in combination: eyes approximate at base, ocular index: 9.5 (Fig. 27); male genitalia with median lobe about 4.5 times its widest at apical region and, internal sac in the apical region without sclerites (Fig. 96). *A. dispar* differs from *A. schwarzi* by the frontal carina present (absent, *A. schwarzi*), cervical boss with three setae (two setae, *A. schwarzi*), median sulcus more than a half the length of the metaventricle (about as half the length of the metaventricle, *A. schwarzi*), last ventrite almost as long as 4-ventrite (almost two times as long as the 4-ventrite, *A. schwarzi*) and internal sac of male genitalia without a pair of sclerite in the apical region (one pair, *A. schwarzi*). *A. dispar* still can be separated from *A. crassipunctatus* by the frontal carina present (absent, *A. crassipunctatus*), eyes closer at

base (Fig. 26) (distant, *A. crassipunctatus*), and median sulcus more than a half the length of metaventrite (about as half as the length of metaventrite, *A. crassipunctatus*).

**Integument color (Fig. 14).** Integument red to dark red.

**Vestiture (Figs 14, 40, 53, 83).** Body covered with light yellow setae. Pronotum with six vaguely condensed patches and a median basal line of setae. Elytra with setae uniformly distributed; pygidium with median stripe of setae.

**Head (Fig. 27).** Eyes approximate at base, ocular index: 9.5, ocular *sinus* 1.3 and postocular lobe about 0.4 the eye length. Frons covered with fine and moderate dense coarse punctures, with frontal carina. Antennae reaching anterior margin of hind coxae, serrate from antennomeres 4-10; antennomere 7 about 1.5 longer than wide, last antennomere subelliptic. Frontoclypeal suture distinct. Clypeus only covered with moderate coarse punctures, except in narrow apical, margin smooth. Labrum with few fine coarse punctures on basal margin.

**Prothorax (Figs 40, 53).** Pronotum trapezoidal (Fig. 53) with lateral margins slightly curved, covered entirely by coarse and dense punctures; lateral carina almost reaching the posterior margin of pronotum; cervical boss with three setae; cervical sulcus conspicuous behind eyes. Prosternal process longer than anterior coxae, gently arched between coxae and slightly constricted between coxae.

**Mesothorax and Metathorax (Figs 6, 14, 40, 67, 68).** Scutellum (Figs 6, 67, 68) about 1.7 longer than wide, tridentate, median tooth longer than the lateral ones. Elytra (Fig. 14) with striae strongly impressed, at basal third striae 1-6 with punctures more isolated, 6-7 striae fused apically. Metepisternum without coarse punctures; metepisternal sulcus with transverse axis gently oblique or straight; the longitudinal axis about  $\frac{1}{2}$  of the metepisternum. Metaventrite (Fig. 40) not prominent in lateral view, without punctures and median sulcus more than a half as long as metaventrite. Metacoxae with coarse punctures. Hind tibia with lateral spur about 2.8 times the length of median spur. First tarsomere about 1.6 the length of the lateral spur and 4.5 times the length of median spur.



**Abdomen (Figs 40, 83).** Ventrites (Fig. 40) with moderately coarse punctures; last ventrite almost as long as the 4-ventrite. Pygidium (Fig. 83) with apical margin rounded and with coarse and dense punctures.

**Male genitalia (Figs 96, 102).** Median lobe (Fig. 96) about 4.5 times its widest at apical region; ventral valve with lateral margins concave and acuminate apex; dorsal valve subtriangular, with lateral margins almost straight. Internal sac (Fig. 96) in the apical region without sclerites, some small spines dispersed. Median region with a J-shaped unpaired sclerite, several denticles forming two lines, a pair of a group of denticles, a pair of a laminar hat-shaped sclerites with denticles at apex. Basal region with several small denticles close to ejaculatory ducto. Tegmen (Fig. 102) with deep, rounded emargination between the enlarged lateral lobes.

**Female.** Similar to male except 5<sup>th</sup> abdominal sternum not emarginate.

**Distribution (Fig. 121).** Brazil (Pará, Mato Grosso, Ceará, Paraíba, Pernambuco, Bahia, Rio de Janeiro), Panama, Venezuela, French Guiana, Argentina, Chile, Peru, Honduras, Curacao.

**New Record (Fig. 121).** Paraguay.

**Host plants (Tab. I).** **Fabaceae:** *Geoffroea decorticans* (Gillies ex Hook. & Arn.) Burkart. **Rhamnaceae:** *Ziziphus joazeiro* Mart.; *Ziziphus* sp. **Anacardiaceae:** *Spondias tuberosa* Arruda.

**New Record (Tab. I).** **Rhamnaceae:** *Sarcomphalus mistol* (Griseb.) Havenschild.

*A. insuturatus* (Pic, 1902)

(Figs 4, 8, 15, 28, 41, 54, 69, 70, 84, 97, 103, 122)

*Spermophagus subflavidus* var. *insuturatus* Pic, 1902: 172 (desc., distr.). For review of literature, see Ribeiro-Costa *et al.* (2018).

### **Type material examined.**

The type material was requested to the USNM, however, the sending of the material was not authorized due to changes in the Brazilian legislation at that moment. The species recognition was done through the *A. insuturatus* original description and the works of Ribeiro-Costa (Ribeiro-Costa, 1995; Kingsolver & Ribeiro-Costa, 1997; Ribeiro-Costa *et al.*, 2018) that illustrated the male genitalia. The type material of *A. insuturatus* was examined by Kingsolver and Ribeiro-Costa (1997) as well as the entities synonymous to that. For the synonymical list of *A. insuturatus*, see Ribeiro-Costa *et al.* (2018).

### **Additional material examined.**

[1 specimen male]: Brasil Pará\ Serra Norte\ POJUCA [escrito a mão]\ 19. VII. 1983\ Col. R. B. Neto; Armadilha\ Suspensa\ 3 MTS.; MPEG 01019973; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (MPEG). [1 specimen male]: BOLIVIA: Santa Cruz, 3.7km\ SSE Buena Vista, Hotel Flora & Fauna 405m., 5-15-XI-2001\ 17°29.949'S; 63°33.152W\ M. C. Thomas & B. K. Dozier\ tropical transition Forest; *Amblycerus insuturatus*\ (Pic)\ det. J. M. Kingsolver; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos, 2018. (FSCA). [1 specimen female]: BOLIVIA Santa Cruz\ 4-6k SSE Buena Vista\ F & F Hotel Oct 22-31\ 2002 Wappes & Morris; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos, 2018. (FSCA). [1 specimen female]: BOLIVIA, Santa Cruz\ Potrerillos del Guerdá\ 16-22 Oct 2006 370m\ Wappes, Nearn & Eya; Snake Farm\ 17°40.26S, 063°27.43W\ Elevation 400 meters; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos, 2018. (FSCA). [1 specimen male]: BOLIVIA, Santa Cruz Prov.\ 4-6 km SSE Buena Vista\ Hotel Fauna y Flora 400-500m\ 17°37'S, 63°37'W\ 1-10 Nov 2002 beating\ Steven W. Lingafelter; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (USNM). [1 specimen male]: Brasil, Mato Grosso, Barra do\ Garças, PE da Serra Azul\ VII/2009\ J. de Farias (leg.); 15°50'15.3"S 52°16'56"W\ 15°50'53"S 52°16'56"W; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male]: Brasil, Mato Grosso, Barra do\ Garças, PE da Serra Azul\ VII/2009\ J. de Farias (leg.); 15°50'15.3"S 52°16'56"W\ 15°50'53"S 52°16'56"W; *Amblycerus insuturatus*\ (Pic, 1902)\ Ribeiro-Costa, C. S. det. 2010; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos, 2018. (DZUP). [5 specimens females]: Brasil, Mato Grosso, Barra do\ Garças, PE da Serra Azul\ VII/2009\ J. de Farias (leg.); 15°50'15.3"S 52°16'56"W\ 15°50'53"S 52°16'56"W; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos, 2018. (DZUP). [1

specimen male]: Brasil - GO Barro Alto\ 15°4'44.50'S 49°0'6.70"W\ V.2009 M. Pimenta & L. L.\ Bergamini cds. Malaise; Chrysomelidae\ Bruchinae sp.4 - RS31\ L. L. Bergamini det. 2010; *Amblycerus insuturatus*\ (Pic, 1902)\ Vieira, M. K. det. 2011; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos, 2018. (DZUP). [1 specimen male]: Brasil-RJ- Cabo Frio\ Praia do Peró\ 15/ iii/ 2015\ J. H. Viana col.; *Amblycerus insuturatus*\ (Pic, 1902)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (DZUP).

**Redescription.** BL: 10.7 mm; BW: 5.5 mm

**Diagnosis (Figs 28, 97, 103).** *A. insuturatus* is characterized by the male genitalia (Figs 97, 103) with median lobe (Fig. 97) about 5.0 times its widest at apical region; internal sac (Fig. 97) in the apical region with a pair of hollow, ovoid, tuberculate sclerites and presence of median wishbone unpaired sclerite. *A. insuturatus* is similar externally to *A. sp. n.*, which differs by the frontoclypeal suture is indistinct (distinct, *A. sp. n.*), cervical boss with three setae (four setae, *A. sp. n.*), the last ventrite almost as long as 4-ventrite (almost two times as long as the 4-ventrite, *A. sp. n.*), internal sac of male genitalia in the apical region with a pair of ovoid sclerites (subtriangular sclerites, *A. sp. n.*), unpaired median wishbone sclerite (subtrapezoidal, *A. sp. n.*).

**Integument color (Figs 15, 41, 84).** Dorsum and abdomen red, except head and the ventral region, which are entirely dark red.

**Vestiture (Figs 15, 41, 54, 84).** Body covered with orange setae. Pronotum (Fig. 54) with setae uniformly distributed or forming two dense median patches. Elytra (Fig. 15) orange, sometimes with gray setae along interstriae margins. Scutellum light yellow. Pygidium (Fig. 84) with median stripe of light yellow setae.

**Head (Fig. 28).** Frons covered with fine and moderate dense coarse punctures, without frontal carina. Eyes distant at base, ocular index: 4.4; ocular *sinus*: 1.1 and postocular lobe about 0.3 the eye length. Antennae (Fig. 41) not reaching anterior margin of hind coxae, serrate from antennomeres 4-10; antennomere 7 about 1.7 longer than wide, last antennomere subelliptic. Frontoclypeal suture indistinct. Clypeus covered with only

moderate coarse punctures except in narrow apical margin. Labrum with few fine punctures on basal margin.

**Prothorax (Fig. 54).** Pronotum (Fig. 54) trapezoidal with lateral margins slightly curved, covered laterally by coarse and dense punctures; lateral carina almost reaching the posterior margin of pronotum; cervical boss with three setae; cervical sulcus conspicuous behind eyes. Prosternal process longer than anterior coxae, gently arched between coxae and slightly constricted between coxae.

**Mesothorax and Metathorax (Figs 15, 41, 69, 70).** Scutellum (Figs 69, 70) about 1.5 longer than wide, tridentate, median tooth longer than the lateral ones. Elytra (Fig. 15) with striae strongly impressed, at basal third striae 1-6 with punctures more isolated, all free apically. Metepisternum (Fig. 41) with moderately coarse and sparse punctures; metepisternal sulcus with transverse axis gently oblique or straight; the longitudinal axis about  $\frac{1}{2}$  the length of the metepisterno. Metaventrite (Fig. 21) not prominent in lateral view, without punctures and median sulcus about as half as long as metaventrite. Metacoxae (Fig. 41) with coarse punctures. Hind tibia with lateral spur (Fig. 41) about 1, 9 times the length of median spur. First tarsomere about 1.6 the length of the lateral spur and 3.0 times the length median spur.

**Abdomen (Figs 41, 84).** Ventrites (Fig. 41) without moderately coarse punctures; last ventrite almost as long as the 4-ventrite. Pygidium (Fig. 84) with apical margin rounded and with moderately coarse and dense punctures.

**Male genitalia (Figs 97, 103).** Median lobe (Fig. 97) about 5.0 times its widest at apical region. Ventral valve with lateral margins almost straight and acuminate apex, dorsal valve subtriangular, with lateral margins almost straight, rounded apically. Internal sac (Fig. 97) in the apical region with a pair of hollow, ovoid, tuberculate sclerites. Median region with a pair of blades serrate at lateral margins and apex; unpaired whisbone sclerite. Basal region with several small denticles close to ejaculatory ducto. Tegmen (Fig. 103) with moderate, rounded emargination between the enlarged lateral lobes.

**Female.** Similar to male except 5<sup>th</sup> abdominal sternum not emarginate and pygidium with apical margin bilobed.

**Distribution (Fig. 122).** Brazil (Pará, Mato Grosso, Goiás, Ceará, Rio Grande do Norte, Rio de Janeiro), French Guiana, Puerto Rico, Suriname, Bolívia.

**Host plants (Tab. I).** **Combretaceae:** *Terminalia corrugata* (Ducke) Gere & Boatwr., *Terminalia tetraphylla* (Aubl.) Gere & Boatwr.

*A. schwarzi* Kingsolver, 1970

(Figs 4, 16, 29, 42, 55, 71, 72, 85, 98, 104, 122)

*Amblycerus schwarzi* Kingsolver, 1970: 477 (desc., type, distr., key, host); Johnson and Kingsolver, 1981: 410 (distr.); Udayagiri and Wadhi, 1989:14 (cat., distr., host.); Johnson and Siemens, 1991: 165 (bio.); Romero *et al.*, 1996: 86, 87, 158 (distr., host., key); Marin and Kingsolver, 1997 (host., new record distr.); Romero *et al.*, 2002 (phyl.).

#### **Type material examined.**

Paratype deposited in DZUP, 1 male, with labels: 17.iv - 26. viii, 1938. Oxf. Um. \ CAYMAN IS. \ Bio. Exped. coll. by C. B. Lewis, G. H. Thompson.; 13.v.1938. \ Grand \ Cayman, \ East end of. East End. \ Light trap A.; PARATYPE [label with blue border] \ Amblycerus \ schwarzi \ Kingsolver; DZUP \ 130646; *Amblycerus schwarzi* \ Kingsolver, 1970 \ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. Paratype deposited in DZUP, 1 female, with labels: Cayamas \ [illegible] Cuba; E A Schwarz \ Collector; ♀; PARATYPE [label with a blue border] \ Amblycerus \ schwarzi \ Kingsolver '70; DZUP \ 130645; *Amblycerus schwarzi* \ Kingsolver, 1970 \ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. Paratype deposited in DZUP, 1 male, with labels: Randia mitis \ Sauri Finca \ Ponce, P. R \ Coll. 8 Aug 31 \ R. G. Oakley; Randis mitis \ Flower, 88. 33 \ Ponce PR. \ RG Oakley \ S. J. 4515; PARATYPE [label with blue border] \ Amblycerus \ schwarzi \ Kingsolver; DZUP \ 130644; *Amblycerus schwarzi* \ Kingsolver, 1970 \ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018; Depository: DZUP.

#### **Additional material examined.**

[1 specimen male]: USA: FLA: Monroe Co. \ N. Big Pine Key \ Wastson's Hammock \ 29.VIII.95, Manchineel \ nuts, S. Peck, 95-64; *Amblycerus schwarzi* \ Kingsolver, 1970 \

Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen female]: USA: FLA: Monroe Co.\ N. Big Pine Key\ Wastson's Hammock\ 29. VIII. 95, Manchineel\ nuts, S. Peck, 95-64; First Record [label with green border]\ North American\ *Amblycerus schwarzi* Kingsolver\ det. JMK 95; *Amblycerus schwarzi*\ Kingsolver, 1970\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen female]: BAHAMAS: Great Inagua\ South Bay road; blacklight\ trap in *Coccothrinax* forest\ 10-VII-2007; [same label] colls. Thomas,\ Turnbow & Smith; *Amblycerus schwarzi*\ Kingsolver, 1970\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen female]: CUBA La Vene\ ciana, Guanabo\ C. Habana xii.95\ col. JA. Genaió (?); Emerged from\ Tropical almond\ Terminalia; Terminalia\ catappa L.; *Amblycerus schwarzi*\ det. Kingsolver\ J. M. Kingsolver; *Amblycerus schwarzi*\ Kingsolver, 1970\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen female]: DOMINICAN REPUBLIC:\ Prov. Pedernales,\ Cabo Rojo, Alcoa\ 3-VII-98 R. Woodruff & R. Baranowski\ blacklight trap; *Amblycerus schwarzi*\ Kingsolver, 1970\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA).

**Measurements.** BL: 7.8 mm; BW: 4.0 mm

**Diagnosis (Figs 85, 98, 104).** *A. schwarzi* is characterized by the following characters in combination: eyes strongly prominent laterally, closer at base, ocular index: 10.0; pronotum and elytra covered with grayish seta; metepisternum with coarse, conspicuous punctures; hind tibia with lateral spur about 3.0 longer than median spur, 1-tarsome about 4.8 times the length of median spur; pygidium (Fig. 85) with coarse and sparse punctures; male genitalia, internal sac (Fig. 98) in the apical region with one pair of subcylindrical sclerites. *A. schwarzi* is very similar externally and internally to *A. dispar*, both have closer eyes at base (Figs 27, 29), and male genitalia with dorsal valve (Figs 96, 98) subtriangular and internal sac with unpair "J" sclerites. *A. dispar* differs from *A. schwarzi* by the frontal carina present (absent, *A. schwarzi*), cervical boss with three setae (two setae, *A. schwarzi*), median sulcus more than a half the length of the metaventrite (about as half the length of the metaventrite, *A. schwarzi*), last ventrite almost as long as 4-ventrite (almost two times as long as the 4-ventrite, *A. schwarzi*) and internal sac of male genitalia without a pair of sclerite in the apical region (one pair, *A. schwarzi*).

**Distribution (Fig. 122).** Cuba, Curacao, Grand Cayman Island, Jamaica, Puerto Rico, Saint Croix, Virgin Islands and United States.

**New Records (Fig. 122).** Bahamas and Republic Dominican.

**Host Plants (Tab. I).** **Combretaceae:** *Terminalia catappa* L. **Euphorbiaceae:** *Hippomane mancinella* L., *Ricinus communis* L. **Verbenaceae:** *Tectona grandis* L. **Rubiaceae:** *Guettarda* sp.

*A. taeniopygus* Ribeiro-Costa, 1999  
(Figs 4, 7, 17, 30, 43, 56, 73, 86, 99, 105, 123)

*Amblycerus taeniopygus* Ribeiro-Costa, 1999c: 236-237 (desc., distr., gen., type); Ribeiro-Costa *et al.*, 2018 (cat., distr., host).

**Type material examined.**

Holotype deposited in CNCI, male, with labels: 10 [blue label with red borders and black writing]; Brazil, Cuyaba\ Matto Grosso; L. J. Bottimer\ Collection\ N°. 61C; CNC; HOLÓTIPO [red label and black writing]\ *Amblycerus taeniopygus*\ Ribeiro-Costa, 1999.

**Measurements.** BL: 7.9 mm; BW: 4.1 mm.

**Diagnosis (Figs 30, 73, 99, 105).** *A. taeniopygus* is characterized by the internal sac of male genitalia without sclerites in the apical region (Figs 99, 105), median region with a pair of blades with denticulate, round structure and without unpaired sclerite. *A. taeniopygus* can be separated from *A. insuturatus* and *A. sp. n.* by the internal sac of male genitalia at apical region without a pair of sclerite (present, *A. insuturatus* and *A. sp. n.*).

**Distribution (Fig. 123).** Brazil (Mato Grosso).

**Host plants.** Unknown.



*Amblycerus* sp. n.

(Figs 4, 18, 31, 44, 57, 74, 87, 100, 106, 123)

**Type material.**

Holotype deposited in DZUP, male, with label: Mineiros - GO\ X-1994\ Magno Col.

**Diagnosis (Figs 100).** *A. sp. n.* is very similar externally and internally to *A. insuturatus*, which differs by the frontoclypeal suture distinct (indistinct, *A. insuturatus*), cervical boss with four setae (three setae, *A. insuturatus*), the last ventrite almost two times as long as the 4-ventrite (almost as long as 4-ventrite, *A. insuturatus*), internal sac of male genitalia in the apical region with a subtriangular sclerites (with a pair of ovoid sclerites, *A. insuturatus*), unpaired median subtrapezoidal sclerite (wishbone sclerite, *A. insuturatus*).

**Description:** BL: 7.9 mm; BW: 4.6 mm.

**Integument color (Figs 18, 44, 87).** Body red, except antennae light red.

**Vestiture (Figs 18, 31, 44, 57, 87).** Body covered with orange setae. Pronotum and elytra uniformly orange. Scutellum light yellow. Pygidium with median stripe of light yellow.

**Head (Fig. 31).** Frons covered with fine and moderate dense coarse punctures; without frontal carina. Eyes distant at base, ocular index: 3.0; ocular *sinus*: 1.3. Postocular lobe 0.3 the eye length. Antennae reaching anterior margin of hind coxae; serrated from 4-10 antennomeres; antennomere 7 about 1.4 longer than wide, last antennomere subelliptic. Frontoclypeal suture distinct. Clypeus covered with fine and moderate coarse punctures except in narrow apical margin. Labrum with few fine punctures on basal margin.

**Prothorax (Fig. 57).** Pronotum (Fig. 57) trapezoidal with lateral margins slightly curved, covered laterally by coarse and dense punctures; lateral carina almost reaching the posterior margin of pronotum; cervical boss with four setae; cervical sulcus conspicuous behind eyes. Prosternal process longer than anterior coxae, gently arched between coxae and slightly constricted between coxae.

**Mesothorax and Metathorax (Figs 18, 44, 74).** Scutellum (Fig. 74) about 1, 5 longer than wide, tridentate in apical margin, median tooth longer than the lateral ones. Elytra (Fig. 18) with striae strongly impressed, all free apically. Metepisternum (Fig. 44) with moderately coarse and sparse punctures; metepisternal sulcus with transverse axis gently oblique; the longitudinal axis about  $\frac{1}{2}$  the length of the metepisternum. Metaventrite (Fig. 44) not prominent in lateral view, without punctures and median sulcus about more than a half as long as metaventrite. Metacoxae (Fig. 44) with coarse punctures. Hind tibia with lateral spur (Fig. 44) about 2.0 times the length of median spur.

**Abdomen (Figs 44, 87).** Ventrites (Fig. 44) without moderately coarse punctures; last ventrite almost two times as long as the 4-ventrite. Pygidium (Fig. 87) with apical margin rounded and with moderately coarse and dense punctures.

**Male genitalia (Figs 100, 106).** Median lobe (Fig. 100) about 4.2 times its widest at apical region. Ventral valve with lateral margins almost straight and acuminate apex. Dorsal valve subtriangular, with lateral margins almost straight, rounded apically. Internal sac (Fig. 100) in the apical region with a pair of hollow, ovoid, tuberculate sclerites. Median region with a pair of blades serrate at lateral margin; unpaired whisbone sclerite. Tegmen (Fig. 106) with moderate, rounded, emargination between the enlarged lateral lobes.

**Female.** Unknown.

**Distribution (Fig. 123).** Brazil (Goiás).

**Host Plants.** Unknown.

#### *Group spondiae*

(Figs 4, 9, 10, 19-22, 32-35, 45-48, 58-61, 75-78, 88-91, 107-114, 124, 125)

Species included: *A. alternatus* (Pic, 1954), *A. cuernavacensis* Romero, Johnson & Kingsolver, 1996, *A. spondiae* Kingsolver, 1980 and *A. vitis* (Schaeffer, 1907).

**Diagnosis.** Group *spondiae* is characterized by the following combination of characters: pronotum entirely covered with coarse punctures (Figs 58-61) and elytra with strips of setae. Male genitalia (Figs 107-110), internal sac in the apical region with a pair of sclerites, median region with a pair of serrate blades at margin and apex and unpaired sclerite.

### 3. 2 Key to males of *spondiae* group

1. Pygidium with setae homogeneously distributed, without a distinct median strip of setae (Fig. 91). Hind tibiae with lateral spur about 1.2 times longer than median spur..... *A. vitis* (Schaeffer, 1907)
- 1'. Pygidium with a median strip of setae (Figs 88, 89, 90). Hind tibiae with lateral spur almost two times longer than median spur (Figs 45, 46, 47).....2
2. Frontoclypeal suture distinct. Elytra with dense stripe of setae distributed in all interestriae (Figs 20, 21). Metepisternum with coarse punctures (Figs 46, 47), metepisternal sulcus with transverse axis gently oblique.....3
- 2'. Frontoclypeal suture indistinct (Fig. 32). Elytra with dense stripe of setae more conspicuous in interestriae 3, 5, 7 and 9 (Fig. 19). Metepisternum with moderately coarse punctures, metepisternal sulcus with transverse axis straight (Fig. 45).....*A. alternatus* (Pic, 1954)
3. Antenna short, not reaching anterior margin of hind coxa; serrate, antennomere 7 about 1.3 longer than wide (Fig. 47). Pronotum subquadrate, with median strip of setae and tufts in lateral areas (Fig. 60), cervical boss with three setae. Scutellum tridentate, median tooth longer than the lateral ones (Fig. 77). Metaventricle with median sulcus more than a half the length of the sclerite.....*A. spondiae* Kingsolver, 1980
- 3'. Antenna long, reaching anterior margin of hind coxa; strongly serrate, antennomere 7 about 1.7 longer than wide (Fig. 46). Pronotum subtrapezoidal, with five dense strips of setae (Fig. 59), cervical boss with two setae. Scutellum tridentate, all teeth with the same length (Fig. 76). Metaventricle with median sulcus about as half as the length of the sclerite.....*A. cuernavacensis* Romero, Johnson and Kingsolver, 1996

**Comparative notes.** Within the *spondiae* group, *A. alternatus* and *A. spondiae* share with *A. cuernavacensis* lateral spur about two times longer than median spur, presence of strip of yellowish setae in pygidium, while *A. vitis* have lateral spur almost the same size than median spur and pygidium without strip of yellowish setae. Concerning to internal characters, *A. alternatus*, *A. vitis* and *A. spondiae*, share more similarities within each other than with *A. cuernavacensis*, male genitalia with ventral valve with obtuse apex and median region with wishbone sclerite, while in *A. cuernavacensis* the ventral valve is rounded and the unpaired sclerite is trapezoidal.

**Geographical distribution (Figs 124, 125).** This species group occurs from the United States to Brazil.

**Host plants (Tab. I).** Species of the *spondiae* group are found in five families of plants, Boraginaceae, Anacardiaceae, Rhamnaceae, Euphorbiaceae and Vitaceae.

*A. alternatus* (Pic, 1954)

(Figs 9, 10, 19, 32, 45, 58, 75, 88, 107, 111, 124)

*Spermophagus alternatus* Pic, 1954: 13-16 (desc.).

*Amblycerus alternatus*: Kingsolver, 1980: 241 (cit.); Romero *et al.*, 1996 (desc., type, distr., key); Romero *et al.*, 2002 (phyl.).

**Type material examined.**

Holotype deposited in MNHN, 1 male, with labels: *Alternatus* \ nsp [handwritten symbol]; type [handwritten]; HOLOTYPE ♂ [handwritten symbol] \ *Spermophagus* \ *alternatus* \ Pic [label with red border]; *Amblycerus* \ *alternatus* \ (Pic) \ det. 76 \ J. M. Kingsolver; MUSÉUM PARIS \ 1958 \ coll. M. PIC; *Amblycerus alternatus* \ (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. Paratype deposited in MNHN, 1 female, with labels: Colombie [handwritten]; PARATYPE [red label written in black]; *alternatus* \ Pic \ det. \ J. M. Kingsolver; MUSÉUM PARIS \ 1958 \ coll. M. PIC; *Amblycerus alternatus* \ (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. Paratype deposited in MNHN, 1 female, with labels: Colombie [handwritten]; PARATYPE [red label written in black]; *alternatus* \ Pic \ det. \ J. M. Kingsolver; MUSÉUM PARIS \ 1958 \ coll. M. PIC;

*Amblycerus alternatus* (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. Paratype deposited in MNHN, 1 female, with labels: Columb [handwritten]/ Spermophag/cervinus. \ Volg [illegible]; PARATYPE [red label written in black]; *alternatus* \ Pic \ det. \ J. M. Kingsolver; MUSÉUM PARIS \ 1958 \ coll. M. PIC; *Amblycerus alternatus* (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017.

#### **Additional material examined.**

[1 specimen male]: Ft. Clayton \ Panama C. Z. \ 1 Mar. '70 \ H. Stockwell \ *alternatus*; *Amblycerus alternatus* (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. (DZUP). [1 specimen female]: GUATEMALA: Zacapa \ rd. to San Lorenzo \ 1000 m., mv + bl, 15 \ Oct. 2006, R. Turnbow; *Amblycerus alternatus* (Pic) \ det. \ J. M. Kingsolver; *Amblycerus alternatus* (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. (FSCA). [1 specimen male]: PANAMA: Bayano \ 10.6 km. E Canita \ 29 June 1997 \ R. Turnbow ♂ [handwritten symbol]; *Amblycerus alternatus* (Pic) \ det. \ J. M. Kingsolver; *Amblycerus alternatus* (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. (FSCA). [1 specimen male]: Brasil Pará \ São João de Pirabas \ Japerica \ 20 a 22-XII-1992; Armadilha \ Malaise; MPEG 01019977; *Amblycerus* sp. \ Viana, JH det. 2016; *Amblycerus alternatus* (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. (MPEG). [1 specimen female]: Brasil Pará \ São João de Pirabas \ Japerica \ Ilha Conceição \ 22-XII-1992; Coleoptera: Polyphaga \ Chrysomeliformia: \ Curculionoidea: \ Bruchidae: \ Incorp: 24.v.2002; MPEG 01019977; *Amblycerus* sp. \ Viana, J. H. det. 2016; *Amblycerus alternatus* (Pic, 1954) \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. (MPEG).

**Measurements.** BL: 6.0 mm; BW: 3.5 mm.

**Diagnosis (Figs 32, 107).** *A. alternatus* is characterized by the following characters in combination: eyes distant at base, ocular index: 4.6; elytra with dense stripes of setae more conspicuous in interestriae 3, 5, 7 and 9; internal sac of male genitalia (Fig. 107) in the apical region with a pair of hollow, subtriangular, tuberculate sclerite. *A. alternatus* differs from *A. spondiae* by the frontoclypeal suture indistinct (distinct, *A. spondiae*), cervical boss with two setae (three setae, *A. spondiae*), median sulcus about as half as long as metaventrite (more than a half as long as metaventrite, *A. spondiae*) and apical region with a pair of hollow, subtriangular, tuberculate sclerites (with a pair of hollow,

subtriangular not tuberculate sclerites, *A. spondiae*). *A. alternatus* differs from *A. vitis* in the apical region of male genitalia where a pair of subtriangular sclerite is tuberculate (smooth, *A. vitis*) and in the median region, it has a short unpaired wishbone sclerite (longer, *A. vitis*). *A. alternatus* differs to *A. cuernavacensis* by the indistinct frontoclypeal suture (distinct, *A. cuernavacensis*), lateral carina almost reaching the posterior margin of pronotum (reaching the posterior margin, *A. cuernavacensis*) and scutellum tridentate with median tooth longer than the lateral ones (all teeth with same length, *A. cuernavacensis*).

**Distribution (Fig. 124).** Colombia, Honduras, Mexico, Panama and Brazil.

**New Records (Fig. 124).** Guatemala.

**Host plants (Tab. I).** Unknown.

*A. cuernavacensis* Romero, Johnson and Kingsolver, 1996  
(Figs 20, 33, 46, 59, 76, 89, 108, 112, 124)

*Amblycerus cuernavacensis* Romero *et al.*, 1996 (desc., type, distr., key); Romero *et al.*, 2002 (phyl.).

**Type material examined.**

The type material was requested to the USNM, however, the sending of the material was not authorized due to changes in the Brazilian legislation at that moment. The species recognition was done through the *A. cuernavacensis* original description and illustration of the male genitalia (Romero *et al.*, 1996).

**Additional material examined.**

[1 specimen male]: Ajijic, JAL., MEX. \ 13 May, 1964 \ WLNutting \ at lt. 5140'; *Amblycerus* sp. ♂ [handwritten symbol]; *Amblycerus* \ *cuernavacensis* \ det. R. J. + K. \ J. M. Kingsolver; *Amblycerus cuernavacensis* \ Romero, Johnson and Kingsolver, 1996 \ Det.: A. T. Santos; \ C. S. Ribeiro-Costa, 2017. (FSCA).

**Measurements.** BL: 6.8 mm; BW: 3.9 mm.

**Diagnosis (Figs 33, 108).** *A. cuernavacensis* is characterized by the following characters in combination: pronotum subtrapezoidal in dorsal view with five dense strips of setae (Fig. 59); internal sac of male genitalia (Fig. 108) with a pair of hollow, subquadrate, tuberculate sclerites in the apical region and median region with an unpaired trapezoidal sclerite. *A. cuernavacensis* differs from *A. spondiae* by the lateral carina reaching the posterior margin of pronotum (almost reaching the posterior margin of pronotum, *A. spondiae*), cervical boss with two setae (three setae, *A. spondiae*) and scutellum tridentate with all teeth with same length (median tooth longer, *A. spondiae*). *A. cuernavacensis* can be distinguished from *A. alternatus* by the distinct frontoclypeal suture (indistinct, *A. alternatus*), lateral carina reaching the posterior margin of pronotum (almost reaching, *A. alternatus*) and scutellum tridentate with all teeth with same length (median tooth longer than the lateral ones, *A. alternatus*). *A. cuernavacensis* can be distinguished from *A. vitis* by the subquadrate and tuberculate apical sclerite (subtriangular, non-tuberculated, *A. vitis*) and in median region *A. cuernavacensis* has unpaired, subtrapezoidal sclerite (longer wishbone sclerite, *A. vitis*).

**Distribution (Fig. 124).** Mexico.

**Host Plants (Tab. I).** Unknown.

*A. spondiae* Kingsolver, 1980

(Figs 21, 34, 47, 60, 77, 90, 109, 114, 125)

*Amblycerus spondiae* Kingsolver, 1980: 239 (desc., type, distr., key, host); Janzen, 1980: 933, 935, 947 (bio., host.); Janzen, 1981: 272 (bio., host.); Pfaffenberger, 1985: 2 (cit.); Johnson and Kingsolver, 1981: 410 (distr.); Udayagiri and Wadhi, 1989:15 (cat., distr., host.); Romero *et al.*, 1996: 86, 87, 158 (descr., host, key, distri., spp. groups); Romero *et al.*, 2002 (phyl., host).

**Type material examined.**

Paratype deposited in AMNH, 1 male, with labels: Rabinal, Guate.\ 3000 ft.\ VII-2-1947; F. Johnson\ Donor, Cols.\ C & P Vaurie; PARATYPE [white label with borders and



writing in blue] ♂ [handwritten symbol] \ Amblycerus\ spondiae\ Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017. Paratypes deposited in AMNH, 2 males, with labels: Salama, Guate. \ 3000 ft. \ VII-24-1947; F. Johnson \ Donor, Cols. \ C & P Vaurie; PARATYPE [white label with borders and writing in blue] ♂ [handwritten symbol] \ Amblycerus\ spondiae\ Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017. Paratype deposited in AMNH, 1 male, with labels: Amatitlan \ Guate., 4000 ft. \ VIII-24-1947; F. Johnson \ Donor, Cols. \ C & P Vaurie; amnh; PARATYPE [white label with borders and writing in blue] ♂ [handwritten symbol] \ Amblycerus\ spondiae\ Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017. Paratypes deposited in AMNH, 2 males, with labels: Amatitlan \ Guate., 4000 ft. \ VIII-24-1947; F. Johnson \ Donor, Cols. \ C & P Vaurie; AMNH; PARATYPE [white label with borders and writing in blue] ♂ [handwritten symbol] \ Amblycerus\ spondiae\ Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017. Depository: AMNH. Paratype deposited in USNM, 1 male, with labels: COSTA RICA \ Guanacaste Prov. \ R. Carroll, coll.; Palo Verde, OTS \ COMELCO A \ 17-XI-1971 \ Spondias mombin. Bag2; PARATYPE [white label with borders and writing in blue] \ Amblycerus\ spondiae\ Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017. Paratype deposited in USNM, 1 female, with labels: COSTA RICA \ Guanacaste Prov. \ R. Carroll, coll.; Palo Verde, OTS \ COMELCO A ♀ [handwritten symbol] \ 17-XI-1971 \ Spondias mombin. Bag2; PARATYPE [white label with borders and writing in blue] \ Amblycerus\ spondiae\ Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017. Paratype deposited in USNM, 1 male, with labels: COSTA RICA: \ Guanacaste Prov. \ Finca La Pacifica \ 5-6-III-1973; Riparian forest, \ dry leaf litter \ D. R. Whitehead; PARATYPE [white label with borders and writing in blue] ♂ [handwritten symbol] \ Amblycerus\ spondiae\ Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017.

#### **Additional material examined.**

[1 specimen male]: MEX., 25 mi. S. \ Malpaso, Chis. \ V.25.1969 \ J. M. Campbell; *Amblycerus* \ *lineolatus* \ (motsch.) \ det. J. M. Kingsolver; *Amblycerus spondiae* \ Kingsolver, 1980 \ Det.: A. T. Santos; C. S. \ Ribeiro-Costa, 2017. (USNM). [1 specimen

male]: MEX., Guerro\ Nr. Ixtapa\ IV-9-1984\ J. E. Wappes ♂ [handwritten symbol];  
*Amblycerus spondiae*\ Kingsolver\ det. J. M. Kingsolver; *Amblycerus spondiae*\  
 Kingsolver, 1980\ Det.: A. T. Santos; C. S.\ Ribeiro-Costa, 2017. (FSCA). [1 specimen  
 male]: MEXICO, CHIAPAS\ 17 KM W TUXTLA GTZ.\ OCT 4-6 1986\ E. GIESBERT,  
 COLL. ♂ [handwritten symbol]; *Amblycerus spondiae*\ Kingsolver\ det. J. M.  
 Kingsolver; *Amblycerus spondiae*\ Kingsolver, 1980\ Det.: A. T. Santos; C. S.\ Ribeiro-  
 Costa, 2017. (FSCA). [1 specimen male]: Mexico: interc\ 15 mar 1976\ S. Diego 3440;  
 CDA Mex\ Mss\ det.\ J. M. Kingsolver; *Amblycerus spondiae*\ Kingsolver, 1980\ Det.:  
 A. T. Santos; C. S.\ Ribeiro-Costa, 2017. (USNM). [1 specimen male]: MEXICO:  
 Chiapas,\ 25 mi. Sw. Cintalapa\ July 11, 1971\ Clark, Murray\ Hart, Schaffner; TAM;  
*Amblycerus spondiae*\ Kingsolver, 1980\ Det.: A. T. Santos; C. S.\ Ribeiro-Costa, 2017.  
 (USNM). [2 specimens males]: Sam Jeronimo\ B. V. P., Guate.\ 3000 ft.\ VII-27-1947;  
 F. Johnson\ Donor, Cols.\ C & P Vaurie; gravidus [handwritten]; *Amblycerus spondiae*\  
 KINGSOLVER\ Det. J. Romero N. 99'; *Amblycerus spondiae*\ Kingsolver, 1980\ Det.:  
 A. T. Santos; C. S.\ Ribeiro-Costa, 2017. (AMNH). [1 specimen male]: HONDURAS: El  
 Pariso [Paraiso] Dpt.\ El Portillo (Apaguis Mts.)\ 7km. S. Danli 12-X-1993\ P. [R.] W.  
 Skillman Jr.; *Spondiae*\ ???\ det. J. M. Kingsolver; *Amblycerus spondiae*\ Kingsolver,  
 1980\ Det.: A. T. Santos; C. S.\ Ribeiro-Costa, 2017. (FSCA). [1 specimen female]:  
 HONDURAS: El Paraiso\ Yuscaran Cerro Monserrat\ 10-31 Mar 1993\ rcol. R. Ortega  
 ♀ [handwritten symbol]; *Amblycerus spondiae*\ Kingsolver\ det. J. M. Kingsolver;  
*Amblycerus spondiae*\ Kingsolver, 1980\ Det.: A. T. Santos; C. S.\ Ribeiro-Costa, 2017.  
 (FSCA). [1 specimen male]: NICARAGUA: Matagalpa:\ 10 km NW Matagalpa, Selva  
 Negra, 10-18-IV-2005, 1280 m\ 12°59'N, 85°54'W, W. Opitz\ beating forest edge  
 vegetation\ Male; *Amblycerus spondiae*\ Kingsolver, 1980\ Det.: A. T. Santos; C. S.\  
 Ribeiro-Costa, 2017. (FSCA). [1 specimen female]: COSTA RICA\ Guanacaste Prov.\  
 D. H. Janzen et al\ 1 MAY - 1976; FINCA LA PACIFICA; Capparis sp 2\ 1900-2000  
 pm; ? *spondiae* [handwriting in red]\ det.\ J. M. Kingsolver; [♀]; *Amblycerus spondiae*\  
 Kingsolver, 1980\ Det.: A. T. Santos; C. S.\ Ribeiro-Costa, 2017. (USNM). [1 specimen  
 male]: COSTA RICA. Punt.\ Monteverde. 1400 m\ -24. VIII.1987\ H & A. Howden;  
 HFH; *Amblycerus spondiae*\ Kingsolver\ det. J. M. Kingsolver; *Amblycerus spondiae*\  
 Kingsolver, 1980\ Det.: A. T. Santos; C. S.\ Ribeiro-Costa, 2017. (FSCA).

**Measurements.** BL: 9.3 mm; BW: 4.7 mm.

**Diagnosis (Figs 34, 109).** *A. spondiae* is characterized by the following characters in combination: eyes distant at base, ocular index: 2.7 (Fig. 34); pronotum (Figs 58, 60) subquadrate with lateral margins slightly curved and lateral carina almost reaching the posterior margin of pronotum, with median strip of setae and tufts in lateral margins (Fig. 60); scutellum tridentate with median tooth longer than the lateral ones (Fig. 77); first tarsomere about 3.5 times the median spur; median lobe of male genitalia about 4.4 times its widest at apical region (Fig. 109); internal sac (Fig. 109) in the apical region with a pair of hollow, subtriangular sclerites.

Share some similarities externally and internally with *A. alternatus*, differs by the frontoclypeal suture distinct (indistinct, *A. alternatus*), cervical boss with three setae (two setae, *A. alternatus*), median sulcus more than a half as long as metaventrite (about as half as long as metaventrite *A. alternatus*) and apical region with a pair of hollow, subtriangular, not tuberculate sclerites (with a pair of hollow, subtriangular tuberculate sclerites, *A. alternatus*). *A. spondiae* differs from *A. cuernavacensis* by the lateral carina almost reaching the posterior margin of pronotum (reaching the posterior margin of pronotum, *A. cuernavacensis*), cervical boss with three setae (two setae, *A. cuernavacensis*) and scutellum tridentate with median tooth longer (all teeth with same length, *A. cuernavacensis*). *A. spondiae* differs from *A. vitis* by the apical sclerite subtriangular not tuberculate and acute apex (subtriangular, non-tuberculated apical sclerite, *A. vitis*) and in median region with a short, unpaired wishbone (longer wishbone sclerite, *A. vitis*).

**Distribution (Fig. 125).** Mexico, Guatemala, El Salvador, Costa Rica and Panama.

**New Record (Fig. 125).** Honduras.

**Host Plants (Tab. I).** **Anacardiaceae:** *Spondias mombin* L., *Spondias radlkoferi* Donn.-Sm. **Boraginaceae:** *Cordia dodecandra* DC. **Euphorbiaceae:** *Hippomane mancinella* L. **Rhamnaceae:** *Ziziphus mexicanus*.

**New Record. Capparaceae:** *Capparis* sp.

*A. vitis* (Schaeffer, 1907)

(Figs 22, 35, 48, 61, 78, 91, 110, 114, 125)

*Spermophagus vitis* Schaeffer, 1907: 293 (desc. type). For review of literature, see Romero *et al.* (1996).

**Type material examined.**

The type material was requested to the USNM, however, the sending of the material was not authorized due to changes in the Brazilian legislation at that moment. The species recognition was done through the *A. vitis* original description and illustration of the male genitalia (Romero *et al.*, 1996).

**Additional material examined.**

[1 specimen male]: USA, TX: Jeff Davis Co\ Davis Mts. Resorts\ VII-1/2-1995\ D. J. Heffern coll; *Amblycerus vitis*\ (Schaeffer, 1907)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (TAMU). [2 specimens males]: Cochise Stronghold\ Cochise Co., Az.\ X-14-73; Reared seeds\ N<sup>o</sup>. 552 or 558-13\ Reared seeds\ *Vitis*\ arizonica; C. D. Johnson\ Collector; *Amblycerus*\ vitis (Schaeffer)\ det. C. D. Johnson\ 19. (FSCA). [1 specimen male]: ARIZ, Huachuca Mts\ Copper Canyon W. of\ Montezuma Pass\ VII-24-1963; Collector\ G. H. Nelson; On *Rhus chlorophylla*; *Amblycerus vitis*\ (Schaeffer, 1907)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FSCA). [1 specimen male]: ARIZ. S. Rita Mts.\ Madera Canyon\ VIII-7-1961; G. H. Nelson\ & Family\ Collectors; at\ light; *Amblycerus vitis*\ (Schaeffer, 1907)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FSCA). [2 specimens males]: ARIZ. Santa Rita Mts.\ Pima Co., Box / Cyn.\ /3-/V/1-77\ J. M. Cicero; *Amblycerus vitis*\ (Schaeffer, 1907)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FSCA). [1 specimen male]: ARIZONA: CHIRICAHUA\ MTNS. CaveCr,\ Ranch 26 VII 87\ G. H. NELSON; ULTRAVIOLET\ LIGHT; *Amblycerus vitis*\ (Schaeffer, 1907)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FSCA). [1 specimen male]: ARIZONA: Cochise\ Co. Chiricahua\ Mts. Near Portal\ July 28-Aug. 7 1966; *Amblycerus*\ vitis\ (Schaeffer, 1907)\ J. M. Kingsolver; *Amblycerus vitis*\ (Schaeffer, 1907)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2017. (FSCA).

**Measurements.** BL: 5.0 mm; BW: 2.8 mm.

**Diagnosis (Figs 22, 35, 78, 110).** *A. vitis* is characterized by the following characters in combination: eyes distant at base, ocular index: 2.7 (Fig. 35); ocular sinus 2.6 and postocular lobe 0.2 the eye length; antennae longer, beyond anterior margin of hind coxae; prosternal process longer than anterior coxae and slightly constricted between coxae; scutellum (Fig. 78) 1.3 longer than wide; elytra (Fig. 22) with striae strongly impressed, at basal third striae 2-6 with punctures more isolated, all free apically; hind tibia lateral spur about 1.2 times the length of median spur; 1-tarsome about 2.5 times the length of the median spur; pygidium (Fig. 91) without strip of median setae and with moderately coarse and sparse punctures; median lobe of male genitalia (Fig. 110) (Fig. 110) about 4.2 times its widest at apical region; internal sac (Fig. 110) in the apical region with a pair of hollow, subtriangular sclerites. *A. vitis* is similar, internally, with the other three species of the *spondiae* group, differs, however, because it has subtriangular, non-tuberculated apical sclerite (subtriangular and tuberculate, *A. alternatus*; *A. cuernavacensis* has subquadrate, and *A. spondiae* has subtriangular not tuberculate but with acute apex); in median region, *A. vitis* shows longer wishbone sclerite (*A. alternatus* and *A. spondiae* have short, unpaired wishbone and *A. cuernavacensis* has unpaired, subtrapezoidal sclerite).

**Distribution (Fig. 125).** United States (Arizona and Texas).

**Host Plants (Tab. I).** Vitaceae: *Vitis arizonica* Engelm.

**New Records (Tab. I).** Anacardiaceae: *Rhus virens* var. *choriophylla* (Wooton & Standl.) L. D. Benson.

### 3. 3 Species excluded from the groups studied

Based on morphological characters the following species were removed from their original groups: *A. eustrophoides*, *A. serieguttatus* were removed from the group *alternatus* (Romero *et al.*, 1996) and *A. simulator* removed from the group *dispar* (Ribeiro-Costa, 1995).

*A. eustrophoides* (Schaeffer, 1904)

(Figs 23, 36, 49, 62, 79, 92, 115, 118, 126)

*Spermophagus eustrophoides* Schaeffer, 1904: 228 (desc., type, distr.). For review of literature, see Romero *et al.* (1996).

**Type material examined.**

The type material was requested to the USNM, however, the sending of the material was not authorized due to changes in the Brazilian legislation at that moment. The species recognition was done through the *A. eustrophoides* original description and illustration of the male genitalia (Romero *et al.*, 1996).

**Additional material examined.**

[1 specimen female]: Paradise\ Key Fla\ Mar 2. 19; H Barber.\ Collector; Spermophagus\ eustrophoides\ H. B 1920 (?) Schaeffer [label handwriting]; *Amblycerus eustrophoides*\ (Schaeffer, 1904)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (USNM). [1 specimen male]: Ac. 5409\ Coll Chas Palm; Kissimmee.\ Fla.; Spermophagus [label handwriting]; *Amblycerus eustrophoides*\ Bott.'60 (Schfr.); *Amblycerus eustrophoides*\ (Schaeffer, 1904)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (AMNH). [1 specimen male]: MEXICO Tamps.\ Hda. Santa Engracia\ May – June 1936\ M. McPhail; reared from\ “huilotillo”; eustrophoides [handwriting]; *Amblycerus eustrophoides*\ (Schaeffer, 1904)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (DZUP).

**Measurements.** BL: 8.5 mm; BW: 4.6 mm.

**Diagnosis (Figs 23, 36, 49, 62, 115).** *A. eustrophoides* is characterized by the following characters in combination: eyes (Fig. 36) distant at base, ocular index: 3.4; antennomere 7 about 2.2 longer than wide; pronotum (Fig. 62) subtrapezoidal with lateral margins straight; metepisternum (Fig. 49) with striated area; elytra (Fig. 23) with striae formed by isolated punctures, interestriae 4-5 and 6-7 fused apically; metafemur with tooth in apical margin; median lobe of male genitalia (Fig. 115) about 4.4 times its widest at apical region; internal sac (Fig. 115) with a pair of hollow, subcylindrical, tuberculate sclerites in the apical region. *A. eustrophoides* is most similar externally to *A. ischiodontus*

Ribeiro-Costa, 1999, belonging to the *ischiodontus* group (Ribeiro-Costa, 1995), which differs in dorsum and ventrites covered with light yellow setae (orange setae, *A. ischiodontus*), pronotum entirely covered by coarse and dense punctures (laterally, *A. ischiodontus*) and metepisternum with moderate coarse punctures (without moderate coarse punctures, *A. ischiodontus*). Other similar species is *A. stridulator*, belonging to the *stridulator* group (Romero *et al.*, 1996), however, *A. eustrophoides* has metepisternum with longitudinal, fusiform and striate file (with transverse, fusiform, curved and striate file, *A. stridulator*), elytra and pygidium without black setae (some black setae, *A. stridulator*) and median region of male genitalia with unpaired wishbone sclerite (one pair of thorn-shaped sclerite, *A. stridulator*). *A. eustrophoides* can still be differentiated from *A. pollens*, species belonging to the *pollens* group (Ribeiro-Costa, 1995), because it shows a tooth in metafemur (without tooth, *A. pollens*) and apical margin of hind tibia with all denticles of the same size (one denticle longer than others, *A. pollens*).

**Female.** Similar to male except for 5<sup>th</sup> abdominal sternum not emarginate.

**Distribution (Fig. 126).** United States, Mexico, Cuba and Costa Rica.

**Host Plant (Tab. I).** Euphorbiaceae: *Drypetes laterifolia* (Sw.) Krug & Urb.

**New Record (Tab. I).** Salicaceae: *Neopringlea* sp.

*A. serieguttatus* (Chevrolat, 1877)

(Figs 24, 37, 50, 63, 80, 93, 116, 119, 126)

*Spermophagus serieguttatus* Chevrolat, 1877: 125 (desc.). For review of literature, see Romero *et al.* (1996).

#### **Type material examined.**

It was not possible to examine the type material deposited in the NHRS, due to changes in the Brazilian legislation at that moment. The species recognition was done through the *A. serieguttatus* original description and the work of Romero *et al.*, (1996) that includes male genitalia illustrations.



### Additional material examined.

[1 specimen female]: MÉXICO: Yucatan\ 2 km. E ChitzenItza\ 25 May 1984\ R. Turnbown; TUR; *Amblycerus serieguttatus* (Chev.)\ Det. J. Romero '91; *Amblycerus serieguttatus* (Chevrolat, 1877)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen male]: COSTA RICA, Punt. Prv.\ 6 km. S. Sta. Elena\ June 6-7, 1983\ J. E. Wappes; *Amblycerus serieguttatus* Chevrolat\ det.\ J. M. Kingsolver; *Amblycerus serieguttatus* (Chevrolat, 1877)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen male]: Nicaragua:\ Leon/ UV\ 20-1-93\ M. Pogatshnik; *Amblycerus serieguttatus* ? (Sharp)\ Ribeiro-Costa, C. S. det. 20; *Amblycerus serieguttatus* (Chevrolat, 1877)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen male]: PANAMA: Coclé Prov.\ El Valle rd., 650 m.\ 20 May 1991\ R. Turnbow; *Amblycerus serieguttatus* (Chevrolat, 1877)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen male]: PANAMA: Coclé\ El Vale\ 19 Feb. 1999\ R. Turnbown; *Amblycerus serieguttatus* (Chevrolat, 1877)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [1 specimen male]: TOBAGO: Speyside\ 30-V-1996\ B. K. Dozier; Collector\ B. K. Dozier; in\ *serieguttatus*\ grp\ det.\ J. M. Kingsolver; Bolivia\ Amblyc. A 15 [label handwriting]; *Amblycerus serieguttatus* (Chevrolat, 1877)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (FSCA). [3 specimens males]: 53 420; Hist. - Coll. (Coleoptera)\ Nr. 53420\ Spermophagus\ alternans N.\ Columb. Moritz.\ Zool. Mus. Berlin; *Amblycerus serieguttatus* (Chevrolat, 1877)\ C. S. Ribeiro-Costa det. 2015; *Amblycerus serieguttatus* (Chevrolat, 1877)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (ZMHB).

**Measurements.** BL: 6.8 mm; BW: 3.3 mm.

**Diagnosis (Figs 24, 37, 116).** *A. serieguttatus* is characterized by the following characters in combination: eyes (Fig. 37) distant at base, ocular index: 4.0; elytra (Fig. 24) with tufts of dense setae in interestriae 3, 5, 7, 9; median lobe of male genitalia (Fig. 116) about 3.6 times its widest at apical region; internal sac (Fig. 116) with a pair of hollow, subcircular, tuberculate sclerites in the apical region; median region of internal sac with a pair of hand-shaped sclerites. *A. serieguttatus* is similar externally to *A. galapagoensis* that differs in lateral carina almost reaching the posterior margin of pronotum (reaching the posterior margin of pronotum, *A. galapagoensis*) and scutellum tridentate, median tooth longer than the lateral ones (scutellum unidentate, *A. galapagoensis*). Other similar species is *A.*

*luteonotatus*, belonging to the *luteonotatus* group (Ribeiro-Costa, 1995), but in *A. serieguttatus*, the prosternal process is expanded beyond anterior coxae, but do not reaching the median legs (expanded beyond anterior coxae and reaching the median legs, *A. luteonotatus*).

**Distribution (Fig. 126).** Costa Rica, Guatemala, Panama, Venezuela and Mexico.

**New Records (Fig. 126).** Trinidad and Tobago, Nicaragua, United States, Argentina.

**Host Plants (Tab. I).** Unknown.

*A. simulator* (Jacquelin Du Val, 1857)  
(Figs 25, 38, 51, 64, 81, 94, 117, 120, 126)

*Spermophagus simulator* Jacquelin Du Val, 1857: 167-168 (desc., distr.). For review of literature, see Ribeiro-Costa *et al.* (2018).

**Type material examined.**

The type material was requested to the MNHN and it was not found. The recognition of *A. simulator* was done by original description, comparison with material previously identified and compared with the type material by J. M. Kingsolver and work that illustrated the male genitalia (Ribeiro-Costa, 1995).

**Additional material examined.**

[1 specimen male]: Faz. Nova Orlandia\ Jataí, Go - Brasil\ I. 964 - Martins,\ Morgante & Silva.; Dep. Zool.\ São Paulo; *Amblycerus simulator* (Jac-Duv)\ det.\ J. M. Kingsolver; *Amblycerus simulator* (Jacquelin Duval, 1857)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (MZSP). [1 specimen female]: Faz. Aceiro ♀ [symbol handwriting]\ Jatai, Goiás - Brasil\ X. 1962\ Exp. Dep. Zool.; Dep. Zool.\ São Paulo; *Amblycerus simulator* (Jac-Duval, 1857)\ Ribeiro-Costa, C. S\ det. 1991; *Amblycerus simulator* (Jacquelin Duval, 1857)\ Det.: A. T. Santos; C. S. Ribeiro-Costa, 2018. (MZSP).

**Redescription.** BL: 6.7 mm; BW: 3.5 mm.

**Diagnosis (Figs 38, 51, 81, 94, 117).** *A. simulator* is characterized by the following characters in combination: head (Fig. 38) entirely covered by only fine punctures; eyes (Fig. 38) closer at base, ocular index: 7.5; antennomere 7 about 1.1 longer than wide; scutellum (Fig. 81) about 6.3 longer than wide, bidentate; longitudinal (Fig. 51) axis  $\frac{1}{4}$  the length of metepisternum; first tarsomere (Fig. 51) about 2.6 the length of the median spur; pygidium (Fig. 94) with apical margin subtruncated; median lobe of male genitalia (Fig. 117) about 6.1 times its widest at the apical region; internal sac (Fig. 117) in the apical region with elongate unpaired sclerite in form of inverted “V”, in lateral view (Fig. 117); median region with a subcylindrical unpaired sclerite and a pair of short, angulate sclerites. The species was not similar to another one examined.

**Integument color (Figs 25, 51, 94).** Dorsum and abdomen red, except head and the ventral region (except abdomen) dark red or entirely deep red.

**Vestiture (Figs 25, 51, 64, 94).** Body covered with light yellow and brown setae. Pronotum and elytra mottled with light yellow and brown setae uniformly distributed. Scutellum light yellow. Ventral region with dark integument mottled with gray and brown setae. Pygidium with median faint stripe of light yellow.

**Head (Fig. 38).** Frons covered with only fine punctures, without frontal carina. Eyes strongly prominent laterally; ocular index: 7.5; ocular *sinus*: 1.6 and postocular lobe about 0.2 the eye length. Antennae (Fig. 51) not reaching anterior margin of hind coxae, serrate from antennomeres 4-10; antennomere 7 about 1.1 longer than wide, last antennomere subelliptic. Frontoclypeal suture indistinct. Clypeus covered with fine punctures, except in narrow apical margin. Labrum with few fine punctures on basal margin.

**Prothorax (Fig. 64).** Pronotum trapezoidal with lateral margins strongly curved, covered laterally by coarse and dense punctures; lateral carina reaching the posterior margin of pronotum; cervical boss with two setae; cervical sulcus conspicuous behind eyes. Prosternal process expanded beyond anterior coxae, curved and gently constricted between coxae.

**Mesothorax and Metathorax (Figs 25, 51, 81).** Scutellum (Fig. 81) about 6.3 longer than wide, bidentate. Elytra (Fig. 25) with striae strongly impressed, all free apically.

Metepisternum (Fig. 51) with moderately coarse and sparse punctures; metepisternal sulcus with transverse axis gently oblique; the longitudinal axis about 1/4 of the length of the metepisternum. Metaventricle (Fig. 51) not prominent in lateral view, without punctures and median sulcus more than a half as long as metaventricle. Metacoxae (Fig. 51) with coarse punctures. Hind tibia (Fig. 51) with lateral spur about 1.8 times the length of the median spur. First tarsomere about 1.4 times the length of the lateral spur and 2.6 times the length of median spur.

**Abdomen (Figs 51, 94).** Ventrites (Fig. 51) with moderately coarse punctures; last ventrite almost two times as long as the 4-ventrite. Pygidium (Fig. 94) with apical margin subtruncated and with coarse and sparse punctures.

**Male genitalia (Figs 117, 120).** Median lobe (Fig. 117) about 6.1 times its widest at the apical region. Ventral valve with lateral margins concave and acuminate apex; dorsal valve subtriangular with lateral margins almost convex. Internal sac (Fig. 117) in the apical region with elongate unpaired sclerite in form of inverted “V”, in lateral view (Fig. 117). Median region with a subcylindrical unpaired sclerite, a pair of blades serrate at the lateral margin and apex and a pair of short, angulate sclerites. Tegmen (Fig. 120) with shallow emargination between the enlarged lateral lobes.

**Female.** Integument color brown, excepted frons and hind leg blackish; 5<sup>th</sup> abdominal sternum not emarginate and pygidium with apex obtuse.

**Distribution (Fig. 126).** Cuba, Honduras, Brazil (Mato Grosso, Goias, São Paulo) and Peru.

**Host plants (Tab. I).** Malvaceae: *Luehea speciosa* Willd.

#### 4 FINAL CONSIDERATIONS

##### Goups of species

In the analysis (Fig. 1) carried out by Ribeiro-Costa (1995), the species of the *dispar* group had the following phenetic relationship: (*A. crassipunctatus* + *A.*

*taeniopygus*) + (*A. insuturatus* + *A. simulator*). *Amblycerus dispar* shows to be the most distinctive species in the group, being the last joined to the previous cited. This arrangement was not corroborated in the present study as here we recognize similarities among *A. crassipunctatus*, *A. dispar* and *A. schwarzi*. Furthermore, as mentioned earlier, we did not observe any character sharing between *A. simulator* and any other species of the genus to date.

*Amblycerus spondiae*, together with *A. alternatus*, *A. cuernavacensis* and *A. vitis*, form the group *spondiae*. In the cladistic analysis of Romero *et al.* (2002), *A. alternatus*, *A. cuernavacensis* and *A. vitis* formed the *alternatus* clade, supported by only one synapomorphy, the presence of a pair of medial, short, subelliptic, serrate sclerites. *Amblycerus spondiae* is related to this clade because it shares vestiture of two or more colors; in the analysis, this character is considerable reversals.

Among the species allocated in the *dispar* group, only *A. schwarzi* was sampled in his analysis. This species is sister of the clade *ireriae*, composed of *A. ireriae*, *A. acapulcensis* and *A. robiniae* and that is supported by the presence of median linear stripe in pygidium as its synapomorphy. This character, however, occurs several times within the genus, and is not exclusive of any single group. In addition, these species belong to two groups, *robiniae* and *alternatus* (Romero *et al.*, 1996).

*Amblycerus serieguttatus*, which previously belonged to the *alternatus* group (Romero *et al.*, 1996), shares with *A. dytiscinus* (Sharp, 1885), *A. galapagoensis* (Blair, 1928) and *A. luteonotatus* (Pic, 1902) the frontal carina absent; eyes grossly faceted and moderately protuberant; antennae with antennomeres 4-10 serrated, the last antennomere truncated at apex; frontoclypeal suture conspicuous; pronotum moderated convex, with three tufts of yellow setae in the lateral margin; cervical sulcus absent; scutellum tridentated at apex; elytra with striae strongly impressed, apically free and the presence seta tufts in the interestriae 3, 5, 7 and 9. In Romero *et al.* (2002), *A. serieguttatus* demonstrated to be the sister group of the clade composed of to *A. spondiae* plus the *alternatus* clade, which is composed of *A. alternatus*, *A. cuernavacensis* and *A. vitis*, owing only to pronotum with foveolae uniformly dispersed or pronotum smooth.

*Amblycerus eustrophoides* shares with other species, namely *A. ischiodontus* Ribeiro-Costa, 1999, *A. pollens* (Sharp, 1885) and *A. stridulator* Kingsolver *et al.*, 1993,

the metepisternum with transversely striae, fusiform node on ventro-posterior margin and ventral carina of metafemur pointed. According to Kingsolver (1970), the fusiform node on the metepisternum is apparently a stridulation mechanism because the blunt tooth of the metafemur is located at exactly the correct distance to scrape across the transverse striations on the surface of the node, but it is not possible to say with certainty, given that no living individual has been analysed (Kingsolver *et al.*, 1993), and in fact these structures have function stridulatory. Because of these peculiar characters, *A. eustrophoides* should belong to another grouping than the *alternatus* group proposed by Romero *et al.* (1996). Indeed, the cladistic analysis performed by Romero *et al.* (2002) showed *A. eustrophoides* more closely related to the *ireriae* clade, formed of *A. ireriae*, *A. acapulcensis* and *A. robiniae* plus *A. schwarzi* (Fig. 2).

In short, three groups of species were reviewed (Fig. 3), the *dispar* (Ribeiro-Costa, 1995), *alternatus* and *spondiae* (Romero *et al.*, 1996) groups, and new placements for the species were suggested (Fig. 4). However, it is still essential to perform a cladistic analysis to test the monophyly of these groups and of *Amblycerus* as a whole, for that matter.

### Host plants

According to Johnson *et al.* (2001) *Amblycerus* feeds on about 14 families of plants, more than any other seed-beetle. The *dispar* group consumes about ten species of nine different genera, while the host plants of the *spondiae* group comprises eight species belonging to seven genera. This high number of host species is also found in other species groups, such as the *obscurus* group (Romero *et al.*, 1996), which consumes about ten plant species; it is worth noting, however, that in this case, the host species belong to only two genera, *Cassia* and *Caesalpinia*. Another group with a considerable number of host species is the *epsilon* group (Romero *et al.*, 1996), with eight species. The other groups proposed by Romero *et al.* (1996) consume a low number of species: *championi* group's species feed on three host species, those of the *marmoratus* and *perfectus* groups feed on two species and, excepting for the *anosignatus* group that do not register host plants, the other groups only record one species. It is common for this genus to find one larva feeding on several seeds during their development, but *A. dispar* and *A. vitis* feed on only one seed (Johnson *et al.*, 2001).

## Geographical distribution

Concerning the geographical distribution, *Amblycerus* occurs mainly in the Neotropical region, with a few species occurring in the Nearctic region and Patagonia. The *dispar* group has the largest distribution, with specimens distributed in the following biogeographical regions (Morrone, 2014): Pacific dominion, Antillean subregion, Boreal Brazilian dominion, South-eastern Amazonian dominion, Chacoan dominion, Parana dominion, South Brazilian dominion and South American transition zone. *Amblycerus dispar* extends throughout the Neotropical region and can be found in X4 Septentrional Patagonian province and XII Valdivian province (Rivas-Martínez & Navarro, 1994) and *A. schwarzi* also occurs in the Nearctic region, from southern United States to northwestern Argentina. The *spondiae* group shows a more restricted distribution compared to the *dispar* group, including the Mexican transition zone and Brazilian subregion. *Amblycerus spondiae* and *A. vitis* are distributed exclusively in the Nearctic region.



**Table I** - Species of *Amblycerus* and its host plants. New records at the species (•), genus (♦) and family level (■).

Groups	Species	Host Plants	Family
Group <i>dispar</i>	<i>A. crassipunctatus</i>	<i>Vantanea minor</i>	Humiriaceae
	<i>A. dispar</i>	<i>Geoffroea decorticans</i>	Fabaceae
		<i>Spondias tuberosa</i>	Anacardiaceae
		<i>Sarcomphalus mistol</i> ♦	Rhamnaceae
		<i>Ziziphus joazeiro</i>	Rhamnaceae
		<i>Ziziphus</i> sp.	Rhamnaceae
		<i>Terminalia tetraphylla</i> •	Combretaceae
	<i>A. insuturatus</i>	<i>Terminalia corrugata</i> •	Combretaceae
		<i>A. schwarzi</i>	<i>Hippomane mancinella</i>
	<i>Ricinus communis</i>		Euphorbiaceae
	<i>Tectona grandis</i>		Verbenaceae
	<i>Terminalia catappa</i>		Combretaceae
	<i>A. taeniopygus</i>	Unknown	Unknown
	<i>A. sp. n.</i>	Unknown	Unknown
Group <i>spondiae</i>	<i>A. alternatus</i>	Unknown	Unknown
	<i>A. cuernavacensis</i>	Unknown	Unknown
	<i>A. spondiae</i>	<i>Cordia dodecandra</i>	Boraginaceae
		<i>Hippomane mancinella</i>	Euphorbiaceae
		<i>Spondias mombin</i>	Anacardiaceae
		<i>Spondias radlkoferi</i>	Anacardiaceae
		<i>Ziziphus mexicanus</i>	Rhamnaceae
		<i>Capparis</i> sp.♦	Capparaceae■
		<i>A. vitis</i>	<i>Vitis arizonica</i>
		<i>Rhus virens</i> var. <i>choriophylla</i> ♦	Anacardiaceae
	<b>Species reallocated</b>	<i>A. eustrophoides</i>	<i>Drypetes laterifolia</i>
<i>Neopringlea</i> sp. ♦			Salicaceae■
<i>A. serieguttatus</i>		Unknown	Unknown
<i>A. simulator</i>		<i>Luehea speciosa</i>	Malvaceae

Source - The author (2018).

**Table II** - Main characters at group level of *Amblycerus* species groups treated in this study.

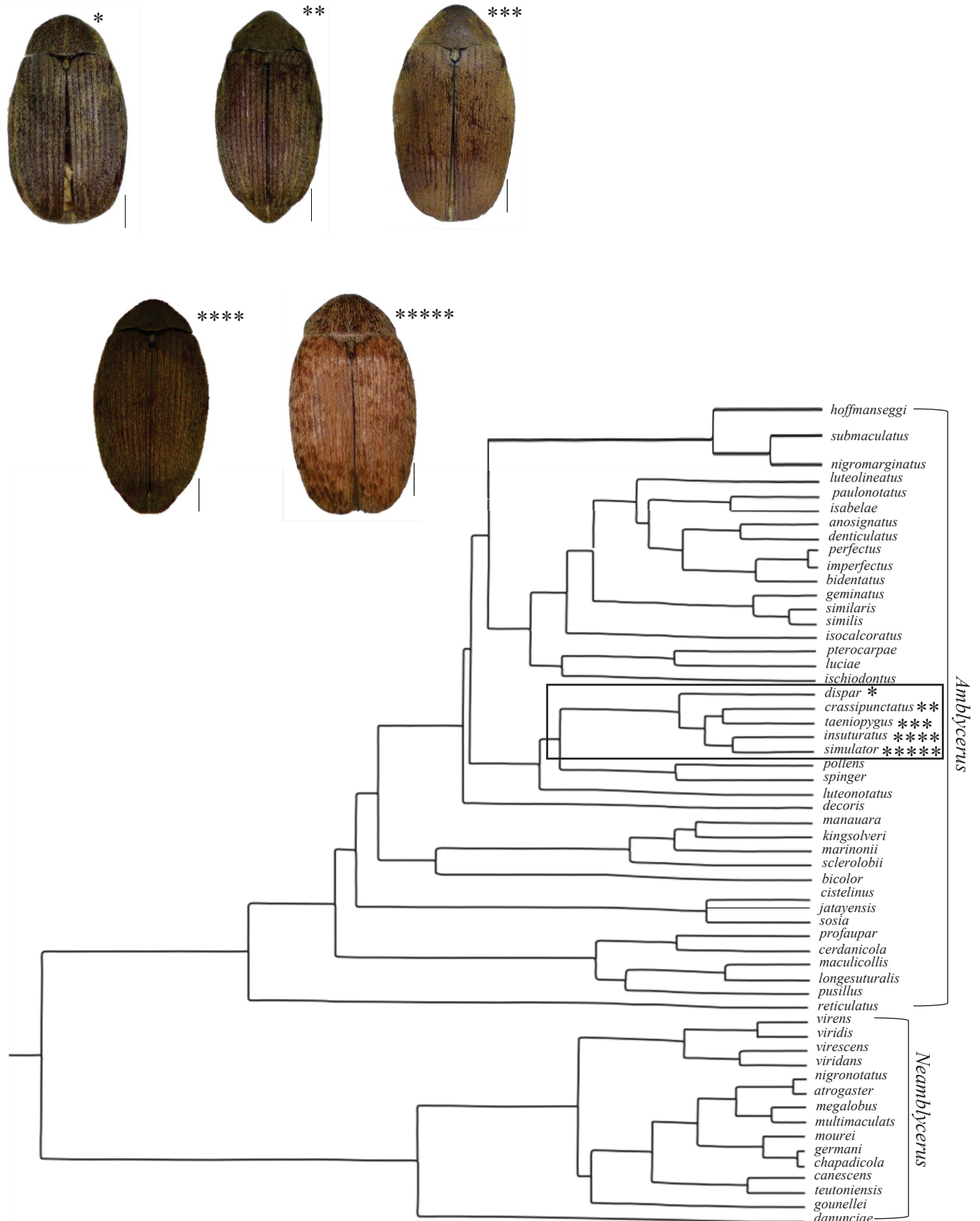
Characters	Group <i>dispar</i>						Group <i>spondiae</i>			
	<i>crassipunctatus</i>	<i>dispar</i>	<i>insuturatus</i>	<i>schwarzi</i>	<i>taeniopygus</i>	<i>A. sp. n.</i>	<i>alternatus</i>	<i>cuernavacensis</i>	<i>spondiae</i>	<i>vitis</i>
Scutellum length	longer than wider	longer than wider	longer than wider	longer than wider	longer than wider	longer than wider	longer than wider	longer than wider	longer than wider	longer than wider
Scutellum at apex	tridentate	tridentate	tridentate	tridentate	tridentate	tridentate	tridentate	tridentate	tridentate	tridentate
Scutellum length of the median tooth	longer than the lateral ones	longer than the lateral ones	longer than the lateral ones	longer than the lateral ones	longer than the lateral ones	longer than the lateral ones	longer than the lateral ones	almost the same length	almost the same length	longer than the lateral ones
Pygidium, pattern of setae distribution	median strip	median strip	median strip	median strip	median strip	median strip	median strip	median strip	median strip	homogeneous
Elytra, pattern of setae distribution	uniform	uniform	uniform	uniform	uniform	uniform	stripes	stripes	stripes	stripes
Pronotum, distribution of coarse punctures	all surface	all surface	lateral areas	all surface	lateral areas	lateral areas	all surface	all surface	all surface	all surface
Male genitalia: median lobe with dorsal valve	rounded	subtriangular	rounded	subtriangular	rounded	rounded	rounded	rounded	rounded	rounded
Internal sac with a pair of sclerites in the apical region	present	absent	present	present	absent	present	present	present	present	present
Internal sac with a pair of blades in median region	present	absent	present	absent	present	present	present	present	present	present
Internal sac with unpaired sclerite	present	present	present	present	absent	present	present	present	present	present

**Source** - The author (2018).

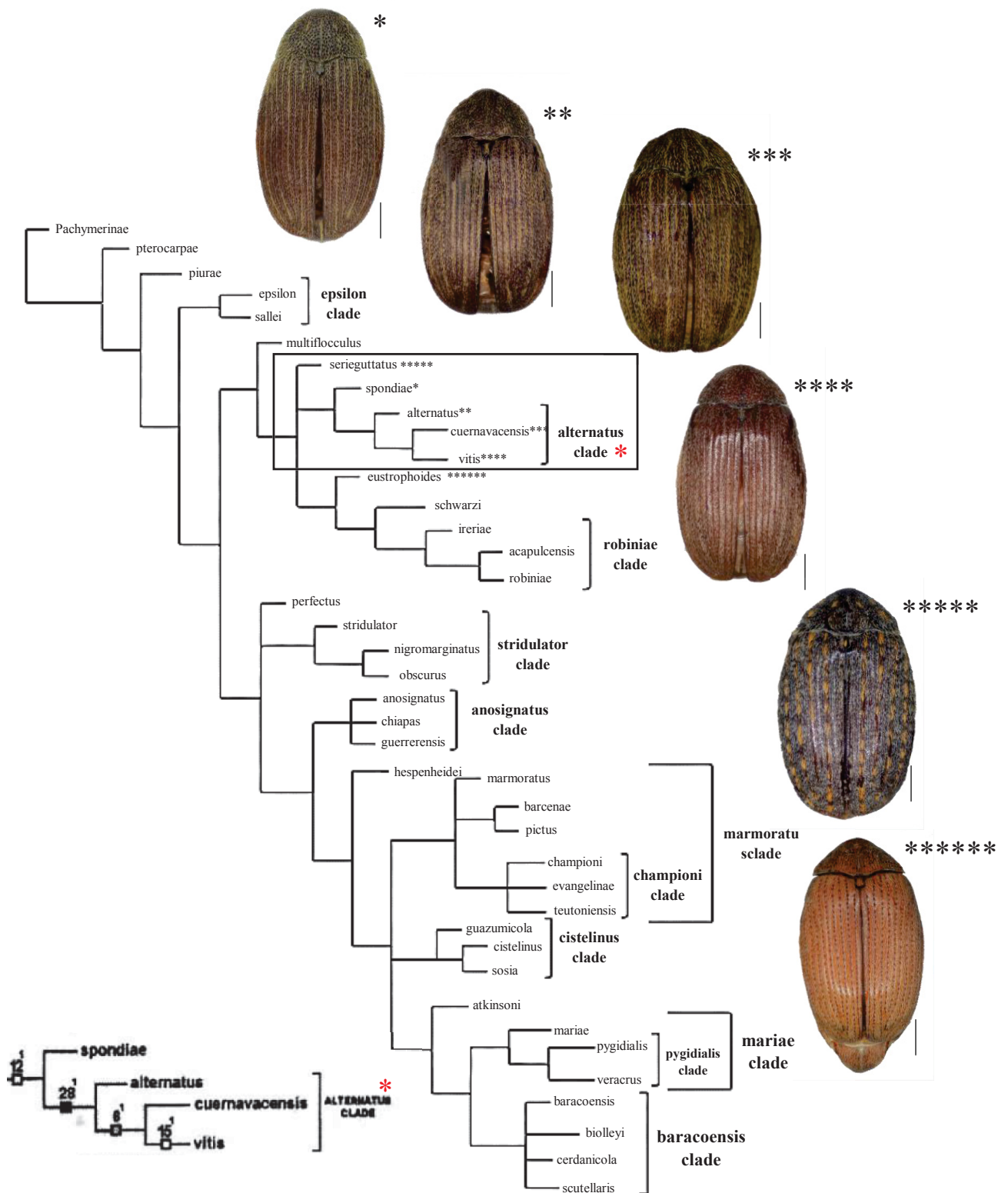
**Table III** - *Amblycerus* species groups. Species with (\*) were suggested by the author to belong to the group.

Groups	Species of <i>Amblycerus</i>	Authors
<i>acapulcensis</i>	<i>A. acapulcensis</i> , <i>A. robiniae</i> , <i>A. taeniatus</i>	Kingsolver, 1975
<i>alternatus</i>	<i>A. eustrophoides</i> , <i>A. serieguttatus</i> , <i>A. alternatus</i> , <i>A. schwarzi</i>	Romero <i>et al.</i> , 1996
<i>anosignatus</i>	<i>A. anosignatus</i> , <i>A. guerrerensis</i> , <i>A. chiapas</i>	Romero <i>et al.</i> , 1996
<i>canescens</i>	<i>A. canescens</i> , <i>A. teutoniensis</i>	Ribeiro-Costa, 1995
<i>cistelinus</i>	<i>A. cistelinus</i> , <i>A. sosia</i> , <i>A. jatayensis</i>	Ribeiro-Costa, 1995
<i>cistelinus</i>	<i>A. cistelinus</i> , <i>A. sosia</i> , <i>A. guazumicola</i>	Romero <i>et al.</i> , 1996
<i>championi</i>	<i>A. championi</i> , <i>A. teutoniensis</i> , <i>A. evangelinae</i>	Romero <i>et al.</i> , 1996
<i>chapidicola</i>	<i>A. chapadicola</i> , <i>A. mourei</i> , <i>A. germaini</i>	Ribeiro-Costa, 1995
<i>danunciae</i>	<i>A. danunciae</i>	Ribeiro-Costa, 1995
<i>decoris</i>	<i>A. decoris</i>	Ribeiro-Costa, 1995
<i>dispar</i>	<i>A. dispar</i> , <i>A. crassipunctatus</i> , <i>A. insuturatus</i> , <i>A. taeniopygus</i> , <i>A. simulator</i> , <i>A. spondiae</i> *, <i>A. alternatus</i> *, <i>A. schwarzi</i> *	Ribeiro-Costa, 1995
<i>epsilon</i>	<i>A. epsilon</i>	Romero <i>et al.</i> , 1996
<i>geminatus</i>	<i>A. geminatus</i> , <i>A. similares</i> , <i>A. similis</i>	Ribeiro-Costa, 1995
<i>gounellei</i>	<i>A. gounellei</i>	Ribeiro-Costa, 1995
<i>hoffmanseggi</i>	<i>A. hoffmanseggi</i> , <i>A. submaculatus</i> , <i>A. nigromarginatus</i> , <i>A. obscurus</i>	Ribeiro-Costa & Marinoni, 1992
<i>ischiodontus</i>	<i>A. ischiodontus</i>	Ribeiro-Costa, 1995
<i>isocalcaratus</i>	<i>A. isocalcaratus</i>	Ribeiro-Costa, 1995
<i>luteonotatus</i>	<i>A. luteonotatus</i>	Ribeiro-Costa, 1995
<i>luteolineatus</i>	<i>A. luteolineatus</i>	Ribeiro-Costa, 1995
<i>marmoratus</i>	<i>A. marmoratus</i> , <i>A. barcenae</i> , <i>A. pictus</i> , <i>A. hespenheidei</i>	Romero <i>et al.</i> , 1996
<i>megalobus</i>	<i>A. megalobus</i> , <i>A. multimaculatus</i> , <i>A. nigronotatus</i> , <i>A. atrogaster</i> , <i>A. championi</i> *	Ribeiro-Costa, 1995
<i>multiflocculus</i>	<i>A. multiflocculus</i>	Romero <i>et al.</i> , 1996
<i>obscurus</i>	<i>A. obscurus</i> , <i>A. nigromarginatus</i>	Romero <i>et al.</i> , 1996
<i>paulonotatus</i>	<i>A. paulonotatus</i> , <i>A. isabelae</i> , <i>A. spectabilis</i> *	Ribeiro-Costa, 1995
<i>perfectus</i>	<i>A. perfectus</i> , <i>A. imperfectus</i> , <i>A. bidentatus</i> , <i>A. denticulatus</i> , <i>A. anosignatus</i>	Ribeiro-Costa, 1995
<i>perfectus</i>	<i>A. perfectus</i>	Romero <i>et al.</i> , 1996
<i>piurae</i>	<i>A. piurae</i>	Romero <i>et al.</i> , 1996
<i>pollens</i>	<i>A. pollens</i> , <i>A. spiniger</i>	Ribeiro-Costa, 1995
<i>pterocarpae</i>	<i>A. pterocarpae</i> , <i>A. luciae</i>	Ribeiro-Costa, 1995
<i>pterocarpae</i>	<i>A. pterocarpae</i>	Romero <i>et al.</i> , 1996
<i>profaupar</i>	<i>A. profaupar</i> , <i>A. cerdanicola</i> , <i>A. maculicollis</i> , <i>A. longesuturalis</i> , <i>A. pusillus</i>	Ribeiro-Costa, 1995
<i>reticulatus</i>	<i>A. reticulatus</i>	Ribeiro-Costa, 1995
<i>robiniae</i>	<i>A. acapulcensis</i> , <i>A. robiniae</i> , <i>A. ireriae</i>	Romero <i>et al.</i> , 1996
<i>sclerolobii</i>	<i>A. sclerolobii</i> , <i>A. kingsolveri</i> , <i>A. marinonii</i> , <i>A. manauara</i> , <i>A. bicolor</i>	Ribeiro-Costa, 1995
<i>scutellaris</i>	<i>A. scutellaris</i> , <i>A. atkinsoni</i> , <i>A. cerdanicola</i> , <i>A. baracoensis</i> , <i>A. veracruz</i> , <i>A. mariae</i> , <i>A. pygidialis</i> , <i>A. biolleyi</i>	Romero <i>et al.</i> , 1996
<i>spondiae</i>	<i>A. spondiae</i> , <i>A. cuernavacensis</i> , <i>A. vitis</i>	Romero <i>et al.</i> , 1996
<i>stridulator</i>	<i>A. stridulator</i>	Romero <i>et al.</i> , 1996
<i>virescens</i>	<i>A. virescens</i> , <i>A. viridans</i> , <i>A. virens</i> , <i>A. viridis</i>	Ribeiro-Costa, 1995
<i>virens</i>	<i>A. virens</i> , <i>A. virescens</i> , <i>A. viridans</i> , <i>A. viridis</i> , <i>A. medialis</i>	Ribeiro-Costa <i>et al.</i> , 2014

Source - The author (2018).

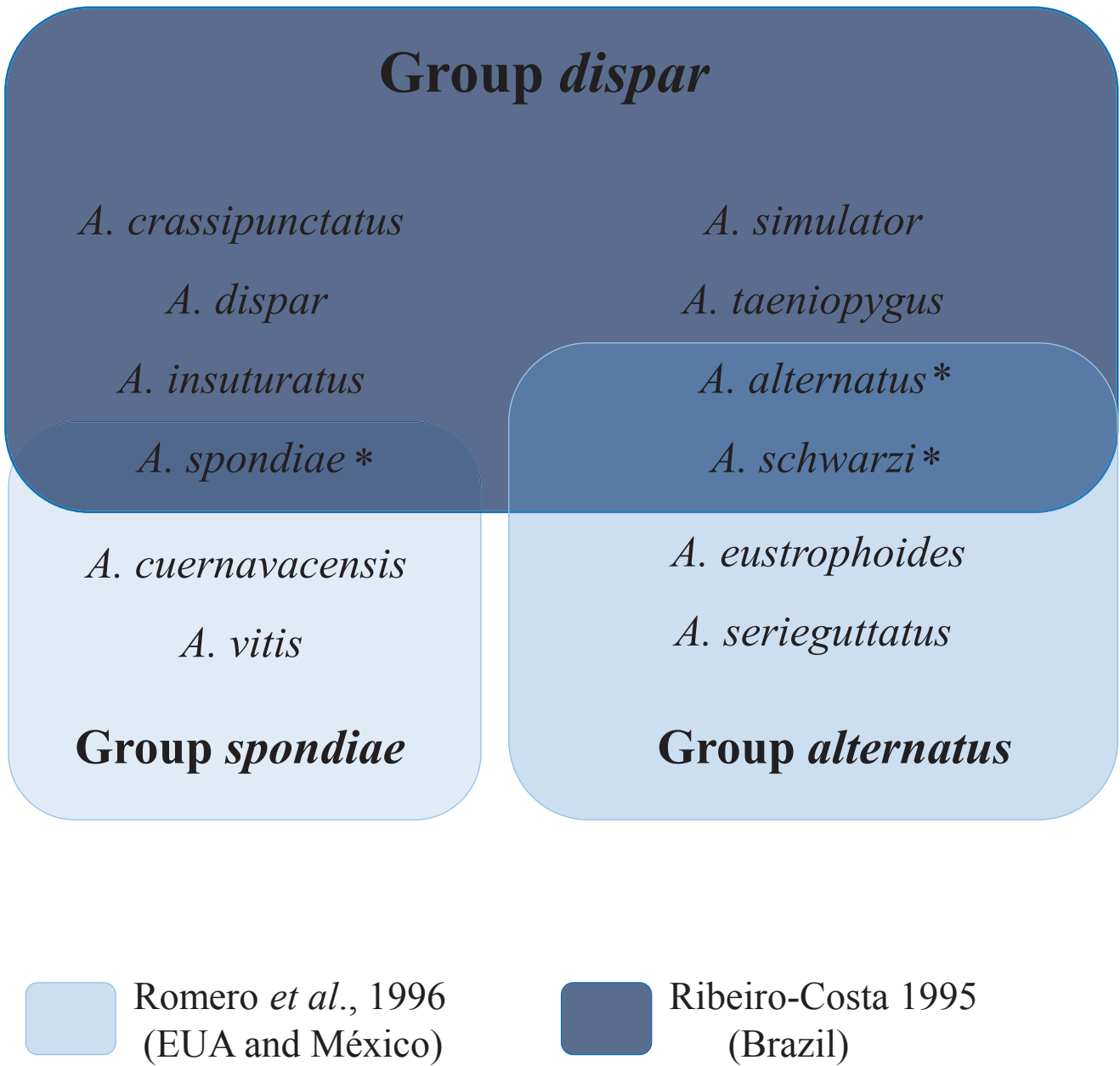


**Figure 1.** Phenogram obtained by Ribeiro-Costa (1995) of the Brazilian *Amblycerus* based on a matrix composed of quantitative and qualitative characters where one more genus was delimited. The group *dispar* was highlighted and illustrations added. Scale bars = 1.0 mm.



- 12 Vestiture: of one color 0; of two or more colors 1
- 28 Pair of medial, short, subelliptic, serrate sclerites: absent 0; present 1
- 6 Outer tibial calcarium: curved 0; straight 1
- 15 Pygidium: without stripes 0; with median linear stripe 1

**Figure 2.** Hypothesis of *Amblycerus* relationships obtained by Romero *et al.* (2002). The species studied here were highlighted in the cladogram and illustrations added. Scale bars = 1.0 mm.



**Figure 3.** Schematic representation of the three groups of *Amblycerus* here studied. Species with asterisk (\*) were suggested to belong to the group *dispar* and are shared with other two groups.



## Group *dispar*



*A. crassipunctatus*



*A. dispar*



*A. insuturatus*



*A. taeniopygus*



*A. sp. n. \**



*A. schwarzi \**

## Group *spondiae*



*A. alternatus \**



*A. spondiae*



*A. vitis*



*A. cuernavacensis*

## Reallocated species




*A. simulator \**




*A. eustrophoides \**



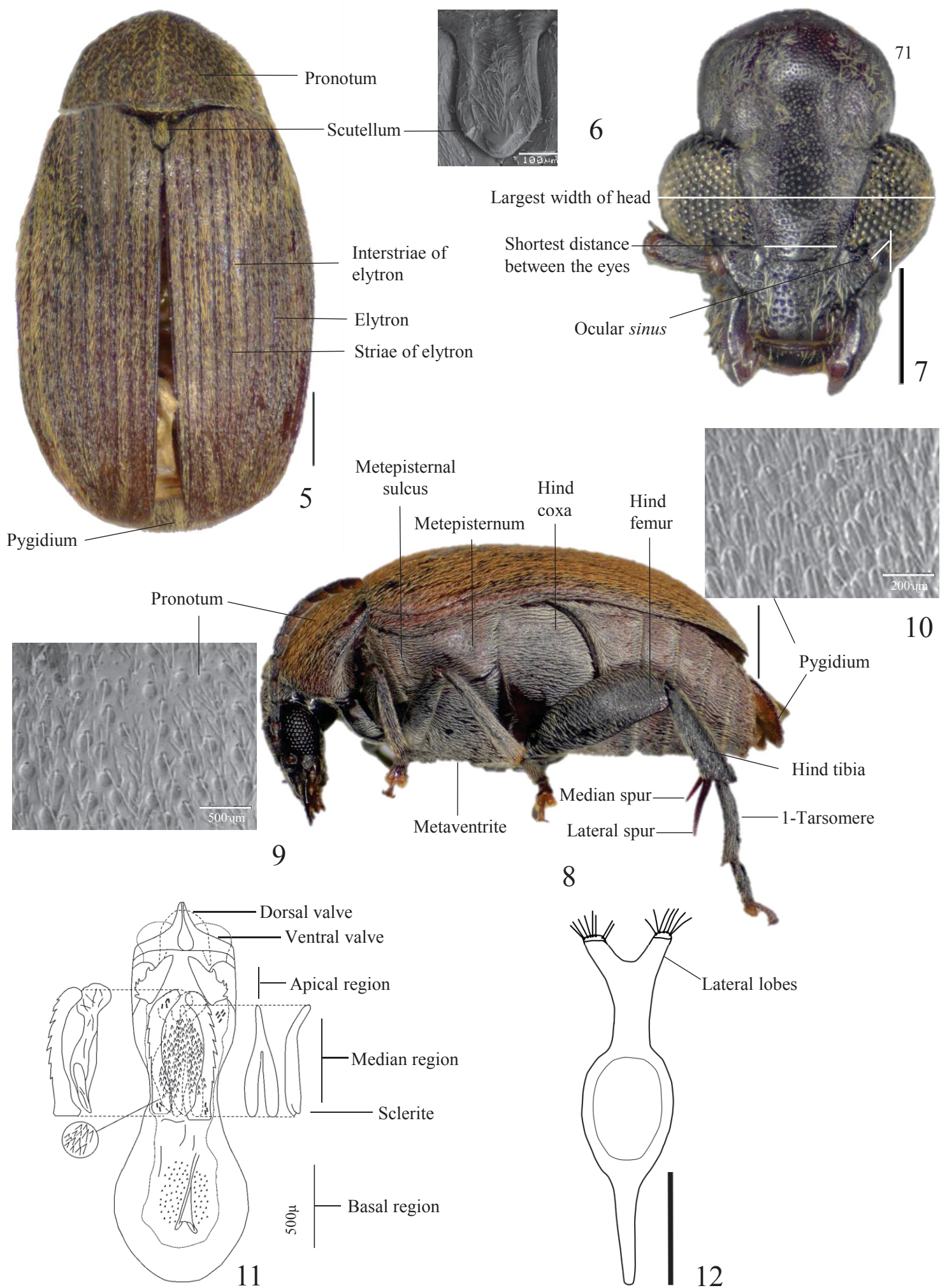
*A. serieguttatus \**

 Romero *et al.* 1996  
(EUA and México)

 Ribeiro-Costa, 1995  
(Brazil)

**Figure 4.** Schematic representation of the rearrangements of the species suggested in this study. Groups *dispar* and *spondiae*: names with asterisk (\*) refer to species included; reallocated species: names with asterisk (\*) refer to the species excluded from the groups *alternatus* or *dispar* (see text for more explanation).





**Figures 5-12:** *Amblycerus dispar*: 5. dorsal; 6. scutellum. *A. taeniopygus*: 7. head, frontal view. *A. insuturatus*: 8. lateral view. *A. alternatus*: 9. detail of coarse punctures on median region of pronotum; 10. detail of coarse punctures on median region of pygidium. *A. crassipunctatus*: 11-12. Male genitalia: 11. median lobe; 12. tegmen. Scale bars = 1.0 mm (Figs. 5, 7, 8); 0.25 mm (Fig. 12).





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**Figures 13-18:** Dorsal view of group *dispar*: 13. *Amblycerus crassipunctatus*, 14. *A. dispar*, 15. *A. insuturatus*, 16. *A. schwarzi*, 17. *A. taeniopygus* and 18. *A. sp. n.* Scale bars = 1.0 mm.





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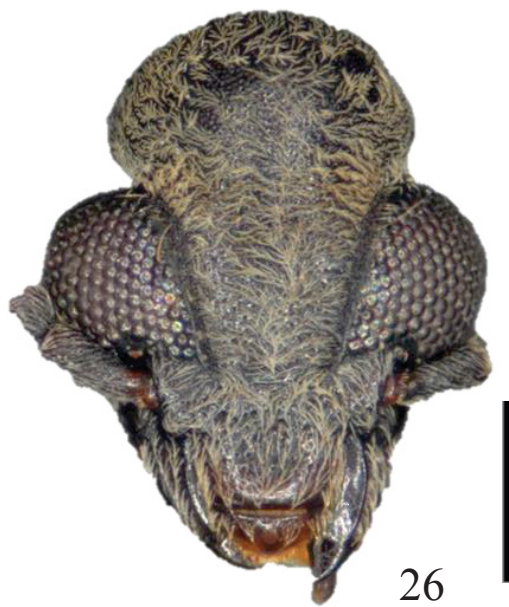
22

**Figures 19-22:** Dorsal view of group *spondiae*: 19. *A. alternatus*, 20. *A. cuernavacensis*, 21. *A. spondiae*, 22. *A. vitis*. Scale bars = 1.0 mm.



**Figures 23-25:** Species reallocated: 23. *A. eustrophoides*, 24. *A. serieguttatus*, 25. *A. simulator*. Scale bars = 1.0 mm.





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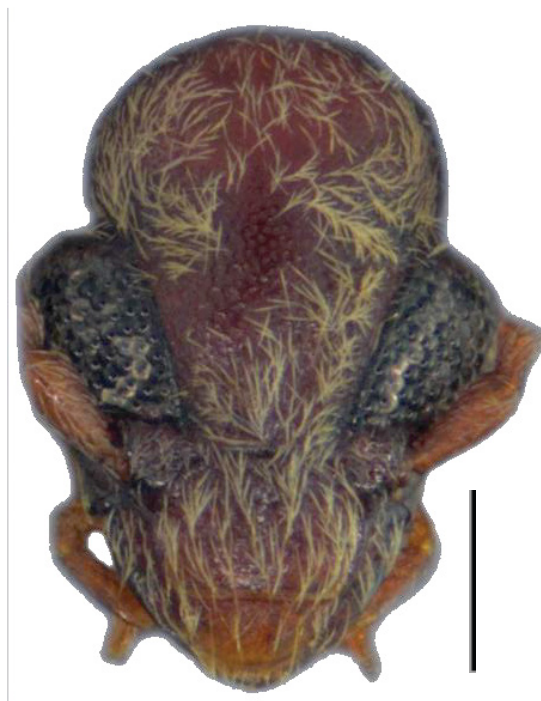


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**Figures 26-31:** Head, frontal view, group *dispar*: 26. *Amblycerus crassipunctatus*, 27. *A. dispar*, 28. *A. insuturatus*, 29. *A. schwarzi*, 30. *A. taeniopygus*, 31. *A. sp. n.* Scale bars = 1.0 mm.



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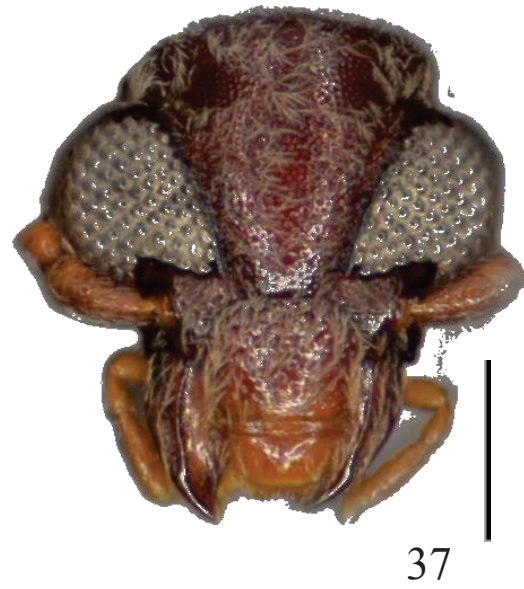
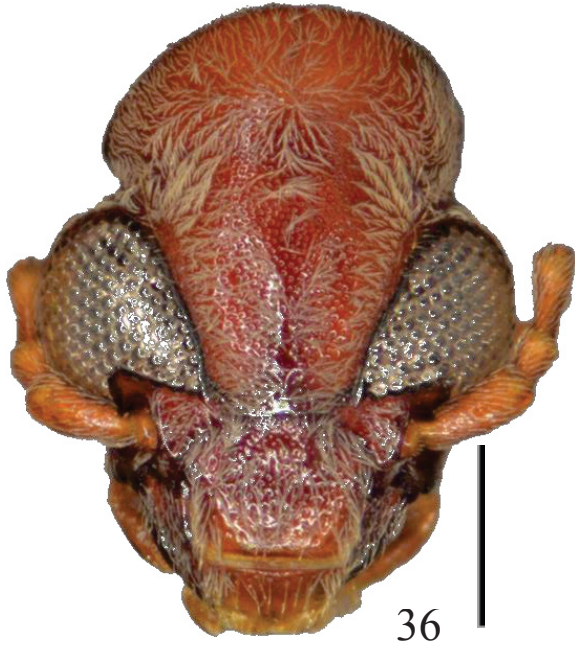
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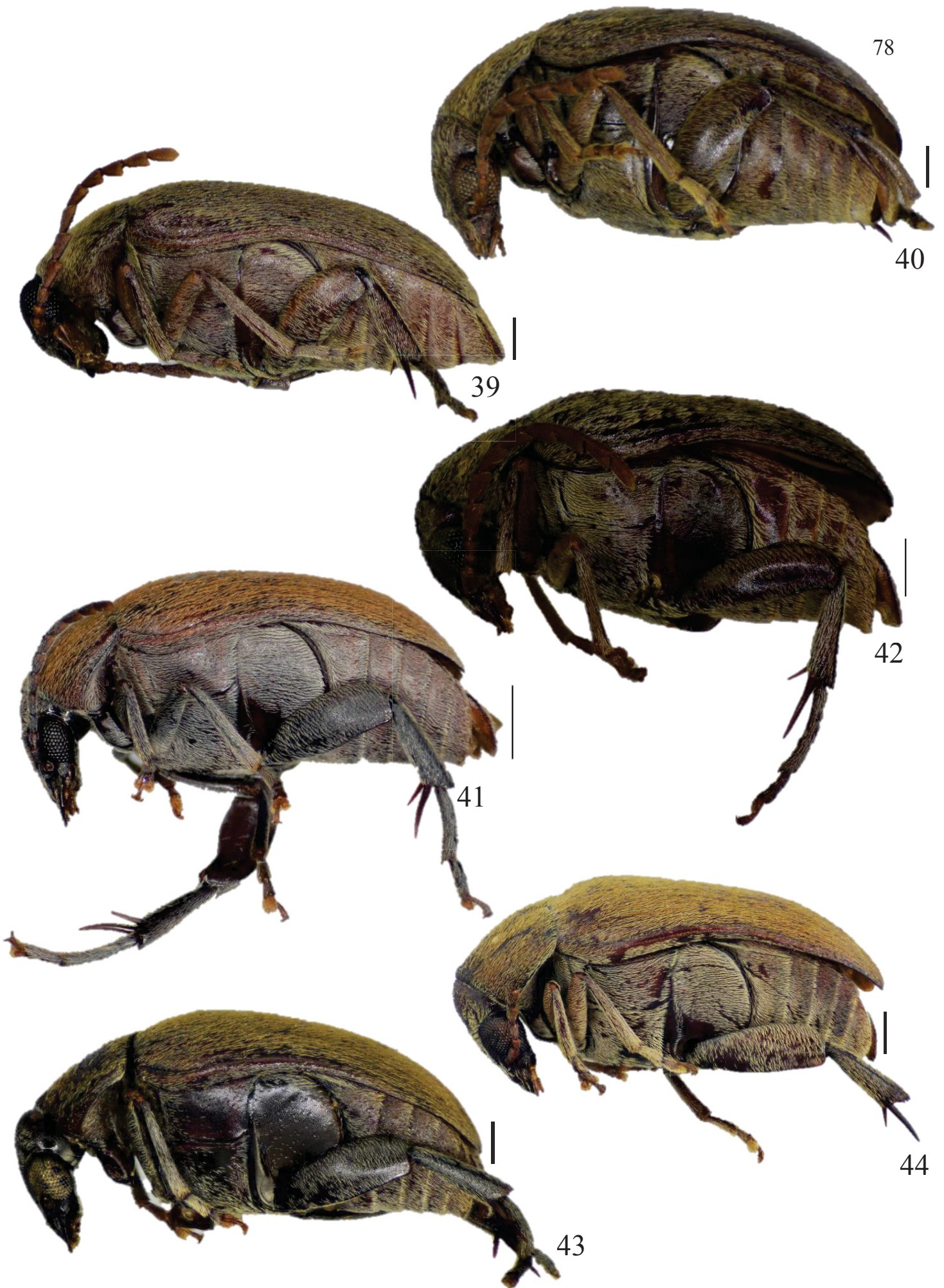
**Figures 32-35:** Head, frontal view, group *spondiae*: 32. *A. alternatus*, 33. *A. cuernavacensis*, 34. *A. spondiae*, 35. *A. vitis*. Scale bars = 1.0 mm.





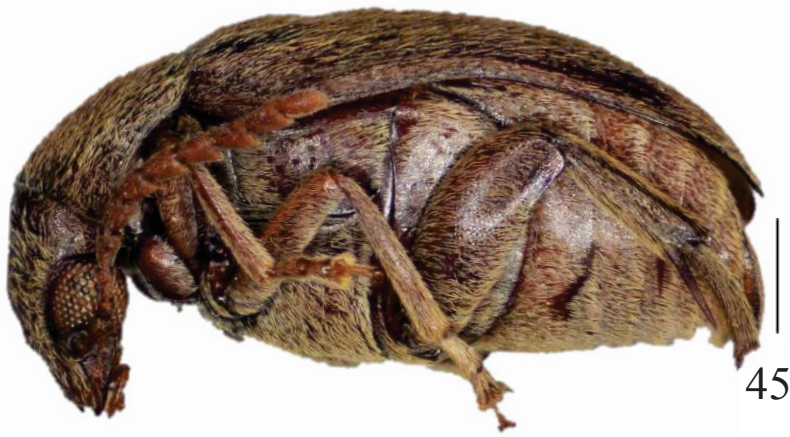
**Figures 36-38:** Head, frontal view, species reallocated: 36. *A. eustrophoides*, 37. *A. serieguttatus*, 38. *A. simulator*. Scale bars = 1.0 mm.





Figures 39-44: Lateral. group *dispar*: 39. *Amblycerus crassipunctatus*, 40. *A. dispar*, 41. *A. insuturatus*, 42. *A. schwarzi*, 43. *A. taeniopygus* and 44. *A. sp. n.* Scale bars = 1.0 mm.





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**Figures 45-48:** Lateral. *spondiae* group: 45. *A. alternatus*, 46. *A. cuernavacensis*, 47. *A. spondiae* and 48. *A. vitis*. Scale bars = 1.0 mm.



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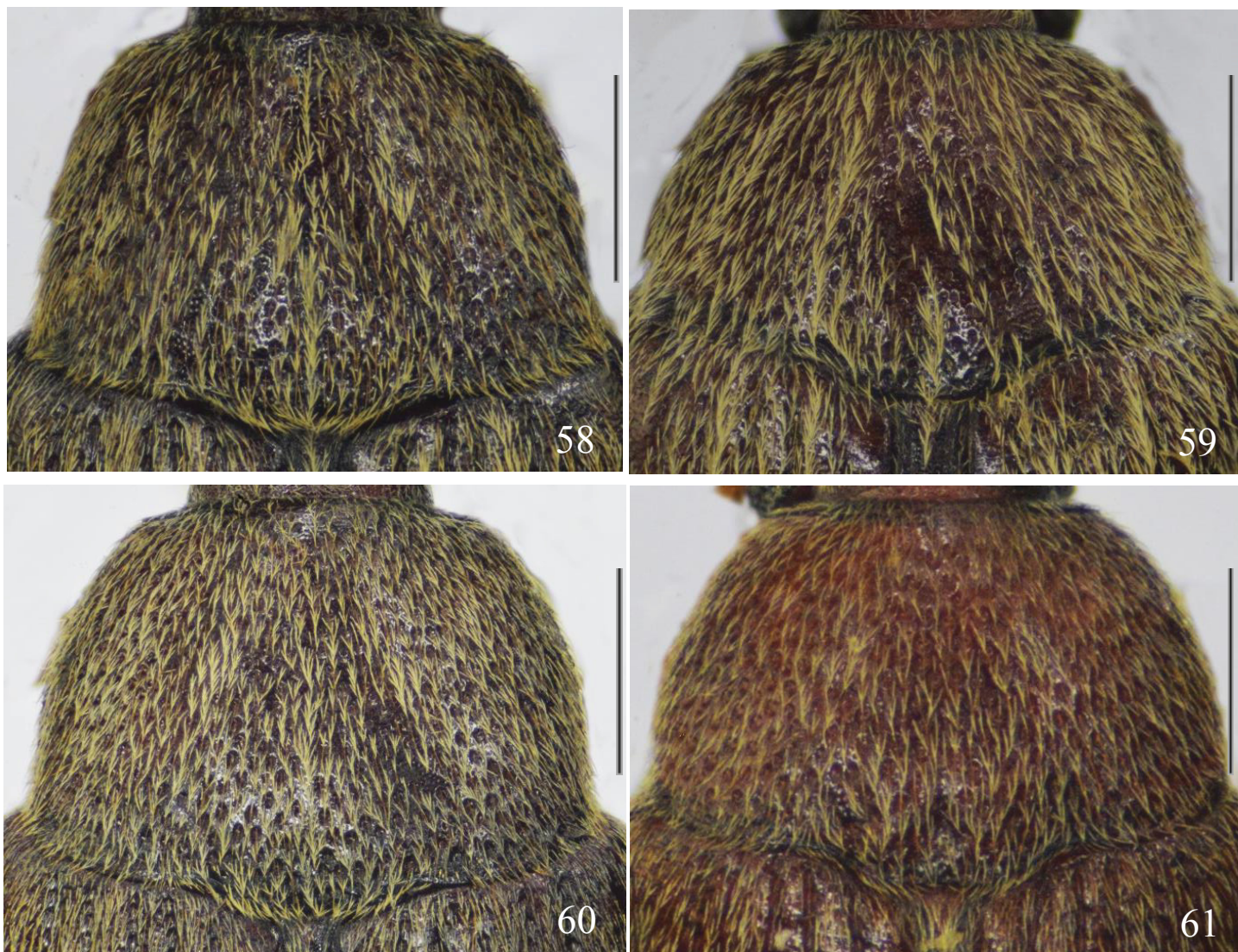
**Figures 49-51:** Lateral. Species reallocated: 49. *A. eustrophoides*, 50. *A. serieguttatus* and 51. *A. simulator*. Scale bars = 1.0 mm.





**Figures 52-57:** Pronotum. Group *dispar*: 52. *Amblycerus crassipunctatus*. 53. *A. dispar*. 54. *A. insuturatus*. 55. *A. schwarzi*. 56. *A. taeniopygus* and 57. *A. sp. n.* Scale bars = 1.0 mm.



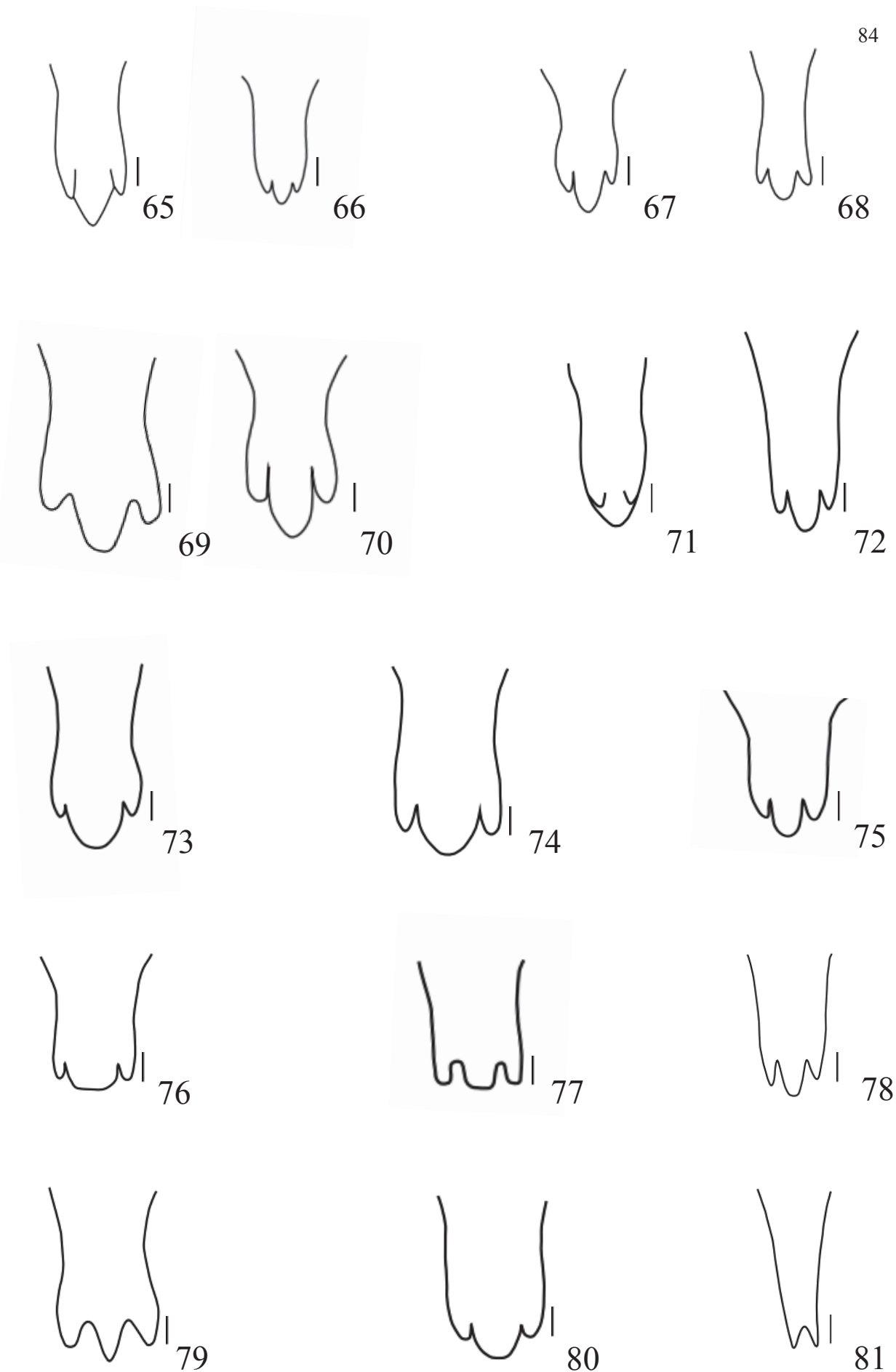


**Figures 58-61:** Pronotum. Group *spondiae*: 58. *A. alternatus*, 59. *A. cuernavacensis*, 60. *A. spondiae* and 61. *A. vitis*. Scale bars = 1.0 mm.





**Figures 62-64:** Pronotum. Species reallocated: 62. *A. eustrophoides*. 63. *A. serieguttatus* and 64. *A. simulator*. Scale bars = 1.0 mm.



**Figures 65-81:** Scutellum. Group *dispar*: 65, 66. *Amblycerus crassipunctatus*, 67, 68. *A. dispar*, 69, 70. *A. insuturatus*, 71, 72. *A. schwarzi*, 73. *A. taeniopygus* and 74. *A. sp. n.* group *spondiae*: 75. *A. alternatus* 76. *A. cuernavacensis*, 77. *A. spondiae* and 78. *A. vitis*. Species reallocated: 79. *A. eustrophoides*, 80. *A. serieguttatus* and 81. *A. simulator*. Scale bars = 0.5 mm.





**Figures 82-87:** Pygidium. Group *dispar*: 82. *Amblycerus crassipunctatus*, 83. *A. dispar*, 84. *A. insuturatus*, 85. *A. schwarzi*, 86. *A. taeniopygus* and 87. *A. sp. n.* Scale bars = 1.0 mm.





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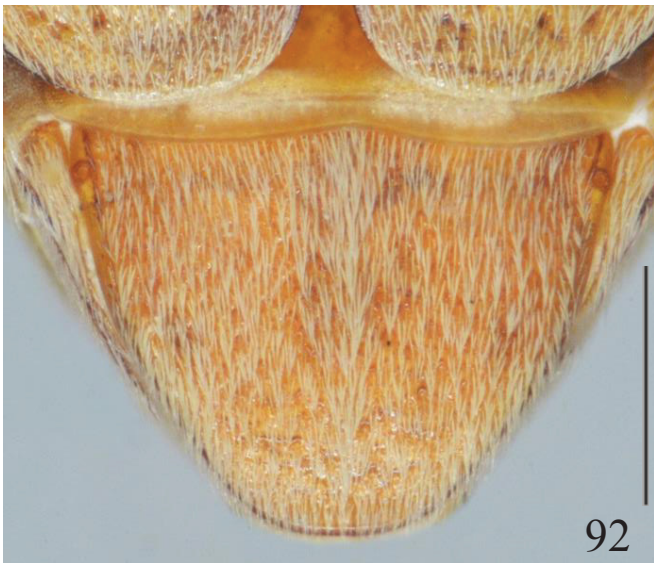


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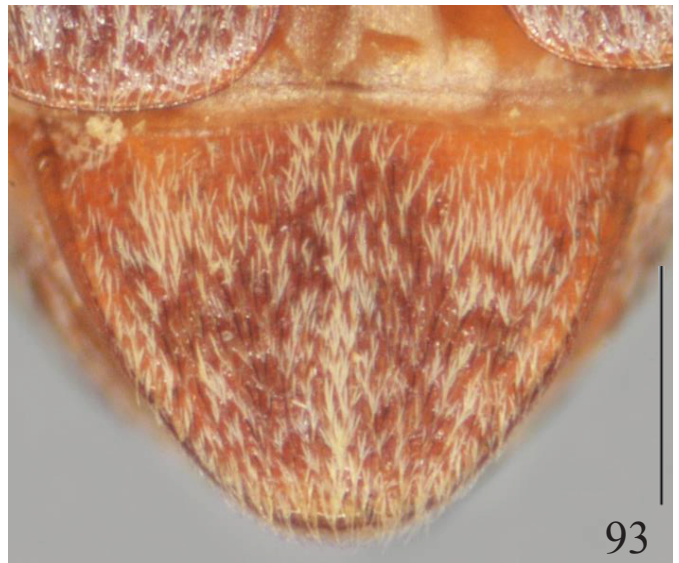


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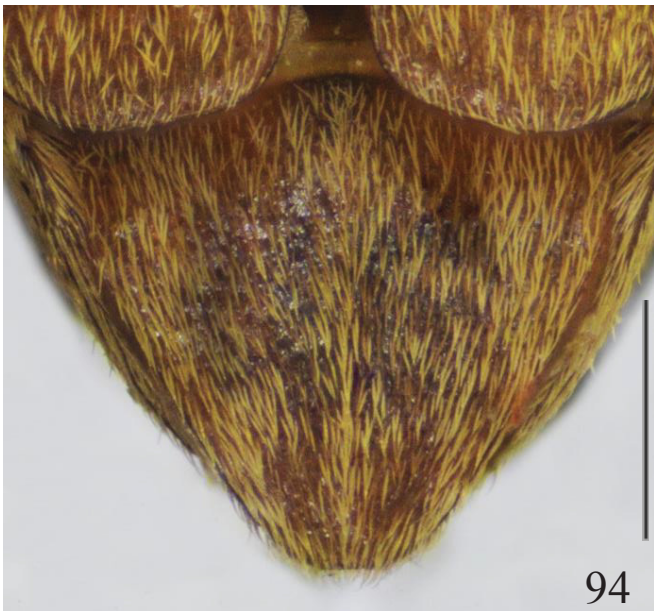
**Figures 88-91:** Pygidium. Group *spondiae*: 88. *A. alternatus*, 89. *A. cuernavacensis*, 90. *A. spondiae* and 91. *A. vitis*. Scale bars = 1.0 mm.



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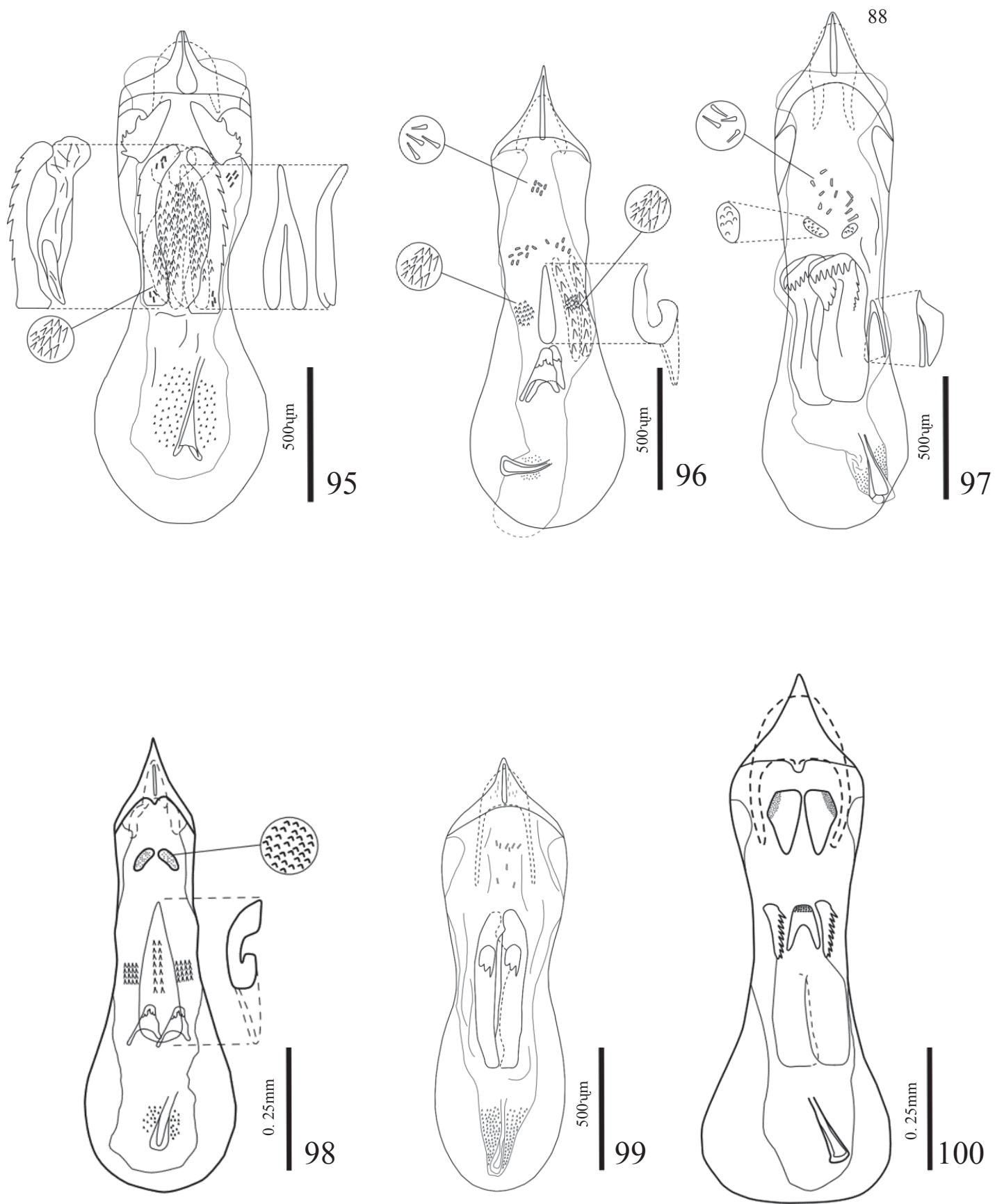
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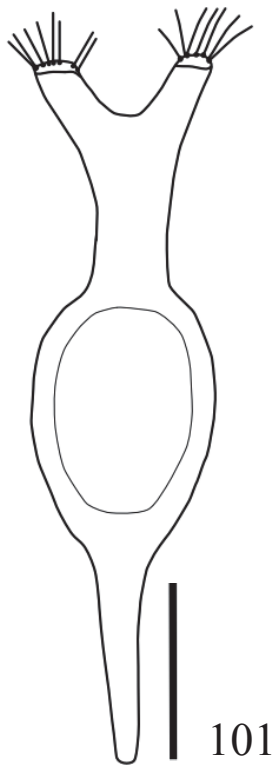
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**Figures 92-94 :** Pygidium. Species reallocated: 92. *A. eustrophoides*, 93. *A. serieguttatus* and 94. *A. simulator*. Scale bars = 1.0 mm.

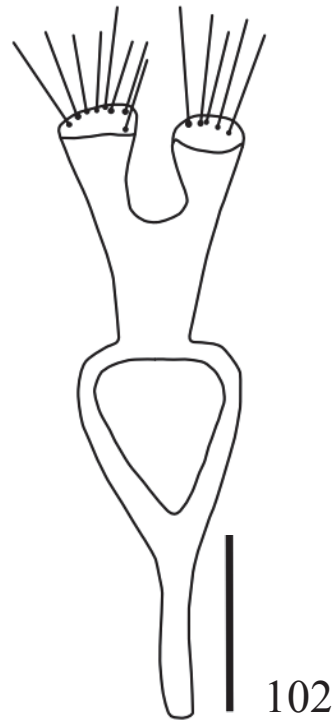




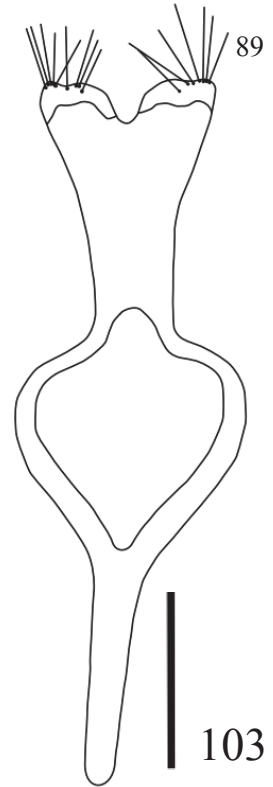
**Figures 95-100:** Male genitalia. Group *dispar*: 95. *Amblycerus crassipunctatus*, 96. *A. dispar*, 97. *A. insuturatus*, 98. *A. schwarzi*, 99. *A. taeniopygus* and 100. *A. sp. n.* Scale bars = 0.25 mm and 500µm.



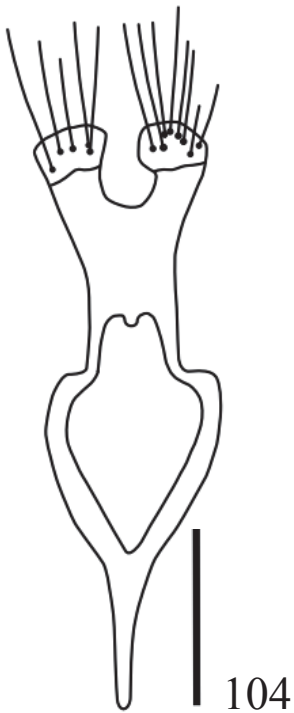
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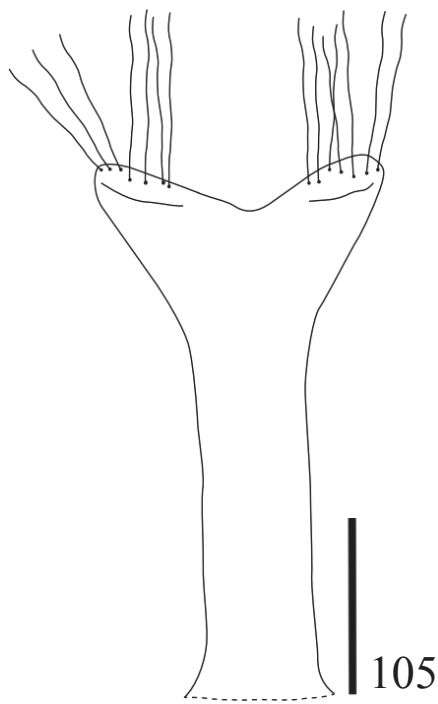
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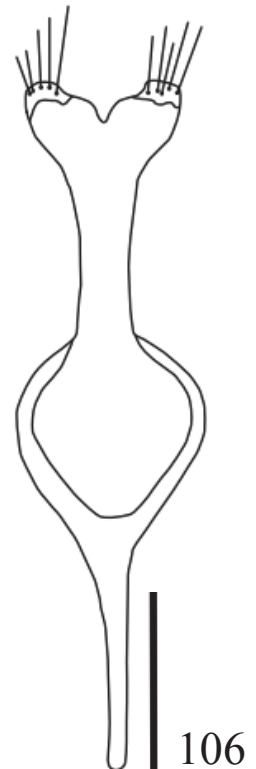
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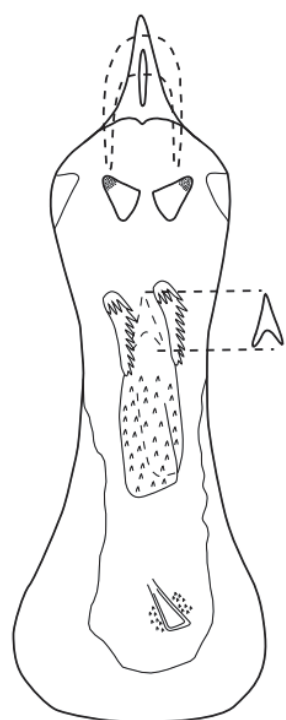


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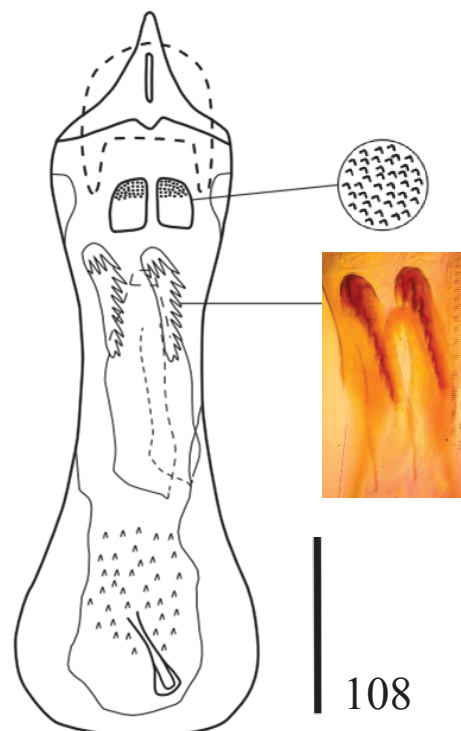


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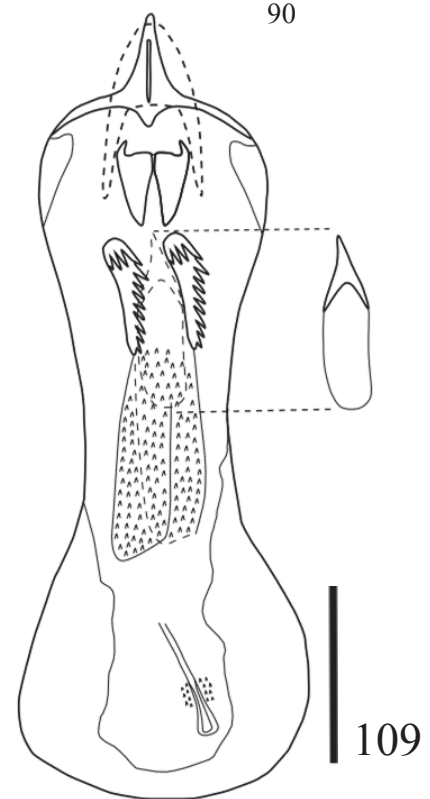
**Figures 101-106:** Male genitalia. Tegmen. **group *dispar*:** 101. *Amblycerus crassipunctatus*, 102. *A. dispar*, 103. *A. insuturatus*, 104. *A. schwarzi*, 105. *A. taeniopygus* and 106. *A. sp. nov.* Scale bars = 0.25 mm.



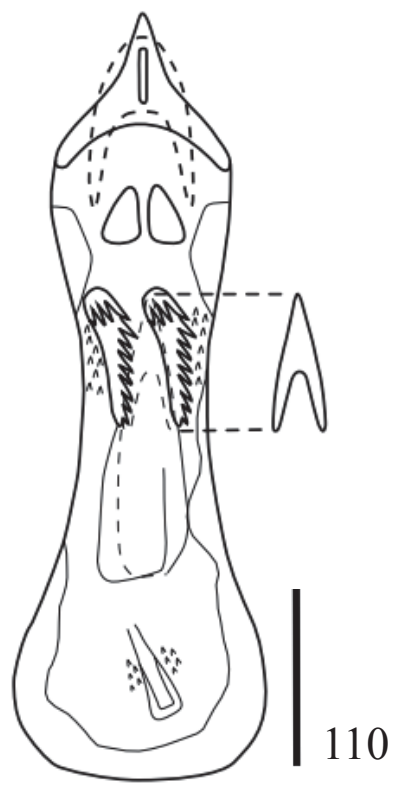
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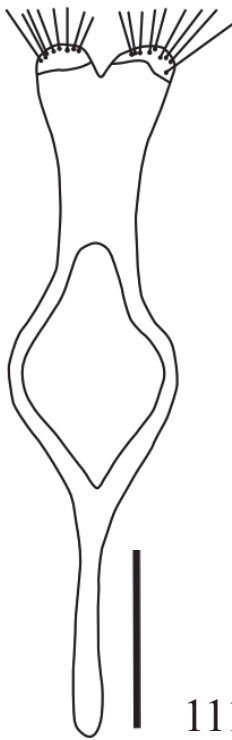


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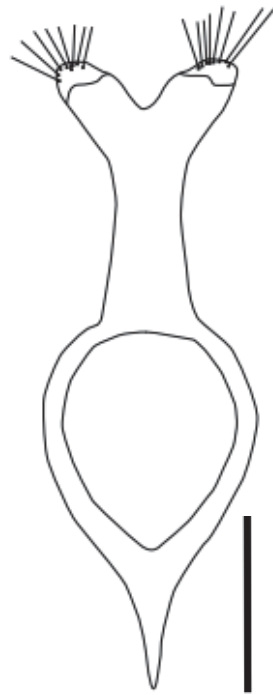


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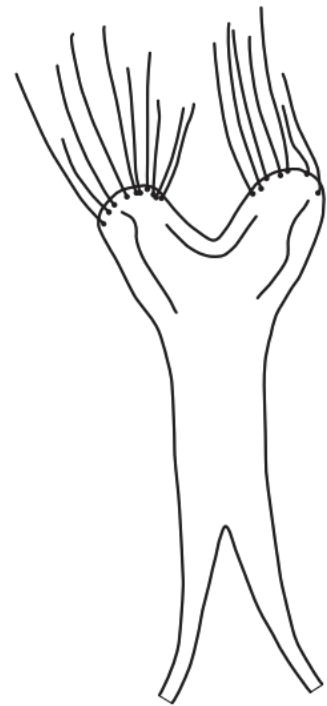
**Figures 107-110:** Male genitalia. group *spondiae*: 107. *A. alternatus*, 108. *A. cuernavacensis*, 109. *A. spondiae* and 110. *A. vitis*. Scale bars = 0.25 mm.



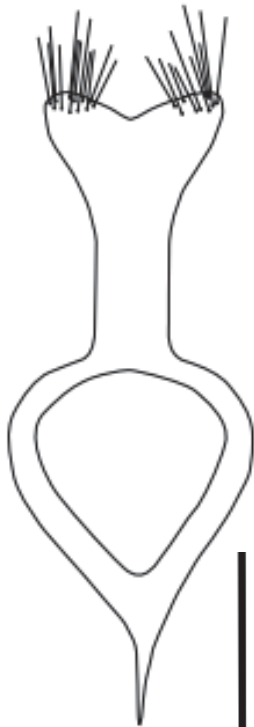
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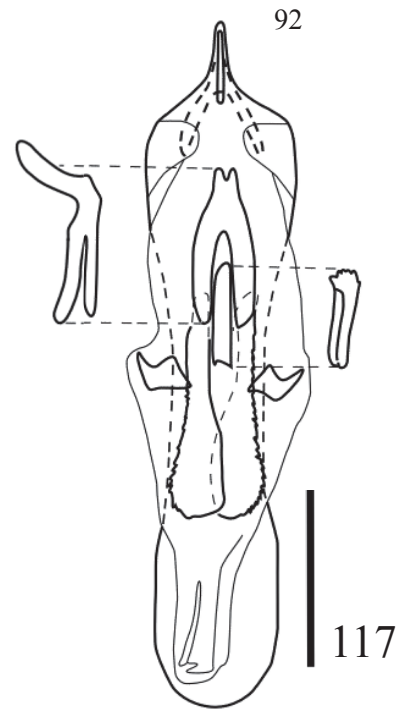
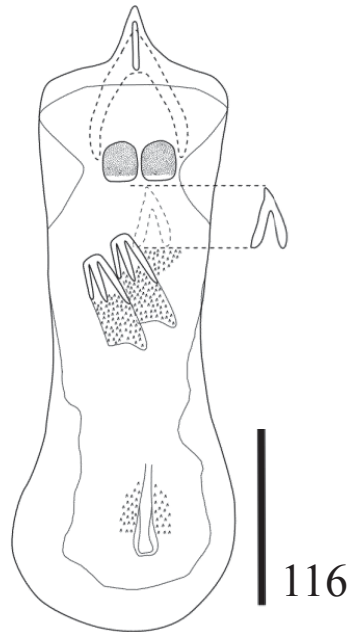
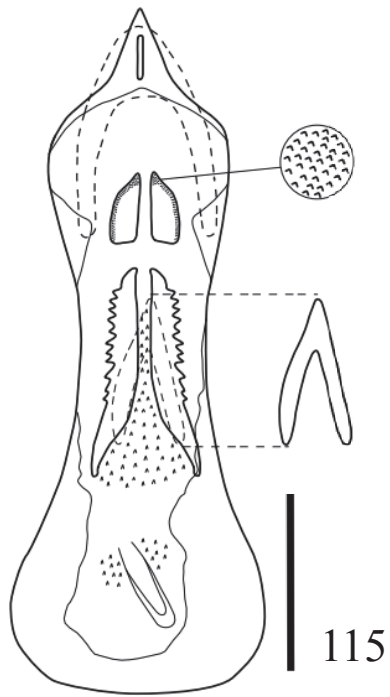
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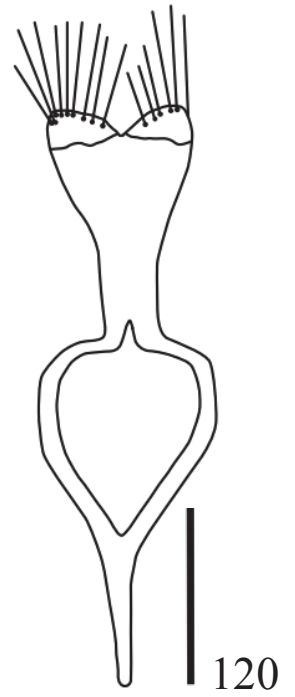
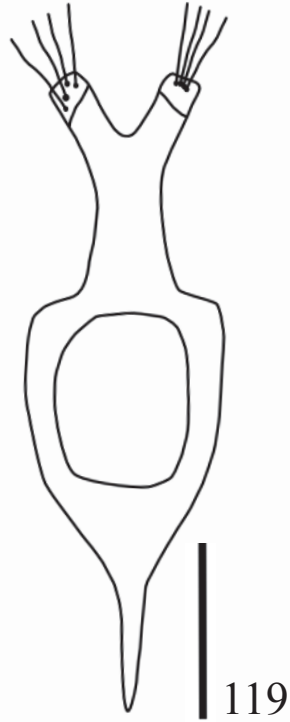
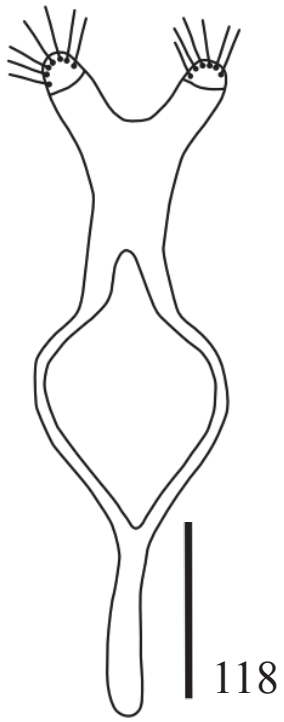
114

**Figures 111-114:** Male genitalia. Tegmen. **group *spondiae*:** 111. *A. alternatus*, 112. *A. cuernavacensis*, 113. *A. spondiae* and 114. *A. vitis*. Scale bars = 0.25 mm.





**Figures 115-117:** Male genitalia. Species reallocated: 115. *A. eustrophoides*, 116. *A. serieguttatus* and 117. *A. simulator*. Scale bars = 0.25 mm.



**Figures 118-120:** Male genitalia. Tegmen. Species reallocated: 118. *A. eustrophoides*, 119. *A. serieguttatus* and 120. *A. simulator*. Scale bars = 0.25 mm.



**Figure 121.** Map with the geographical distribution of *A. crassipunctatus* and *A. dispar*. Leaked symbols refer to bibliography data.



**Figure 122.** Map with the geographical distribution of *A. insuturatus* and *A. schwarzi*. Leaked symbols refer to bibliography data.



**Figure 123.** Map with the geographical distribution of *A. taeniopygus* and *A. sp. n.* Leaked symbols refer to bibliography data.



**Figure 124.** Map with the geographical distribution of *A. alternatus* and *A. cuernavacensis*. Leaked symbols refer to bibliography data.



**Figure 125.** Map with the geographical distribution of *A. spondiae* and *A. vitis*. Leaked symbols refer to bibliography data.



**Figure 126.** Map with the geographical distribution of *A. eustrophoides*, *A. serieguttatus* and *A. simulator*. Leaked symbols refer to bibliography data.

## 5 REFERENCES

- Blair, K. G. 1928. Coleoptera (Heteromera, Terebrantia, Malacodermata and Bruchidae) from the Galapagos Islands collected on the "St. George" Expedition, 1924. **Annals and Magazine of Natural History**. 1(10). p. 671-680.
- Borowiec, L. 1987. The genera of seed beetles (Coleoptera, Bruchidae). **Polskie Pismo Entomologiczne**. 57. p. 3-207.
- Bouchard, P.; Bousquet, Y.; Davies, A.; Alonso-Zarazaga, M.; Lawrence, J.; Lyal, C.; Newton, A.; Reid, C.; Schmitt, M.; Slipinski, A & Smith, A. 1987. Family-Group Names *In*: Coleoptera (Insecta). **ZooKeys**. 88. p. 1-972.
- Bridwell, J. C. 1946. The genera of beetles of the family Bruchidae in America north of Mexico. **Journal of the Washington Academy of Sciences**. 36. p. 52-57.
- Chevrolat, L. A. A. 1877. Les diagnoses de nouvelles espèces de bruchides. **Bulletin de la Société Entomologique de France**. p. 125, 134.
- Decelle, J. 1951. Contribution a l'étude des Bruchidae du Congo Belge (Col: Phytophaga). **Revue de Zoologie et de Botanique Africaines**. 45. p. 172-192.
- Fabricius, J. C. 1781. **Species insectorum exhibentes eorum differentias specificas, synonymia auctorum, loca natalia, metamorphosin adiectis observationibus, descriptionibus**. Bohn; Hamburgi & Kilonii. vol. 1. p. 552.
- Gómez-Zurita, J., Hunt, T. & Vogler, A. P. 2008. Multilocus ribosomal RNA phylogeny of the leaf beetles (Chrysomelidae). **Cladistics**. 24. p. 34-50.
- Grimaldi, D.; Engel, M. S. 2005. **Evolution of the insects**. Cambridge University Press. p. 755.
- Gyllenhal, L. 1833. *In*: Schoenherr, C. J. **Genera et species curculionidum cum synonymia hujus familiae**. Roret, Paris. 1(1). p. 381.



Haddad, S. & Mckenna, D. 2016. Phylogeny and evolution of the superfamily Chrysomeloidea (Coleoptera: Cucujiformia). **The Royal Entomological Society, Systematic Entomology**. 41. p. 697-716.

Horn, G. H. 1885. Contributions to the coleopterology of the United States. **Transactions of the American Entomological Society**. 12. p. 128-162.

Jacquelin du Val, P. N. C. 1857. Insectes. Ordre des coléoptères, Lin. *In*: Sagra, Histoire physique, politique et naturelle de l'île de Cuba. **Animaux Articules, Insectes**. 7. p. 137-328.

Janzen, D. H. 1980. Specificity of seed attacking beetles in a Costa Rican deciduous forest. **Journal of Ecology**. 68. p. 929-952.

Janzen, D. H. 1981. Patterns of herbivory in a tropical deciduous forest. **Biotropica**. 13. p. 271-282.

Jekel, H. 1855. **Insecta Saundersiana: Coleoptera, Curculionides**. Van Voorst, London. 1. p. 1-153.

Johnson, C. D. 1981. Interactions between bruchid (Coleoptera) feeding guilds and behavioral patterns of pods of the Leguminosae. **Environmental Entomology**. 10. p. 249-253.

Johnson, C. D. 1989. Adaptive Radiation of *Acanthoscelides* in Seeds: Examples of Legume-Bruchid Interactions. *In*: C. H. Shirton and J. L. Zarucchi (eds.) **Advances in Legume Biology**. Monogr. Syst. Botany. Missouri Bot. Gard. p. 747-779.

Johnson, C. D. & Kingsolver, J. M. 1981. Checklist of the Bruchidae (Coleoptera) of Canada, United States, Mexico, Central America, and the West Indies. **Coleopterists Bulletin**. 35(4). p. 409-422.

Johnson, C. D.; Romero, J. J. & Raimúndez-Urrutia, E. 2001. Ecology of *Amblycerus crassipunctatus* Ribeiro-Costa (Coleoptera: Bruchidae) in seeds of Humiriaceae, a new host family for Bruchids, with an ecological comparison to other species of *Amblycerus*. **The Coleopterists Bulletin**. 55(1). p. 37-48.

- Johnson, C. D; Romero-Nápoles, J. J. 2004. A review of evolution of ovoposition guilds in the Bruchidae (Coleoptera). **Revista Brasileira de Entomologia**. 48(3). p. 401-408.
- Johnson, C. D. & Siemens, D. H. 1991. Interactions between a new species of *Acanthoscelides* and a species of Verbenaceae, a new host family for Bruchidae (Coleoptera). **Annals of the Entomological Society of America**. 84. p. 165-169.
- Jolivet, P. 2015. Together with 30 years of Symposia on Chrysomelidae! Memories and personal reflections on what we know more about leaf beetles. **ZooKeys**. 547. p. 35-61.
- Kergoat, G. J.; Delobel, A; Le Rü, B. & Silvain, J. F. 2008. Seed-beetles in the age of the molecule: recent advances on systematics and host-plant association patterns. *In*: Jolivet, P.; Santiago-Blay, J. A. and Schmitt, M. (Eds.). **Research on Chrysomelidae**. Brill, Leiden. p. 59-86.
- Kergoat, G. J; Le Ru, B; Sadeghi, S. E; Tuda, M; Reid, C. A; György, Z; Genson, G; Ribeiro-Costa, C. S. & Delobel, A. 2015. Evolution of *Spermophagus* seed beetles (Coleoptera, Bruchinae, Amblycerini) indicates both synchronous and delayed colonizations of host plants. **Molecular Phylogenetics and Evolution**. 89. p. 91-103.
- Kingsolver, J. M. 1970. A synopsis of the subfamily Amblycerinae Bridwell in the West Indies, with descriptions of new species (Coleoptera: Bruchidae). **Transaction of the American Entomological Society**. 96. p. 469-497.
- Kingsolver, J. M. 1975. *Amblycerus acapulcensis*, a new species of seed beetle from Mexico (Coleoptera: Bruchidae). **Journal of the Washington Academy of Sciences**. 65. p. 33-35.
- Kingsolver, J. M. 1980. Eighteen new species of Bruchidae, principally from Costa Rica, with host records and distributional notes (Insecta: Coleoptera). **Proceedings of the Biological Society of Washington**. 93(1). p. 229-283.
- Kingsolver, J. M. 1990. Checklist of Chilean Bruchidae with new synonymies and new combinations (Coleoptera). **Revista Chilena de Entomología**. 18. p. 49-52.

Kingsolver, J. M. 1991. A new species of *Amblycerus* (Coleoptera: Bruchidae) from Central and South America, with notes on its biology. **Proceedings of the Entomological Society of Washington**. 93(2). p. 433-436.

Kingsolver, J. M. 2002. Bruchidae Latreille 1802. *In*: Arnett, R. H.; Thomas, M. C.; Skelley, P. E.; Frank, J. H. (Eds.). **American Beetles. Polyphaga: Scarabaeoidea though Curculionoidea**. Boca Raton: CRC. p. 602-608.

Kingsolver, J. M. 2004. Handbook of the Bruchidae of the United States and Canada (Insecta, Coleoptera). United States Department of Agriculture, Agricultural Research Service. **Technical Bulletin**. Vol. I. p. 1-1912.

Kingsolver, J. M. & Ribeiro-Costa, C. S. 1997. Taxonomic notes on *Amblycerus* Thunberg, 1815 (Coleoptera: Bruchidae). **Insecta Mundi**. 11(3-4). p. 325-330.

Kingsolver, J. M. & Ribeiro-Costa, C. S. 2001. Bruchidae (Insecta: Coleoptera) of the Galapagos Islands with new host and locality records, new synonyms, and descriptions of two new species. **Insecta Mundi**. 15(1). p. 19-30.

Kingsolver, J. M., Romero, N. J. & Johnson, C. D. 1993. Files and scrapers: circumstantial evidence for stridulation in three species of *Amblycerus*, one new (Coleoptera: Bruchidae). **The Pan-Pacific Entomologist**. 69(2). p. 122-132.

Latreille, P. A. 1802. **Histoire naturelle, générale et particulière des crustacés et des insectes. Ouvrage faisant suite à l'histoire naturelle générale et particulière, composée par Leclerc de Buffon, et rédigée par C. S. Sonnini, membre de plusieurs sociétés savantes**. Familles naturelles des genres. Tome troisième. F. Dufart, Paris, xii + 13-467 + [1] p. [An X (title page, = 1802). Nov. 1802. (Evenhuis 1997)].

Lawrence, J. F.; Beutel R. G., Leschen R. A. B. & Ślipiński, A. 2010a. 2. Glossary of morphological terms, pp. 9-20. *In*: Leschen, R. A. B, Beutel, R. G. and J. F. Lawrence (Eds.). **Handbuch der Zoologie/Handbook of Zoology**. Band/Volume IV Arthropoda: Insecta Teilband/Part 38. Coleoptera, Beetles. Vol. 2. Morphology and Systematics (Polyphaga partim). W. DeGruyter, Berlin.

- Marin, D. A. & Kingsolver, J. M. 1997. A preliminary list of the Bruchidae (Coleoptera) of Cuba. **Entomological News**. 108(3). p. 215-221.
- Marvaldi, A. E.; Duckett, C. N.; Kjer, K. M. & Gillespie, K. J. 2009. Structural alignment of 18S and 28S rDNA sequences provides insights into phylogeny of Phytophaga (Curculionoidea and Chrysomeloidea). **Zoologica Scripta**. 38. 1. p. 63-77.
- McKenna, D. D. & Farrell, B. D. 2009. Beetles (Coleoptera). *In*: Hedges, S. B. & Kumar, S. (Eds.). The Timetree of Life. **Oxford University Press, Oxford**. p. 278-289.
- Morrone, J. J. 2006. Biogeographic areas and transition zones of Latin America and the Caribbean Islands based on panbiogeographic and cladistic analyses of the entomofauna. **Annual Review of Entomology**. 51. p. 467-94.
- Morse, G. E. 2014. Bruchinae Latreille, 1802. pp. 189-197. *In* Leschen, R. A. B; Beutel, R. G (Eds.). **Arthropoda: Insecta: Coleoptera**. Vol. 3: Morphology and Systematics (Phytophaga). Berlin, Boston: De Gruyter.
- Motschulsky, V. 1874. Enumération des nouvelles espèces de coléoptères rapportés de ses voyages. **Bulletin de la Société Imperiale des Naturalistes de Moscou**. 46(2). p. 203-252.
- Pfaffenberger, G. S. 1985. Checklist of selected world species of described first and/ or final larval instars (Coleoptera: Bruchidae). **Coleopterists Bulletin**. 39. p. 1-6.
- Pic, M. 1902. Description de Coléoptères Nouveaux. Bruchidae de l'Amérique Méridionale. **Naturaliste**. 24. p. 172.
- Pic, M. 1927. Nouveautés diverses. Mélanges Exotico-Entomologiques. 48. p. 1-32.
- Pic, M. 1954. **Coléoptères du Globe**. Échange. 70(537). p. 9-12.
- Pierce, D. 1915. Descriptions of some weevils reared from cotton in Peru. **Report (U.S. Department of Agriculture), Washington, D. C.** 102. p. 1-16.
- Reid, C. A. M. 2000. Spilopyrinae Chapuis: a new subfamily in the Chrysomelidae and its systematic placement (Coleoptera). **Invertebrate Taxonomy**. 14. p. 837-862.

Ribeiro-Costa, C. S. 1992a. Two new species of *Amblycerus* Thunberg from Brazil (Coleoptera, Bruchidae). **Revista Brasileira de Zoologia**. 9(112). p. 5-9.

Ribeiro-Costa, C. S. 1992b. Gênero *Amblycerus* Thunberg, 1815 (Coleoptera: Bruchidae). Grupo "*hoffmanseggi*": II. Redescrições, chave e dados biológicos das espécies. **Revista Brasileira de Entomologia**. 36(1). p. 149-175.

Ribeiro-Costa, C. S. 1995. **Análise fenética das espécies brasileiras de *Amblycerus* Thunberg, 1815 (Coleoptera: Bruchidae) com descrição de um novo gênero**. PhD thesis, Universidade Federal do Paraná, Curitiba, Paraná. p. 1-140.

Ribeiro-Costa, C. S. 1998. Descrições de oito novas espécies de *Amblycerus* Thunberg (Coleoptera, Bruchidae). **Revista Brasileira de Zoologia**. 14(3). p. 629-648.

Ribeiro-Costa, C. S. 1999a. Descriptions of two new species of *Amblycerus* Thunberg (Coleoptera: Bruchidae) with a probable stridulatory mechanism. **Proceedings of the Entomological Society of Washington**. 101(2). p. 337-346.

Ribeiro-Costa, C. S. 1999b. Sete novas espécies de bruquídeos do gênero *Amblycerus* Thunberg (Coleoptera: Bruchidae). **Revista Brasileira de Zoologia**. 16(3). p. 789-806.

Ribeiro-Costa, C. S. 1999c. Descrições de duas espécies novas de *Amblycerus* Thunberg (Coleoptera: Bruchidae). **Revista Brasileira de Zoologia**. 16 (Supplement 1). p. 233-238.

Ribeiro-Costa, C. S. 2000. Descrições de sete novas espécies de brasileiras de *Amblycerus* Thunberg (Coleoptera: Bruchidae). **Revista Brasileira de Zoologia**. 17(2). p. 323-338.

Ribeiro-Costa, C. S. & Almeida, L. M. Seed-Chewing Beetles (Coleoptera: Chrysomelidae, Bruchinae). 2012. In: Panizzi, A. R; Parra, J. R. P. (Eds.) **Insect Bioecology and Nutrition for Integrated Pest Management**. Embrapa. Brasil. p. 325-352.

Ribeiro-Costa, C. S. & Kingsolver, J. M. 1992. A new species of *Amblycerus* Thunberg, 1815 (Coleoptera: Bruchidae) and a lectotype designation. **Insecta Mundi**. 6(3). p. 183-187.



Ribeiro-Costa, C. S. & Kingsolver, J. M. 1993. *Amblycerus teutoniensis* (Coleoptera: Bruchidae), a new species of seed beetle. **Entomological News**. 104(4). p. 160-164.

Ribeiro-Costa, C. S.; Manfio, D. & Morse, G. 2018. Catalog for the Brazilian *Amblycerus* Thunberg (Coleoptera: Chrysomelidae: Bruchinae) with taxonomic notes, host plants associations and distributional records. **Zootaxa**. 4388 (4). p. 499-525.

Ribeiro-Costa, C. S. & Marinoni, R. C. 1992. Gênero *Amblycerus* Thunberg, 1815 (Coleoptera: Bruchidae). Grupo "*hoffmanseggi*": I. Taxonomia Numérica. **Revista Brasileira de Entomologia**. 36(1). p. 129-47.

Ribeiro-Costa, C. S.; Vieira, M. K.; Manfio, D. & Kergoat, G. J. 2014. A remarkable new species group of green seed beetles from genus *Amblycerus* Thunberg (Coleoptera: Chrysomelidae: Bruchinae), with a description of a new Brazilian species. **ZooKeys**. 401. p. 31-44.

Rivas-Martínez, S. & Navarro, G. 1994. **Mapa biogeográfico de Suramérica**. Published by the authors, Madrid.

Romero, J. N; Ayers, T. & Johnson, C. D. 2002. Cladistics, bruchids and host plants: evolutionary interactions in *Amblycerus* (Coleoptera: Bruchidae). **Acta Zoologica Mexicana**. (n.s.) 86. p. 1-16.

Romero, J. N; Johnson, C. D. & Kingsolver, J. M. 1996. Revision of the Genus *Amblycerus* of the United States and Mexico (Coleoptera: Bruchidae: Amblycerinae). United States Department of Agriculture. **Technical Bulletin**. 1845. p. 166.

Romero, J. N. & Johnson, C. D. 2000. Revision of the genus *Zabrotes* Horn of Mexico (Coleoptera: Bruchidae: Amblycerinae). **Transactions of the American Entomological Society**. 126(2). p. 221-274.

Romero Nápoles, J. & Johnson, C. D. 2004. Checklist of the Bruchidae (Insecta: Coleoptera) of Mexico. **The Coleopterists Bulletin**. 58(4). p. 613-635.

Schaeffer, C. F. A. 1904. New genera and species of Coleoptera. **Journal of the New York Entomological Society**. 12. p. 197-236.

Schaeffer, C. F. A. 1907. New Bruchidae with notes on known species and list of species known to occur at Brownsville, Texas, and in the Huachuca Mountains, Arizona. **Science Bulletin, Museum of the Brooklyn Institute of Arts and Sciences**. 1. p. 291-306.

Schilsky, J. 1905. Bruchidae. *In*: Kuster, H. C. & Kraatz, G. Die Käfer Europa's. **Nach der Natur beschrieben**. Bauer & Raspe, Nürnberg. Heft. 41. p. 1-100. a-f. A-MM.

Schoenherr, C. J. (Ed.) 1833. **Genera et species curculionidum, cum synonymia hujus familiae: species novae aut hactenus minus cognitae, descriptionibus a Dom. Leonardo Gyllenhal, C. H. Boheman, et entomologis aliis**. 1(1). Roret, Paris.

Sharp, D. 1885. **Biologia Centralia Americana, Insecta, Coleoptera, Bruchidae**. 5. p. 437-504.

Slipinski, S. A; Leschen, R. A. B & Lawrence, J. F. 2011. Order Coleoptera Linnaeus, 1758. Animal biodiversity: an outline of higher-level classification and survey of taxonomic richness. **Zootaxa**. 3148. p. 203-208.

Stork, N. E. 2018. How Many Species of Insects and Other Terrestrial Arthropods are there on Earth? **Annual Review of Entomology**. 63. p. 31-45.

Suffrian, E. 1870. Verzeichniss der von Dr. Gundlach auf der Insel Cuba gesammelten Rüsselkäfer. **Archiv für Naturgeschichte**. 36(1). p. 150-234.

Terán, A. 1984. Observaciones sobre Bruchidae (Coleoptera) del noroeste argentino. VI. Estudios morfológicos y biológicos de *Amblycerus testaceus*. **Acta Zoologica Lilloana**. 37(2). p. 207-217.

Terán, A. & S. Muruaga de l'Argentier. 1979. Observaciones sobre Bruchidae (Coleoptera) del noroeste argentino. II. Estudios morfológicos y biológicos de algunas especies de Amblycerinae y Bruchinae. **Acta Zoologica Lilloana**. 35(1). p. 435-474.

Terán, A. & Muruaga de L'Argentier, S. 1981. Observaciones sobre Bruchidae (Coleoptera) del Noroeste Argentino. IV Estudios morfológicos y biológicos de *Amblycerus hoffmanseggi* (Gyll.), *Acanthoscelides comptus* Kingsolver y *Merobruchus bicoloripes* (Pic). **Acta Zoologica Lilloana**. 36(2). p. 61-84.

Thunberg, C. P. 1815. De Coleopteris rostratis commentatio. **Nova Acta Regiae Societatis Scientiarum Upsaliensis**. 7. p. 104-125.

Turnbow, R. H. J.; Cave, R. D. & Kingsolver, J. M. 2003. An annotated checklist of the Bruchidae of Honduras. **Ceiba**. 44(2). p. 269-278.

Wilcox, J. A. 1975. **Checklist of the beetles of Canada, United States, México, Central America and West Indies**. Family 130. Bruchidae. p. 1-10.

Udayagiri, S. & Wadhi, S. R. 1989. Catalog of Bruchidae. **Memoirs of the American Entomological Institute**. 45. p. 84-8.

Viana, J. H. 2016. Nomenclatural changes and lectotype designations in the seed-beetle genus *Senni* Bridwell: with the synonymization of *Megasenni* Whitehead & Kingsolver (Coleoptera: Chrysomelidae: Bruchinae). **Zootaxa**. 4175(3). p. 249-260.