

# A synopsis of the *Hydrometra* (Hemiptera, Heteroptera, Hydrometridae) from the Amazon River floodplain, Brazil, with redescription of *Hydrometra argentina* Berg

Felipe Ferraz Figueiredo Moreira<sup>1</sup>; José Ricardo Inacio Ribeiro<sup>2</sup> & Jorge Luiz Nessimian<sup>1</sup>

<sup>1</sup>Departamento de Zoologia, Instituto de Biologia Laboratório de Entomologia, Universidade Federal do Rio de Janeiro. Av. Brigadeiro Trompowski s/n – CCS – Bloco A, sala A1 107. 21944970 Rio de Janeiro-RJ, Brasil. Caixa-Postal: 68044. felipento@hotmail.com; nessimia@acd.ufrj.br.

<sup>2</sup>Centro de Ciências Rurais de São Gabriel. Universidade Federal do Pampa, Av. Antônio Trilha, 1847, Centro. 97300-000 São Gabriel-RS, Brasil. joseribeiro@unipampa.edu.br

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**ABSTRACT.** A synopsis of the *Hydrometra* (Hemiptera, Heteroptera, Hydrometridae) from the Amazon River floodplain, Brazil, with redescription of *Hydrometra argentina* Berg. *Hydrometra argentina* Berg, 1879, *H. caraiba* Guérin-Méneville, 1857 and *H. guianana* Hungerford & Evans, 1934 are newly recorded in the Amazon River floodplain, Brazil. A redescription of *H. argentina* is also given, as the original description is incomplete. A key to the three known species occurring in this region is provided. *Hydrometra argentina* can be distinguished from *H. caraiba* and *H. guianana* by the body length smaller than 12.50 mm, anteoculus/postoculus ratio between 1.80 and 2.00, clypeus narrow and conical, metacetaulum with no circular pits, and projections on male abdominal sternite VI in the shape of simple spines. The other species can be distinguished mainly by the anteoculus/postoculus ratio and position of projections on male abdominal sternite VI.

**KEYWORDS.** Amazon; aquatic insects; Gerromorpha; Neotropics; taxonomy.

**RESUMO.** Sinopse de *Hydrometra* (Hemiptera, Heteroptera, Hydrometridae) da várzea do Rio Amazonas, Brasil, com a redescricao de *Hydrometra argentina* Berg. Novos registros na várzea do Rio Amazonas, Brasil, são feitos para *Hydrometra argentina* Berg, 1879, *H. caraiba* Guérin-Méneville, 1857 e *H. guianana* Hungerford & Evans, 1934. Uma redescricao de *H. argentina* também é provida, já que a descricao original é incompleta. Uma chave de identificacao para as três espécies do gênero ocorrentes na área é apresentada. *Hydrometra argentina* pode ser distinguida de *H. caraiba* e *H. guianana* pelo comprimento do corpo menor que 12,50 mm, proporcao anteoculo/pós-oculo entre 1,80 e 2,00, clipeo estreito e cônico, metacetaulo sem pontuacoes, e projeções do esternito abdominal VI do macho na forma de espinhos simples. As demais espécies distinguem-se principalmente pela proporcao anteoculo/pós-oculo e pela posicao das projeções do esternito abdominal VI do macho.

**PALAVRAS-CHAVE.** Amazônia; Gerromorpha; insetos aquáticos; Região Neotropical; taxonomia.

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The Amazon River floodplain is one of the most important Amazonian ecosystems in terms of biodiversity and productivity, occupying an area of more than 100.000 km<sup>2</sup>, including small tributaries, open water lakes, floating meadows and a great extension of seasonally flooded forests. Within the aquatic insect fauna in floodplains, several aquatic heteropteran species are present, but there is scarce knowledge on their distribution (Goulding *et al.* 2003; Nessimian *et al.* 2004).

Hydrometridae is a group of moderate sized bugs generally found associated with the marginal vegetation of calm water collections, although some genera may have terrestrial or semi-terrestrial representatives. Among the semi-aquatic genera, only *Hydrometra* (37 known neotropical species, 4 in Brazilian Amazon) has previous records on the Amazon River floodplain. (Hungerford & Evans 1934; Nieser 1970; Polhemus & Polhemus 2008).

In the present paper we make a survey of the *Hydrometra* found on the Amazon River floodplain, also presenting new records in Brazil, a key to the represented species and the redescription of *H. argentina* Berg, 1879, as the original description is deficient.

## MATERIAL AND METHODS

The study area included twenty six localities in the floodplain of the Amazon River in Brazilian territory, between the municipalities of Tabatinga, Amazonas State, and Afuá, Pará State. Examined material was collected associated with floating plants of the genus *Eichhornia* or on U.V. light traps positioned near to the water.

Deposition of the specimens was made on the entomological collections of the Instituto Nacional de Pesquisas da Amazônia (INPA) and the Coleção Entomológica Professor José Alfredo Pinheiro Dutra, Departamento de Zoologia, Instituto de Biologia, UFRJ, Rio de Janeiro, Brazil (DZRJ). Additional material from INPA, DZRJ and Museu Nacional do Rio de Janeiro (MNRJ) was observed, and new records from other localities in Brazil are presented in the distribution section below each species.

Identification of specimens was based mainly on Hungerford & Evans (1934) and Nieser (1970). Nomenclature of structures and measurements (partially) follow Hungerford & Evans (1934) and Andersen (1977). Measurements are given in millimeters.

In quotations of label data, a comma separates different information, a period mark separates information on different specimens, and a semicolon separates different specimens with same information. New locality records are marked with an exclamation period. All the localities are organized by north to south order. Names of collectors or deposition institutes appear inside parenthesis.

## RESULTS AND DISCUSSION

Three species of *Hydrometra* were recorded in the study area: *H. argentina*; *H. caraiba* Guérin-Méneville, 1857, and *H. guianana* Hungerford & Evans, 1934.

### Identification key to the species of *Hydrometra* recorded on the floodplain of the Amazon River

1. Body length at most 12.5 mm; antecolus/postocolus ratio between 1.80 and 2.00; clypeus narrow and conical (Fig. 1: CLY); rostrum distinctly surpassing eyes; pro- and mesoacetabulum with at most two circular pits each; metacetabulum with no circular pits; projections on male abdominal sternite VI in the shape of simple spines (Fig. 5: PRJ) ..... *Hydrometra argentina*
1. Body length at least 14.00 mm; antecolus/postocolus ratio at least 2.50; clypeus broad, not conical (Fig. 7, 9); rostrum not surpassing eyes; pro- and mesoacetabulum with more than ten circular pits each; metacetabulum with circular pits; projections on male abdominal sternite VI are brushes of setae (Fig. 8, 10: PRJ) ..... 2
- 2a(1b). Clypeus with a small angulose median projection (Fig. 9); propleura with seven to eight circular pits in a line; projections of abdominal sternite VI of male located on the posterior half of the segment (Fig. 10: PRJ) ..... *Hydrometra guianana*
- 2b. Clypeus with a short blunt median projection (Fig. 7); propleura with nine to twelve circular pits in two lines, most dorsal one shorter; projections of abdominal sternite VI of male located on the middle of the segment (Fig. 10: PRJ) ..... *Hydrometra caraiba*

### *Hydrometra argentina* Berg, 1879

*Hydrometra mensor* White, 1879 non *H. mensor* Champion, 1898 [synonym determined by Drake (1954)]

*Limnometra chilensis* Reed, 1901 [synonym determined by Drake (1953)]

*Hydrometra kirkaldyana* Torre-Bueno, 1926 [synonym determined by Drake (1953)]

*Hydrometra husseyi* Torre-Bueno, 1926 [synonym determined by Drake (1953)]

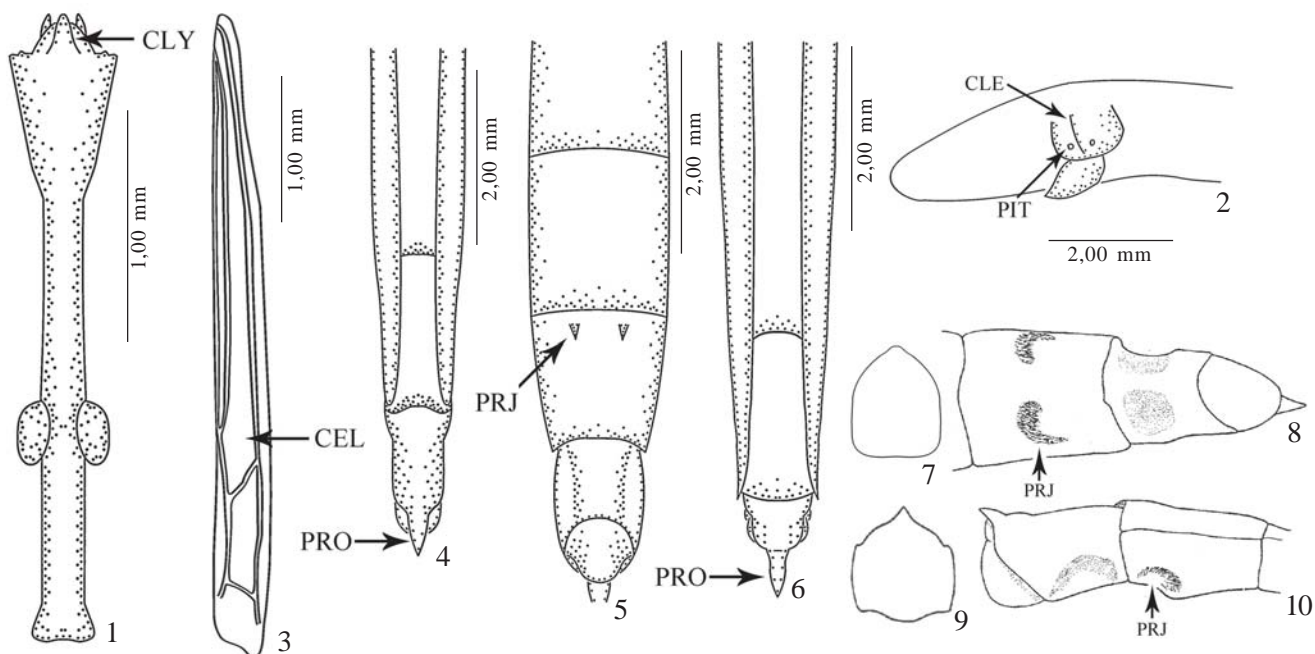
Examined material. BRAZIL: Amapá – Oiapoque, 15.V.1989, (Alvarenga): 1 macropterous female (MNRJ). Pará - Prainha, Retiro JK, 04.X.2003, (P. de Marco & N. Ferreira-Jr.): 1 macropterous female (DZRJ). Amazonas – Uruará, Lirio do Vale, 24.IX.2003: 14 macropterous males and 5 macropterous males (INPA) [Albano Lake, UV light trap, -2,41418° -57,49993°]. Itacoatiara, Ilha da Trindade, 22.IX.2003: 2 macropterous females and 1 macropterous male (INPA)

[lake, UV light trap, -3,31345° / -58,73231°]. Nossa Senhora do Perpétuo Socorro, 21.IX.2003: 15 macropterous males and 8 macropterous females (DZRJ) [Traíra Lake, UV light trap, -3,159975° -59,32716°]. Bahia – Juazeiro, V.1974, (J. C. M. Carvalho): 1 macropterous female (MNRJ). Rio de Janeiro – Macaé, 2005, (N. Ferreira-Jr.): 1 apterous female (DZRJ). Maricá, 26.I.????, (no collector information): 1 apterous female (DZRJ) [Ubatiba River]. Rio de Janeiro, Ilha do Fundão, 9.VI.2000, (A. L. Carvalho): 1 macropterous female (DZRJ) [pool]. Mangaratiba, Ilha da Marambaia, I.1953, (Castro): 1 brachypterous female (DZRJ). São Paulo – Ubatuba, Parque Estadual da Serra do Mar, Núcleo Picinguaba, 19.VI.2004, (F. F. F. Moreira): 1 apterous female (DZRJ) [pond].

Redescription. Macropterous male. Body length—9.60–10.40; body width on pronotum—0.39–0.51; head length—2.72–2.91; head width across eyes—0.35–0.41; antecolus/postocolus ratio—1.87–2.00; antennal joints length (intersegmental pieces not included): I—0.39–0.41, II—0.84–0.95, III—1.92–2.08, IV—0.96–1.01; minimum interocular distance—0.13; eye width—0.12–0.14; rostrum length beyond eyes—0.29–0.38; pronotum length on midline—1.35–1.42; wing length—4.00–4.65; forecoxa/midcoxa distance—0.78–0.83; midcoxa/hindcoxa distance—1.25–1.38; foreleg length: femur—2.24–2.43, tibia—2.27–2.56, tarsomerus I—0.06, tarsomerus II—0.19–0.38, tarsomerus III—0.16–0.23; midleg length: femur—2.62–2.98, tibia—2.94–3.10, tarsomerus I—0.06–0.09, tarsomerus II—0.28–0.38, tarsomerus III—0.18–0.24; hindleg length: femur—3.30–3.74, tibia—4.13–4.45, tarsomerus I—0.08–0.10, tarsomerus II—0.29–0.35, tarsomerus III—0.23–0.31; abdominal length—4.22–4.90.

Ground color brown, with central dorsum of head, venter of head and thorax yellowish brown. Central area of clypeus translucent; antenniferous tubercles and base of antennal joint I shining; apical half of antennal joint II and joints III and IV dark brown; eyes dark red; apex of rostrum dark brown. Pronotum centrally dark brown with light median longitudinal line and sinuous lighter stripe on each side; mesopleura dark brown with dorsal margin almost black; coxae, trochanters and venter of femur yellowish brown; apex of tibia and tarsi dark brown; forewing fuscous with brown veins. Lateral margins of connexives darker than rest of abdomen, almost black.

Body covered by small black tubercles, except for central areas of venter, from head up to abdominal sternite VII. Head very long, with anterior and posterior fifths wider; clypeus narrow and conic (Fig. 1: CLY); antennal joint I slightly curved outward and dilated on apex, wider than others; antennal joints II and III progressively narrower; antennal joints II and IV wider on apex; rostrum long, surpassing eyes. Pronotum with discrete shallow rounded pits distributed on dorsum; three to five more visible pits present on propleura; acetabula with shallow median longitudinal cleft (Fig. 2: CLE); pro- and mesoacetabula with at most two weak rounded pits, one on each side of the cleft (Fig. 2: PIT); wings reaching abdominal tergite V or VI; forewing with three longitudinal veins, two extending almost to the apex of the wing, and two terminal transversal veins (the most apical can bifurcate in one end) forming three closed cells (Fig. 3: CEL); legs covered by brown setae, longer on tibiae and tarsi; trochanters with three



Figs. 1-10. 1-6, *Hydrometra argentina* Berg, 1879. 1, head, dorsal view. 2, anterior part of thorax, lateral view. 3, forewing. 4, male, apex of abdomen, dorsal view. 5, male, apex of abdomen, ventral view. 6, female, apex of abdomen, dorsal view; 7-8, *Hydrometra caraiba* Guérin-Ménéville, 1857. 7, clypeus. 8, male, apex of abdomen, ventral view (from Nieser, 1970); 9-10, *Hydrometra guianana* Hungerford & Evans, 1934. 9, clypeus (from Nieser, 1970). 10, male, apex of abdomen, lateral view (from Nieser, 1970). [CEL – wing closed cell, CLE – cleft, CLY – clypeus, PIT – circular pit, PRJ – projection of male abdominal sternite VI, PRO – dorsocaudal prolongation of abdomen].

tubercles visible on dorsal view; femora with small black spines, slightly longer than body tubercles; tibiae with spines longer than that of femora and more numerous. Abdominal connexives horizontal or weakly turned up, becoming narrower up to abdominal tergite VII; abdominal tergite VIII covered by light setae, more abundant on lateral areas; abdominal tergite VIII with lateral margins curved and posterior margin prolonged in a simple sharp spine (Fig. 4: PRO); intersegmental fissures between abdominal sternites becoming fainted centrally; lateral areas of abdominal sternites with light setae; projections of abdominal sternite VI are two median spines near anterior margin (Fig. 5: PRJ).

Macropterous female. Body length—10.40–12.24; body width on pronotum—0.41–0.54; head length—2.66–3.20; head width across eyes—0.38–0.41; anteculus/postoculus ratio—1.93–2.00; antennal joints length (intersegmental pieces not included): I—0.39–0.43, II—0.89–1.11, III—1.82–1.96, IV—0.94–1.00; minimum interocular distance—0.14–0.15; eye width—0.14–0.15; rostrum length beyond eyes—0.21–0.40; pronotum length on midline—1.34–1.60; wing length—4.10–5.20; forecoxa/midcoxa distance—0.76–0.98; midcoxa/hindcoxa distance—1.13–1.47; foreleg length: femur—1.70–2.76, tibia—2.72–2.88, tarsomerus I—0.06–0.08, tarsomerus II—0.21–0.29, tarsomerus III—0.19–0.20; midleg length: femur—2.69–3.20, tibia—2.94–3.30, tarsomerus I—0.06–0.08, tarsomerus II—0.34–0.40, tarsomerus III—0.20–0.25; hindleg length: femur—3.50–4.13, tibia—4.16–4.51, tarsomerus I—0.08, tarsomerus II—0.28–0.39, tarsomerus III—0.20–0.24; abdominal length—4.95–5.70.

Very similar to males, with yellowish-brown body color

and with a dorsocaudal sharp-pointed prolongation on apex of abdomen (Fig. 6: PRO). Projections of abdominal sternite VI absent.

Comments. Integrants of this species can be separated from other South American *Hydrometra* by the narrow cone-shaped clypeus (Fig. 1: CLY); projections of male abdominal sternite VI spine-shaped (Fig. 5: PRJ); and female with a sharp-pointed dorsocaudal prolongation on apex of abdomen (Fig. 6: PRO). Other typical feature is the presence of circular pits on foreleg and midleg acetabula, generally one or two on each one (Fig. 2: PIT).

Distribution (Fig. 11). Widely distributed in South America (Nieser & Melo, 1997). Distribution in Brazil: Amapá – Oiapoque!; Pará – Quatipuru (Nieser, 1970), Santarém (Champion, 1898), Prainha!; Amazonas – Uruará!, Presidente Figueiredo (Pereira & Melo, 2007), Coari (Nieser, 1970), Manaus (White, 1879), Careiro (Nieser, 1970), Itacoatiara!; Bahia! – Juazeiro!; Mato Grosso – Nova Xavantina (Nieser, 1970); Mato Grosso do Sul – Corumbá (Torre-Bueno, 1926); Minas Gerais – Januária (Melo & Nieser, 2004), Uberaba, Martinho Campos (Nieser & Melo, 1997), Mariana (Souza *et al.*, 2006), Parque Nacional da Serra da Canastra (Pelli *et al.*, 2006); Rio de Janeiro – Macaé, Maricá (Ribeiro *et al.*, in press), Rio de Janeiro (Kirkaldy, 1899)\*; São Paulo! – Ubatuba!; Paraná (Jaczewski, 1928); Rio Grande do Sul – between Agudo and Nova Palma (Dona Francisca Power Plant) (Neri *et al.*, 2005). \*Kirkaldy (1899), based on material deposited on the Belgian Museum, records the species from Botafogo, without further details on

the locality. However, it probably is the first record of the species in Rio de Janeiro State, as he indicates that the collector of the specimens was Van Volxen, who also collected in other areas in southeastern Brazil.

### *Hydrometra caraiba* Guérin-Méneville, 1857

*Hydrometra agenor* Kirkaldy, 1902 [synonym determined by Drake & Lauck (1959)]

*Hydrometra championiana* Torre-Bueno, 1926 [synonym determined by Drake (1954)]

Examined material. BRAZIL: Amazonas – Santo Antônio do Içá, Vila Presidente Getúlio Vargas, 04.IX.2003, (N. Hamada & J. L. Nessimian), F. F. F. Moreira det. 2007: 1 brachypterous female (INPA) [Canini Lake, -3,16629° / -67,97124°].

Brachypterous female. Body length—19.00; body width on pronotum—0.70; head length—5.45; head width across eyes—0.70; anteculus/postoculus ratio—2.50; antennal joints length (intersegmental pieces not included): I—0.83, II—1.82, III—6.50, IV—2.14; minimum interocular distance—0.21; eye width—0.26; rostrum length beyond eyes—rostrum does not surpasses eyes; pronotum length on midline—2.69; wing length—2.55; forecoxa/midcoxa distance—1.44; midcoxa/hindcoxa distance—2.69; foreleg length: femur—5.60, tibia—5.68, tarsomerus I—0.10, tarsomerus II—0.48, tarsomerus III—0.31; midleg length: femur—6.72, tibia—6.32, tarsomerus I—0.13, tarsomerus II—0.75, tarsomerus III—0.39; hindleg length: femur—8.72, tibia—8.24, tarsomerus I—0.13, tarsomerus II—0.64, tarsomerus III—0.38; abdominal length—7.20.

Comments. Hungerford & Evans (1934) state in their identification key that body length of females of this species is superior to 22 mm (as in original description), although other data from literature point out smaller values (*e.g.* Champion, 1898). Furthermore, Drake & Lauck (1959) believed that the measures given in the original description were due to typographical errors, and delimit a normal variation between 16 and 18 mm.

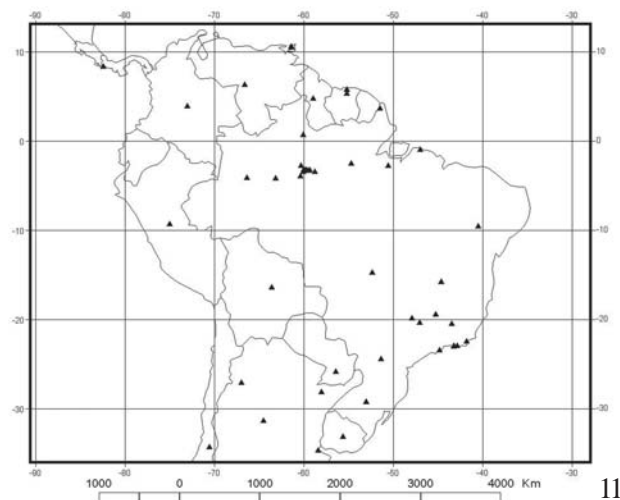
*Hydrometra caraiba* is very similar to *H. guianana*, but can be separated from it mainly by the shape of clypeus (Fig. 7) and by position and shape of the projections of sternite VI of male (Fig. 8: PRJ). The apex of female abdomen of the two species is also very similar.

Distribution (Fig. 12). The species is known from Mexico to Peru (Nieser, 1970). Distribution in Brazil: Amazonas – Tabatinga, Tefé/Coari (Catua Lake) (NIESER, 1970), Santo Antônio do Içá (Torre-Bueno, 1926\*), Manacapuru (Hungerford & Evans, 1934). \*Cited as Río Putumayo, Brasil. The Putumayo River is called Içá River when it crosses from Colombia into Brazil, and runs through the municipality of Santo Antônio do Içá until it reaches the Amazon River.

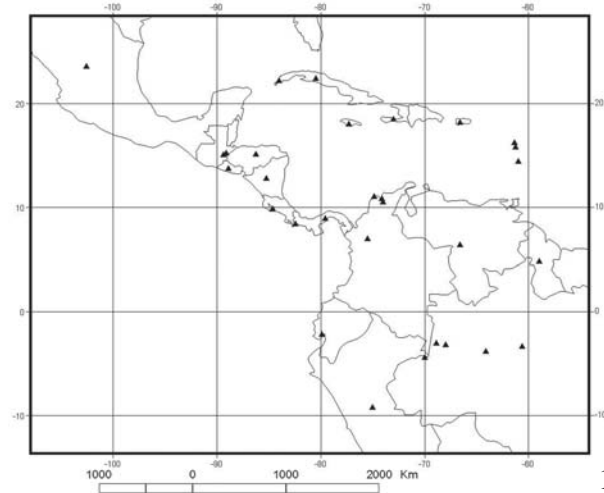
### *Hydrometra guianana* Hungerford & Evans, 1934

Examined material. BRASIL: Amazonas – Presidente Figueiredo, Balbina, Igarapé Trilha do Boto, Ramal da Morena [02° 07' 02.0" S /

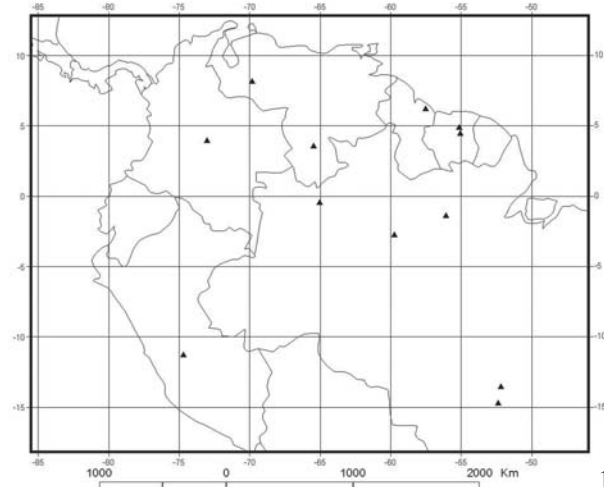
59° 18' 24.4" W], 12.X.2002, (D. L. V. Pereira): 1 macropterous female. Manaus, Reserva Ecológica Adolpho Ducke, 30.IV.1990, (M. V. B. Garcia): 1 brachypterous female.



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Figs. 11-13. 11, geographic distribution of *Hydrometra argentina* Berg, 1879. 12, geographic distribution of *Hydrometra caraiba* Guérin-Méneville, 1857. 13, geographic distribution of *Hydrometra guianana* Hungerford & Evans, 1934.

Brachypterous female. Body length—15.04; body width on pronotum—0.61; head length—5.15; head width across eyes—0.45; anteoculus/postoculus ratio—3.17; antennal joints length (intersegmental pieces not included): I—0.54, II—1.75, III—6.08, IV—2.60; minimum interocular distance—0.16; eye width—0.26; rostrum length beyond eyes—rostrum does not surpasses eyes; pronotum length on midline—2.45; wing length—6.64; forecoxa/midcoxa distance—1.40; midcoxa/hindcoxa distance—2.30; foreleg length: femur—5.25, tibia—5.55, tarsomerus I—0.10, tarsomerus II—0.48, tarsomerus III—0.33; midleg length: femur—6.32, tibia—6.08, tarsomerus I—0.11, tarsomerus II—0.64, tarsomerus III—0.38; hindleg length: femur—7.84, tibia—7.60, tarsomerus I—0.10, tarsomerus II—0.54, tarsomerus III—0.29; abdominal length—5.85.

Macropterous female. Body length—16.48; body width on pronotum—0.74; head length—5.25; head width across eyes—0.68; anteoculus/postoculus ratio—2.77; antennae broken off; minimum interocular distance—0.16; eye width—0.26; rostrum length beyond eyes—rostrum does not surpasses eyes; pronotum length on midline—2.15; wing length—2.45; forecoxa/midcoxa distance—1.25; midcoxa/hindcoxa distance—2.25; foreleg length: femur—4.40, tibiae and tarsi broken off; midleg length: femur—5.36, tibia—5.12, tarsomerus I—0.08, tarsomerus II—0.60, tarsomerus III—0.31; hindleg length: femur—6.48, tibia—5.76, tarsomerus I—0.09, tarsomerus II—0.45, tarsomerus III—0.28; abdominal length—5.75.

Comments. Specimens of *Hydrometra guianana* can be identified by the broad clypeus with a small angulose median projection (Fig. 9), and by projections of abdominal sternite VI of male U-shaped and turned to the terminal part of the body, covered by a dense layer of setae and located on the posterior half of the segment (Fig. 10: PRJ).

According to Hungerford & Evans (1934) and Nieser (1970), body length of male can range from 14.3 to 16.0 mm, whereas in females it ranges from 15.0 to 18.4 mm. Brachypterous individuals are generally longer than macropterous (Nieser 1970).

Distribution (Fig. 13). The species is well distributed in Northern South America (Nieser 1970). Distribution in Brazil: Pará –Paru do Oeste River; Amazonas – Santa Isabel do Rio Negro (Nieser 1970), Presidente Figueiredo!, Estrada Manaus/Rio Preto da Eva (km 77-78) (Nieser 1970), Manaus!; Mato Grosso – source region of Xingu River (Garapu Lake); Serra do Roncador (Nieser 1970).

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