EntomoBrasilis
e-ISSN 1983-0572

Taxonomy and Systematics

Checklist of Aquatic Heteroptera genera (Insecta: Hemiptera) from Brazilian Savanna (Cerrado Biome), with family and genera identification key

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EntomoBrasilis 15: e986 (2022)

Abstract. Insects of the order Hemiptera (Heteroptera) are considered the largest group of insects with incomplete metamorphosis. Representatives of the Gerromorpha and Nepomorpha infraorders are found in the Brazilian Savanna (Cerrado Biome). This manuscript provides information about the occurrence and distribution of families and genera that occur in the states of the Cerrado Biome, deposited in the UnB Aquatic Invertebrate Collection (CIAq-UnB). The collection started in 1995 and have aquatic specimens of Cerrado Biome. An identification key is also presented for the families and genera that occur in this region.

Keywords: Brazil; Insecta; Neotropics; new record; True Bugs.

Edited by:
Mateus Aparecido Clemente

Article History:
Received: 20.xii.2021
First Answer: 03.iii.2022
Accepted: 18.vi.2022
Published: 15.viii.2022

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Funding agencies:
Without funding declared

EntomoBrasilis Update Check

doi: 10.12741/ebrasilis.v15.e986

The suborder Heteroptera is well represented in South America, with some species having a high impact on agriculture and public health (Heckman 2011). However, aquatic species bring benefits, since they act in the control of harmful insects, mainly mosquitoes. Typically, true bugs have modified mouthparts to puncture and suck in internal fluids from their prey. The forewings are called hemielytron (half wing) because its basal parts are modified to cover the hardened wings, while the apical parts are membranous (Heckman 2011).

Heteroptera is subdivided into 7 infraorders, two of which have representatives in the Cerrado Biome: Gerropmorpha and Nepomorpha. The Gerromorpha infraorder is composed of semi-aquatic true bugs composed of about 2,000 species in 11 families (Panizzi & Grazia 2015). Most of them have modifications in the tarsi to facilitate locomotion over2 water and bristle coating on some parts of the body, which repel water and are able to carry a small amount of air, necessary when the insect needs to submerge (Heckman 2011). Most species in the neotropical region belong to the families Gerridae, Hebridae, Hydrometridae, Mesoveliidae and Veliidae (Grazia & Fernandes 2012). In the Cerrado, species of all these families occur.

Most of the infraorder Gerromorpha is composed of semi-aquatic insects, associated with the surface of inland waters. They are represented by 115 genera and about 1900 described species, of which 510 occur in the neotropical region (Ribeiro *et al.* 2014). Most of them have the ability to walk on the water's surface (Bush & Hu 2006). They act as predators, mainly of other arthropods, and they can present solitary or gregarious tendencies and either may be very active or have slower behaviour (Schuh & Slater 1995). The fauna of the Gerromorpha infraorder in Brazil has been the subject of studies since the 1970's (Nieser 1970a, 1970b, 1994; Niese & Melo 1999; Melo & Nieser 2004; Moreira & Ribeiro 2009). However, large areas of the Brazilian territory lack studies (Moreira *et al.* 2011).

The truly aquatic true bugs belong to the Nepomorpha infraorder. They typically feature a small antenna that is hidden under the head and ranges in size from 1 to 130 mm. They are generally predators, although some Corixidae feed on algae and decaying plant material (Panizzi & Grazia 2015). In the Neotropical region, Pereira *et al.* (2007) published an identification key for species that occur in the Central Amazon region of Brazil. The following families occur in the neotropical region: Belostomatidae, Corixidae, Gelastocoridae and Naucoridae, Nepidae, Notonectidae, Ochteridae, Pleidae and Potamocoridae. In the Cerrado, there are species of practically all these families, excluding Ochteridae and Potamocoridae.

The Cerrado Biome is the second largest biome in South America, occupying about 22% of the Brazilian territory. It is spread over 12 states (Goiás, Tocantins, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Bahia, Maranhão, Piauí, Rondônia, São Paulo, Paraná and the Distrito Federal) (Klein 2002). This region comprises the Central Plateau where the main watersheds of South America (Tocantins-Araguaia, São Francisco and Paraná) are born. The Cerrado is considered one of the global biodiversity hotspots, with loss of habitat. The main objective of this work is to provide information on the records of aquatic Heteroptera

in the Cerrado Biome with a key to identify the families and genera found. These records were deposited in the UnB Aquatic Invertebrate Collection.

The UnB Aquatic Invertebrate Collection (CIAq-UnB) was created in 1995 at the Zoology Department of the University of Brasilia. In this collection are deposited specimens of aquatic insects of the order Odonata, Ephemetoptera, Trichoptera, Plecoptera, Megaloptera, Hemiptera (Heteroptera), Coleoptera and Diptera. The specimens of Heteroptera were collected over several years and are the result of several scientific works.

This publication aims to provide information about the occurrence and distribution of Heteroptera in the water bodies of the Cerrado Biome and present a taxonomic key to identify the families and genera that occur in this region (Appendix 1).

MATERIAL AND METHODS

The studied specimens are deposited in the UnB Aquatic Invertebrate Collection (CIAq- UnB), with samples from the states of Goiás (GO), Mato Grosso (MT), Minas Gerais (MG) and Distrito Federal (DF). The specimens were collected for 20 years in the streams of the Cerrado Biome. The Heteroptera part of the Collection comprises 495 lots, totaling 1,354 specimens.

The samples were made using Benthos net type "D", Surber net and sieves. Individuals were fixed and preserved in 80% alcohol. The references used for identification are Heckman (2011), Ribeiro *et al.* (2014), Panizzi & Gracia (2015) and Moreira *et al.* (2018).

RESULTS AND DISCUSSION

Twelve families were identified with 28 genera, with 482 records of Heteroptera in the collection (Table 1).

In the Brazilian Cerrado Gerromorpha, the families Gerridae, Hebridae, Hydrometridae, Mesoveliidae and Veliidae were found.

Gerridae. Insects in this family have the ability to walk on water, with elongated median and hind legs (Panizzi & Grazia 2015) that keep the body well above the water's surface and allow insects to move quickly with a brisk march (Heckman 2011). Gerridae have the exclusive characteristic of modifying the chest, which is associated with life on water (Ribeiro *et al.* 2014). The stretching of the mesothorax and the orientation of the median and posterior legs horizontally are part of the body changes of individuals in this family (Ribeiro *et al.* 2014). They can be identified by their non-distinctly elongated head, eyes located close to the anterior margin of the thorax, the mesocoxae located very close to the metacoxae and farther from the procoxae. The metapleura is long and usually exceeds the apex of the abdomen and the tarsus is biarticulate with pretarsals claws (Moreira *et al.* 2018). Each pair of legs has its own function: the first acts in the capture of food, the second acts in the lateral movement of the insect and the third, larger than the others, gives the direction of the insect's movement. The ability to live on water is aided by the presence of hydrophobic hair on the legs and body (Panizzi & Grazia 2015). It is the largest and most diverse family among the Gerromorpha, with 60 genera and 750 species described (Moreira *et al.* 2018).

In Brazil there are records of 56 species, of which 29 occur in the Amazon (Ribeiro *et al.* 2014). Six genera were found in the Cerrado: *Brachymetra* Mayr, 1865 (subfamily Charmatometrinae) (Figure 1D), *Limnogonus* Stål, 1868 (Figure 2A, B) and *Neogerris* Matsumura, 1913 (subfamily Gerrinae) (Figure 1E, F), *Rheumatobates* Berbroth, 1892 (subfamily Rhagadotarsinae) (Figure 1A, B), *Ovatametra* Berbroth, 1892 (Figure 1C) and *Trepobates* Uhler, 1883 (subfamily Trepobatinae) (Figure 1G). The genus *Brachymetra* was registered in the present study in the states of Federal District (DF), Mato Grosso (MT) and Goiás (GO). According to Moreira & Campos (2012) this genus is registered for the states of Pará (PA), Amazonas (AM), Ceará (CE), Mato Grosso (MT), Bahia (BA), Minas Gerais (MG), São Paulo (SP), Rio de Janeiro (RJ) and Rondônia (RO) (new record for the states of GO and DF). According to Moreira & Campos (2012) *Limnogonus* occurs in PA, AM, DF, GO, MT, MG, ES, SP, RJ, SC, MS, RS, RO. *Neogerris* is a genus that occurs in the states of PA, AM, MT, RO, MG, SP, AP (Moreira & Campos 2012). In our work, this genus was registered for the DF (new record for DF). The genus *Rheumatobates*, according to Moreira & Campos (2012), occurs in the states SP, SC, RS, PA, MT, MG, SP, RJ, AM, and in this work a new record was registered for GO. Floriano *et al.* (2017) records the genus *Ovatametra* for the states of BA, AM and PA. In the present study, they were found in the DF (new record for the DF). According to Moreira *et al.* (2011) the genus *Trepobates* has a restricted distribution to the states of PA and AM. In our work it was registered in the states of DF and GO (new record for DF and GO).

Moreira & Campos (2012) register the specie *Halobatopsis platensis* (Berg, 1879) occurring in the DF, according to information from Nielsen (1970a, 1970b), but their occurrence was not recorded in this work.

Hydrometridae. This family shows extreme changes in relation to the pattern found for the Gerromorpha families. These small insects are very thin with their head very elongated (Heckman 2011). The family has about 125 species distributed in 8 genera. They are always thin, from 2.7 to 22mm, the eyes are located far from the anterior margin of the chest and the antennae and legs are very long and thin (Moreira *et al.* 2018). It is represented in South America by two subfamilies: Heterocleptinae and Hydrometrinae. In the Cerrado there is only one genus, *Hydrometra* Latreille, 1797, (Figure 3G, H) belonging to the subfamily Hydrometrinae. Moreira & Campos (2012) recorded three species of the same genus without occurrence for GO and DF (*Hydrometra argentina* Berg, 1879; *Hydrometra comata* Torre-Bueno, 1926 and *Hydrometra fruhstorfe* Hungerford & Evans, 1934). In our work this genus was found in Chapada dos Veadeiros (GO), being a new record for the region.

Mesoveliidae. Insects of this family are small (1.2 to 4.2 mm) and have a varied body and wing (Moreira *et al.* 2018). They occur in calm waters with marginal vegetation. As an exception, the members of this family have claws inserted in the region close to the apex and with dark and rigid bristles scattered on the legs. In winged adults the scutellum and ocelli are present, however in wingless forms they are absent (Heckman 2011). There were 42 species in 12 genera in aquatic environments (Moreira *et al.* 2018), distributed in two subfamilies (Mesoveliinae and Madeoceliinae). Only one genus, *Mesovelia* Mulsant and Rey, 1852 (Figure 2C, D), was found in the Cerrado. Moreira & Campos (2012) recorded *M. mulsanti* for GO. In our work, we registered *Mesovelia* in GO and DF, with a new record of the genus in the last state.

Veliidae. It is a large family with about 38 genera and 600 species. They have a body with a 1 to 10 mm length, adapted for life on the water surface. Its species are distributed in 6 subfamilies: Ocelloveliinae, Rhagoveliinae, Perittopinae, Veliinae, Microveliinae and Haloveliina. Members of this family commonly have short legs close to the body, with few exceptions. They present extreme changes in the tarsus, which makes the identification of some genera relatively easy

Table 1. Infraorders, families and genera deposited in UnB Aquatic Invertebrate Collection (CIAq-UnB). (*new occurrence)

Infraorder	Family	Genera
Gerromorpha	Gerridae	*Brachymetra* Mayr, 1865*
		Limnogonus Stål, 1868
		Neogerris Matsumura, 1913*
		Ovatametra Berbroth, 1892*
		Rheumatobates Berbroth, 1892*
		Trepobates Uhler, 1883*
	Hydrometridae	*Hydrometra* Latreille, 1797*
	Hebridae	*Hebrus* Curtis,1831*
	Mesoveliidae	*Mesovelia* Mulsant and Rey, 1852*
	Veliidae	*Microvelia* Westwood, 1834*
		Rhagovelia Mayr, 1865*
		Stridulivelia Hungerford, 1929*
Nepomorpha	Belostomatidae	*Belostoma* Latreille, 1807*
		Lethocerus Mayr, 1853*
		Weberiella De Carlor 1966*
	Corixidae	*Heterocorixa* White, 1879*
		Palmacorixa Abbott,1912
		Sigara Fabricius, 1775*
		Tenagobia Bergroth, 1899*
	Gelastocoridae	*Gelastocoris* Kirlakdy, 1897*
	Naucoridae	*Ambrysus* Stål 1861*
		Cryphocricos Signoret, 1850*
		Limnocoris Stål, 1860*
		Pelocoris Stål 1876*
	Nepidae	*Curicta* Stål 1861*
		Ranatra Fabricius, 1790*
	Notonectidae	*Buenoa* Kerkaldt, 1904*
		Martarega White, 1879*
		Notonecta Linaeus, 1758*
	Pleidae	*Neoplea* Esaki and China, 1928*
		Paraplea Esaki and China, 1928*

(Heckman 2011). In Brazil, 105 species are registered (Ribeiro *et al.* 2014). In the Cerrado, 3 genera were recorded: *Microvelia* Westwood, 1834 (Figure 2C, D), *Rhagovelia* Mayr, 1865 and *Stridulivelia* Hungerford, 1929. The insects found in DF and GO for the genus *Microvelia* are a new record of the genus in these regions. *Rhagovelia* has two species registered for the State of GO, *Rhagovelia robusta* Gould, 1931 and *Rhagovelia whitei* (Breddin, 1898) (Moreira & Campos 2012). However, no record of this genera was found for the DF, being a new record. According to Moreira & Campos (2012) the genus *Stridulivelia* has no record for GO, which was recorded in this work.

The infraorder Nepomorpha comprising about 2000 species, in 11 families, whose sizes vary from 1 mm (Pleidae) to 130 mm (Belostomatidae) (Panizzi & Grazia 2015). They are characteristically non velvety insects, large eyes that practically occupy the sides of the head and, except for Ochteroidea and Corixidae, ocelli are absent (Ribeiro *et al.* 2014). They also have anterior legs that are almost always raptorial and median and posterior legs covered by well-developed bristles that assist in swimming.

According to Moreira *et al.* (2018), Nepomorpha's classification has undergone more changes at the family level than Gerromorpha. Among the most important taxonomic classifications are the studies by Popov (1971), Mahner (1993) and Hebsgaard *et al.* (2004). The first two were not based on phylogenetic analysis. On the other hand, Hebsgaard *et al.* (2004) combined morphological characters with molecular data and supported the monophilia of the 11 families of Nepomorpha. They considered Nepoidea (Belostomatidae + Nepidae) as the basal group and brother of the remaining families: Corixoidea (Corixidae), Aphelocheiroidea (Potamocoridae + Aphelocheiridae), Naucoroidea (Naucoridae), Ochteridae (Ochteridae), Gelastocoridae and Gelastocoridae and Pleoidea (Helotrephidae + Pleidae). There are some exceptions in the classification of Corixidae, because some researchers consider the two subfamilies, Micronectinae and Diaprepocorinae, as distinct families (e.g., Nieser 2002; Chen *et al*. 2005). More recently, these two subfamilies have been frequently reported in the literature as families, and the results of a preliminary analysis based on morphological and molecular characters support the family status of Micronectidae (Tinerella 2008). In some Nepomorpha families there are species whose movements are quite slow. The Belostomatidae family includes individuals who are particularly slow, probably due to its large size, but they are very effective in their camouflage (Heckman 2011).

Belostomatidae. The individuals of this family reach the largest sizes among the Heteroptera. They are associated with lentic environments with vegetation. They are also commonly known as giant water bugs, or electrical bugs, and may vary from 10 to 100 mm body length (Moreira *et al.* 2018). They have 3 subfamilies: Belostomatinae, Horvathiniinae and Lethocerinae (Lauck & Menke 1961; Stys & Jansson 1988), comprising 160 species and 11 genera (Estevez & Ribeiro 2011). Females typically lay their eggs on the male's back. They have a broad, flattened body, anterior legs adapted to catch prey and posterior flattened legs suitable for swimming (Moreira *et al.* 2018). The family Belostomatidae is easily found in tropical and subtropical regions and rare or absent in places with a colder climate (Heckman 2011). Belostomatidae are well represented in the Old and New World, indicating that, during some period of geological history, it was able to overcome the oceanic barriers that currently separate the continents. Although it does not present physiological adaptations to the colder periods, many species have managed to colonize habitats that undergo periodic desiccation. They have a short and retractable respiratory siphon; the posterior thighs are conical and fused with metapleura. The middle and posterior tarsus consists of two or three segments and, except in some cases, the anterior tarsus as well. The veins in the hemielyter's membranes are reticulated (Heckman 2011).

In the Neotropical region, the subfamily Belostomatinae is represented by three genera: *Abedus* Stal, 1862, *Belostoma* Latreille, 1807 and *Weberiella* De Carlor, 1966 (Panizzi & Grazia 2015). The genus *Belostoma* is the most diverse genus, with 77 neotropical species ranging from Mexico to Argentina (Lauck 1959; Lanzer de Souza 1980, 1992; Estévez & Polhemus 2001, 2007; Estévez & Armúa de Reyes 2003; Ribeiro & Alecrim 2008; Ribeiro & Estévez 2009). *Weberiella* is exclusively neotropical, with *Weberiella rhomboides* (Menke, 1965), taking place in the North and midwest of Brazil and French Guiana (Estévez & Ribeiro 2011). According to Heckman (2011), this genus occurs only in French Guiana and in the Amazon. Horvathiniinae has only one genus and one species, *Horvathinia pelocoroides* Montandon, 1911 (Schnack & Estévez 2005), whose distribution is reported for Brazil. In the present work this species was not found. The Lethocerinae sub-family is represented by the genus *Lethocerus* Mayr, 1853, with 15 species for the Neotropical region. In this work, the genera *Belostoma* (Figure 3C) (DF and GO), *Weberiella* (Figure 3A, B) (new record for the states of GO) and *Lethocerus* (GO and new record for DF) were registered for the Cerrado Biome.

Corixidae. It is a cosmopolitan family inhabiting both fresh, salty and brackish water. They have two pairs of long legs used for swimming and a pair of front legs used to grab food. They present the ventral rostrum very small, in relation to the head, and without segmentation (Heckman 2011). The anterior tarsus is always flattened with rows of hair. According to Moreira *et al.* (2018) this family, popularly known as water boatman, is the family with the greatest diversity among the Nepomorpha, having about 560 species distributed in 35 genera and six subfamilies (Corixinae, Cymatiainae, Diaprepocorinae, Heterocorixinae, Micronectinae and Stenocorixinae).

In the Cerrado, three genera were found: *Heterocorixa* White, 1879 (Figure 4A, B) in DF (new record) and GO, *Tenagobia* Bergroth, 1899 (Figure 4D, E, F) in DF (new record) GO and MT; and *Sigara* Fabricius, 1775 (Figure 4G) in DF (new record).

Gelastocoridae. They usually inhabit margin regions in water bodies, where their color and shape provide camouflage behavior (Heckman 2011). The front legs are raptorial, helping to catch prey. Most species are active mainly during the day, relying on their camouflage for protection. Their jumping movements and general shape cause them to be confused with small frogs right after the metamorphosis, which can be an additional aid for survival (Heckman 2011). Gelastocoridae has two subfamilies: Gelastocorinae and Nerthrinae. The first is monotypic. *Gelastocoris* Kirlakdy, 1897 occurs in the Neotropical region, with 23 species (Todd 1955; Estévez & Schnack 1980; Boulard & Jauffret 1984). Nerthrinae is also monotypic, presenting the genus *Nerthra* Say, 1832, cosmopolitan, with about 30 neotropical species (Todd 1955; Schnack & Estévez 1979; Polhemus & Lindskog 1994). The subfamilies are differentiated by the positioning of the openings of the cephalic glands, the different shape of the gular bridge and the number of abdominal spiracles (Estévez & Lopez-Ruf 2006).

According to Ribeiro *et al.* (2014) there are 21 species recorded in Brazil, seven of with in the Amazon. Heckman (2011) reports the occurrence of the genus *Gelastocoris* for the states of MT, AM, PA, MG, RJ, BA, AC, SC, PR, SP. In the Brazilian Fauna Taxonomic Catalog (http://fauna.jbrj.gov.br/fauna/faunadobrasil/2) are records of the genus *Nerthra* for GO, MG and MS, but without mentioning the reference. Panizzi & Grazia (2015) does not record its presence in the Brazilian savannah. According to the authors, Champion (1901) reported species of this genus from the south and west of the Brazil, but Todd (1955) doubted that there are species of this genus occurring anywhere in South America. In the Cerrado Biome, only specimens of the genus *Gelastocoris* (Figure 4E, F) were found, being a new record for the states of GO and DF.

Naucoridae. Similar to Belostomatidae, although with smaller dimensions (5 to 20 mm) are cosmopolitan, having greater diversity in the region neotropical. They have about 390 species, of which 61 occur in Brazil (Moreira *et al* 2018). They present a behavior of going to the surface to breathe, renewing the air supply in the respiratory tubes through the formation of air bubbles (Heckman 2011). They have short antennas visible from the ventral side. The labrum is small and does not extend beyond the posterior margin of the prosternum (Heckman 2011). The Naucoridae is subdivided into 5 subfamilies: Cheirochelinae, Cryphocricinae, Laccocorinae, Limnocorinae and Naucorinae (Stys & Jansson 1988), with only Cheirochelinae not occurring in the Neotropical region. They are found in a wide variety of habitats, including vegetated lake shores, seaweed mats, brackish water and vertical rock faces and waterfall splash zones (Moreira *et al* 2018). Four genera were found in the Cerrado: *Ambrysus* Stål 1861, *Cryphocricos* Signoret, 1850, *Limnocoris* Stål, 1860 and *Pelocoris* Stål 1876. In this work, the genus *Ambrysus* was registered for DF, GO and MT, being a new record for DF; *Cryphocricos* was recorded in DF and GO, and new record for the two states; *Limnocoris* presented records in DF, GO, MT and MG (new record for DF) and *Pelocoris* recorded in DF and GO, with new record for the two locations.

Nepidae. The Nepidae, popularly known as the water scorpion, is divided into two subfamilies: Nepinae and Ranatrinae. The subfamily Nepinae has two genera, *Curicta* Stål 1861 with about 22 species registered for the Neotropical region (Panizzi & Grazia 2015) and *Telmatotrephes* Stål, 1854, with 4 species occurring in the Neotropical and Eastern regions (Lansbury 1972). The Ranatrinae subfamily has only one genus, *Ranatra* Fabricius, 1790, cosmopolitan with about 63 species in the Neotropical region (Panizzi & Grazia 2015). The Nepidae is formed by elongated insects, large and with a flat or cylindrical body, with long legs and, typically, 1 pair of long, non-retractable breathing tubes, from the posterior region of the body (Moreira *et al.* 2018). They have a brownish color and, despite being predators, they are not good swimmers.

In the Cerrado the occurrence of the genera *Curicta* and *Ranatra* was registered in GO and DF. Both were registered for the state of GO; however, they are a new record for the DF.

Notonectidae. They have an elongated and fusiform body, predators of small arthropods and even small fish. The hind legs are elongated and used to propulsion the body into the water. They have two subfamilies, Notonectinae and Anisopinae, with about 400 species (Ribeiro *et al.* 2014). These are divided into 11 genera, of which four occur in the neotropical region (Moreira *et al.* 2018). All species have well-developed paired claws on the front and middle legs, and reduced claws on the hind legs (Moreira *et al.* 2018). The genus *Notonecta* Linaeus, 1758 is the only cosmopolitan of this family, having about 40 neotropical species (Hungerford 1934; Mazzucconi *et al*. 2009; Barbosa & Rodrigues 2013). *Martarega* White, 1879 (Panizzi & Grazia 2015) currently comprises 22 species and *Buenoa* Kerkaldt, 1904 has about 56 neotropical species (Truxal 1949, 1953; Roback & Nieser 1974; Barbosa *et al*. 2010; Padilla-Gil 2010, 2012; Moreira *et al*. 2011; Barbosa & Rodrigues 2013).

According to Ribeiro *et al.* (2014) these true bugs are well adapted to locomotion in water, occupying the same niche as Corixidae in fresh and brackish environments. Also, according to the authors, they have a size between 5 to 15 mm, with very large eyes and a very convex back.

In this work, we registered the genera *Buenoa* in DF (new record) and GO, *Martarega* in DF (new record), GO and MT and *Notonecta* in DF (new record), GO and MG.

Pleidae. They are small insects (1.5 to 3.5 mm) with a semiglobular body. The head and pronotum are not fused (Heckman 2011). The family has 4 genera and about 38 species (Ribeiro *et al.* 2014), with no subdivisions into subfamilies. The shape of the body is related to the habit of swimming from top to bottom. They inhabit still waters with aquatic vegetation, and feeding on small invertebrates, such as insect larvae and ostracodes (Moreira *et al.* 2018). According to Moreira *et al.* (2018) they are known as pigmy swimmers. Panizzi & Grazia (2015) emphasizes that Pleiade is a small family, with its greater diversity in the Neotropics. For this region 3 genera are registered, *Neoplea* Esaki and China, 1928, *Paraplea* Esaki and China, 1928 and *Heteroplea* Cook, 2011, having only one species restricted to Venezuela (Panizzi & Grazia 2015). In Cerrado Biome were recorded *Neoplea* to GO (new record).

Important information about the distribution of families and genera deposited at CIAQ-UnB was recorded. The Gerromorpha deposited in the collection are distributed in the states of DF and GO, and *Hydrometra* (Hydrometridae), *Limnogonus* (Gerridae) and *Stridulivelia* (Veliidae) are registered only for the state of GO. *Neogerris*, *Ovatametra* and *Trepobates* (Gerridae) for the DF and *Rheumatobares* (Gerridae), *Mesovelia* (Mesoveliidae), *Microvelia* and *Rhagovelia* (Veliidae), and *Brachymetra* (Gerrida) occurred in both states. In GO the streams are part of the Tocantins Araguaia basin. In the Federal District, the records were made in streams in the Tocantins-Araguaia basin (*Neogerris*, *Limnogonus* and *Brachymetra*), in the Paraná River basin (*Ovatametra*) and in streams that are part of both (*Trepobates*, *Rheumatobates*). *Hydrometra* (Hydrometridae) and *Strirdulivelia* (Veliidae) were recorded in rivers of the Tocantins-Araguaia basin, in the Chapada dos Veadeiros region. This region is considered the central area of the Cerrado Biome and the core area of the Brazilian Biodiversity Reserve. In Chapada dos Veadeiros, *Mesovelia* (Mesoveliidae), *Microvelia* and *Rhagovelia* (Veliidae) were also recorded.

In relation to Nepomorpha, an occurrence was also recorded in the states of MT and MG, in addition to DF and GO. *Limnocoris* (Naucoridae) was the only registered genus in the collection recorded in the state of MG, in the streams of the São Francisco, Tocantins-Araguaia and Paraná river basins. For the state of MT, the genera *Tenagobia* (Corixidae), *Ambrysus* (Naucoridae and *Martarega* (Notonectidae), in addition to *Limnocoris*. *Neoplea* (Pleidae) and *Weberiella* (Belostomatidae) were recorded only in the state of GO, in the Chapada dos Veadeiros region, and *Sigara* (Corixidae) only in the DF (Paraná River basin). all listed genera belonging to the families Naucoridae, Nepidae and Notonectidae. These genera were recorded in streams of the Paraná and São Francisco river basins.

The Federal District (DF) has in its territory the headwaters of the main Brazilian hydrographic basins (Tocantins-Araguaia, São Francisco and Paraná). In the state of Goiás, two very important regions for the conservation of the Biome Biodiversity were sampled: Chapada dos Veadeiros and the Rio Paranã swamp (Goiano swamp). These two areas differ mainly in terms of altitude and the type of body of water encountered. The Chapada dos Veadeiros region is a region with altitudes of up to 1,600 m and the Rio Paranã 400 m in relation to sea level. Thus, there are streams with rapids and waterfalls in the Chapada region and streams and rivers that are bigger and with slower flow in the Paranã swamp

This article aims to fill an important gap in the knowledge of the occurrence of Heteroptera genera in the Cerrado Biome, adding information about the Aquatic Invertebrate Collection of UnB (CIAq-UnB), the only one of its kind in the central west region of Brazil. For the identification of Heteroptera genera, specific articles were available aimed at specific groups or books with information on biology and distribution in the Brazilian territory, or in states or regions (Heckman 2011; Panizzi & Grazia 2015; Ribeiro *et al.* 2014). It also provides a taxonomic key for families and genera that occur in the region, creating another channel of information about the aquatic biota of the Cerrado Biome (Brazilian Savanna), an international biodiversity hotspot.

ACKNOWLEDGMENTS

I would like to thank the undergraduate and graduate students who, since the creation of the UnB Aquatic Invertebrate Collection, have contributed to the listing and maintenance of the collection.

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EntomoBrasilis
e-ISSN 1983-0572

APPENDICES

Appendix 1. Taxonomic key for families and genera of the Brazilian Savanna

Key for family and genera of Heteoptera from Brazilian Savanna (adapted from Ribeiro *et al.* 2014; Heckman 2011)

1. Short antennae inserted below the eyes; are considered truly aquatic..... NEPOMORPHA

1'. Long antennae inserted in front of the eyes; occur on the banks, in riparian vegetation or on the waters.....2

2. Metacoxae wide, in a transverse position, widely attached to the thoracic pleura; outer wing membrane with 4 or 5 similar cells ..... LEPTODOMORPHA (one family, Saldidae - not found in Cerrado)

2'. Small metacoxae, conical or cylindrical (photo) with free rotational movement in the acetabulum; outer membrane without cells or with different cells from each other ....GERROMORPHA

3. Ocelli usually present; live on the margins of water bodies 4

3'. Absent ocelli; truly aquatic.....20

4. Short rostrum visible between the anterior femurs .... Gelastocoridae (*Gelastocoris*)

4'. Long rostrum reaching the outer coxae 5

5. Raptorial forelegs.....6

5'. Non-raptorial forelegs 14

6. Hemierlytra membrane with veins without reticulum.....10

6'. Hemielytra membrane without veins.....Naucoridae 7

7. Anterior margin of the pronotum with deep invagination in the interocular space.....8

7'. Anterior margin of the pronotum straight or slightly concave in the interocular space 9

8. Protopleural plaques, in the form of plaques, completely covering the posterior portion of the prosternum..... .....Ambrysinae (*Ambrysus*)

8'. The prostern is completely exposed .... Cryphocricinae (*Cryphocricos*)

9. Inner margin of the eyes diverging previously; meso and meta-sternum with prominent longitudinal carinae..... .....Limnocorinae (*Limnocoris*)

9'. Inner margin of the eyes converge anteriorly; meso and meta-sternum without prominent longitudinal carinae..... Naucorinae (*Pelocoris*)

10. Hind legs without fringe of bristles; long, non-retractable siphon at the end of the abdomen..... Nepidae 11

10'. Hind legs with fringe of bristles; short retractable siphon at the end of the abdomen..... Belostomatidae 12

11. Cylindrical body; pronotum longer than broad; head free from pronotum .....*Ranatra*

11'. Elongated body; head narrower than pronotum.. *Curitcta*

12. Anterior tarsus with 2 articles and a well-developed claw; tibia and tarsi flattened posteriorly..... *Lethocerus*

12'. Anterior tarsus with 1 or 2 articles; when 2 articles occur 2 claws are present; tibia and tarsus from cylindrical to slightly flattened 14

13. Anterior tarsus with 1 article; lateral margins of the abdomen clearly sawn .....*Weberiella*

13'. Anterior tarsus with 2 articles; lateral margins of the abdomen not serrated.....*Belostoma*

14. Dorsum-ventrally flattened body; rostrum not apparently segmented, but with transverse streaks; modified anterior tarsi, spatulated and with a bristle comb ..... Corixidae 15

14'. Convex body; segmented rostrum, without streaks; unmodified anterior tarsi with distinct tarsal claws.....18

15. Pronotum covers the anterior part of the scutellum; absent eyes; antennas with 3 segments..... Micronectinae (*Tenagobia*)

15'. Scutellum completely covered by pronotum 16

16. Ventral margin of the eyes closer than the posterior margin .....Heterocorixinae (*Heterocorixa*)

16'. Ventral margin of the eyes at the same distance from the anterior margin .....Corixinae (*Sigara*)

17. Globose body with convex dorsal surface; small species (up to 3 mm); almost symmetrical legs, tibiae and posterior tarsi with undeveloped swimming fringe ....Pleidae (*Neopleia*)

17'. Elongated body; hind legs longer than the forelegs with clear swimming fringe ..... Notonectidae 18

18. Labrum with rounded apex; hemielytra with a pit marked by a line of bristles at its commissure.....*Buenoa*

18'. Labrum with triangular apex; hemielytra without pit in the commissure 19

19. Eyes joined together; median femur without spur ....*Martarega*

19'. Eyes apart; median femur with spur ..... *Notonecta*

20. Apical tarsal claws..... Hydrometridae (*Hydrometra*)

20'. Sub-apical tarsal claws 21

21. Legs inserted ventrolaterally close to the midline ....Mesoveliidae (*Mesovelia*)

21'. Legs inserted ventrolaterally, away from the midline...22

22.Mesothorax very developed; anterior and median coxae more distant than medians and posterior .....Gerridae 26

22'. Less developed mesothorax; equidistant coxae..... ..... Veliidae 28

23. Beveled eyes on the back 24

23. Non-beveled eyes 25

24. Pronotum color varies from brown to black with 2 lighter elongated spots; median tarsi with claws..... *Limnogonus*

24'. Pronotum color varies from brown to black with an oval spot in the center; median tarsi without claws..... *Neogerris*

25. Tarsomer II length of the median leg less than twice the length of tarsomer I.....*Brachymetra*

25'. Tarsomer II length greater than 2 times the length of tarsomer I 26

26. Middle femur length greater than median tibia length and posterior femur ..... *Rheumatobates*

26'. Median femur length not as above 27

27. Median tibia clearly shorter than the body..... *Ovatametra*

27' Medium tibia not as above .....*Trepobates*

28. Median tarsus with traditional, sickle-shaped claws..... ..... *Microvelia*

28'. Median tarsus with non-traditional claws 29

29. Median tarsus with deep fissure, tarsal claws in the shape of a blade; feather-modified aroliths ..... *Rhagovelia*

29' Unmodified median tarsus.....*Stridulivelia*

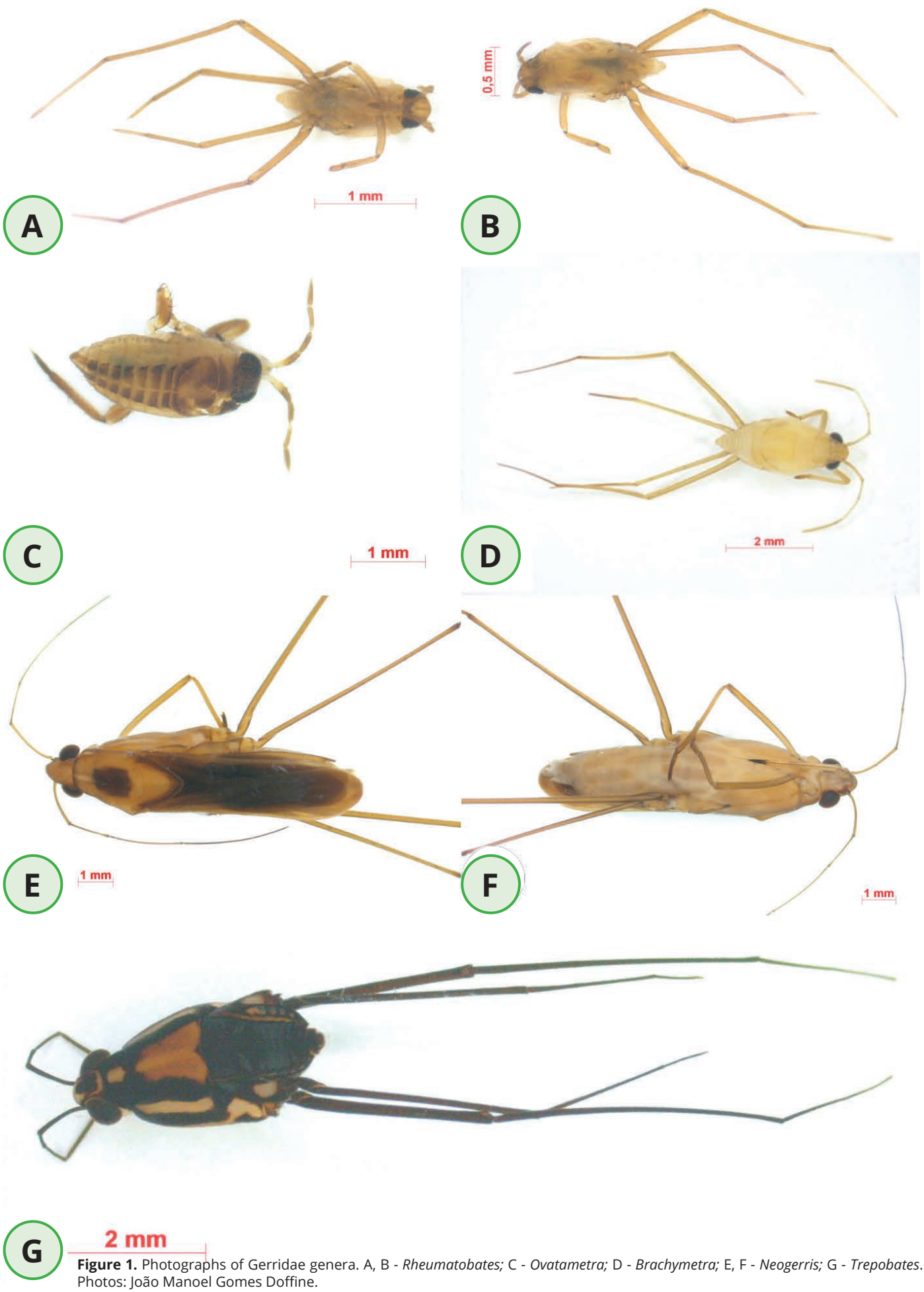

Figure 1. Photographs of Gerridae genera. A, B - *Rheumatobates;* C - *Ovatametra;* D - *Brachymetra;* E, F - *Neogerris;* G - *Trepobates*. Photos: João Manoel Gomes Doffine.

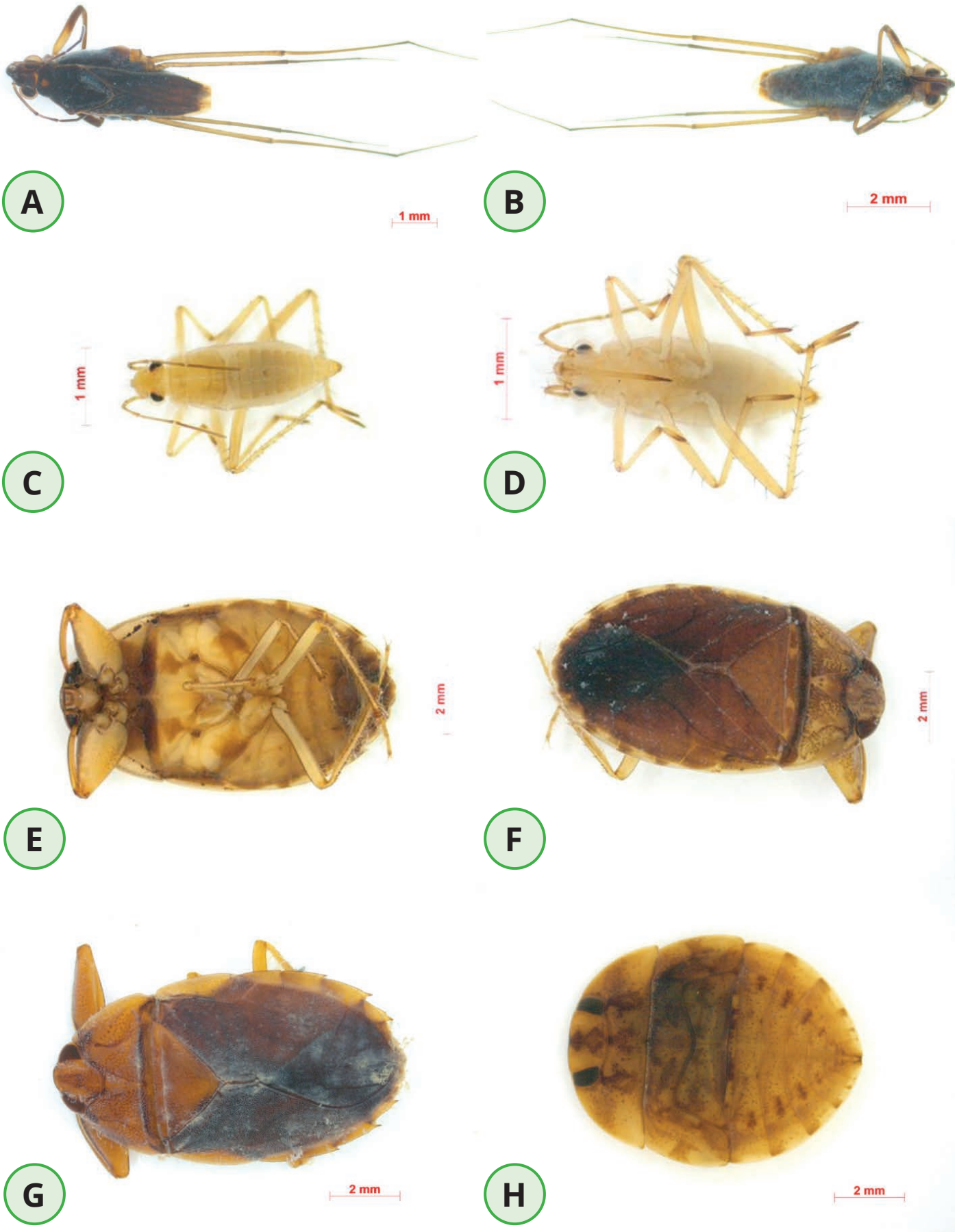

Figure 2. Photographs of Gerridae, Mesovellidae e Naucoridae genera. A, B - *Limnogonus* (Gerridae); C, D - *Mesovelia* (Mesovellidae); E, F- *Ambrysus,* G - *Cryphocricos* and H - *Limnocoris* (Naucoridae). Photos: João Manoel Gomes Doffine.

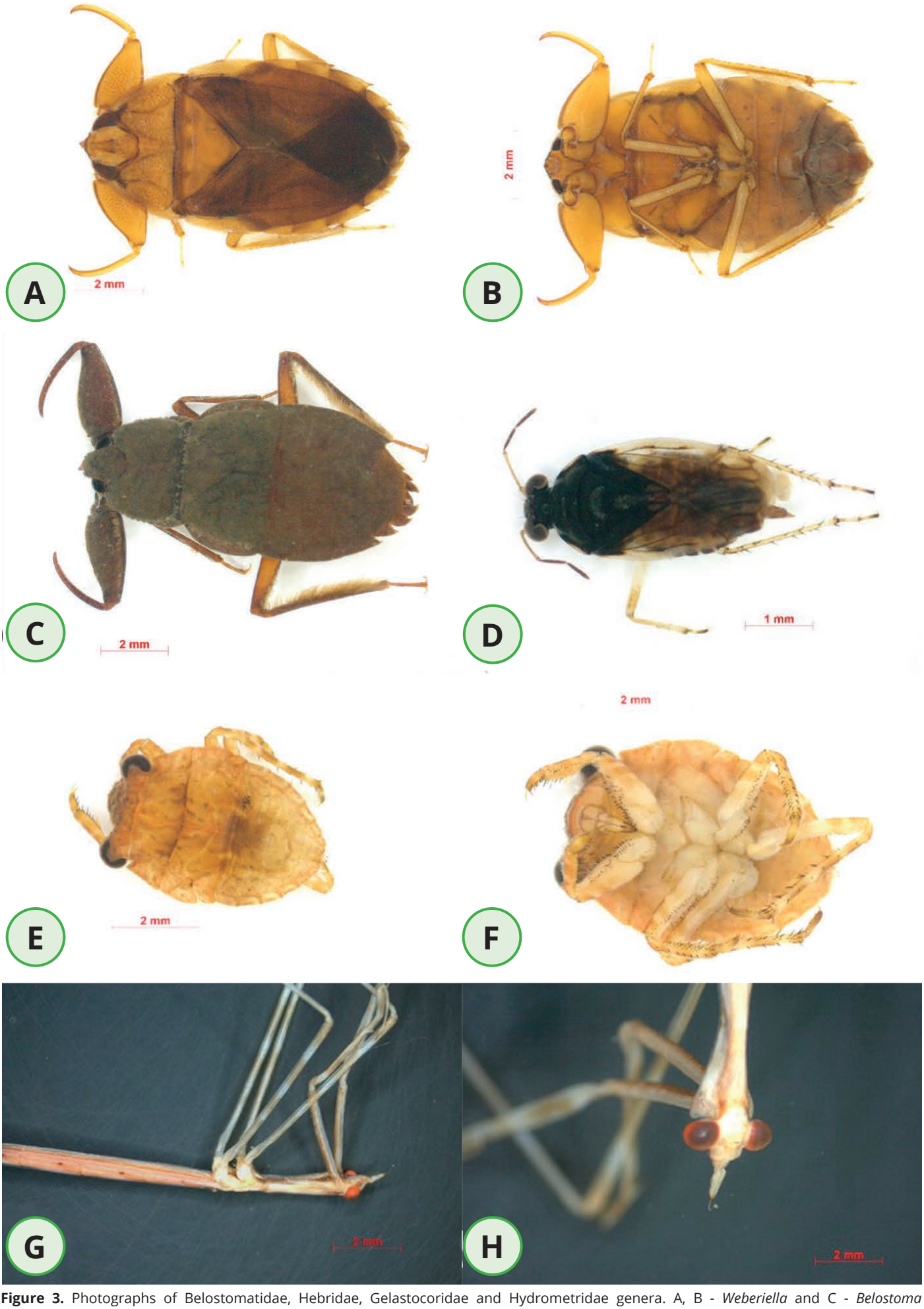

Figure 3. Photographs of Belostomatidae, Hebridae, Gelastocoridae and Hydrometridae genera. A, B - *Weberiella* and C - *Belostoma* (Belostomatidae); D - *Hebrus* (Hebridae); E, F - *Gelastocoris* (Gelastocoridae); G, H - *Hydrometra* (Hydrometridae). Photos: João Manoel Gomes Doffine.

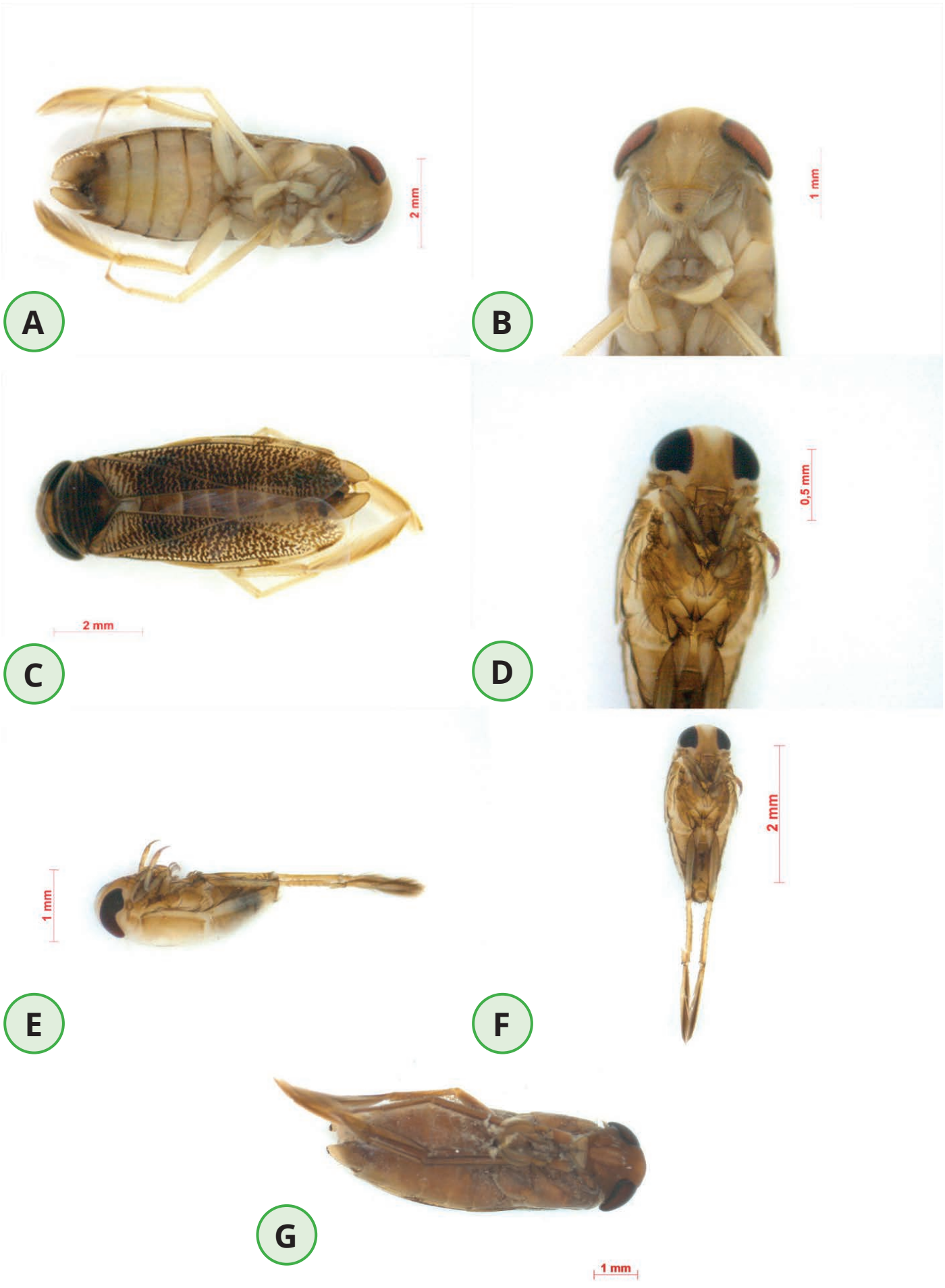

Figure 4. Photographs of Corixidae genera. A, B, C - *Heterocorixa;* D, E, F- *Tenagobia;* G - *Sigara.* Photos: João Manoel Gomes Doffine.