



Corixoidea and Notonectidae (Hemiptera: Heteroptera: Nepomorpha) of Pará, Brazil, with new records from the western portion of the state

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Abstract

Corixoidea and Notonectidae are the two most speciose groups of Nepomorpha (Insecta: Hemiptera: Heteroptera). They live in the water column of fresh and brackish water bodies. In Brazil, there are records of 46 species of Corixidae and Micronectidae (Corixoidea), and 58 species of Notonectidae. Of these, 35 species have been previously recorded from the state of Pará, in the northern portion of the country. However, large sampling gaps exist in the state, especially in its western portion. Here, we report the results of field work performed from 2019 through 2024 in 12 municipalities within this area, together with an annotated list and identification keys to species occurring in Pará. In total, four genera and 11 species of Corixoidea, and three genera and 26 species of Notonectidae, are known from Pará. Our new data include the first records from the state of *Buenoa deplanatylus* Barbosa & Nessimian, 2013 and *Martarega williamsi* Truxal, 1949, increasing the local richness of Notonectidae by 8%. Finally, *B. konta* Nieser & Pelli, 1994, *B. tarsalis* Truxal, 1953, *B. tibialis* Truxal, 1957, *B. truxali* Nieser, 1968, *B. unguis* Truxal, 1953, and *Notonecta pulchra* Hungerford, 1926 are recorded for the first time from western Pará.

Key words: aquatic insects, aquatic ecosystems, eastern Amazon, faunistics, Neotropical Region, taxonomy

Introduction

Corixoidea and Notonectidae (Hemiptera: Heteroptera: Nepomorpha) are the two most speciose groups of Nepomorpha (Hungerford 1948; Polhemus & Polhemus 2008). These insects usually occupy the same niche in the water column of fresh and brackish water bodies (Ribeiro *et al.* 2019), including swimming pools, lakes, lagoons, and stream pools (Moreira *et al.* 2018).

Corixoidea includes three families and more than 600 described species globally (Polhemus & Polhemus 2008). Corixidae and Micronectidae are cosmopolitan, with approximately 400 and 230 species, respectively (Nieser 2002; Nieser & Chen 2006; Ye *et al.* 2023), whereas Diaprepocoridae consists of four species endemic to the Australian Region (Andersen & Weir 2004). Representatives of Corixoidea can be recognized by the oval, elongated, flattened body, the short labium with superficial striae, and the unarticulated protarsus modified into a spatula (Moreira *et al.* 2018). Most corixoids prey upon small invertebrates, such as microcrustaceans and immature aquatic insects, but some species can feed on algae or plant debris, which is unique among aquatic bugs (Chen *et al.* 2005; Hädicke *et al.* 2017; Schuh & Weirauch 2020). Further, they are present in the diet of fishes and birds, being important components of limnic environments (Frost & Macan 1948; Savage 1989).

Both Corixidae and Micronectidae occur in Brazil, totaling seven genera and 46 species. The northern region of the country has the highest richness with 24 species, of which 11 occur in the state of Pará (Ribeiro *et al.* 2024a). In

Notonectidae, four genera and 58 species have been recorded from Brazil. Again, the northern region has the highest richness with 37 species, of which 24 occur in Pará (Ribeiro *et al.* 2024b).

Notonectidae is globally distributed, including 11 genera and approximately 400 described species (Polhemus & Polhemus 2008). Members of this family swim upside down using their hindlegs and exhibit reverse countershading. They are elongate, fusiform, ranging from 4 to 15 mm in body length (Moreira *et al.* 2018). The pretarsal claws are well-developed in the fore- and midlegs but reduced in the hindlegs, the forewing membrane does not bear venation, and the abdominal venter has a median carina (Barbosa & Rodrigues 2015). They are strictly predators, feeding upon arthropods and small fishes (Moreira *et al.* 2018).

Although many species of these aquatic bugs have been recorded from Pará, knowledge gaps still exist in areas with lower sampling effort, like in the western portion of the state. This area is under threat from increasing human activity, including deforestation for agriculture and pasture, road construction, and logging, all of which severely impacts the local aquatic ecosystems (Rego & Kato 2017).

Here, we present a survey of the Corixoidea and Notonectidae recorded from the state of Pará, together with illustrated identification keys to the species.

Material and Methods

From June 2019 through February 2024, we performed field work in the following 12 municipalities in the western portion of the state of Pará: Alenquer, Aveiro, Belterra, Curuá, Itaituba, Mojuí dos Campos, Monte Alegre, Óbidos, Oriximiná, Rurópolis, Santarém, and Terra Santa (Barros 2023) (Fig. 1). The climate in the region according to Köppen's classification is Am, tropical, with average annual precipitation of 2000 mm (Rodrigues 2001).

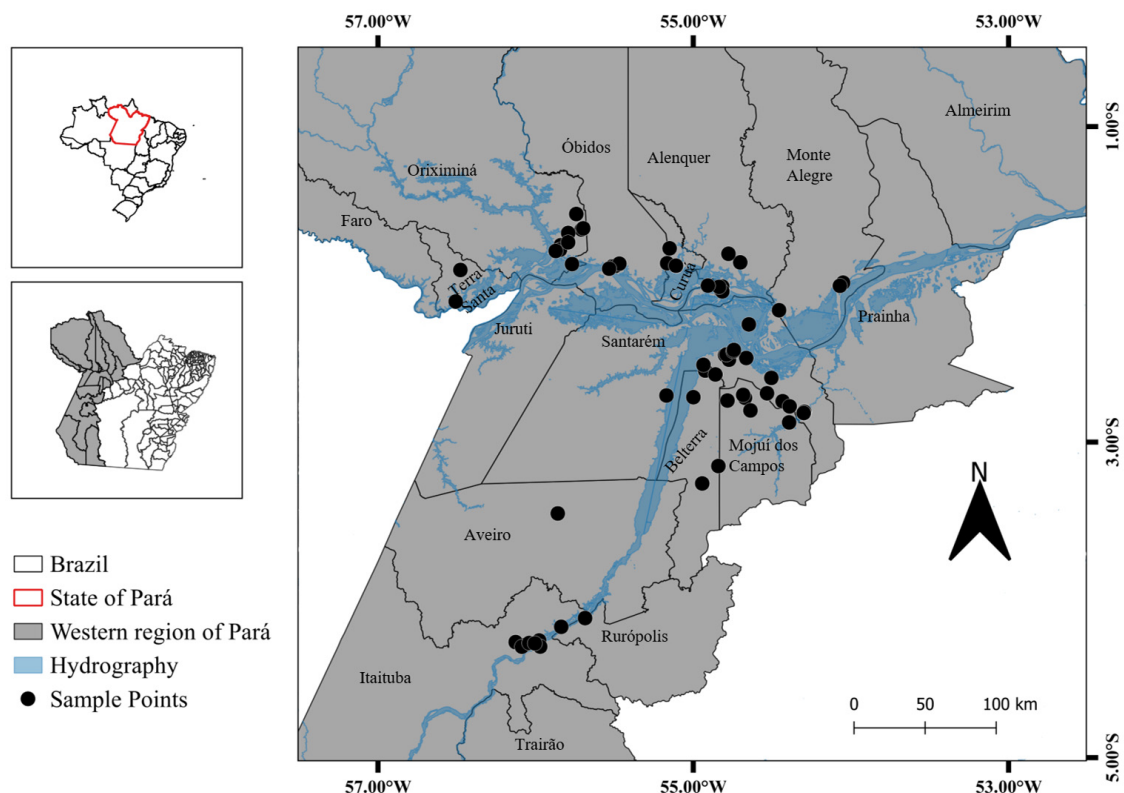


FIGURE 1. Collecting localities in the western portion of the state of Pará, northern Brazil.

We collected specimens using aquatic D-nets and sieves (mesh pores: 1 and 0.062 mm, respectively) in 72 sampling stations (Fig. 1), including natural lakes, temporary pools, waterfalls, rivers, and streams (Fig. 2). We fixed and preserved the material in 70% ethanol, and labelled it with locality, date, and collectors' names. We used a Garmin eTrex 30 GPS receptor to georeference the sampling stations. We identified species using keys provided by

Nieser (1970a, 1975), Barbosa *et al.* (2012), and Barbosa & Nessimian (2013a, 2013b). Keys and figures presented here are based on the same literature. We included both brachypterous and macropterous morphs of *Martarega* in the key and corresponding figures.

The material is deposited in the collection of the Laboratório de Ecologia e Taxonomia de Insetos Aquáticos (LETIA), Universidade Federal do Oeste do Pará (UFOPA), Santarém, Brazil. In the geographic distribution of represented species, only the first known reference is cited for each country or territory, whereas all known references are cited for the records from Brazil.



FIGURE 2. Photographs of selected collecting localities. **A.** Temporary puddle, Campo Grande, Alenquer. **B.** Lago Maicá, Santarém. **C.** Igarapé at BR-163 km 115, Belterra. **D.** Lago Transamazônica, Itaituba. **E.** Temporary puddle, Igarapé das Pedras, Oriximiná.

Results

Corixoidea

Corixidae

Heterocorixa boliviensis Hungerford, 1928

(Fig. 11A–C)

Heterocorixa boliviensis Hungerford, 1928: 100 (original description)

Distribution. Bolivia (Hungerford 1928). Brazil: Amazonas, Pará. Ecuador. Peru (Hungerford 1948).

Distribution in Pará. Belém (Hungerford 1948).

***Heterocorixa chapadiensis* Hungerford, 1928**

(Fig. 12A–C)

Heterocorixa hesperia var. *chapadiensis* [lapsus] Hungerford, 1928: 102 (original description)

Heterocorixa chapadiensis: Hungerford (1948): 123 (status change)

Distribution. Brazil: Amazonas (Nieser 1970a), Maranhão (Sousa *et al.* 2024), Mato Grosso, Pará (Hungerford 1948).

Distribution in Pará. Unknown (Hungerford 1948).

Comments. Hungerford (1948) recorded this species from “Para, Brazil” without giving any details. The collecting locality is also absent from his map (Hungerford 1948: plate XX).

***Heterocorixa hesperia hesperia* (White, 1879)**

(Fig. 13A–B)

Corixa (*Heterocorixa*) *hesperia* White, 1879: 273 (original description)

Heterocorixa hesperia hesperia: Hungerford (1948): 110–112 (combination change; nominal subspecies)

Distribution. Brazil: Pará (White 1879; Hungerford 1928, 1948; Lundblad 1928a; Nieser 1970a).

Distribution in Pará. Prainha (White 1879; Hungerford 1928, 1948; Lundblad 1928a; Nieser 1970a).

Comments. Hungerford (1948: plate XX) included Bolivia and the Brazilian states of Goiás and Rio Grande do Norte when mapping the distribution of *H. h. hesperia*. However, he did not mention examining any material from these areas and Nieser (1975) doubted that specimens from these localities belonged to this subspecies.

***Trichocorixa orinocoensis* Sailer, 1948**

(Fig. 9C–D)

Trichocorixa orinocoensis Sailer 1948, in Hungerford: 339 (original description)

Distribution. Aruba. Bonaire & Klein Bonaire. Curaçao & Klein Curaçao (Nieser 1969a). Brazil: Pará (Nieser 1970a), Paraíba (Sailer in Hungerford 1948). Colombia. Suriname. Trinidad & Tobago. Venezuela (Sailer in Hungerford 1948).

Distribution in Pará. Quatipuru (Nieser 1970a).

Micronectidae

***Synaptogobia heissi* Nieser & Chen, 2006**

(Fig. 3A–C)

Synaptogobia heissi Nieser & Chen, 2006: 528 (original description)

Distribution. Brazil: Amazonas, Pará (Nieser & Chen 2006).

Distribution in Pará. Belterra, Santarém (Nieser & Chen 2006).

***Tenagobia* (*Fuscagobia*) *selecta selecta* (White, 1879)**

(Fig. 5A)

Sigara selecta White, 1879: 273 (original description)

Tenagobia selecta: Bergroth (1899): 282 (combination change)

Tenagobia (*Fuscagobia*) *selecta*: Nieser (1977): 53 (subgeneric placement)

Tenagobia (*Fuscagobia*) *selecta selecta*: Bachmann (1979): 312 (nominal subspecies)

Distribution. Bolivia (Hungerford 1927). Brazil: Amazonas (White 1879; Lundblad 1928b; Deay 1935; Hungerford 1948; Nieser 1977; Reiss 1977), Pará (Nieser 1977; present study), Tocantins (Nieser 1977). Colombia (Roback & Nieser 1974).

Distribution in Pará. Alenquer (present study), Aveiro (Nieser 1977; present study), Belterra (Nieser 1977), Curuá (present study), Itaituba (Nieser 1977; present study), Mojuí dos Campos (present study), Monte Alegre (Nieser 1977; present study), Óbidos (present study), Oriximiná (Nieser 1977; present study), Rurópolis (present study), Santarém (Nieser 1977; present study).

Comments. Bachmann (1979) did not examine the material recorded from Paraguay by Deay (1935) and Hungerford (1948) as *T. selecta* but suspected that it belonged to *T. (F.) s. tarahui* Bachmann, 1979. Material from the Brazilian state of São Paulo reported by Nieser & Melo (1997) might also belong to this subspecies.

Material examined. BRAZIL, Pará: Município de Alenquer, Lago Auerana, 02°01'40"S 54°49'07"W, 07/VII/2023, S.E. Santos col. (4 ♂, 4 ♀); Lago Preto, 02°02'42" S; 54°48'57" W, 07/VII/2023, S.E. Santos col. (18 ♂, 31 ♀); Lago da Buraca, 02°02'19"S 54°49'27"W, 05/VII/2023, S.E. Santos col. (2 ♂, 1 ♀); Nova Aurora, 02°00'59" S; 54°50'11" W, 05/VII/2023; S.E. Santos col. (1 ♂); Fazenda São Francisco, 02°00'51" S/ 54°48'59" W, 06/VII/2023, S.E. Santos col. (7 ♂, 2 ♀). Município de Aveiro, Cameté, 03°27'08" S; 55°51'35" W, 06/II/2022, M.V. Nascimento col. (7 ♂, 11 ♀). Município de Curuá, Município de Curuá, Lago Paraíso, 01°53'01" S; 55°06'29" W, 27/IX/2022, S.E. Santos col. (24 ♂, 35 ♀); Poça Sr. Ermenegildo, 01°52'54" S/ 55°06'36" W, 27/IX/2022, S.E. Santos col. (8 ♂, 6 ♀); Açude Cá te espero, 01°52'18" S/ 55°46'09" W, 27/IX/2022, S.E. Santos col. (1 ♂, 11 ♀). Município de Itaituba, Mirirituba, 04°17'46"S; 55°58'16"W, 10/II/2022, M.V. Nascimento col. (3 ♂, 5 ♀); Poça Lago Bom Jardim, 04°16'33" S; 56°00'18" W, 27/VII/2022, S.E. Santos col. (1 ♂). Município de Mojuí dos Campos, Porto Alegre, 02°52'31" S; 54°23'32" W, 08/X/2022, (3 ♂, 1 ♀), S.E. Santos col. Município de Monte Alegre, Estrada Santana do Taparú, 02°09'51"S 54°27'22"W, 24/IV/2023, S.R.M. Couceiro col. (2 ♂, 2 ♀). Município de Óbidos, Lago Geretepaua, 01°54'03" S; 55°32'01" W, 31/V/2023, S.E. Santos col. (1 ♂). Município de Oriximiná, Lago Ururiá, 01°47'18"S 55°52'22"W, 12/VI/2019, L.A. Oliveira col. (1 ♂); Tanque Patty Chouli, 01°44'01" S; 55°47'39" W, 06/XI/2023, S.E. Santos col. (5 ♂, 3 ♀); Lago Iripixi, 01°46'50" S; 55°50'45" W, 12/VI/2019, L.A. Oliveira col. (1 ♂). Município de Rurópolis, Barreiras, 04°06'56"S; 55°41'11"W, 08/II/2022, M.V. Nascimento col. (39 ♂, 62 ♀); Santarenzinho, 04°10'15" S; 55°50'16" W, 09/II/2022, M.V. Nascimento col. (2 ♂, 1 ♀). Município de Santarém, Lago Maicá, 02°28'01" S/ 54°39'51" W, 27/V/2021, E.C. Oliveira col. (8 ♂, 10 ♀); *idem*, except 27/VII/2021, S.E. Santos col. (7 ♂, 5 ♀); Poça Curuá-Una, 02°49'03"S 54°17'56"W, 05/VI/2023, S.E. Santos col. (3 ♂, 1 ♀); Escola da Floresta, 02°30'38" S; 54°56'09" W, 12/I/2023, S.E. Santos col. (6 ♂, 15 ♀); Lago Mapiri, 02°25'28" S; 54°44'47" W, 18/II/2020, E.C. Oliveira col. (1 ♂); Rio Tapajós UFOPA, 02°24'59" S/ 54°44'34" W, 08/II/2023, S.E. Santos col. (2 ♂); *idem*, except 03/I/2023, (2 ♂, 2 ♀); Igarapé do Costa, 02°15'14"S 54°38'52"W, 17/VII/2023, S.E. Santos col. (1 ♂); Suruacá, 02°42'17"S 55°10'13"W, 05/II/2022, M.V. Nascimento col (1 ♂).

***Tenagobia (Incertagobia) incerta* Lundblad, 1928**

(Fig. 8G–L)

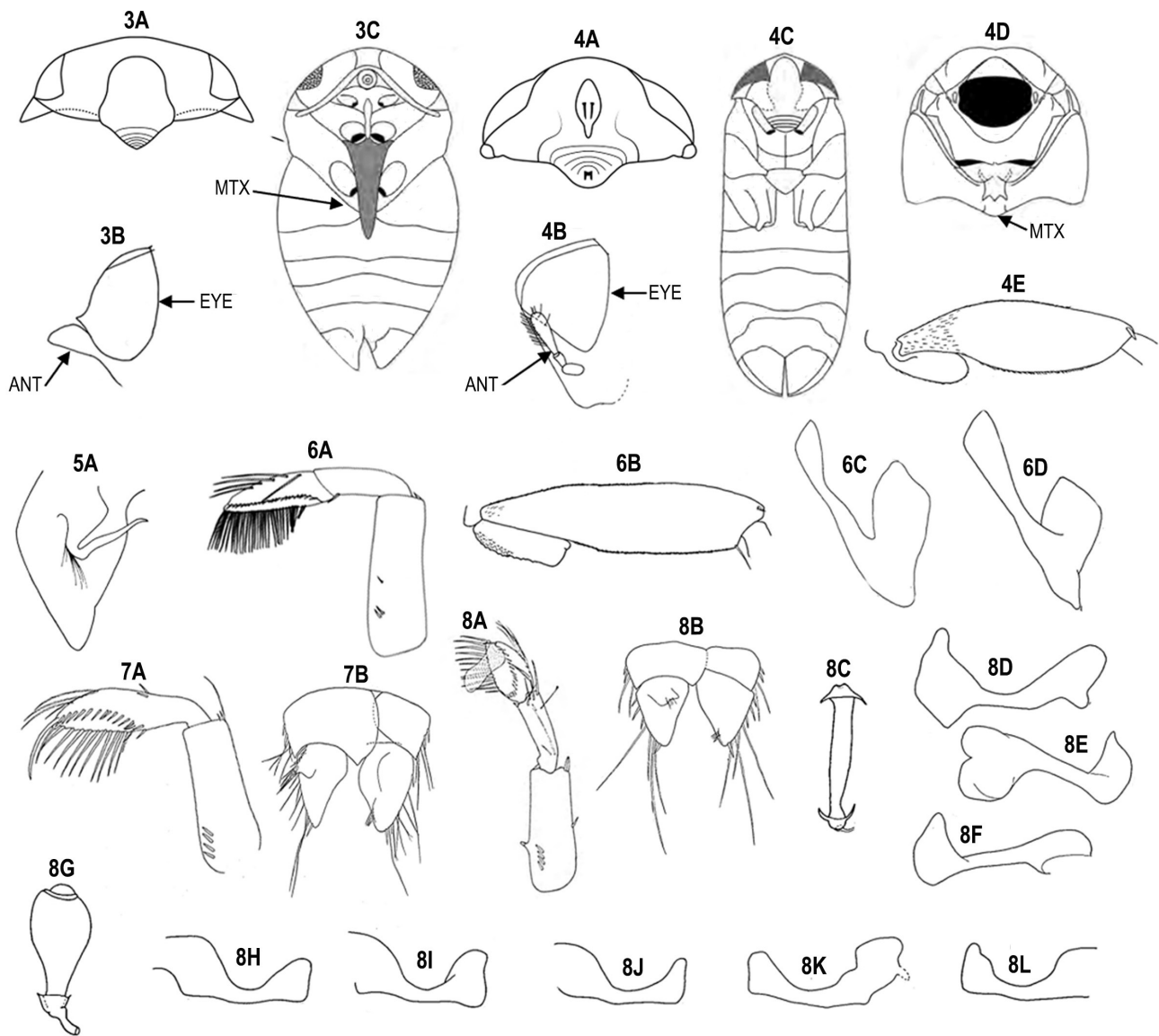
Tenagobia signata var. *incerta* Lundblad, 1928b: 16 (original description)

Tenagobia incerta: Deay (1930): 175 (status change)

Tenagobia (Incertagobia) incerta: Nieser (1977): 16 (subgeneric placement)

Distribution. Argentina (Bachmann 1962a). Bolivia (Deay 1935). Brazil: Amazonas (Deay 1935; Hungerford 1948; Nieser 1977; Irmiler & Junk 1982; Pereira & Melo 2007), Bahia, Ceará (Nieser 1977), Mato Grosso (Nieser 1977; Heckman 1998a, 1998b; Dias-Silva *et al.* 2010, 2020), Mato Grosso do Sul (Deay 1935; Hungerford 1948; Floriano *et al.* 2013), Minas Gerais (Deay 1935; Hungerford 1948; Nieser 1977; Nieser & Melo 1997; Pelli & Barbosa 1998; Barbosa 2002; Souza *et al.* 2006; Melo & Nieser 2004; Pelli *et al.* 2020), Pará (Deay 1935; Hungerford 1948; Nieser 1977), Paraíba (Nieser 1977), Pernambuco (Jaczewski 1933; Hungerford 1948; Nieser 1977), Rio Grande do Sul, Roraima, Santa Catarina, São Paulo, Tocantins (Nieser 1977). Colombia (Roback & Nieser 1974). Grenada (Uhler 1894). Panama (Nieser 1977). Paraguay (Lundblad 1928b). Peru (Deay 1935). Suriname (Nieser 1970a). Trinidad & Tobago (Deay 1935). Venezuela (Nieser 1969a).

Distribution in Pará. Alenquer (Nieser 1977), Belém (Deay 1935; Hungerford 1948), Belterra, Bragança, Curuá, Jacareacanga, Oriximiná, Quatipuru, Santarém, Tomé-açu (Nieser 1977).



FIGURES 3–8. Micronectidae. **3A–C.** *Synaptogobia heissi*. **A.** Head, frontal view. **B.** Part of head, caudal view. **C.** Ventral habitus, mesosternal carina in gray (adapted from Nieser & Chen 2006). **4A–E.** *Tenagobia*. **A.** Head, frontal view (adapted from Pereira *et al.* 2007). **B.** Part of head, caudal view (adapted from Nieser & Chen 2006). **C.** Ventral habitus. **D.** Part of thorax, ventral view (adapted from Moreira *et al.* 2018). **E.** Metatrochanter and metafemur (adapted from Nieser 1977). **5A.** *Tenagobia (Fuscagobia) selecta*, dorsal lobe of left part of male tergum VIII (adapted from Nieser 1975). **6A–B.** *Tenagobia (Romanogobia)*. **A.** Male foreleg (adapted from Hungerford 1948). **B.** Metatrochanter and metafemur. **6C.** *Tenagobia (Romanogobia) pseudoromani*, left paramere. **6D.** *Tenagobia (Romanogobia) romani*, left paramere (adapted from Nieser 1977). **7A–B.** *Tenagobia (Schadeogobia) schadei*. **A.** Male foreleg. **B.** Apex of male abdomen, dorsal view. **8A–B.** *Tenagobia (Incertagobia)*. **A.** Male foreleg. **B.** Apex of male abdomen, dorsal view. **8C–F.** *Tenagobia (Incertagobia) socialis*. **C.** Receptaculum seminis. **D–F.** Variation of left paramere. **8G–L.** *Tenagobia (Incertagobia) incerta*. **G.** Receptaculum seminis. **H–L.** Variation of left paramere (adapted from Nieser 1977). Abbreviations: ANT, antenna; EYE, eye; MTX, metaxyphus.

Tenagobia (Incertagobia) socialis (White, 1879)

(Fig. 8C–F)

Sigara socialis [var. *socialis*] White, 1879: 274 (original description)

Tenagobia socialis [var. *socialis*]: Bergroth (1899): 282 (combination change)

Tenagobia signata var. *socialis*: Lundblad (1928b): 16 (status change)

Tenagobia serrata Deay, 1930: 175 (synonym by Nieser 1977)

Tenagobia socialis: Deay (1935): 451 (status change)

Tenagobia (Incertagobia) socialis: Nieser (1977): 25 (subgeneric placement)

Distribution. Argentina (Bachmann 1962a). Bolivia (Deay 1930). Brazil: Amazonas (White 1879; Deay 1935; Hungerford 1948; Irmiler 1975; Nieser 1975, 1977), Pará (White 1879; Deay 1935; Hungerford 1948; Nieser 1977). Colombia (Roback & Nieser 1974). French Guiana (Nieser 1975). Guyana (Deay 1935). Panama (Nieser 1977). Suriname (Jaczewski 1931a). Trinidad & Tobago (Hynes 1948).

Distribution in Pará. Alenquer, Aveiro, Belterra, Itaituba, Óbidos (Nieser 1977), Santarém (Deay 1935; Hungerford 1948; Nieser 1977), Quatipuru (Nieser 1977), Rio Trombetas (White 1879; Deay 1935; Hungerford 1948).

Comments. Records from Grenada (Uhler 1894) correspond to *T. incerta*, whereas most of those from North America (Uhler 1894; Champion 1901; Osborn & Drake 1915; Jaczewski 1931b) refer to *T. mexicana* Deay, 1930 (Deay 1935). Nieser (1977) provided the only reliable record of this species from Panama.

Tenagobia (Romanogobia) pseudoromani Nieser, 1975

(Fig. 6C)

Tenagobia pseudoromani Nieser, 1975: 236 (original description)

Tenagobia (Romanogobia) pseudoromani: Nieser (1977): 36 (subgeneric placement)

Distribution. Brazil: Amazonas, Pará (Nieser 1977). Suriname (Nieser 1975).

Distribution in Pará. Monte Alegre (Nieser 1977).

Tenagobia (Romanogobia) romani Lundblad, 1928

(Fig. 6D)

Tenagobia romani Lundblad, 1928b: 25 (original description)

Tenagobia (Romanogobia) romani: Nieser (1977): 38 (subgeneric placement)

Distribution. Brazil: Amazonas (Lundblad 1928b, Nieser 1975, 1977), Pará (Nieser 1977; present study). Peru (Sites 2023).

Distribution in Pará. Aveiro, Jacareacanga (Nieser 1977), Santarém, Terra Santa (present study).

Material examined. Brazil, Pará, Município de Santarém, Igarapé do Rai, 02°35'35"S; 54°30'18"W, 13/XI/2019, S.E. Santos col. (27 ♂, 27 ♀); Terra Santa, Igarapé Aimê, 01°54'33" S/ 56°28'38" W, 07/IV/2023, S.E. Santos col (1♂, 1 ♀).

Tenagobia (Schadeogobia) schadei Lundblad, 1928

(Fig. 7A–B)

Tenagobia schadei Lundblad, 1928b: 23 (original description)

Tenagobia hungerfordi Deay, 1930: 177 (synonym by Nieser 1977)

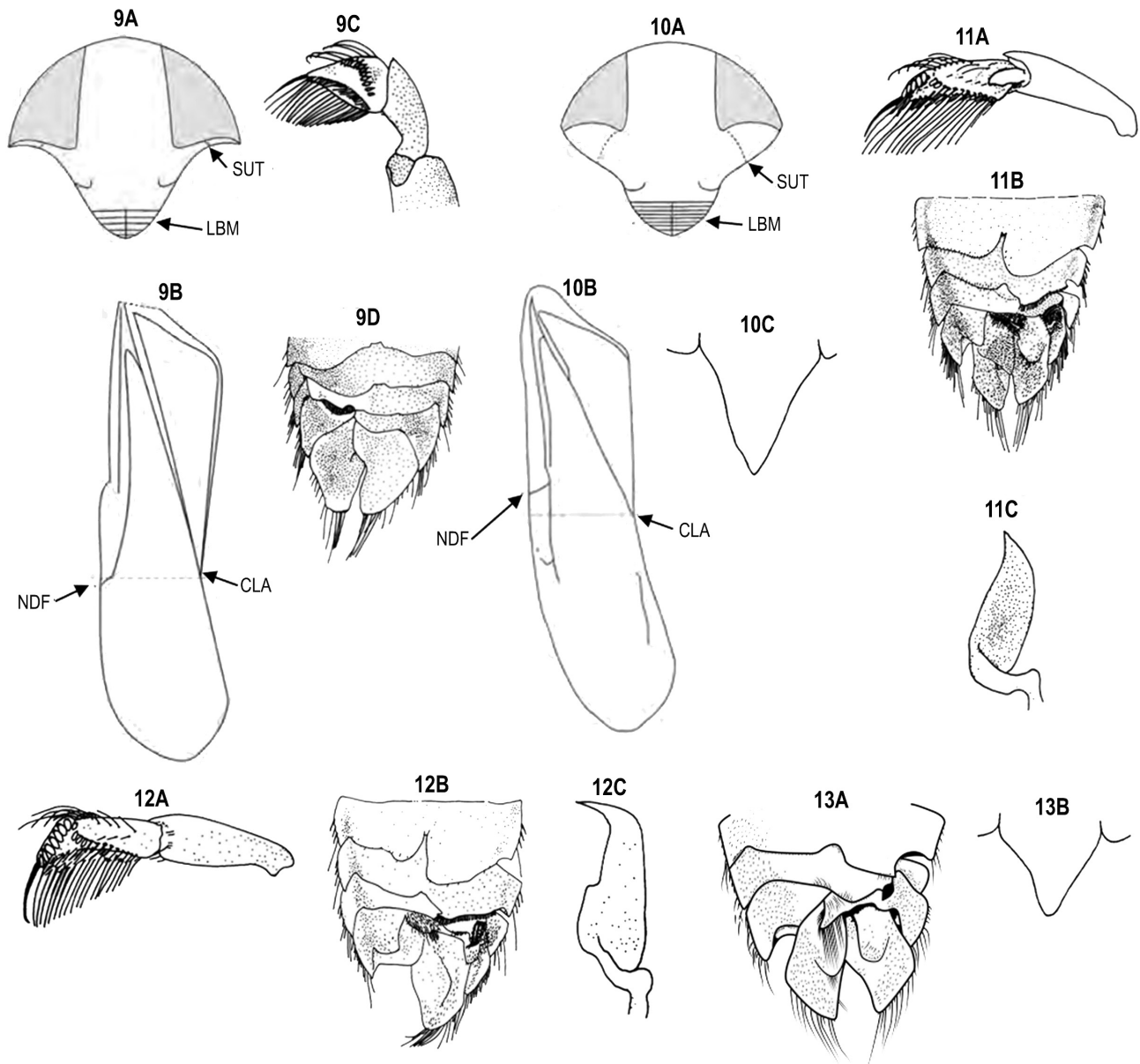
Tenagobia (Schadeogobia) schadei: Nieser (1977): 44 (subgeneric placement)

Distribution. Argentina (Bachmann 1962a). Bolivia (Deay 1935). Brazil: Amazonas, Mato Grosso (Nieser 1975, 1977), Mato Grosso do Sul (Deay 1930), Minas Gerais (Nieser & Melo 1997; Melo & Nieser 2004; Pelli *et al.* 2006; Souza *et al.* 2006), Pará (Nieser 1977; present study), Pernambuco (Jaczewski 1933), São Paulo (Nieser & Melo 1997), Tocantins (Nieser 1975, 1977). Colombia (Roback & Nieser 1974). Ecuador (Nieser 1977). Paraguay (Lundblad 1928b). Suriname (Nieser 1975).

Distribution in Pará. Curuá (present study), Jacareacanga, Óbidos/Oriximiná (Nieser 1977), Santarém (present study).

Material examined. Brazil, Pará, Município de Curuá, Igarapé da Neca, 01°51'59" S; 55°09'57" W, 27/IX/2022, S.E. Santos col. (16 ♂, 14 ♀); Barragem M^a Raimunda, 01°46'19" S; 55°09'01" W, 28/IX/2022, S.E. Santos col. (3

♂, 2 ♀). Município de Santarém, Igarapé Juá, 02°26'40"S; 54°47'21"W, 28-29/IX/2023 (Pensilvânia), L.A. Oliveira col. (56 ♂, 67 ♀).

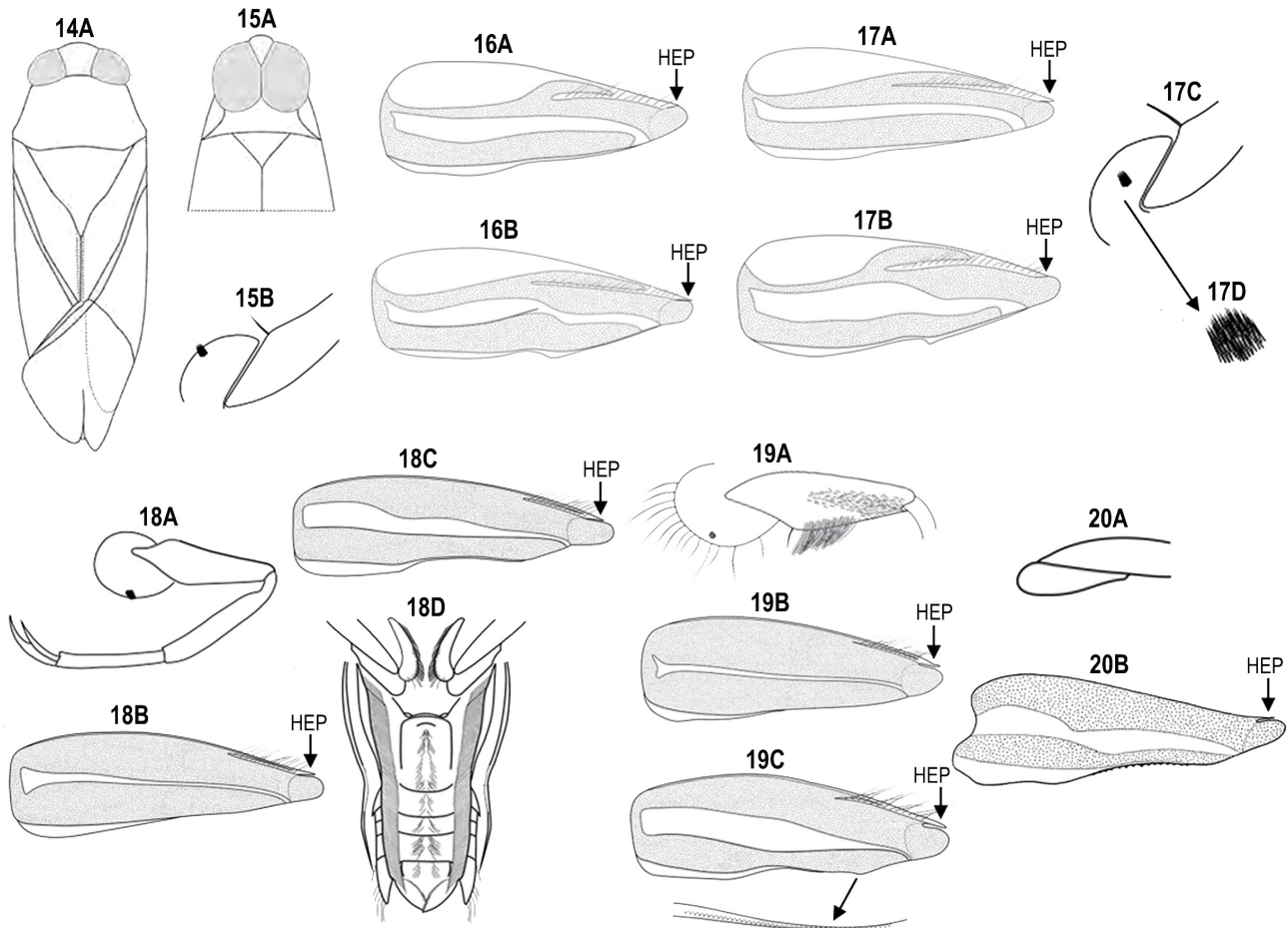


FIGURES 9–13. Corixidae. **9A–B.** *Trichocorixa*. **A.** Head, frontal view. **B.** Female forewing (adapted from Moreira *et al.* 2018). **9C–D.** *Trichocorixa orinocoensis*. **C.** Male foreleg. **D.** Apex of male abdomen, dorsal view (adapted from Hungerford 1948). **10A–C.** *Heterocorixa*. **A.** Head, frontal view. **B.** Female forewing (adapted from Moreira *et al.* 2018). **C.** Metaxyphus (adapted from Nieser 1975). **11A–C.** *Heterocorixa boliviensis*. **A.** Male foreleg. **B.** Apex of male abdomen, dorsal view. **C.** Left paramere (adapted from Hungerford 1948). **12A–C.** *Heterocorixa chapadiensis*. **A.** Male foreleg (adapted from Nieser 1975). **B.** Apex of male abdomen, dorsal view. **13C.** Left paramere (adapted from Hungerford 1948). **13A–B.** *Heterocorixa hesperia hesperia*. **A.** Apex of male abdomen, dorsal view (adapted from Hungerford 1948). **B.** Metaxyphus (adapted from Nieser 1975). Abbreviations: CLA, apex of clavus; LBM, labium; NDF, nodal furrow; SUT, hypo-ocular suture.

Notonectidae

Comments. Truxal (1953) recorded *Buenoa communis* Truxal, 1953 from Pará based on specimens collected by A.M. Olalla in “Lago Grande”. The Lago Grande where Olalla collected is in western Amazonas state, not in Pará (Patterson 1992). Due to the lack of other records from the latter state, this species is excluded from the list below. Truxal (1953) also recorded the same species from the state of Paraíba based on specimens collected by Olalla

in “João Pessoa, River Juruá”. This locality is near the Lago Grande in western Amazonas state, not in Paraíba (Patterson 1992).



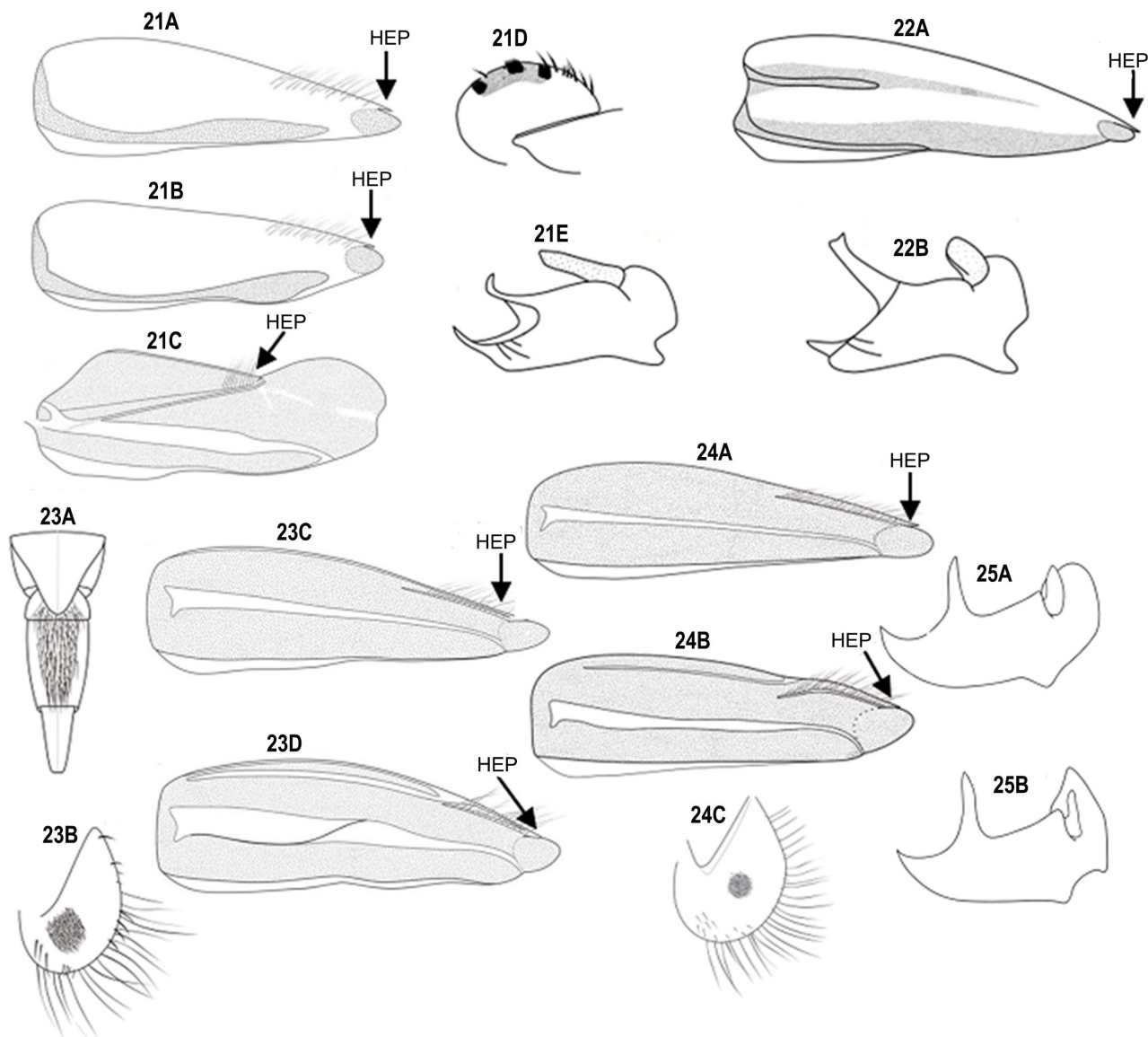
FIGURES 14–20. Notonectidae. **14A.** Dorsal habitus, eyes in gray. **15A.** *Martarega*, head and part of thorax, dorsal view, eyes in gray (adapted from Moreira *et al.* 2018). **15B.** *Martarega williamsi*, male mesotrochanter and base of mesofemur. **16A–B.** *Martarega membranacea*. **A.** Left brachypterous hemelytron, male, lateral view. **B.** Left brachypterous hemelytron, female, lateral view. **17A–D.** *Martarega chinai*. **A.** Left brachypterous hemelytron, male, lateral view. **B.** Left brachypterous hemelytron, female, lateral view. **C.** Male mesotrochanter and base of mesofemur. **D.** Detail of group of ensiform setae (adapted from Barbosa *et al.* 2012). **18A–D.** *Martarega oriximinaensis*. **A.** Male foreleg. **B.** Left brachypterous hemelytron, male, lateral view. **C.** Left brachypterous hemelytron, female, lateral view. **D.** Female abdomen, ventral view (adapted from Barbosa *et al.* 2010). **19A–C.** *Martarega siolii*. **A.** Male mesotrochanter and mesofemur. **B.** Left brachypterous hemelytron, male, lateral view. **C.** Left brachypterous hemelytron, female, lateral view (adapted from Barbosa *et al.* 2015). **20A–B.** *Martarega hungerfordi*. **A.** Male metatrochanter and base of metafemur. **B.** Left brachypterous hemelytron, female, lateral view. Abbreviation: HEP, hemelytral process.

***Buenoa amnigenoidea* Nieser, 1970**

(Fig. 34A–B)

Buenoa amnigenoidea Nieser, 1970b: 80 (original description)

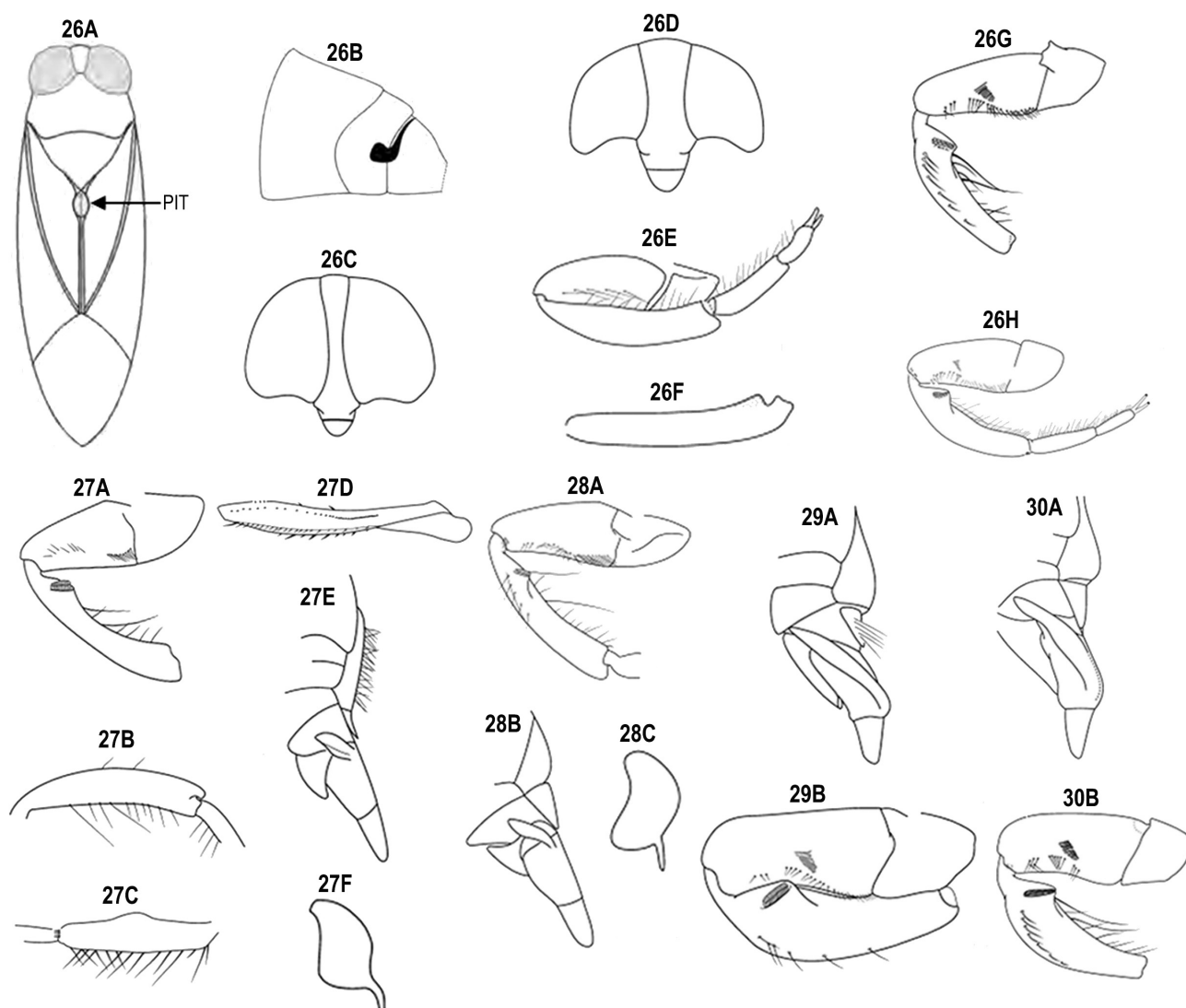
Distribution. Brazil: Amazonas (Nieser 1970b; Barbosa & Nessimian 2013a), Pará (Barbosa & Nessimian 2013a).



FIGURES 21–25. Notonectidae. **21A–E.** *Martarega gonostyla*. **A.** Left brachypterous hemelytron, male, lateral view. **B.** Left brachypterous hemelytron, female, lateral view. **C.** Left macropterous hemelytron, male, lateral view. **D.** Male metatrochanter and base of metafemur. **E.** Male genital capsule showing left paramere, lateral view. **22A–B.** *Martarega williamsi*. **A.** Left brachypterous hemelytron, male, lateral view. **B.** Male genital capsule showing left paramere, lateral view. **23A–D.** *Martarega brasiliensis*. **A.** Labium, ventral view. **B.** Male mesotrochanter. **C.** Left brachypterous hemelytron, male, lateral view. **D.** Left brachypterous hemelytron, female, lateral view (adapted from Barbosa *et al.* 2012). **24A–C.** *Martarega nessimiani*. **A.** Left brachypterous hemelytron, male, lateral view. **B.** Left brachypterous hemelytron, female, lateral view. **C.** Male mesotrochanter (adapted from Barbosa & Rodrigues 2013). **25A.** *Notonecta (Paranecta) disturbata*, genital capsule, lateral view. **25B.** *Notonecta (Paranecta) pulchra*, genital capsule, lateral view (adapted from Barbosa & Nessimian 2013a). Abbreviation: HEP, hemelytral process.

Distribution in Pará. Belterra, Itaituba (present study), Oriximiná (Barbosa & Nessimian 2013a; present study).

Material examined. Brazil, Pará, Município de Belterra, Igarapé Aramanaí, 02°42'56" S/ 54°59'59" W, 07/XI/2019, S.E. Santos col. (1 ♂, 4 ♀). Município de Itaituba, Lago Bom Jardim, 04°16'33" S/ 56°00'18" W, 27/VII/2022, S.E. Santos col. (1 ♂). Município de Oriximiná, Tanque Patty Chouli, 01°44'01" S/ 55°47'39" W, XI/2023, S.E. Santos col. (9 ♂, 3 ♀).



FIGURES 26–30. Notonectidae. **26A–H.** *Buenoa*. **A.** Dorsal habitus, eyes in gray. **B.** Apex of abdomen, lateral view (adapted from Moreira *et al.* 2018). **C.** Head with narrow frons. **D.** Head with wide frons. **E.** Foreleg, dorsal view. **F.** Mesotibia. **G.** Male foreleg, ventral view. **H.** Male foreleg, ventral view. **27A–F.** *Buenoa deplanatylus*. **A.** Male foreleg, ventral view. **B.** Protibia, dorsal view. **C.** External margin of mesotibia. **D.** Metafemur, ventral view. **E.** Male labium, lateral view. **F.** Right paramere (adapted Barbosa & Nessimian 2013). **28A–C.** *Buenoa tibialis*. **A.** Male foreleg, ventral view. **B.** Male labium, lateral view. **C.** Right paramere. **29A–B.** *Buenoa platycnemis*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **30A–B.** *Buenoa pallipes*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. Abbreviation: PIT, hair-lined pit.

Buenoa amnigenopsis Nieser, 1975

(Fig. 41A–B)

Buenoa amnigenus: Truxal (1953): 1462 (partim; specimens from Rio Juruá)

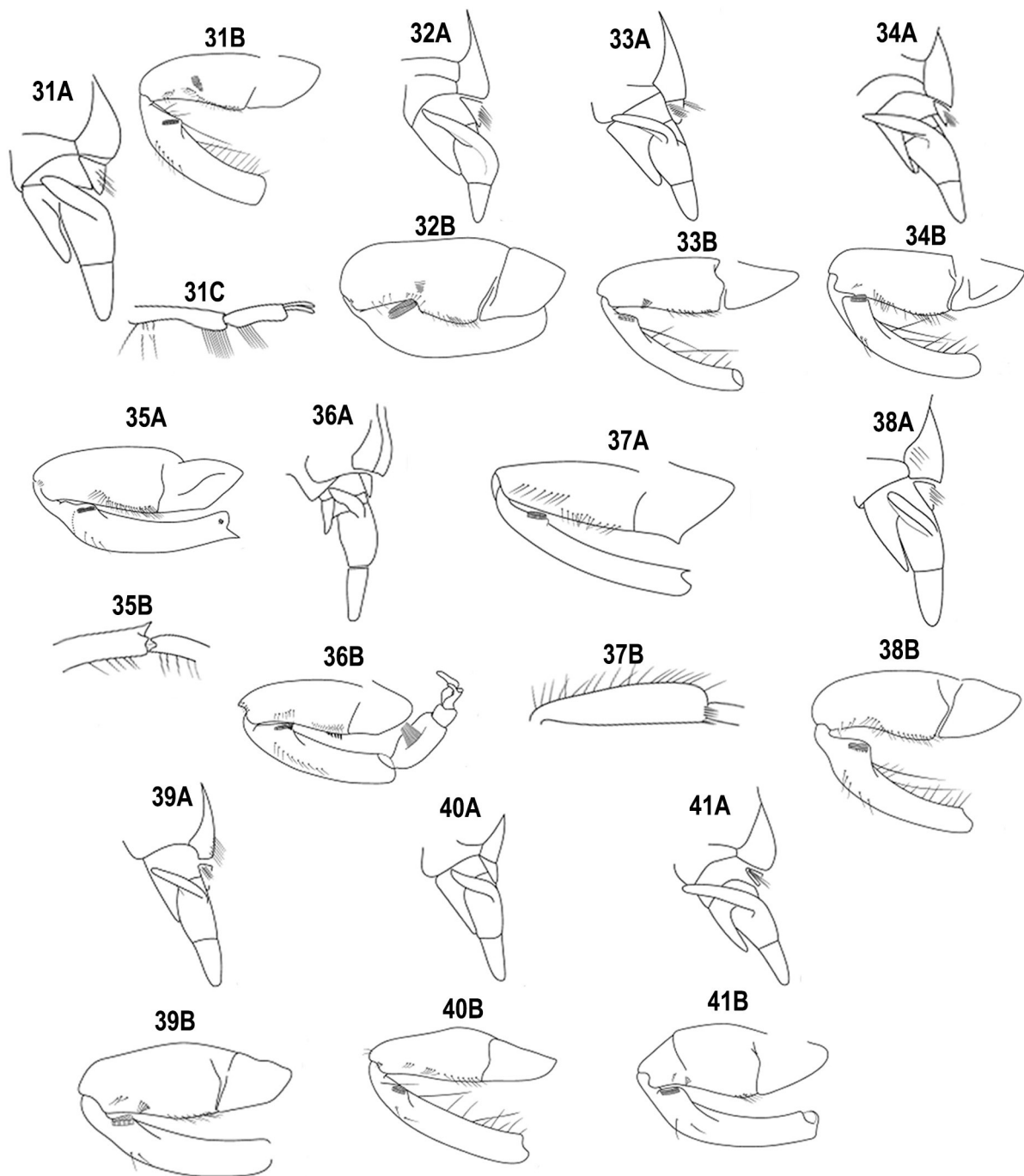
Buenoa amnigenus: Nieser (1968): 122 (misidentification)

Buenoa amnigenus: Nieser (1970b): 80 (misidentification)

Buenoa amnigenopsis Nieser, 1975: 179 (original description)

Distribution. Brazil: Amazonas (Truxal 1953; Nieser 1970b, 1975; Barbosa & Nessimian 2013a), Pará (Barbosa & Nessimian 2013a). Suriname (Nieser 1968).

Distribution in Pará. Juruti, Oriximiná (Barbosa & Nessimian 2013a).



FIGURES 31–41. *Buenoa*. **31A–C.** *Buenoa tarsalis*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **C.** Apex of midleg. **32A–B.** *Buenoa macrotrichia*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **33A–B.** *Buenoa amnigenus*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **34A–B.** *Buenoa amnigenoidea*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **35A–B.** *Buenoa truxali*. **A.** Male foreleg, ventral view. **B.** Apex of protibia. **36A–B.** *Buenoa unguis*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **37A–B.** *Buenoa fuscipennis*. **A.** Male foreleg, ventral view. **B.** Male mesotibia. **38A–B.** *Buenoa incompta*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **39A–B.** *Buenoa konta*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **40A–B.** *Buenoa salutis*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view. **41A–B.** *Buenoa amnigenopsis*. **A.** Male labium, lateral view. **B.** Male foreleg, ventral view (adapted from Barbosa & Nessimian 2013a).

***Buenoa amnigenus* (White, 1879)**

(Fig. 33A–B)

Anisops amnigenus White, 1879: 271 (original description)

Buenoa amnigenus: Kirkaldy (1904): 120 (combination change)

Distribution. Argentina (Bachmann 1971). Bolivia (Truxal 1953). Brazil: Alagoas (Jordão *et al.* 2025), Amazonas (White 1879; Truxal 1953; Nieser 1975; Barbosa & Nessimian 2013a), Bahia (Jordão *et al.* 2025), Ceará (Truxal 1953; Nieser 1975; Jordão *et al.* 2025), Goiás (Truxal 1957), Mato Grosso (Heckman 1998a, 1998b), Mato Grosso do Sul (Truxal 1953), Minas Gerais (Valbon *et al.* 2021), Pará (Truxal 1953; Barbosa & Nessimian 2013a; present study), Paraíba (Truxal 1953; Nieser 1975), Pernambuco (Truxal 1953; Nieser 1975; Jordão *et al.* 2025), Piauí (Jordão *et al.* 2025), Rio Grande do Norte (Truxal 1953; Nieser 1975), São Paulo (Castanhole *et al.* 2013; Pereira *et al.* 2015a), Tocantins (Truxal 1957). Guyana (Truxal 1953). Paraguay. Peru (Truxal 1953). Suriname (Nieser 1975). Trinidad & Tobago (Nieser & Alkins-Koo 1991).

Distribution in Pará. Alenquer (present study), Almeirim (Barbosa & Nessimian 2013a), Curuá, Itaituba (present study), Juruti (Barbosa & Nessimian 2013a), Mojuí dos Campos, Monte Alegre, Óbidos (present study), Oriximiná (Barbosa & Nessimian 2013a; present study), Parauapebas, Prainha (Barbosa & Nessimian 2013a), Santarém (Truxal 1953; Barbosa & Nessimian 2013a; present study).

Comment. Specimens from Rio Juruá, Brazil (Truxal 1953), and those reported by Nieser (1968, 1970b) were later identified as *Buenoa amnigenopsis* (Nieser 1975).

Material examined. Brazil, Pará, Município de Alenquer, Lago KM 11, 01°51'40" S/ 54°42'08" W, 06/XI/2022, S.E. Santos col. (3 ♂, 1 ♀); Poça Campo Grande, 01°48'23" S/ 54°46'37" W, 05/XI/2022, S.E. Santos col. (10 ♂, 13 ♀); Município de Curuá, Açude Cá te espero, 01°52'18" S/ 55°46'09" W, 27/IX/2022, S.E. Santos col. (1 ♂); Município de Itaituba, Poça Lago Bom Jardim, 04°16'33" S/ 56°00'18" W, 27/VII/2022, S.E. Santos col. (14 ♂, 20 ♀); Lago Transamazônica, 04°17'48" S/ 56°05'14" S, 27/VII/2022, S.E. Santos col. (7 ♂, 7 ♀). Município de Mojuí dos Campos, Mojuí dos Caboclos, 02°42'03" S/ 54°41'01" W, 21/I/2020, S.E. Santos col. (1 ♂); Igarapé Manel, 02°2'06" S/ 54°44'26" W, 24/II/2020, S.E. Santos col. (6 ♂, 13 ♀). Município de Óbidos, Igarapé Alegria, 01°53'07" S/ 55°30'43" W, 30/V/2023, S.E. Santos col. (1 ♂, 1 ♀). Município de Monte Alegre, Estrada Santana do Taparú, 02°09'51" S/ 54°27'22" W, 24/IV/2023, S.R.M. Couceiro col. (1 ♂, 2 ♀). Município de Oriximiná, Lago Iripixi, 01°46'50" S/ 55°50'45" W, 12/VI/2019, L.A. Oliveira col. (1 ♂); Tanque Patty Choulí, 01°44'01" S/ 55°47'39" W, 06/XI/2022, S.E. Santos col. (5 ♂, 2 ♀). Município de Santarém, Lago Maicá, 02°28'01" S/ 54°39'51" W, 27/V/2021, E.C. Oliveira col. (9 ♂, 3 ♀); Lago Mapiri, 02°25'28" S/ 54°44'47" W, 18/II/2020, E.C. Oliveira col. (3 ♂, 3 ♀); *idem*, except 12/IX/2022, S.E. Santos col. (4 ♂, 3 ♀).

***Buenoa deplanatylus* Barbosa & Nessimian, 2013**

(Fig. 27A–F)

Buenoa deplanatylus Barbosa & Nessimian, 2013a: 104 (original description)

Distribution. Brazil: Pará (present study), Rondônia (Barbosa & Nessimian 2013a).

Distribution in Pará. Belterra, Santarém (present study).

Material examined. Brazil, Pará, Município de Belterra, Igarapé KM 115 BR 163, 03°17'34" S/ 54°52'45" W, 23/XI/2019, S.E. Santos col. (2 ♀). Município de Santarém, Igarapé da Débora, 02°44'27" S/ 54°26'01" W, 21/X/2019, S.E. Santos col. (3 ♂, 3 ♀).

***Buenoa fuscipennis* (Berg, 1879)**

(Fig. 37A–B)

Anisops fuscipennis Berg, 1879: 76 (original description)

Anisops naias Kirkaldy, 1899a: 194 (synonym by Truxal 1953)

Buenoa fuscipennis: Kirkaldy (1904): 120 (combination change)

Buenoa dentipes Jaczewski (1928): 127 (synonym by Truxal 1953)

Distribution. Argentina (Berg 1879). Bolivia (Truxal 1953). Brazil: Ceará (Jordão *et al.* 2025), Mato Grosso (Heckman 1998a, 1998b), Pará (Barbosa & Nessimian 2013a; Nobre *et al.* 2019), Paraná (Jaczewski 1928), Pernambuco (Jordão *et al.* 2025), Santa Catarina (Truxal 1953). Chile (Kirkaldy 1899a). Paraguay. Uruguay (Truxal 1953).

Distribution in Pará. Canaã dos Carajás (Barbosa & Nessimian 2013a).

***Buenoa incompta* Truxal, 1953**

(Fig. 38A–B)

Buenoa incompta Truxal, 1953: 1466 (original description)

Distribution. Bolivia (Truxal 1953). Brazil: Amazonas (Truxal 1953; Nieser 1970b; Barbosa & Nessimian 2013a), Goiás (Truxal 1957), Pará (Barbosa & Nessimian 2013a; present study). Suriname (Nieser 1968).

Distribution in Pará. Curuá, Itaituba (present study), Santarém (Barbosa & Nessimian 2013a).

Comment. Truxal (1953) recorded this species from the state of Paraíba based on specimens collected by A.M. Olalla in “vic. João Pessoa, River Juruá”. This locality is in western Amazonas state, not in Paraíba (Patterson 1992).

Material examined. Brazil, Pará, Município de Curuá, Barragem Maria Raimunda, 01°46'19" S/ 55°09'01" W, 28/IX/2022, S.E. Santos col. (4 ♂, 3 ♀). Município de Itaituba, Poça Campo Belo, 04°16'24" S/ 56°02'28" W, 26/VII/2022, S.E. Santos col. (1 ♂).

***Buenoa konta* Nieser & Pelli, 1994**

(Fig. 39A–B)

Buenoa konta Nieser & Pelli, 1994: 1 (original description)

Distribution. Brazil: Alagoas, Bahia, Ceará (Jordão *et al.* 2025), Goiás (Barbosa & Dias-Silva 2017), Mato Grosso do Sul (Barbosa *et al.* 2010a), Minas Gerais (Nieser & Pelli 1994; Nieser & Melo 1997; Melo & Nieser 2004; Barbosa & Rodrigues 2013; Carrenho *et al.* 2020), Pará (Barbosa *et al.* 2010a; Barbosa & Nessimian 2013a; present study), Rio de Janeiro (Ribeiro *et al.* 2010), Sergipe (Jordão *et al.* 2025).

Distribution in Pará. Canaã dos Carajás (Barbosa *et al.* 2010a; Barbosa & Nessimian 2013a), Capitão Poço (Barbosa & Nessimian 2013a), Curionópolis (Barbosa *et al.* 2010a; Barbosa & Nessimian 2013a), Itaituba (present study), Parauapebas (Barbosa *et al.* 2010a; Barbosa & Nessimian 2013a).

Material examined. Brazil, Pará, Município de Itaituba, Lago São Tomé, 04°15'27" S/ 55°58'40" W, 26/VII/2022, S.E. Santos col. (7 ♂, 5 ♀).

***Buenoa macrotrichia* Truxal 1953**

(Fig. 32A–B)

Buenoa macrotrichia Truxal, 1953: 1429 (original description)

Distribution. Brazil: Pará (Barbosa & Nessimian 2013a). Peru (Truxal 1953).

Distribution in Pará. Vigia, Vigia/São Caetano de Odivelas (Barbosa & Nessimian 2013a).

***Buenoa pallipes* (Fabricius, 1803)**

(Fig. 30A–B)

Notonecta pallipes Fabricius, 1803: 103 (original description)

Anisops pallipes: Stål (1868): 137 (combination change)

Buenoa pallipes: Kirkaldy (1904): 123 (combination change)

Distribution. Bolivia (Kirkaldy 1899b). Barbados (Nieser 1967). Brazil: Alagoas (Jordão *et al.* 2025), Amazonas, Pará (Nieser 1970b), Pernambuco (Jordão *et al.* 2025). Colombia (Kirkaldy 1899c). Costa Rica (Torre-Bueno 1906). Cuba (Nieser 1967). Ecuador (Kirkaldy 1899c). Guadeloupe (Kirkaldy 1904). Hawaiian Islands (Kirkaldy 1913). Honduras (Truxal 1953). Jamaica (Kirkaldy 1900). Martinique (Kirkaldy 1904). Mexico (Champion 1901). Panama (Kirkaldy 1899d). Paraguay. Peru (Truxal 1953). Puerto Rico (Fieber 1851). St. Barthélemy (Lethierry 1881). St. Vincent & the Grenadines (Uhler 1893). U.S. Virgin Islands (Fieber 1851).

Distribution in Pará. Óbidos/Oriximiná (Nieser 1970b).

Comment. Records in the Americas north of Mexico are erroneous.

***Buenoa platycnemis* (Fieber, 1851)**

(Fig. 29A–B)

Anisops platycnemis Fieber, 1851: 61 (original description)

Buenoa platycnemis: Kirkaldy (1904): 123 (combination change)

Distribution. Argentina (Kirkaldy 1904). Bonaire (Nieser 1967). Brazil: Amazonas (Barbosa & Nessimian 2013a), Goiás (Truxal 1957), Maranhão (Truxal 1953; Jordão *et al.* 2025), Mato Grosso (Nieser 1970b), Pará (Nieser 1970b; Barbosa & Nessimian 2013a; Nobre *et al.* 2019; present study), Pernambuco (Jordão *et al.* 2025), Rio de Janeiro (Kirkaldy 1904; Ribeiro *et al.* 1998; Nessimian & Ribeiro 2000; Barbosa *et al.* 2010a; Ribeiro *et al.* 2010), Sergipe (Jordão *et al.* 2025), Tocantins (Truxal 1957). Cayman Islands. Colombia. Costa Rica (Truxal 1953). Cuba (Uhler 1884). Curaçao. Guadeloupe (Nieser 1967). Haiti. Jamaica. Martinique (Truxal 1953). Mexico (Uhler 1884). Nicaragua (Lopez *et al.* 1998). Panama. Peru (Truxal 1953). Puerto Rico (Fieber 1851). St. Martin (Nieser 1967). United States (Uhler 1884). U.S. Virgin Islands (Fieber 1851). Trinidad & Tobago (Nieser & Alkins-Koo 1991). Venezuela (Truxal 1953).

Distribution in Pará. Belterra (Nieser 1970b), Canaã dos Carajás (Barbosa & Nessimian 2013a; Nobre *et al.* 2019), Itaituba (present study), Parauapebas (Barbosa & Nessimian 2013a), Santarém (present study).

Comment. Records from the United States other than from Texas and Florida correspond to other species (Truxal 1953).

Material examined. Brazil, Pará, Município de Itaituba, Poça Campo Belo, 04°16'24" S/ 56°02'28" W, 26/VII/2022, S.E. Santos col. (12 ♂, 21 ♀); Poça Lago Bom Jardim, 04°16'33" S/ 56°00'18" W, 27/VII/2022, S.E. Santos col. (1 ♂). Município de Santarém, Lago Maicá, 02°28'01" S/ 54°39'51" W, 27/V/2021, E.C. Oliveira col. (1 ♂); Poça Curuá-Una, 02°48'29" S/ 54°17'44" W, 05/VI/2023, S.E. Santos col. (4 ♂, 6 ♀).

***Buenoa salutis* Kirkaldy, 1904**

(Fig. 40A–B)

Buenoa salutis Kirkaldy, 1904: 124 (original description)

Buenoa mallochi Jaczewski, 1928: 129 (synonym by Truxal 1953)

Distribution. Argentina (Bachmann 1962b). Bolivia (Truxal 1953). Brazil: Alagoas (Jordão *et al.* 2025), Amazonas (Truxal 1953; Nieser 1970b; Barbosa & Nessimian 2013a), Bahia (Jordão *et al.* 2025), Ceará (Truxal 1953; Jordão *et al.* 2025), Mato Grosso do Sul (Floriano *et al.* 2013), Minas Gerais (Nieser & Melo 1997; Melo & Nieser 2004; Barbosa & Rodrigues 2013), Pará (Truxal 1953; Nieser 1970b; Barbosa & Nessimian 2013a; present study), Paraíba (Truxal 1953), Paraná (Jaczewski 1928), Pernambuco (Truxal 1953), Piauí (Takiya *et al.* 2016), Rio de Janeiro (Ribeiro *et al.* 1998, 2010), Rio Grande do Sul (Truxal 1953, Kleerekoper 1955; SEMA-RS 2014), Roraima (Barbosa & Nessimian 2013a), São Paulo (Truxal 1953), Sergipe (Jordão *et al.* 2025), Tocantins (Truxal 1957). Colombia (Roback & Nieser 1974). French Guiana (Kirkaldy 1904). Guyana (Truxal 1953). Paraguay (Truxal 1953). Peru (Zalom & Smilanick 1979). Suriname (Nieser 1968). Trinidad & Tobago (Nieser & Alkins-Koo 1991). Venezuela (Truxal 1953).

Distribution in Pará. Afuá (Barbosa & Nessimian 2013a), Alenquer (present study), Almeirim (Barbosa & Nessimian 2013a), Aveiro (Nieser 1970b), Benevides (Barbosa & Nessimian 2013a), Curuá, Itaituba (present

study), Juruti (Barbosa & Nessimian 2013a), Monte Alegre (Nieser 1970b; present study), Óbidos, Oriximiná, Prainha (Barbosa & Nessimian 2013a), Quatipuru (Nieser 1970b), Rio Ararã (tributary to Rio Tocantins) (Barbosa & Nessimian 2013a), Santarém (Truxal 1953; Nieser 1970b; Barbosa & Nessimian 2013a; present study).

Comment. Peralta-Argomeda *et al.* (2024) overlooked the note published by Zalom & Smilanick (1979), in which *B. communis* and *B. salutis* were recorded from Peru.

Material examined. Brazil, Pará, Município de Alenquer, Poça Campo Grande, 01°48'23" S/ 54°46'37" W, 05/XI/2022, S.E. Santos col. (2 ♂, 6 ♀). Município de Curuá, Açude Cá te espero, 01°52'18" S/ 55°46'09" W, 27/IX/2022, S.E. Santos col. (1 ♂, 1 ♀). Município de Itaituba, Poça Lago Bom Jardim, 04°16'33" S/ 56°00'18" W, 27/VII/2022, S.E. Santos col. (3 ♂, 7 ♀). Município de Monte Alegre, Terminal hidroviário, 02°00'34" S/ 54°04'13" W, 26/IV/2023, S.E. Santos col. (1 ♂). Município de Santarém, Lago Maicá, 02°28'01" S/ 54°39'51" W, 12/IX/2022, S.E. Santos col. (1 ♂); *idem*, except 27/V/2021, S.E. Santos col. (5 ♂); Lago Mapiri, 02°25'28" S/ 54°44'47" W, 18/II/2020, E.C. Oliveira col. (6 ♂, 5 ♀).

***Buenoa tarsalis* Truxal, 1953**

(Fig. 31A–C)

Buenoa tarsalis Truxal, 1953: 1392 (original description)

Distribution. Brazil: Alagoas (Jordão *et al.* 2025), Amazonas (Nieser 1970b; Barbosa & Nessimian 2013a), Bahia (Jordão *et al.* 2025), Ceará (Truxal 1953; Jordão *et al.* 2025), Goiás (Barbosa & Dias-Silva 2017), Minas Gerais (Nieser & Melo 1997; Melo & Nieser 2004; Gutiérrez *et al.* 2017a, 2017b), Pará (Truxal 1953; Barbosa & Nessimian 2013a; present study), Paraíba (Truxal 1953), Pernambuco (Truxal 1953; Jordão *et al.* 2025), Piauí (Takiya *et al.* 2016; Jordão *et al.* 2025), Rio de Janeiro (Truxal 1953; Barbosa *et al.* 2010a), Rio Grande do Norte (Truxal 1953), Sergipe (Jordão *et al.* 2025).

Distribution in Pará. Belém (Truxal 1953), Benevides, Canaã dos Carajás (Barbosa & Nessimian 2013a), Itaituba (present study), Parauapebas (Barbosa & Nessimian 2013a), Santarém (present study).

Material examined. Brazil, Pará, Município de Itaituba, Poça Campo Belo, 04°16'24" S/ 56°02'28" W, 26/VII/2022, S.E. Santos col. (2 ♂, 9 ♀). Município de Santarém, Lago Maicá, 02°28'01" S/ 54°39'51" W, 27/V/2021, S.E. Santos col. (1 ♂, 1 ♀); Poça Curuá-Una, 02°48'29" S/ 54°17'44" W, 05.VI.2023, S.E. Santos col. (2 ♂, 2 ♀).

***Buenoa tibialis* Truxal, 1957**

(Fig. 28A–C)

Buenoa tibialis Truxal, 1957: 19 (original description)

Distribution. Brazil: Goiás (Truxal 1957), Pará (Barbosa & Nessimian 2013a; present study).

Distribution in Pará. Belterra (present study), Parauapebas (Barbosa & Nessimian 2013a).

Material examined. Brazil, Pará, Município de Belterra, Igarapé KM 115 BR 163, 03°17'34" S/ 54°52'45" W, 23/XI/2019, S.E. Santos col. (1 ♂).

***Buenoa truxali* Nieser, 1968**

(Fig. 35A–B)

Buenoa truxali Nieser, 1968: 128 (original description)

Distribution. Brazil: Amazonas (Nieser 1970b; Pereira & Melo 2007; Barbosa & Nessimian 2013a; Barbosa & Rodrigues 2013), Pará (Barbosa & Nessimian 2013a; present study), Rondônia (Barbosa & Nessimian 2013a). Suriname (Nieser 1968). Trinidad & Tobago (Nieser 1969b).

Distribution in Pará. Mojuí dos Campos (present study), São Miguel do Guamá (Barbosa & Nessimian 2013a).

Material examined. Brazil, Pará, Município de Mojuí dos Campos, Igarapé Antonio Leite, 03°09'06" S/ 54°50'28" W, 18/X/2019, S.E. Santos col. (1 ♂).

***Buenoa unguis* Truxal, 1953**

(Fig. 36A–B)

Buenoa unguis Truxal, 1953: 1476 (original description)

Distribution. Argentina. Bolivia (Truxal 1953). Brazil: Alagoas (Jordão *et al.* 2025), Amazonas (Rico *et al.* 2010; Barbosa & Nessimian 2013a), Ceará (Truxal 1953; Barbosa *et al.* 2010a; Jordão *et al.* 2025), Minas Gerais (Truxal 1953; Nieser & Melo 1997; Melo & Nieser 2004; Barbosa *et al.* 2010a), Pará (Truxal 1953; Andrade 1992; Barbosa & Nessimian 2013a; present study), Paraíba, Pernambuco (Truxal 1953; Jordão *et al.* 2025), Piauí (Takiya *et al.* 2016; Jordão *et al.* 2025), Rio de Janeiro (Truxal 1953; Barbosa *et al.* 2010a), Rio Grande do Norte (Truxal 1953), São Paulo (Castanhole *et al.* 2013; Pereira *et al.* 2015a), Sergipe (Jordão *et al.* 2025), Tocantins (Truxal 1957). Paraguay. Peru (Truxal 1953). Venezuela (Herrera Millán 2005).

Distribution in Pará. Alenquer (present study), Benevides (Barbosa & Nessimian 2013a), Itaituba, Oriximiná (present study), Parauapebas (Andrade 1992), Santarém (Truxal 1953; present study).

Material examined. Brazil, Pará, Município de Alenquer, Poça Campo Grande, 01°48'23" S/ 54°46'37" W, 05/XI/2022, S.E. Santos col. (1 ♂). Município de Itaituba, Lago Transamazônica, 04°17'48" S/ 56°05'14" W, 27/VII/2022, S.E. Santos col. (3 ♂, 4 ♀); Poça Lago Bom Jardim, 04°16'33" S/ 56°00'18" W, 27/VII/2022, S.E. Santos col. (3 ♂). Município de Oriximiná, Poça Igarapé das Pedras, 01°33'15" S/ 55°44'32" W, 07/XII/2022, S.E. Santos col. (24 ♂). Município de Santarém, Lago Maicá, 02°28'01" S/ 54°39'51" W, 27/V/2021, S.E. Santos col. (7 ♂, 7 ♀); Poça Curuá-Una, 02°48'29" S/ 54°17'44" W, 05.VI.2023, S.E. Santos col. (1 ♂).

***Martarega brasiliensis* Truxal, 1949**

(Fig. 23A–D)

Martarega brasiliensis Truxal, 1949: 7 (original description)

Distribution. Brazil: Alagoas (Jordão *et al.* 2025), Ceará (Truxal 1949; Jordão *et al.* 2025), Goiás (Barbosa & Dias-Silva 2017), Mato Grosso (Barbosa & Giehl 2014), Mato Grosso do Sul (Floriano *et al.* 2013), Pará (Nieser 1970b; Barbosa *et al.* 2010b, 2012; present study), Pernambuco (Truxal 1949), Rio de Janeiro (Ribeiro *et al.* 2010), Roraima (Barbosa *et al.* 2012; Barbosa & Rodrigues 2013), São Paulo (Castanhole *et al.* 2013; Pereira *et al.* 2015a, 2015b). Colombia (Padilla-Gil 2014). Peru (Truxal 1949). Suriname (Nieser 1968).

Distribution in Pará. Juruti (Barbosa *et al.* 2012), Óbidos/Oriximiná (Nieser 1970b), Oriximiná (Barbosa *et al.* 2012), Parauapebas (Barbosa *et al.* 2010b), Santarém (Nieser 1970b; present study).

Material examined. Brazil, Pará, Município de Santarém, Rio Curuá-Una, 02°48'21" S/ 54°17'49" W, 05/VI/2023, S.E. Santos col. (5 ♂, 1 ♀); *idem*, except 06/VI/2023, (1 ♀).

***Martarega chinai* Hynes, 1948**

(Fig. 17A–D)

Martarega chinai Hynes, 1948: 354 (original description)

Distribution. Argentina (Bachmann 1962c). Bolivia (Truxal 1949). Brazil: Amazonas (Truxal 1949; Nieser 1970b; Barbosa *et al.* 2012; Barbosa & Rodrigues 2013), Mato Grosso (Dias-Silva *et al.* 2013; Barbosa & Giehl 2014; Giehl *et al.* 2018), Minas Gerais (Nieser & Melo 1997), Pará (Nieser 1970b; Barbosa *et al.* 2012; present study). Colombia (Roback & Nieser 1974). Trinidad & Tobago (Hynes 1948). Venezuela (Menke & Truxal 1966).

Distribution in Pará. Alenquer, Mojuí dos Campos, Óbidos (present study), Oriximiná (Nieser 1970b; Barbosa *et al.* 2012; present study), Santarém (Barbosa *et al.* 2012; present study), São Miguel do Guamá (Barbosa *et al.* 2012), Tomé-açu (Nieser 1970b).

Material examined. Brazil, Pará, Município de Alenquer, Lago Atumamirim, 02°02'14" S/ 54°48'51" W, 05/VII/2023, S.E. Santos col. (2 ♂, 1 ♀). Município de Mojuí dos Campos, Porto Alegre, 02°52'31" S/ 54°23'32" W, 08/X/2022, M.V. Nascimento col. (3 ♀). Município de Óbidos, Lago Geretepaua, 01°54'03" S/ 55°32'01" W, 31/V/2023, S.E. Santos col. (4 ♂, 7 ♀). Município de Oriximiná, Tanque Patty Chouli, 01°44'01" S/ 55°47'39" W, 06/XI/2022, S.E. Santos col. (1 ♂). Município de Santarém, Igarapé do Costa, 02°15'14" S/ 54°38'52" W, 18/VII/2023, S.E. Santos col. (2 ♂, 2 ♀); Rio Curuá-Una, 02°48'21" S/ 54°17'49" W, 05/VI/2023, S.E. Santos col. (1 ♂).

Martarega gonostyla Truxal, 1949

(Fig. 21A–E)

Martarega gonostyla Truxal, 1949: 12 (original description)

Distribution. Bolivia (Truxal 1949). Brazil: Amazonas (Truxal 1949; Nieser 1970b; Barbosa *et al.* 2012; Barbosa & Rodrigues 2013), Mato Grosso (Nieser 1970b; Heckman 1998a, 1998b; Barbosa & Giehl 2014), Pará (Nieser 1970b; Barbosa *et al.* 2012; Cunha *et al.* 2015; Cunha & Juen 2017; present study), Rondônia (Barbosa *et al.* 2012). Suriname (Nieser 1968). Venezuela (Moreira *et al.* 2016).

Distribution in Pará. Abaetetuba (Barbosa *et al.* 2012), Belterra (present study), Benevides (Nieser 1970b; Barbosa *et al.* 2012), Irituia (Barbosa *et al.* 2012), Jacareacanga (Nieser 1970b), Maracanã (Barbosa *et al.* 2012), Mojuí dos Campos (present study), Oriximiná (Barbosa *et al.* 2012; present study), Paragominas (Nieser 1970b), Parauapebas, Primavera (Barbosa *et al.* 2012), Santarém (present study), Tailândia (Cunha *et al.* 2015; Cunha & Juen 2017), Terra Santa (present study), Vigia (Barbosa *et al.* 2012).

Material examined. Brazil, Pará, Município de Belterra, Igarapé KM 115 BR 163, 03°17'34" S/ 54°52'45" W, 23/XI/2019, S.E. Santos col. (9 ♂, 12 ♀); Igarapé Jatuarana, 03°15'44" S/ 54°56'37" W, 11/II/2020, S.E. Santos col. (5 ♂, 5 ♀). Município de Mojuí dos Campos, Igarapé Manel, 02°25'06" S/ 54°44'26" W, 24/II/2020, L.A. Oliveira col. (1 ♂, 1 ♀); Igarapé Terra Preta, 02°43'09" S/ 54°40'20" W, 24/II/2020, L.A. Oliveira col. (1 ♂); Mojuí do Belarmino, 02°44'12" S/ 54°47'00" W, 18/II/2023, A.S. Corrêa col. (13 ♂, 9 ♀); Terra de Areia, 02°47'58" S/ 54°38'15" W, 24/I/2020, L.A. Oliveira col. (1 ♀). Município de Oriximiná, Cachoeira Jatuarana, 01°39'10" S/ 55°42'30" W, 11/VI/2023, L.A. Oliveira col. (1 ♂); Igarapé do Monteiro, 01°38'42" S/ 55°41'54" W, 08/XII/2022, L.A. Oliveira col. (4 ♂, 6 ♀). Município de Santarém, Igarapé Cucurunã, 02°28'40" S/ 54°46'25" W, 29/V/2021, S.E. Santos col. (2 ♂); *idem* local, 12/I/2023, (3 ♂, 4 ♀); Igarapé do Laranjal, 02°32'47" S/ 54°55'27" W, 31/I/2024, L.A. Oliveira col. (1 ♂); *idem* local, 28/II/2024, L.A. Oliveira col. (1 ♀); Fazenda Experimental Ufopa, 02°41'26" S/ 54°31'57" W, 14/XII/2022, S.E. Santos col. (21 ♂, 9 ♀); Igarapé Guaraná, 02°46'25" S/ 54°23'20" W, 06/III/2020, S.E. Santos col. (1 ♂); Igarapé Jatobá, 02°34'17" S/ 54°51'36" W, 10/X/2020, S.E. Santos col. (25 ♂, 13 ♀). Município de Terra Santa, Igarapé Aimê, 02°05'27" S/ 56°29'02" W, 07/IV/2023, x S.E. Santos col. (10 ♂, 12 ♀).

Martarega hungerfordi Truxal, 1949

(Fig. 20A–B)

Martarega hungerfordi Truxal, 1949: 12 (original description)

Distribution. Brazil: Amazonas (Nieser 1970b), Pará (Nieser 1970b, 1975). Guyana (Truxal 1949). Suriname (Nieser 1968).

Distribution in Pará. Santarém (Nieser 1970b, 1975).

Comments. The descriptions and illustrations of *M. hungerfordi* provided by Nieser (1970b, 1975) do not match this species. His material from the state of Amazonas corresponds in part or entirely to *M. nieseri* Barbosa, Ribeiro & Nessimian, 2012, whereas that from the state of Pará belongs partially or totally to *M. siolii* Barbosa, Nessimian & Takiya, 2015 (Barbosa *et al.* 2012, 2015).

Martarega membranacea White, 1879

(Fig. 16A–B)

Martarega membranacea White, 1879: 272 (original description)

Distribution. Argentina (López-Ruf *et al.* 2003). Bolivia (Truxal 1949). Brazil: Amazonas (White 1879; Truxal 1949; Nieser 1970b; Pereira & Melo 2007; Barbosa *et al.* 2012; Barbosa & Rodrigues 2013), Bahia (Jordão *et al.* 2025), Goiás (Nieser 1970b; Barbosa & Dias-Silva 2017), Mato Grosso (Barbosa & Giehl 2014), Mato Grosso do Sul (Floriano *et al.* 2013), Minas Gerais (Melo & Nieser 2004; Barbosa & Rodrigues 2013), Pará (Truxal 1949; Nieser 1970b; Andrade 1992; Barbosa *et al.* 2010b, 2012; present study), Piauí (Takiya *et al.* 2016), Rio de Janeiro (Ribeiro *et al.* 2010), Rondônia (Truxal 1949), São Paulo (Castanhole *et al.* 2013; Pereira *et al.* 2015a), Sergipe (Jordão *et al.* 2025), Tocantins (Truxal 1957). Colombia (Roback & Nieser 1974). Guyana (Truxal 1949). Suriname (Nieser 1968).

Distribution in Pará. Alenquer (Barbosa *et al.* 2012; present study), Aveiro (Nieser 1970b; present study), Belém (Truxal 1949), Belterra, Curuá (present study), Curionópolis, Irituia (Barbosa *et al.* 2012), Itaituba (Nieser 1970b; present study), Jacareacanga (Nieser 1970b), Maracanã (Barbosa *et al.* 2012), Marituba (Nieser 1970b), Melgaço (Barbosa *et al.* 2012), Mojuí dos Campos (Barbosa *et al.* 2012; present study), Monte Alegre, Óbidos (present study), Oriximiná (Nieser 1970b; Barbosa *et al.* 2012; present study), Parauapebas (Andrade 1992; Barbosa *et al.* 2010b, 2012), Rurópolis (present study), Santarém (Nieser 1970b; Barbosa *et al.* 2012; present study), São João de Pirabas (Nieser 1970b), Senador José Porfírio (Barbosa *et al.* 2012), Terra Santa (present study), Tomé-açu (Nieser 1970b; Barbosa *et al.* 2012), Tucuruí, Vigia (Barbosa *et al.* 2012).

Material examined. Brazil, Pará, Município de Alenquer, Lago Atumamirim, 02°02'14" S/ 54°48'51" W, 05/VII/2023, S.E. Santos col. (6 ♂, 3 ♀); Lago Preto, 02°02'42" S/ 54°48'57" W, 07/VII/2023, S.E. Santos col. (1 ♂, 1 ♀); Nova Aurora, 02°00'59" S/ 54°50'11" W, 05/VII/2023, S.E. Santos col. (1 ♂); Valmir, 02°00'29" S/ 54°54'26" W, 05/VII/2023, S.E. Santos col. (1 ♂). Município de Aveiro, Cametá, 03°27'08" S/ 55°51'35" W, 06/II/2022, M.V Nascimento col. (1 ♀). Município de Belterra, Igarapé Aramanai, 02°42'56" S/ 54°59'59" W, 07/XI/2019, S.E. Santos col. (4 ♂, 3 ♀); Igarapé Jatuarana, 03°15'44" S/ 54°56'37" W, 11/II/2020, S.E. Santos col. (1 ♂). Município de Curuá, Açude Cá te espero, 01°52'18" S/ 55°46'09" W, 27/IX/2022, S.E. Santos col. (1 ♂). Município de Itaituba, Ponte Fonte Azul, 04°17'07" S/ 56°04'07" W, 27/VII/2022, S.E. Santos col. (4 ♂, 7 ♀); Igarapé Sai Cinzas, 04°16'04" S/ 56°07'37" W, 27/VII/2022, S.E. Santos col. (1 ♂); Lago Bom Jardim, 04°16'33" S/ 56°00'18" W, 27/VII/2022, S.E. Santos col. (5 ♂, 6 ♀) Município de Mojuí dos Campos, Igarapé Terra Preta, 02°43'09" S/ 54°40'20" W, 10/II/2020, L.A. Oliveira col. (9 ♂, 13 ♀); *idem*, excet 24/II/2020, (1 ♂, 3 ♀); Porto Alegre, 02°52'31" S/ 54°23'32" W, 08/X/2022, S.E. Santos col. (43 ♂, 43 ♀). Município de Monte Alegre, Estrada Santana do Tapará, 02°09'51" S/ 54°27'22" W, S.R.M. Couceiro col. (1 ♂); Igarapé do Batata, 01°59'23" S/ 54°03'00" W, 18/VI/2023, S.E. Santos col. (11 ♂, 7 ♀); *idem*, except 29/VI/2023, (6 ♂, 5 ♀). Município de Óbidos, Igarapé Alegria, 01°53'07" S/ 55°30'43" W, 30/V/2023, S.E. Santos col. (7 ♂, 2 ♀); Igarapé Estrada da Campina, 01°52'59" S/ 55°29'42" W, 30/V/2023, S.E. Santos col. (1 ♂, 2 ♀); Lago da Campina, 01°52'09" S/ 55°28'09" W, 01/VI/2023, S.E. Santos col. (2 ♂, 3 ♀); Lago Geretepaua, 01°54'03" S/ 55°32'01" W, 31/V/2023, S.E. Santos col. (5 ♂, 15 ♀). Município de Oriximiná, Igarapé da Eldra, 01°45'07" S/ 55°50'24" W, 05/XI/2022, S.E. Santos col. (5 ♂, 8 ♀); Lago Iripixi, 01°46'50" S/ 55°50'45" W, 12/VI/2019, S.E. Santos col. (3 ♂, 2 ♀); Sítio Tô de boa, 01°40'29" S/ 55°47'37" W, 07/XII/2022, S.E. Santos col. (12 ♂, 3 ♀); Tanque Patty Chouli, 01°44'01" S/ 55°47'39" W, 06/XI/2022, S.E. Santos col. (5 ♂, 6 ♀). Município de Rurópolis, Santarenzinho, 04°10'15" S/ 55°50'16" W, 09/II/2022, S.E. Santos col. (1 ♀). Município de Santarém, Amar Juá, 02°26'56" S/ 54°47'53" W, 13/IX/2019, S.E. Santos col. (1 ♂, 1 ♀); Igarapé do Costa, 02°15'14" S/ 54°38'52" W, 17/VII/2023, S.E. Santos col. (1 ♀); *idem*, except 18/VII/2023, (1 ♂, 2 ♀); Igarapé Guaraná, 02°46'25" S/ 54°23'20" W, 06/III/2020, S.E. Santos col. (2 ♂, 1 ♀); Lago Escola da Floresta, 02°30'38" S/ 54°56'09" W, 12/I/2023, S.E. Santos col. (1 ♂); Lago Maicá, 02°28'01" S/ 54°39'51" W, 27/V/2021, S.E. Santos col. (3 ♂, 3 ♀); Mapiri, 02°25'28" S/ 54°44'47" W, 12/IX/2022, S.E. Santos col. (1 ♀); Rio Curuá-Una, 02°49'01" S/ 54°17'52" W, 14/XI/2023, S.E. Santos col. (8 ♂, 1 ♀); Rio Curuá-Una, 02°48'21" S/ 54°17'49" W, 05/VI/2023, S.E. Santos col. (4 ♂, 3 ♀); Rio Curuá-Una, 02°48'56" S/ 54°17'59" W, 06/VI/2023, S.E. Santos col. (6 ♂, 1 ♀); Poça Curuá-Una, 02°48'29" S; 54°17'44" W, 05/VI/2023, S.E. Santos col. (3 ♂, 3 ♀). Município de Terra Santa, Costa do Cajual, 02°06'32" S/ 56°30'26" W, 08/IV/2023, S.E. Santos col (1 ♂).

***Martarega nessimiani* Barbosa & Rodrigues, 2013**

(Fig. 24A–C)

Martarega nessimiani Barbosa & Rodrigues, 2013: 535 (original description)

Distribution. Brazil: Pará, Goiás, Minas Gerais (Barbosa & Rodrigues 2013).

Distribution in Pará. Canaã dos Carajás (Barbosa & Rodrigues 2013).

***Martarega oriximinaensis* Barbosa, Ribeiro & Ferreira-Keppler, 2010**

(Fig. 18A–D)

Martarega oriximinaensis Barbosa, Ribeiro, Ferreira-Keppler, 2010: 60 (original description)

Distribution. Brazil: Pará (Barbosa *et al.* 2010b, 2015; Rodrigues & Ferreira-Keppler 2013).

Distribution in Pará. Oriximiná (Barbosa *et al.* 2010b, 2015; Rodrigues & Ferreira-Keppler 2013).

Comment. Part of the type series of *M. oriximinaensis* was later described as *M. siolii*.

***Martarega siolii* Barbosa, Nessimian & Takiya, 2015**

(Fig. 19A–C)

Martarega hungerfordi: Nieser (1970b): 78 (partim; specimens from Pará)

Martarega hungerfordi: Nieser (1975): 202 (partim; specimens from Pará)

Martarega oriximinaensis: Barbosa *et al.* (2010b): 60 (partim)

Martarega siolii Barbosa, Nessimian & Takiya, 2015: 418 (original description)

Distribution. Brazil: Pará (Barbosa *et al.* 2010b, 2015).

Distribution in Pará. Oriximiná (Barbosa *et al.* 2010b, 2015), Santarém (Nieser 1970b, 1975; Barbosa *et al.* 2015).

***Martarega williamsi* Truxal, 1949**

(Fig. 15B)

Martarega williamsi Truxal, 1949: 13 (original description)

Distribution. Brazil: Amazonas (Truxal 1949; Nieser 1970b), Pará (present study). Ecuador. Panama. Peru (Truxal 1949).

Distribution in Pará. Belterra (present study).

Material examined. Brazil, Pará, Município de Belterra, igarapé KM 115 BR 163, 03°17'34" S/ 54°52'45" W, 23/XI/2019, S.E. Santos col. (1 ♂).

***Notonecta (Paranecta) disturbata* Hungerford, 1926**

(Fig. 25A)

Notonecta disturbata Hungerford, 1926: 13 (original description)

Notonecta (Paranecta) disturbata: Hungerford (1933): 145 (subgeneric placement)

Distribution. Argentina (Bachmann 1963). Brazil: Alagoas, Ceará (Jordão *et al.* 2025), Espírito Santo (Bachmann 1963), Goiás (Truxal 1957), Mato Grosso (Nieser 1970b), Minas Gerais (Melo & Nieser 2004; Barbosa & Nessimian 2013b), Pará (Barbosa & Nessimian 2013b; Nobre *et al.* 2019), Pernambuco (Jordão *et al.* 2025), Piauí (Barbosa & Nessimian 2013b; Takiya *et al.* 2016), Rio de Janeiro (Hungerford 1926, 1933; Ribeiro *et al.* 1998, 2010; Barbosa &

Nessimian 2013b), Rio Grande do Sul (Bachmann 1963; Barbosa & Nessimian 2013b), Sergipe (Jordão *et al.* 2025), São Paulo (Barbosa & Nessimian 2013b), Tocantins (Truxal 1957). Paraguay (Hungerford 1933).

Distribution in Pará. Canaã dos Carajás (Barbosa & Nessimian 2013b; Nobre *et al.* 2019), Curionópolis, Parauapebas (Barbosa & Nessimian 2013b).

Notonecta (Paranecta) pulchra Hungerford, 1926

(Fig. 25B)

Notonecta pulchra Hungerford, 1926: 14 (original description)

Notonecta (Paranecta) pulchra: Hungerford (1933): 145 (subgeneric placement)

Distribution. Argentina (Angrisano 1982). Brazil: Amazonas (Nieser 1970b; Pereira & Melo 2007; Barbosa & Nessimian 2013b; Barbosa & Rodrigues 2013), Mato Grosso do Sul (Floriano *et al.* 2013), Minas Gerais (Nieser & Melo 1997; Melo & Nieser 2004; Barbosa & Nessimian 2013b), Pará (Barbosa & Nessimian 2013b; present study), Rio de Janeiro (Ribeiro *et al.* 2010), Rio Grande do Sul (SEMA-RS 2014). Ecuador (Sites 1990). Paraguay (Hungerford 1933).

Distribution in Pará. Parauapebas (Barbosa & Nessimian 2013b), Santarém (present study).

Material examined. Brazil, Pará, Município de Santarém, Lago Maicá, 02°28'01" S/ 54°39'51" W, 27/V/2021, S.E. Santos col. (1 ♂).

Key to genera and species of Micronectidae from Pará

(adapted from Nieser 1977; Nieser & Melo 1997; Nieser & Chen 2006)

- 1a. Head, in frontal view, abruptly narrowed towards labium ventrally of eyes (Fig. 3A); antennae fused with head capsule (Fig. 3B); mesosternum with distinct carina (Fig. 3C); metaxyphus very long (Fig. 3C) *Synaptogobia heissi* Nieser & Chen, 2006
- 1b. Head, in frontal view, gradually narrowed towards labium ventrally of eyes (Fig. 4A); antennae free, triarticulate (Fig. 4B); mesosternum without carina (Fig. 4C); metaxyphus short (Fig. 4D) (*Tenagobia* Bergroth, 1899) 2
- 2a (1b). Body longer than 4.0 mm; left side of male abdominal tergum VIII with a long finger-like projection at apex of dorsal lobe (Fig. 5A) *Tenagobia (Fuscagobia) selecta* (White, 1879)
- 2b. Body shorter than 4.0 mm; male without long finger-like projection at dorsal lobe of abdominal tergum VIII 3
- 3a (2b). Ocular index 0.5–0.8; male profemur with 2 spines in ventral row (Fig. 6A); meso and hindlegs yellowish, with distinct brown bands and blotches; metatrochanter knobby (Fig. 6B) (*Tenagobia (Romanogobia)* Nieser, 1977) 4
- 3b. Ocular index 0.7–1.6; profemur with 3–9 spines in ventral row (Figs. 7A, 8A); meso and hindlegs unicoloured; metatrochanter not knobby (Fig. 4E) 5
- 4a (3a) Left paramere without apical projections (Fig. 6C) *Tenagobia (Romanogobia) pseudoromani* Nieser, 1975
- 4b. Left paramere with short apical projections (Fig. 6D) *Tenagobia (Romanogobia) romani* Lundblad, 1929
- 5a (3b) Body longer than 3.0 mm, castaneous; male profemur without ventral papilla and peg (Fig. 7A); ratio length of pruinose area of embolium: length of hemelytra 0.4–0.6; margins of male abdominal segment VIII with 2 spines and 2 long bristles (Fig. 7B) *Tenagobia (Schadeogobia) schadei* Lundblad, 1929
- 5b. Body at most 3.0 mm long, light greyish-brown; male profemur with a ventral papilla bearing a small peg (Fig. 8A); ratio length of pruinose area of embolium: length of hemelytron 0.2–0.3; margins of male abdominal segment VIII with 4 spines: 3 long and one normal bristle (Fig. 8B) (*Tenagobia (Incertagobia)* Nieser, 1977) 6
- 6a (5b). Receptaculum seminis dumb-bell shaped (Fig. 8C); left paramere apically broadly expanded, with pronounced toe (Figs. 8D–F) *Tenagobia (Incertagobia) socialis* (White, 1879)
- 6b. Receptaculum seminis broad (Fig. 8G); left paramere with a short dorsal expansion, apicoventral edge not or hardly produced (Figs. 8H–L) *Tenagobia (Incertagobia) incerta* Lundblad, 1929

Key to genera and species of Corixidae from Pará

(adapted from Hungerford 1948; Nieser 1970)

- 1a. Head, in lateral view, with posterior margin of eye almost straight; hypo-ocular suture arising near midway along posterior margin of eye (Fig. 9A); apices of clavi not exceeding a line drawn through nodal furrows of hemelytra in females and slightly exceeding in males (Fig. 9B); male protibia strongly produced apically over pala (Fig. 9C); male abdomen without prestrigil, with sinistral asymmetry and strigil on the left side (Fig. 9D) *Trichocorixa orinocoensis* Sailer, 1948
- 1b. Head, in lateral view, with posterior margin of eye concave; hypo-ocular suture arising from posteroventral angle of eye (Fig. 10A); apices of clavi distinctly exceeding a line drawn through nodal furrows of hemelytra in both sexes (10B); male protibia not produced over pala (Fig. 11A, 12A); male abdomen with prestrigil on dorsal segment V, with dextral asymmetry and strigil on the right side (Fig. 11B, 12B, 13A) (*Heterocorixa* White, 1879) 2
- 2a (1b). Mesopretarsal claw at most as long as respective tarsus; hemelytra lacking short spines on corium; metaxyphus as long as or longer than inner line of metacoxae (Fig. 10C); metafemur with little more than basal end pilose, with no more than 10–12 spines on ventral side; male with long prestrigilar comb and median lobe of tergum VII rounded (Figs. 11B, 12B) 3
- 2b. Mesopretarsal claw longer than respective tarsus; hemelytra with both slender setae and short spines on corium, hemelytral pattern very fine; metaxyphus with half the length of inner line of metacoxae (Fig. 13B); metafemur pilose on basal two-fifths, with many spines on ventral side; male with short prestrigilar comb and median lobe of the tergum VII triangular (Fig. 13A) *Heterocorixa hesperia hesperia* (White, 1879)
- 3a (2a). Posterolateral margin of head slightly sinuate; male protibia with a long flap resting in a depression of the pala (Fig. 11A); posterior pruinose area of the embolar groove a little longer than that of claval suture; left paramere not strongly hooked apically (Fig. 11C) *Heterocorixa boliviensis* Hungerford, 1928
- 3b. Posterolateral margin of head slightly convex, not sinuate; male protibia without a flap as described above but with a carina on caudal side (Fig. 12A); posterior pruinose area of embolar groove considerably longer than that of claval suture; left paramere strongly hooked apically (Fig. 12C) *Heterocorixa chapadiensis* Hungerford, 1928

Key to genera and species of Notonectidae from Pará

(adapted from Barbosa *et al.* 2013a, 2013b; Moreira *et al.* 2018)

- 1a. Hemelytral commissure without setae-lined pit (Fig. 14A); male protibia without stridulatory comb; abdominal tergum 7 caudosinistral margin without spine 2
- 1b. Hemelytral commissure anteriorly with setae-lined pit (Fig. 26A); male protibia with stridulatory comb (Figs. 26G, 27A); abdominal tergum 7 caudosinistral margin with spine (Fig. 26B) (*Buenoa* Kirkaldy, 1904) 3
- 2a (1a). Eyes contiguous posteromesally (Fig. 15A); clavus distal end with spine-like process (hemelytral process) (Figs. 16A–B, 17A–B, 18B–C, 19B–C, 20B, 21A–C, 22A, 23C–D, 24A–B); mesofemur without preapical spur (*Martarega* White, 1879) 17
- 2b. Eyes separated (Fig. 14A); clavus distal end without spine-like process (Fig. 14A); mesofemur with preapical spur (*Notonecta* Linnaeus, 1758) 25
- 3a (1b). Profemur without stridulatory area on mesal surface (Fig. 27A) 4
- 3b. Profemur with stridulatory area on mesal surface (Fig. 26G) 14
- 4a (3a). Mesal margin of protibia with apex projected (Fig. 26E) 5
- 4b. Mesal margin of protibia with apex not projected (Fig. 26H) 7
- 5a (4a). Apex of mesal margin of protibia bluntly projected (Figs. 27A, 28A); lateral margin of mesotibia with lateral expansion (Fig. 27C); metafemur sinuous (Fig. 27D) 6
- 5b. Apex of mesal margin of protibia acute (Figs. 35A); lateral margin of mesotibia without expansion; metafemur not sinuous *Buenoa truxali* Nieser, 1968
- 6a (5a). Tylus flat, pubescent (Fig. 27E); apex of right paramere straight (Fig. 27F) *Buenoa deplanatylus* Barbosa & Nessimian, 2013
- 6b. Tylus rounded, glabrous (Fig. 28B); apex of right paramere rounded (Fig. 28C) *Buenoa tibialis* Truxal, 1957
- 7a (4b). Tylus inflated or, if not inflated, rounded and without lateral carinae (Figs. 33A, 34A, 38A, 39A, 40A, 41A); protarsus tubular, thin, with claws not modified 8
- 7b. Tylus flat, with two lateral carinae (Fig. 36A); protarsus, notably basal segment, swollen, claws hooked (Fig. 36B) *Buenoa unguis* Truxal, 1953

8a (7a). Synthlipsis narrow, one-fourth or less of anterior width of vertex; prothorax without process on posterior margin; mesal margin of mesotibia not enlarged	9
8b. Synthlipsis wide, about one-half of anterior width of vertex; prothorax with process on posterior margin (Fig. 37A); mesal margin of mesotibia enlarged (Fig. 37B)	<i>Buenoa fuscipennis</i> (Berg, 1879)
9a (8a). Synthlipsis flat, without median keel; pronotum not impressed	10
9b. Synthlipsis with faint median keel; pronotum tricarinate	<i>Buenoa incompta</i> Truxal, 1953
10a (9a). Synthlipsis very narrow, about one tenth of vertex width (Fig. 33A, 34A, 40A, 41A); without dark mark at costal margin of hemelytra; apex of profemur narrow (Fig. 33B, 34b, 40B, 41B)	11
10b. Synthlipsis wider, about one-fourth of vertex width (Fig. 39A); dark mark accompanying the costal margin of hemelytra and delimiting start of membrane; apex of profemur broad (Fig. 39B)	<i>Buenoa konta</i> Nieser & Pelli, 1994
11a (10a). Body distinctly longer than 5.0 mm; frons narrow (Fig. 26C); apex of labial prong rounded (Figs. 33A, 34A, 41A)	12
11b. Body at most 4.0 mm long; frons wide (Fig. 26D); apex of labial prong sinuous (Fig. 40A)	<i>Buenoa salutis</i> Kirkaldy, 1904
12a (11a). Mesal surface of profemur not notched (Fig. 33B, 34B)	13
12b. Mesal surface of profemur notched apically (Fig. 41B)	<i>Buenoa amnigenopsis</i> Nieser, 1975
13a (12a). Labrum with tufts of setae on sides (Fig. 33A); prothorax without projection on mesal surface; apex of profemur narrow (Fig. 33B); stridulatory comb of protibia with 24–30 teeth of similar size	<i>Buenoa amnigenus</i> (White, 1879)
13b. Labrum with tufts of setae on ventral surface (Fig. 34A); prothorax with triangular projection on mesal surface (Fig. 34B); apex of profemur robust; stridulatory comb of protibia with 20–22 teeth narrow at the base and widening toward apex	<i>Buenoa amnigenoidea</i> Nieser, 1970
14a (3b). Labial prong originating distally on third labial article; tarsomere I of midleg with mesal margin continuous	15
14b. Labial prong originating proximally on third labial article (Fig. 31A); tarsomere I of midleg with mesal margin distinctly emarginate (Fig. 31C)	<i>Buenoa tarsalis</i> Truxal, 1953
15a (14a). Pronotum tricarinate; stridulatory area of profemur with 11–23 ridges	16
15b. Pronotum not tricarinate; stridulatory area of profemur with less than 11 ridges (Fig. 32B)	<i>Buenoa macrotrichia</i> Truxal, 1953
16a (15a). Labial prong protruding anteriorly at base (Figs. 29A); pronotum length about 2.5 times head length; posterior margin of pronotum not or slightly excavated; profemur with 11–14 stridulatory ridges (Fig. 29B)	<i>Buenoa platycnemis</i> (Fieber, 1851)
16b. Labial prong not protruding at base (Fig. 30A); pronotum length about 3 times head length; posterior margin of pronotum distinctly excavated; profemur with about 17 stridulatory ridges (Fig. 30B)	<i>Buenoa pallipes</i> (Fabricius, 1803)
17a (2a). Males shorter than 4.3 mm; females shorter than 4.8 mm; hemelytron of both sexes with median stripe bifurcated near apex (Figs. 16A–B, 17A–B); ventral carina with setae on anteroventral and lateral surfaces (Fig. 18D)	18
17b. Males longer than 4.7 mm; females longer than 5.6 mm; hemelytron of both sexes with median stripe not bifurcated near apex or with stripe not located medially (Figs. 18B–C, 19B–C, 20B, 21A–B, 22A, 23C–D, 24A–B); ventral carina with setae only on lateral surface	19
18a. (17a) Hemelytral process extending to apex of membrane in both sexes (16A–B); ventral surface of male mesotrochanter without group of ensiform setae	<i>Martarega membranacea</i> White, 1879
18b. Hemelytral process not extending to apex of membrane in both sexes (17A–B); ventral surface of male mesotrochanter with central group of ensiform setae (Fig. 17C–D)	<i>Martarega chinai</i> Hynes, 1948
19a. (17b) Lateral margin of metatrochanter with apex truncate (Fig. 19A)	20
19b. Lateral margin of metatrochanter with apex not truncate (Fig. 20C)	22
20a. (19a) Male mesotrochanter with group of ensiform setae near lateral margin (19A); female abdomen constricted at posterior half (Figs. 18D)	21
20b. Male mesotrochanter without group of ensiform setae (18A); female abdomen not constricted	<i>Martarega hungerfordi</i> Truxal, 1949
21a. (20a) Lateral margin of mesotrochanter without process in both sexes (18A); male mesofemur with only a few setae (18A); median stripe of female hemelytron with concavity at posterior margin (18C)	<i>Martarega oriximinaensis</i> Barbosa, Ribeiro & Ferreira Keppler, 2010
21b. Lateral margin of male mesotrochanter with rounded process (19A); lateral margin of male mesofemur distinctly setose (19A); median stripe of female hemelytron with parallel margins (Fig. 19C)	<i>Martarega siolii</i> Barbosa, Nessimian & Takiya, 2015

- 22a. (19b) Hemelytron mostly hyaline, with opaque stripes (21A–B, 22A); no sexual dimorphism on hemelytral stripes shape (21A–B, 22A); male mesotrochanter with small groups of ensiform setae on lateral margin (Fig. 21D); macropterous hemelytron brown 23
- 22b. Hemelytron mostly opaque, with hyaline stripes (24C–D, 25A–B); sexual dimorphism on hemelytral stripes shape (24C–D, 25A–B); male mesotrochanter with thin setae centrally on ventral surface (Fig. 24B, 25C); macropterous hemelytron yellow 24
- 23a. (22a) Hemelytron with a single opaque stripe along costal margin (Fig. 22A–B); male mesotrochanter with 3–4 groups of ensiform setae on lateral margin (Fig. 22D); left paramere three times as long as wide (Fig. 22E) . . . *Martarega gonostyla* Truxal, 1949
- 23b. Hemelytron with short opaque stripe at basal third medially and another opaque stripe along costal margin (Fig. 23A); male mesotrochanter with 1–2 groups of ensiform setae on lateral margin (Fig. 16B); left paramere at most twice as long as wide (Fig. 23B) *Martarega williamsi* Truxal, 1949
- 24a. (22b) Ventral surface of labium setose (23A); group of setae on male mesotrochanter with irregular shape (23B); hyaline stripe originating from base of brachypterous female hemelytral process slightly curved to straight (Fig. 23C) *Martarega brasiliensis* Truxal, 1949
- 24b. Ventral surface of labium glabrous; group of setae on male mesotrochanter rounded, slightly tumid (24C); hyaline stripe originating from base of brachypterous female hemelytral process tectiform (Fig. 24B) *Martarega nessimiani* Barbosa & Rodrigues, 2013
- 25a (2b). Anterior width of vertex a little less than four times synthlipsis width; male genital capsule with dorsocaudal margin pointed and two ventrocaudal protuberances; parameres not reaching dorsocaudal margin of male genital capsule (Fig. 25A) *Notonecta (Paranecta) disturbata* Hungerford, 1926
- 25b. Anterior width of vertex about four times synthlipsis width; male genital capsule with dorsocaudal margin rounded and one ventrocaudal protuberance; parameres reaching dorsocaudal margin of male genital capsule (Fig. 25B) *Notonecta (Paranecta) pulchra* Hungerford, 1926

Discussion

In total, four genera and 11 species of Corixoidea are known from Pará. The superfamily had been previously recorded from eleven municipalities in the western portion of the state (Alenquer, Aveiro, Belterra, Curuá, Itaituba, Jacareacanga, Monte Alegre, Óbidos, Oriximiná, Prainha and Santarém), to which we add three (Mojuí dos Campos, Rurópolis, and Terra Santa). Although eight species had been recorded from western Pará, we only found three of them in our samples. *Tenagobia (Fuscagobia) selecta selecta*, previously reported from Aveiro, Belterra, Itaituba, Monte Alegre, Oriximiná, and Santarém (Nieser 1977), is herein recorded for the first time from Alenquer, Curuá, Mojuí dos Campos, Óbidos, and Rurópolis. We also expand the distributions in Pará of *T. (Romanogobia) romani*, which was recorded from Aveiro and Jacareacanga (Nieser 1977), and of *T. (Schadeogobia) schadei*, known from Jacareacanga and the border between Óbidos and Oriximiná (Nieser 1977). The former is herein recorded from Santarém and Terra Santa, and the latter from Curuá and Santarém.

Three genera and 26 species of Notonectidae occur in Pará, of which all three genera and 15 species are known from the western portion of the state. The family had been previously recorded from nine municipalities in the western portion of the state (Alenquer, Aveiro, Belterra, Itaituba, Mojuí dos Campos, Monte Alegre, Óbidos, Oriximiná, and Santarém), to which we add three (Curuá, Rurópolis, and Terra Santa). Our results include the first records from Pará of *Buenoa deplanatylus* and *Martarega williamsi*, increasing the number of species reported from the state by 8%. The former was described and previously known only from the state of Rondônia (Barbosa & Nessimian 2013a; Ribeiro *et al.* 2024b). Our material examined expands the known distribution of the species by more than 1200 km to the northeast. *Martarega williamsi* was previously recorded from Panama, Peru, Ecuador, and the Brazilian state of Amazonas (Truxal 1949; Nieser 1970b). Our record is approximately 600 km to the east of the closest locality in Amazonas. We also recorded the following six species from the western portion of Pará: *B. konta* Nieser & Pelli, 1994, *B. tarsalis*, *B. tibilais*, *B. truxali*, *B. unguis*, and *Notonecta pulchra*.

The identification keys and plates included here bring together information that was previously scattered in the literature (e.g. Truxal 1949; Nieser 1970a,b), facilitating access to researchers and students interested in the aquatic bugs from the state of Pará.

Conclusion

The western portion of Pará is a large and still poorly explored area for many taxa, especially due to the logistics and costs necessary to develop studies in the region. This is true for all aquatic insects, including nepomorpha, and hinders a better knowledge on this fauna. Even though our work contributes to diminish this knowledge gap, there is still no sampling of aquatic bugs in the municipalities of Faro, Novo Progresso, and Trairão in western Pará.

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References

- Andersen, N.M. & Weir, T.A. (2004) Australian water bugs (Hemiptera-Heteroptera, Gerromorpha & Nepomorpha) their biology and identification. *Entomograph*, 14, 1–344.
<https://doi.org/10.1163/9789004474512>
- Andrade, C.F.S.D. (1992) Susceptibilidade de *Anopheles triannulatus* (Neiva & Pinto, 1922) e espécies não alvo a larvicidas à base de temephos e de *Bacillus thuringiensis* H-14. *Acta Amazonica*, 22 (4), 595–604.
<https://doi.org/10.1590/1809-43921992224604>
- Angrisano, E.B. (1982) Presencia de *Notonecta pulchra* Hungerford (Insecta, Notonectidae) en la República Argentina. *Physis (Buenos Aires)*, 40, 1–120.
- Bachmann, A.O. (1962a) Catálogo de las Corixidae de la República Argentina (Insecta, Hemiptera). *Neotrópica*, 8, 15–25.
- Bachmann, A.O. (1962b) Apuntes para una hidrobiología argentina. IV. Los Hemiptera Cryptocerata del delta del Paraná (Insecta). *Revista de la Sociedad Entomológica Argentina*, 23, 24–25.
- Bachmann, A.O. (1962c) El genero *Martarega* en la Argentina (Hem Notonect.). *Revista de la Sociedad Entomológica Argentina*, 23, 30.
- Bachmann, A.O. (1963) El género *Notonecta* en la Argentina, al norte del río Colorado (Hemiptera, Notonectidae). *Revista de la Sociedad Entomológica Argentina*, 26, 5–6.
- Bachmann, A.O. (1971) Catálogo sistemático y clave para la determinación de las subfamilias, géneros y especies de las Notonectidae de la República Argentina (Insecta, Hemiptera). *Physis*, 30, 601–617.
- Bachmann, A.O. (1979) Notas para una monografía de las Corixidae Argentinas (Insecta, Heteroptera). *Acta Zoológica Lilloana*, 35, 305–350.
- Barbosa, F.A.R. (2002) *Diversidade aquática. Programa de Pesquisas Ecológicas de Longa Duração - PELD/CNPQ*. Minas Gerais, Belo Horizonte, 154 pp. [pp. 84–237]
- Barbosa, J.F. & Dias-Silva, K. (2017) Checklist and new records of Notonectidae (Hemiptera: Heteroptera: Nepomorpha) from Goiás, Brazil. *EntomoBrasilis*, 10 (1), 44–50.
<https://doi.org/10.12741/ebrasilis.v10i1.667>
- Barbosa, J.F. & Giehl, N. (2014) New distribution records of the genus *Martarega* White, 1879 (Hemiptera: Heteroptera: Notonectidae) in eastern Mato Grosso State, Brazil. *Check List*, 10 (5), 1152–1155.
<https://doi.org/10.15560/10.5.1152>
- Barbosa, J.F. & Nessimian, J.L. (2013a) The genus *Buenoa* Kirkaldy, 1904 (Hemiptera: Heteroptera: Nepomorpha: Notonectidae) in northern Brazil: inventory, new records, and new species. *Zootaxa*, 3694 (2), 101–130.
<https://doi.org/10.11646/zootaxa.3694.2.1>
- Barbosa, J.F. & Nessimian, J.L. (2013b) New species and new records of *Notonecta* (Hemiptera: Heteroptera: Notonectidae) from Brazil. *Zoologia*, 30, 692–696.
<https://doi.org/10.1590/S1984-46702013005000011>
- Barbosa, J.F. & Rodrigues, H.D.D. (2013) A new species of *Martarega* White, 1879, with new distributional records of Notonectidae (Hemiptera: Heteroptera: Nepomorpha) from Brazil. *Zootaxa*, 3682 (4), 534–540.
<https://doi.org/10.11646/zootaxa.3682.4.4>

- Barbosa, J.F., Rodrigues, H.D.D. (2015) The True Water Bugs (Nepomorpha). In: Panizzi, A. & Grazia, J. (Eds.), *True Bugs (Heteroptera) of the Neotropics. Entomology in Focus. Vol. 2*. Springer, Dordrecht, pp. 159–199.
https://doi.org/10.1007/978-94-017-9861-7_7
- Barbosa, J.F., Ribeiro, J.R.I. & Nessimian, J.L. (2010a) A new species of *Buenoa* Kirkaldy (Hemiptera, Heteroptera, Notonectidae) from Rio de Janeiro, Brazil. *Revista Brasileira de Entomologia*, 54, 560–564.
<https://doi.org/10.1590/S0085-56262010000400004>
- Barbosa, J.F., Ribeiro, J.R.I. & Ferreira-Keppler, R.L. (2010b) A new species of *Martarega* White, 1879 (Hemiptera: Heteroptera: Notonectidae) from the State of Pará, Brazil, and other new records for three species in Brazil. *Zootaxa*, 2351 (1), 58–64.
<https://doi.org/10.11646/zootaxa.2351.1.6>
- Barbosa, J.F., Ribeiro, J.R.I. & Nessimian, J.L. (2012) A synopsis of *Martarega* White, 1879 (Insecta: Heteroptera: Notonectidae) occurring in the Brazilian Amazonia, with descriptions of three new species. *Journal of Natural History*, 46, 1025–1057.
<https://doi.org/10.1080/00222933.2011.651645>
- Barbosa, J.F., Nessimian, J.L. & Takiya, D.M. (2015) Description of two new species of *Martarega* White, 1879 (Heteroptera: Nepomorpha: Notonectidae), one based on the mixed type-series of *M. oriximinaensis* Barbosa, Ribeiro & Ferreira-Keppler, 2010. *Zootaxa*, 3947 (3), 417–424.
<https://doi.org/10.11646/zootaxa.3947.3.8>
- Barros, M.J.B. (2023) *Oeste do Pará: ocupação, território e município*. UFOPA, Santarém and MC&G Editorial, Rio de Janeiro, 135 pp. [dados eletrônicos (pdf)]
- Berg, C. (1879) *Hemiptera Argentina enumeravit speciesque novas descripsit*. Ex typographiae P.E. Coni, Bonariae, 316 pp.
<https://doi.org/10.5962/bhl.title.36493>
- Bergroth, E. (1899) A new genus of Corixidae. *Entomologist's Monthly Magazine*, 10 (35), 282.
- Carrenho, R., Rodrigues, H.D.D., Lima, A.C.D. & Schwertner, C.F. (2020) Type specimens of true bugs (Hemiptera: Heteroptera) housed in the Museu de Zoologia da Universidade de São Paulo, Brazil. *Papéis avulsos de Zoologia*, 60, e20206017.
<https://doi.org/10.11606/1807-0205/2020.60.17>
- Castanhole, M.M.U., Marchesin, S.R.C., Pereira, L.L.V., Moreira, F.F.F., Barbosa, J.F., Valério, J.R. & Itoyama, M.M. (2013) The first assess of the haplotypes from *COI* gene sequences in species of spittlebugs (Cicadomorpha: Hemiptera) and aquatic true bugs (Gerromorpha and Nepomorpha: Hemiptera) in Brazil. *Genetics and Molecular Research*, 12 (4), 5372–5381.
<https://doi.org/10.4238/2013.November.7.12>
- Champion, G.C. (1901) Rhynchota: Hemiptera-Heteroptera. Vol. II. *Biologia Centrali-Americana*, 2, 1–385.
- Chen, P., Nieser, N. & Zettel, H. (2005) The Aquatic and Semi-Aquatic Bugs (Heteroptera: Nepomorpha & Gerromorpha) of Malesia. *Fauna Malesiana Handbook*, 5, 1–546.
<https://doi.org/10.1163/9789047416807>
- Cunha, E.J. & Juen, L. (2017) Impacts of oil palm plantations on changes in environmental heterogeneity and Heteroptera (Gerromorpha and Nepomorpha) diversity. *Journal of Insect Conservation*, 21, 111–119.
<https://doi.org/10.1007/s10841-017-9959-1>
- Cunha, E.J., Montag, L.F.A. & Juen, L. (2015) Oil palm crops effects on environmental integrity of Amazonian streams and Heteropteran (Hemiptera) species diversity. *Ecological Indicators*, 52, 422–429.
<https://doi.org/10.1016/j.ecolind.2014.12.024>
- Deay, H.O. (1930) Six new species of *Tenagobia* Bergroth (Hemiptera, Corixidae). *Bulletin of the Brooklyn Entomological Society*, 25, 171–181.
- Deay, H.O. (1935) *The genus Tenagobia Bergroth (Corixidae, Hemiptera)* (Doctoral dissertation). *The University of Kansas Science Bulletin*, 22, 403–477.
- Dias-Silva, K., Cabette, H.S. & Juen, L. (2010) The influence of habitat integrity and physical-chemical water variables on the structure of aquatic and semi-aquatic Heteroptera. *Zoologia, Curitiba*, 27, 918–930.
<https://doi.org/10.1590/S1984-46702010000600013>
- Dias-Silva, D., Cabette, H.S.R., Giehl, N.F.S. & Juen, L. (2013) Distribuição de Heteroptera Aquáticos (Insecta) em Diferentes Tipos de Substratos de Córregos do Cerrado Matogrossense. *EntomoBrasilis*, 6 (2), 132–140.
<https://doi.org/10.12741/ebrazilis.v6i2.302>
- Dias-Silva, K., Brasil, L.S., Veloso, G.K.O., Cabette, H.S.R. & Juen, L. (2020) Land use change causes environmental homogeneity and low beta-diversity in Heteroptera of streams. *Annales de Limnologie-International Journal of Limnology*, 56, 9.
<https://doi.org/10.1051/limn/2020007>
- Fabricius, J.C. (1803) *Systema Rhyngotorum Secundum Ordines, Genera, Species Adjectis Synonymis, Locis, Observationibus, Descriptionibus*. Carolus Reichard, Brunsvigae, x + 314 pp.
<https://doi.org/10.5962/bhl.title.11644>
- Fieber, F.X. (1851) Rhynchotographieen Drei monographische Abhandlung. *Abhandlungen der Königlich Böhmisches Gesellschaft der Wissenschaften*, 7, 469–486.
- Floriano, C.F.B., Oliveira, I.A.D.V. & Melo, A.L. (2013) New records and checklist of aquatic and semi-aquatic Heteroptera (Insecta: Hemiptera: Gerromorpha and Nepomorpha) from the southern region of Mato Grosso do Sul, Brazil. *Biota Neotropica*, 13 (1), 210–219.

<https://doi.org/10.1590/S1676-06032013000100022>

- Frost, W.E. & Macan, T.T. (1948) Corixidae (Hemiptera) as food of fish. *Journal of Animal Ecology*, 17, 174–179.
<https://doi.org/10.2307/1481>
- Giehl, N.F.D.S., Resende, B.O.D., Silva, K.D., Nogueira, D.S., Cabette, H.S.R. & Roges, P.F. (2018) Diversidade de presas e predadores (Insecta) em mesohabitats de córregos de Cerrado. *Iheringia*, Série Zoologia, 108, 1–11.
<https://doi.org/10.1590/1678-4766e2018042>
- Gutiérrez, Y., Ramos, G.S., Tomé, H.V.V., Oliveira, E.E. & Salaro, A.L. (2017a) Bti-based insecticide enhances the predatory abilities of the backswimmer *Buenoa tarsalis* (Hemiptera: Notonectidae). *Ecotoxicology*, 26, 1147–1155.
<https://doi.org/10.1007/s10646-017-1840-1>
- Gutiérrez, Y., Tomé, H.V.V., Guedes, R.N.C. & Oliveira, E.E. (2017b) Deltamethrin toxicity and impaired swimming behavior of two backswimmer species. *Environmental Toxicology and Chemistry*, 36 (5), 1235–1242.
<https://doi.org/10.1002/etc.3645>
- Hädicke, C.W., Rédei, D. & Kment, P. (2017) The diversity of feeding habits recorded for water boatmen (Heteroptera: Corixoidea) world-wide with implications for evaluating information on the diet of aquatic insects. *European Journal of Entomology*, 114, 147–159.
<https://doi.org/10.14411/eje.2017.020>
- Heckman, C.W. (1998a) The seasonal succession of biotic communities in the wetlands of the tropical wet-and-dry climatic zone: V. Aquatic invertebrate communities in the Pantanal of Mato Grosso, Brazil. *International Review of Hydrobiology*, 83 (1), 31–63.
<https://doi.org/10.1002/iroh.19980830105>
- Heckman, C.W. (1998b) *The Pantanal of Poconé: Biota and Ecology in the Northern Section of the World's Largest Pristine Wetland*. Kluwer Academic Publishers, Dordrecht, 622 pp.
- Herrera Millán, M.J. (2005) Notonectídeos (Hemiptera, Cryptocerata: Notonectidae) de Venezuela: listado de especies y distribución geográfica. *Entomotropica*, 20 (2), 115–120.
- Hungerford, H.B. (1926) Some *Notonecta* from South America. *Psyche*, 33, 11–16.
<https://doi.org/10.1155/1926/90626>
- Hungerford, H.B. (1927) A report upon the aquatic and semi-aquatic Hemiptera from the Mulford Biological Expedition to Bolivia, South-America, 1921–22. *Proceedings of the Entomological Society of Washington*, 29 (8), 187–191.
- Hungerford, H.B. (1928) Notes on the genus *Heterocorixa* with the description of some new species. *Bulletin of the Brooklyn Entomological Society*, 23, 99–102.
- Hungerford, H.B. (1933) The genus *Notonecta* of the world (Notonectidae-Hemiptera). *The University of Kansas Science Bulletin*, 21 (1), 1–195.
- Hungerford, H.B. (1948) The Corixidae of the Western Hemisphere. *The University of Kansas Science Bulletin*, 32, 1–827.
- Hynes, H.B.N. (1948) Notes on the aquatic Hemiptera-Heteroptera of Trinidad and Tobago, B.W.I., with a description of a new species of *Martarega* B. White (Notonectidae). *Transactions of the Royal Entomological Society of London*, 99 (10), 341–360.
<https://doi.org/10.1111/j.1365-2311.1948.tb01225.x>
- Irmler, U. (1975) Ecological studies of the aquatic soil invertebrates in three inundation forests of Central Amazonia. *Fascículo*, 3, 337–409.
- Irmler, U. & Junk, W.J. (1982) The inhabitation of artificially exposed leaf samples by aquatic macro-invertebrates at the margin of Amazonian inundation forests. *Tropical Ecology*, 23 (1), 64–75.
- Jaczewski, T. (1928) Notonectidae from the State of Paraná. *Prace Panstwowego Muzeum Zoologicznego (Annales Zoologici Musei Polonici Historiae Naturalis)*, 7, 121–136.
- Jaczewski, T. (1931a) Die Corixiden (Corixidae, Heteroptera) des Zoologischen Staatsinstituts und Zoologischen Museums in Hamburg. *Mitteilungen Zoologisches Staatsinstitut und Zoologisches Museum in Hamburg*, 140–148.
- Jaczewski, T. (1931b) Studies on Mexican Corixidae: from the scientific results of the Mexican trip of Dr. T. Jaczewski and Dr. T. Wolski, in 1929. *Annales Musei Zoologici Polonici*, 9 (15), 187–230.
- Jaczewski, T. (1933) Corixidae collected during the Winter Voyage, 1931–1932, of the Polish Training Ship "Dar Pomorza". *Annales Musei Zoologici Polonici*, 10 (1), 1–6.
- Jordão, R., Barbosa, J.F. & Moreira, F.F.F. (2025) Survey of the Notonectidae (Insecta, Hemiptera, Heteroptera, Nepomorpha) from northeastern Brazil. *Zookeys*, 1233, 245–288.
- Kirkaldy, G.W. (1899a) Notes on Aquatic Rhynchota. No. 3. *Entomologist*, 32 (435), 193–196.
<https://doi.org/10.5962/bhl.part.3139>
- Kirkaldy, G.W. (1899b) Viaggio del Dott. A. Borelli nel Chaco Boliviano e nella Republica Argentina. XVI. Aquatic Rhynchota. *Bollettino dei Musei di Zoologia ed Anatomia Comparata Della R. Università di Torino*, 14, 51–352.
- Kirkaldy, G.W. (1899c) Viaggio del Dr. Enrico Festa nell'Ecuador e regioni vicine. XIX. Aquatic Rhynchota. *Bollettino dei Musei di Zoologia ed Anatomia comparata della R. Università di Torino*, 14 (350), 1–9.
<https://doi.org/10.5962/bhl.part.7275>
- Kirkaldy, G.W. (1899d) Aquatic Rhynchota collected by Dr. E. Festa in Darien & Venezuela. *Bollettino dei Musei di Zoologia ed Anatomia Comparata Della R. Università di Torino*, 14, 1–348.
<https://doi.org/10.5962/bhl.part.7275>

- Kirkaldy, G.W. (1900) Notes on Jamaican Rhynchota. No 2. *The Entomologist*, 33, 70–73.
<https://doi.org/10.5962/bhl.part.3888>
- Kirkaldy, G.W. (1904) Über Notonectiden. *Wiener Entomologische Zeitung*, 23, 93–13.
- Kirkaldy, G.W. (1913) Supplement to Hemiptera. Part VI *Fauna Hawaiiensis*, 3 (2), 531–599.
- Kleerekoper, H. (1955) Limnological observations in northeast Rio Grande do Sul, Brazil. *Archiv für Hydrobiologie*, 50, 553–567.
- Lethierry, L. (1881) Liste des Hémiptères recueillis par M. Delauney à la Guadeloupe, la Martinique et Saint Barthélemy. In *Annales de la Société Entomologique de Belgique*, 25, 8–19.
- López, M., López, D., Espinoza, P., Valle, S., Rivera, P. & García, I. (1998) Valoración de la capacidad depredadora de los chinches acuáticos nicaragüenses en condiciones de laboratorio. *Revista Nicaragüense de Entomología*, 46, 1–5.
- López Ruf, M.L., Mazzucconi, S.A. & Bachmann, A.O. (2003) Heteroptera acuáticos y semiacuáticos del Parque Nacional Mburucuyá (provincia de Corrientes, Argentina). *Revista de la Sociedad Entomológica Argentina*, 62 (1–2), 65–71.
- Lundblad, O. (1928a) Monographie der bis jetzt bekannten Arten der neotropischen Corixidengattung *Heterocorixa* B. White. *Entomologisk Tidskrift*, 49, 66–83.
- Lundblad, O. (1928b) Zur Kenntnis Der Gattung *Tenagobia* Bergroth. *Arkiv För Zoologi*, 20A (7), 1–28.
- Melo, A.L. & Nieser, N. (2004) Faunistical notes on aquatic Heteroptera of Minas Gerais (Brazil): an annotated list of Gerromorpha and Nepomorpha collected near Januária, MG. *Lundiana*, 5 (1), 43–49.
<https://doi.org/10.35699/2675-5327.2004.21901>
- Menke, A.S. & Truxal, F.S. (1966) New distribution data for *Martarega*, *Buenoa* and *Abedus*: including the first record of the genus *Martarega* in the United States (Hemiptera: Notonectidae, Belostomatidae). *Contributions in Science*, 106, 1–6.
<https://doi.org/10.5962/p.241095>
- Moreira, F.F.F., Rodrigues, H.D., Barbosa, J.F., Klementová, B.R. & Svitok, M. (2016) New records of Gerromorpha and Nepomorpha (Insecta: Hemiptera: Heteroptera) from South America. *Biodiversity Data Journal*, 4, e7975.
<https://doi.org/10.3897/BDJ.4.e7975>
- Moreira, F.F.F., Rodrigues, H.D.D., Sites, R.W., Cordeiro, I.R.S. & Magalhães, O.M. (2018) Order Hemiptera. In: Hamada, N., Thorp, J. & Rogers, D.C. (Eds.), *Thorp and Covich's Freshwater Invertebrates. Fourth Edition. Vol. III. Keys to Neotropical Hexapoda*. Academic Press, London, pp. 175–216.
<https://doi.org/10.1016/B978-0-12-804223-6.00007-X>
- Nessimian, J.L. & Ribeiro, J.R.I. (2000) Aspectos da biologia de *Buenoa platycnemis* (Fieber) (Insecta, Heteroptera, Notonectidae) da Restinga de Maricá, Rio de Janeiro. *Revista Brasileira de Zoologia*, 17, 229–239.
<https://doi.org/10.1590/S0101-81752000000100020>
- Nieser, N. (1967) The heteroptera of the Netherlands Antilles—VI Notonectidae. *Studies on the Fauna of Curaçao and other Caribbean Islands*, 24 (1), 157–189.
- Nieser, N. (1968) Notonectidae of Suriname with additional records of other neotropical species. *Studies on the Fauna of Suriname and other Guyanas*, 10 (1), 110–136.
- Nieser, N. (1969a) The Heteroptera of the Netherlands Antilles—VII Corixidae. *Studies on the Fauna of Curaçao and other Caribbean Islands*, 28 (1), 135–164.
- Nieser, N. (1969b) Notes on Antillean Notonectidae. *Studies on the Fauna of Curaçao and other Caribbean Islands*, 30 (1), 88–98.
- Nieser, N. (1970a) Corixidae of Suriname and the Amazon with records of other Neotropical species. *Studies on the Fauna of Suriname and other Guyanas*, 12 (1), 43–70.
- Nieser, N. (1970b) Records of South American Notonectidae mainly from the Amazon-Region. *Studies on the Fauna of Suriname and other Guyanas*, 12 (46), 71–93.
- Nieser, N. (1975) The water bugs (Heteroptera: Nepomorpha) of the Guyana Region. *Studies on the Fauna of Suriname and other Guyanas*, 16 (59), 1–310.
https://doi.org/10.1007/978-94-017-7118-4_1
- Nieser, N. (1977) A revision of the genus *Tenagobia* Bergroth (Heteroptera: Corixidae). *Studies on Neotropical Fauna and Environment*, 12, 1–56.
<https://doi.org/10.1080/01650527709360510>
- Nieser, N. (2002) Guide to aquatic Heteroptera of Singapore and Peninsular Malaysia. IV. Corixoidea. *The Raffles Bulletin of Zoology*, 50, 263–274.
- Nieser, N. & Alkins-Koo, M. (1991) The water bugs of Trinidad & Tobago. *Occasional Papers of The Zoology Department, University of the West Indies*, 9, I + I–III + 1–127.
- Nieser, N. & Chen, P.P. (2006) Two new genera and a new subfamily of Micronectidae (Heteroptera, Nepomorpha) from Brazil. *Denisia*, 19, 523–534.
- Nieser, N. & Melo, A.L. (1997) *Os heterópteros aquáticos de Minas Gerais. Guia introdutório com chave de identificação para as espécies de Nepomorpha e Gerromorpha*. Universidade Federal de Minas Gerais, Belo Horizonte, 177 pp.
- Nieser, N. & Pelli, A. (1994) Two new *Buenoa* (Heteroptera: Notonectidae) from Minas Gerais (Brazil). *Storkia*, 3, 1–4.
- Nobre, R.L., Caliman, A., Guariento, R.D., Bozelli, R.L. & Carneiro, L.S. (2019) Effects of the introduction of an omnivorous fish on the biodiversity and functioning of an upland Amazonian lake. *Acta Amazonica*, 49, 221–231.
<https://doi.org/10.1590/1809-4392201804131>

- Osborn, H. & Drake, C.J. (1915) Records of Guatemalan-Hemiptera-Heteroptera with Descriptions of New Species. *The Ohio Naturalist*, 15, 529–541.
- Padilla-Gil, D.N. (2014) New records of aquatic Heteroptera (Hemiptera) from the Andean foothills of the Amazonia (Putumayo, Colombia). *Revista Colombiana de Entomología*, 40 (2), 230–234.
- Patterson, B.D. (1992) *Fieldiana. Zoology. New Series. No. 66. Mammals in the Royal Natural History Museum, Stockholm, collected in Brazil and Bolivia by AM Olalla during 1934-1938. Publication (Field Museum of Natural History 1432.* Chicago Natural History Museum, Chicago, Illinois, 42 pp.
<https://doi.org/10.5962/bhl.title.3551>
- Pelli, A. & Barbosa, F.A.R. (1998) Insetos coletados em *Salvinia molesta* Mitchell (Salviniaceae), com especial referência as espécies que causam dano a planta, na Lagoa Olhos d'água, Minas Gerais, Brasil. *Revista Brasileira de Entomologia*, 42 (1–2), 9–12.
- Pelli, A., Nieser, N. & de Melo, A.L. (2006) Nepomorpha and Gerromorpha (Insecta: Heteroptera) from the Serra da Canastra, southwestern Minas Gerais state, Brazil. *Lundiana: International Journal of Biodiversity*, 7 (1), 67–72.
<https://doi.org/10.35699/2675-5327.2006.22190>
- Pelli, A., Pedreira, M.M., Machado, A.R.M. & Souza, F. de (2020) Proposta de índice para avaliação da qualidade de água em ambientes lóticos: estudo de aplicação no Córrego Gameleira, Uberaba/MG. In: Hayashi, C., Sardinha, D.S. & Pamplin, P.A.Z. (Eds.), *Ciências Ambientais. Recursos Hídricos*. Carmino Hayashi & Ribeirão Preto, Alfenas, pp. 29–58.
- Peralta-Argomedo, J.L., Rodrigues, J.M.D.S., Huamantínco-Araujo, A.N.A. & Moreira, F.F.F. (2024) Checklist of the aquatic and semiaquatic bugs (Hemiptera: Heteroptera: Gerromorpha, Leptopodomorpha & Nepomorpha) of Peru. *Zootaxa*, 5467 (1), 1–72.
<https://doi.org/10.11646/zootaxa.5467.1.1>
- Pereira, D.L.V. & Melo, A.L. (2007) Aquatic and semiaquatic Heteroptera (Insecta) from Pitinga, Amazonas, Brazil. *Acta Amazonica*, 37 (4), 643–648.
<https://doi.org/10.1590/S0044-59672007000400021>
- Pereira, L.L.V., Alevi, K.C.C., Castanhole, M.M.U., Moreira, F.F.F., Barbosa, J.F. & Itoyama, M.M. (2015a) Cytogenetics Analysis and Testis Morphology of Aquatic Species of the Families Belostomatidae, Gelastocoridae, Gerridae, Notonectidae, and Veliidae (Heteroptera). *Journal of Insect Science*, 15 (1), 1–10.
<https://doi.org/10.1093/jisesa/iev009>
- Pereira, L.L.V., Alevi, K.C.C., Moreira, F.F.F., Barbosa, J.F., Silistino-Souza, E.R., Silva Júnior, F.C., Souza-Firmino, T.S., Banho, C.A. & Itoyama, M.M. (2015b) Study of nucleolar behavior during spermatogenesis in *Martarega brasiliensis* (Heteroptera, Notonectidae). *Genetics and Molecular Research*, 14 (3), 8988–8994.
<https://doi.org/10.4238/2015.August.7.7>
- Polhemus, J.T. & Polhemus, D.A. (2008) Global diversity of true bugs (Heteroptera; Insecta) in freshwater. *Hydrobiologia*, 595, 379–391.
<https://doi.org/10.1007/s10750-007-9033-1>
- Rego, A.K.C. & Kato, O.R. (2017) Agricultura de corte e queima e alternativas agroecológicas na Amazônia. *Novos Cadernos Núcleo de Altos Estudos Amazônicos*, 20 (3), 203–224.
<https://doi.org/10.5801/ncn.v20i3.3482>
- Reiss, F. (1977) Qualitative and quantitative investigations on the macrobenthic fauna of Central Amazon lakes. 1. Lago Tupé, a black water lake on the lower Rio Negro. *Amazoniana: Limnologia et Oecologia Regionalis Systematis Fluminis Amazonas*, 6 (2), 203–235.
- Ribeiro, J.R.I., Nessimian, J.L. & Mendonça, E.C. (1998) Aspectos da distribuição dos Nepomorpha (Hemiptera: Heteroptera) em corpos d'água na Restinga de Maricá, estado do Rio de Janeiro. *Oecologia Brasiliensis*, 5 (1), 8.
<https://doi.org/10.4257/oeco.1998.0501.09>
- Ribeiro, J.R.I., Moreira, F.F.F., Alecrim, V.P., Barbosa, J.F. & Nessimian, J.L. (2010) Espécies de heterópteros dulciaquícolas (Hemiptera, Heteroptera, Gerromorpha e Nepomorpha) registradas no Estado do Rio de Janeiro, Brasil. *Publicações avulsas do Museu Nacional*, 67 (3–4), 303–312.
- Ribeiro, J.R.I., Moreira, F.F.F., Barbosa, J.F., Alecrim, V.P. & Rodrigues, H.D.D. (2019) Ordem Hemiptera Subordem Heteroptera. In: Hamada, N., Nessimian, J.L., Querino, R.B (Eds.), *Insetos aquáticos na Amazônia brasileira: taxonomia, biologia e ecologia*. Editora do INPA, Manaus, pp. 117–128.
- Ribeiro, J.R.I., Rodrigues, H.D.D. & Barbosa, J.F. (2024a) Corixidae in Catálogo Taxonômico da Fauna do Brasil. Available from: <http://fauna.jbrj.gov.br/fauna/faunadobrasil/1776> (accessed 23 April 2024)
- Ribeiro, J.R.I., Rodrigues, H.D.D. & Barbosa, J.F. (2024b) Notonectidae in Catálogo Taxonômico da Fauna do Brasil. Available from: <http://fauna.jbrj.gov.br/fauna/faunadobrasil/35343> (accessed 23 April 2024)
- Rico, A., Geber-Corrêa, R., Campos, P.S., Garcia, M.V.B., Waichman, A.V. & Van den Brink, P.J. (2010) Effect of Parathion-Methyl on Amazonian Fish and Freshwater Invertebrates: A Comparison of Sensitivity with Temperate Data. *Archives of Environmental Contamination and Toxicology*, 58, 765–771.
<https://doi.org/10.1007/s00244-009-9409-5>
- Roback, S.S. & Nieser, N. (1974) Aquatic Hemiptera (Heteroptera) from the llanos of Colombia. *Proceedings of the Academy of Natural Sciences of Philadelphia*, 1974, 29–49.

- Rodrigues, T.E. (2001) *Caracterização dos solos da área do planalto de Belterra, Município de Santarém, Estado do Pará*. Embrapa Amazônia Oriental, Belém, 55 pp.
- Rodrigues, H.D.D. & Ferreira-Keppeler, R.L. (2013) Catalog of type specimens of invertebrates in the collection of the Instituto Nacional de Pesquisas da Amazônia, Manaus, Brazil. VI. Hexapoda: Hemiptera: Heteroptera. *Zootaxa*, 3716 (2), 192–206.
<https://doi.org/10.11646/zootaxa.3716.2.4>
- Savage, A.A. (1989) *Adults of the British aquatic Hemiptera Heteroptera a key with ecological notes*. Freshwater Biological Association Scientific Publication, Ambleside, Cumbria, 173 pp.
- Schuh, R.T. & Weirauch, C. (2020) *True bugs of the world (Hemiptera: Heteroptera): Classification and Natural history. 2nd Edition*. Siri Scientific Press, Manchester, 768 pp.
- SEMA-RS [Secretaria Estadual de Meio Ambiente e Infraestrutura do Rio Grande do Sul] (2014) *Plano de Manejo. Parque Estadual do Delta do Jacuí*. Secretaria Estadual de Meio Ambiente e Infraestrutura do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, 348 pp.
- Sites, R.W. (1990) Naucorid records from Amazonian Ecuador (Heteroptera: Naucoridae). *The Florida Entomologist*, 73, 334–335.
<https://doi.org/10.2307/3494819>
- Sites, R.W. (2023) A new species of *Maculambrysus* Reynoso & Sites, 2021 (Hemiptera: Heteroptera: Naucoridae) from an aguaje palm swamp in southeastern Peru. *Zootaxa*, 5389 (2), 288–294.
<https://doi.org/10.11646/zootaxa.5389.2.10>
- Sousa, D.C., Veras, D.S., Azevêdo, C.A.S., Cunha, E.J. & Juen, L. (2024) Efficiency in using genera and families of heteroptera for stream biomonitoring in the Cerrado Biome, Eastern Maranhão, Brazil. *Environmental Monitoring and Assessment*, 196, 1278.
<https://doi.org/10.1007/s10661-024-13402-7>
- Souza, M.A., Melo, A.L.D. & Vianna, G.J. (2006) Heterópteros aquáticos oriundos do Município de Mariana, MG. *Neotropical Entomology*, 35, 803–810.
<https://doi.org/10.1590/S1519-566X2006000600013>
- Stål, C. (1868) Hemiptera Fabriciana: Fabricianska Hemipterarter, Efter De I Köpenhamn Och Kiel Förvarade Typexemplaren Granskade Och Beskrifn. *Kongl.Svenska Vetenskaps-Akademiens Handlingar*, 7 (11), 1–148.
- Takiya, D.M., Santos, A.P.M., Pinto, A.P., Henriques-Oliveira, A.L., Carvalho, A.L., Sampaio, B.H.L., Clarkson, B., Moreira, F.F.F., Avelino-Capistrano, F., Gonçalves, I.C., Cordeiro, I.R.S., Câmara, J.T., Barbosa, J.F., Souza, W.R.M. & Rafael, J.A. (2016) Aquatic insects from the Caatinga: checklists and diversity assessments of Ubajara (Ceará State) and Sete Cidades (Piauí State) National Parks, Northeastern Brazil. *Biodiversity Data Journal*, 4, e8354.
<https://doi.org/10.3897/BDJ.4.e8354>
- Torre-Bueno, J.R. (1906) On some aquatic Hemiptera from Costa Rica, Central America. *Entomological News*, 17 (2), 54–57.
- Truxal, F.S. (1949) A study of the genus *Martarega* (Hemiptera, Notonectidae). *Journal of the Kansas Entomological Society*, 22 (1), 1–24.
- Truxal, F.S. (1953) A revision of the genus *Buenoa* (Hemiptera: Notonectidae). *The University of Kansas Science Bulletin*, 35 (11), 1353–1523.
- Truxal, F.S. (1957) Systematics of the Notonectidae (Hemiptera). *Contributions in Science*, 12, 1–21.
<https://doi.org/10.5962/p.214226>
- Uhler, P.R. (1884) Order IV.—Hemiptera. In: Kingsley, J.S. (Ed.), *The Standard Natural History. Vol. 2. 2nd Edition*. Cassim & Co., Boston, Massachusetts, pp. 204–296.
- Uhler, P.R. (1893) A list of Hemiptera-Heteroptera collected in the island of St. Vincent by Mr. Herbert H. Smith, with description of new genera and species. *Proceedings of the Zoological Society of London*, 1893, 705–719.
- Uhler, P.R. (1894) On the Hemiptera-Heteroptera of the Island of Grenada, West Indies. *Proceedings of the Zoological Society of London*, 1894, 167–224.
- Valbon, W., Araújo, S.H., Nery, R.S., Barbosa, J.F., Newland, P.L. & Oliveira, E.E. (2021) Predatory Abilities of The Backswimmer *Buenoa Amnigenus* Are Not Impaired After Sublethal Exposures To Pyriproxyfen. *Research Square*, 1–16. [under review]
<https://doi.org/10.21203/rs.3.rs-855427/v1>
- White, F.B. (1879) List of the Hemiptera collected in the Amazons by Prof. J. W. H. Trail, M. A., M. D., in the years 1873–1875, with descriptions of new species. *Transactions of the Entomological Society of London*, 4, 267–276.
<https://doi.org/10.1111/j.1365-2311.1879.tb01994.x>
- Ye, Z., Damgaard, J., Hädicke, C.W.; Zhu, X., Mazzucconi, S.S., Hebsgaard, M.B., Xie, T., Yang, H. & Bu, W. (2023) Phylogeny and historical biogeography of the water boatmen (Insecta: Hemiptera: Heteroptera: Nepomorpha: Corixoidea). *Molecular Phylogenetics and Evolution*, 180, 107698.
<https://doi.org/10.1016/j.ympev.2022.107698>
- Zalom, F.G. & Smilanick, J.M. (1979) New records of *Buenoa* (Hemiptera: Notonectidae) from Peru. *Entomologist's Record and Journal of Variation*, 91 (7–8), 204.