



Diversity, distribution and new records of freshwater and estuarine shrimp in the state of Amapá, eastern Brazilian Amazon region

INACIA MARIA VIEIRA^{1,2,5*}, LUIZ MAURÍCIO ABDON SILVA^{1,2,6}, ALINI GOMES SANTIAGO DE ALMEIDA^{2,7}, DANILO PELAES DE ALMEIDA^{2,3,8}, ORLENO MARQUES SILVA-JÚNIOR^{2,9} & MARCOS TAVARES-DIAS^{1,4,10}

¹Programa de Pós-Graduação em Biodiversidade e Biotecnologia (BIONORTE), Universidade Federal do Amapá, Macapá, AP, Brasil.

²Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá – IEPA.

³Programa de Pós-Graduação em Ciências Ambientais, Universidade Federal do Amapá, Macapá, AP, Brasil.

⁴Embrapa Amapá, Macapá, AP, Brasil.

⁵✉ inaciavieira2011@gmail.com; <https://orcid.org/0000-0002-6911-0780>

⁶✉ luis.abdon13@gmail.com; <https://orcid.org/0000-0001-9510-0993>

⁷✉ alinigsantiago@gmail.com; <https://orcid.org/0000-0002-9773-489X>

⁸✉ danielopelaes@gmail.com; <https://orcid.org/0000-0002-6157-2948>

⁹✉ orlenomarques@yahoo.com.br; <https://orcid.org/0000-0002-1173-1429>

¹⁰✉ marcos.tavares@embrapa.br; <https://orcid.org/0000-0002-8376-1846>

*Corresponding author: ✉ inaciavieira2011@gmail.com

Abstract

This study presents the freshwater and estuarine shrimp species that occur in the state of Amapá, in the eastern region of the Brazilian Amazon. The data were obtained through information contained in the Brazilian crustacean collections of the Institute of Scientific and Technological Research of the State of Amapá (IEPA) and the National Institute for Research in the Amazon (INPA) and the detailed examination of the listed specimens. All information contained in the log book and specimen labels were noted for the identification and mapping of occurrence areas in the region. A survey in the literature of the species previously recorded for Amapá was carried out. The diversity of freshwater and estuarine shrimp was composed of 21 species distributed in the following families: Alpheidae (*Alpheus nuttingi*), Euryrhynchidae (*Euryrhynchus amazoniensis*, *Euryrhynchus burchelli*, *Euryrhynchus tomasi* and *Euryrhynchus wrzesniowskii*), Lysmatidae (*Exhippolysmata oplophoroides*), Palaemonidae (*Macrobrachium acanthurus*, *Macrobrachium amazonicum*, *Macrobrachium brasiliense*, *Macrobrachium carcinus*, *Macrobrachium jelskii*, *Macrobrachium inpa*, *Macrobrachium olfersii*, *Macrobrachium surinamicum*, *Nematopalaemon schmitti*, *Palaemon carteri*, *Pseudopalaemon amazoniensis*, *Pseudopalaemon chryseus*, *Leander tenuicornis*), Penaeidae (*Xiphopenaeus kroyeri* and Sergestidae) (*Acetes marinus* and *Acetes paraguayensis*). *Alpheus nuttingi* and *L. tenuicornis* were new records for the state of Amapá. This study contributes to the knowledge of the diversity and geographic distribution of decapod crustaceans in Amapá and highlights areas where there are gaps in collection, thus contributing to a better understanding of these invertebrates in the region.

Key words: Amazon region, Decapoda, geographic distribution, Neotropical region, new records

Introduction

Globally, it has been estimated that more than one million of Crustacea species occur in tropical freshwater ecosystems, but only 73,141 species are known (Zhang 2013). The order Decapoda Latreille, 1802 is the most diverse among crustaceans, comprising 14,756 known species (De Grave *et al.* 2009). Shrimp are particularly in the suborders Dendrobranchiata, Pleocyemata and Stenopodidea (Coelho *et al.* 2006). In freshwater environments, the shrimp have a high species richness and a high endemism, therefore constituting good models for studying changes that can occur in diverse aquatic ecosystems (Cumberlidge *et al.* 2009). Due to the dispersed information on the decapod species in the state of Amapá, combined with the lack of information on their geographic distribution, the availability of material from scientific collection is essential for investigating records from different areas,

being that they are essential for carrying out geographic mapping of the existing taxa, and, thus, for allowing quick identification of sampled areas. In addition, they can be also useful for conservation assessments. Thus, this study gathers information on the records of taxonomic diversity, geographic distribution and richness of shrimp species from state of Amapá, deposited in the Crustacean collection of the Instituto de Pesquisas Científicas e Tecnológicas do Estado Amapá - IEPA (Scientific and Technological Research Institute of the State of Amapá/IEPA), in the eastern of the Brazilian Amazon region and .

Materials and methods

Study area. The study area comprises the state of Amapá, delineated by the Jari River to the southwest, the Amazon River to the southeast, the Atlantic Ocean to the northeast and the Oiapoque River to the northwest. In the central region is the basin of the Araguari River, which flows into the Atlantic Ocean (Gama 2006). The Jari River basin, a left bank tributary of the Amazon River, marks the boundary between the states of Amapá and Pará. This river, an important tributary of the Amazon River, within the boundaries of state of Amapá and state of Pará, comprises a surface area of 32,166 km² of its main course, with an extension of 397 km (Silva *et al.* 2001). The Oiapoque River begins in the Tumucumaque Mountains and flows into the Atlantic Ocean, having a course of approximately 350 kilometers and delimits the border between Brazil and French Guiana; hence, it is a river with transboundary waters (Batista *et al.* 2007). The Araguari River, which crosses the state of Amapá from west to east, representing the largest hydrographic basin in the state, with about 42,000 km², constitutes the main drainage artery for rivers and streams in the state. In addition, its mouth constitutes a dividing mark between the oceanic coastal zone to the North, which has a pattern of macro to meso-tides, and the estuarine coastal zone to the south, which exhibits meso-tides (El-Robrini & Torres 2006). In addition to the rivers mentioned above, there are important water courses that run through the entire territory of Amapá, such as the Calçoene, Amapá Grande, Amapari, Anacuí, Cupixi and Mutum rivers, all of which are tributaries of the Araguari River basin.

The Amazon River has an extension of 6,885 km from its source to its mouth, receiving water from approximately 1,100 tributaries. It has an average width of 4–5 km in its course on the plain and its smaller bed reaches almost 10 km in width (Irion *et al.* 1995). This basin is located between two hemispheres (North and South) and contributes to the seasonal alternation of the hydrological cycle, with an immense volume of drained water, resulting in annual fluctuations in the water level, known as the flood pulse, and with a strong influence on the functioning ecology of river systems (Cunha & Pascoaloto 2009; Junk *et al.* 1989). Consequently, the state of Amapá has extensive wetlands distributed mainly in the coastal plain and with a diversity of environments: continental environments include swamps, peatlands, floodplains, rivers and lakes; coastal environments consist of saline marshes, mangroves, coral reefs and other marine areas located at depths of up to six meters at low tide; and artificial environments are also present, such as reservoirs and water treatment basins (Santos 2016).

Data collection. The materials examined were deposited in the Amapá Fauna Collection, in the collection of crustaceans, of the Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá – IEPA (Institute for Scientific and Technological Research of the State of Amapá - IEPA) and the National Institute for Research in the Amazon (INPA). In the collection are specimens of crustaceans collected in various localities of freshwater and estuarine systems in the state of Amapá, northern Brazil. For each lot examined, the geo-referenced location, environmental characteristics such as habitats (type of water body).

The specimens were identified based on Cervigon *et al.* (1992); García-Dávila & Magalhães (2003); De Grave *et al.* (2008); Holthuis (1952); Kensley & Walker (1982); Melo (2003); Pachelles & Tavares (2018); Pimentel & Magalhães (2014); Ramos-Porto (1985). The classification of higher taxa follows Martin & Davis (2001).

Maps were created using ArcGIS Desktop, Version 10.3 (ESRI 2014). To represent the location of collected specimens we elaborate the shapefile “Shrimp Species”, which was created with data from the crustacean collection (Amapá Fauna Collection, IEPA, 1981–2022). For the Hydrography we used several sources: SEMA-AP (2000).

Continuous Digital Cartographic Base of Amapá (Base Cartográfica Digital Contínua do Amapá [BCDC-AP]) (Vieira 2015); Atlas of Environmental Sensitivity to Oil of the Amazonas Mouth Maritime Basin (SAO FZA Project) (aka SAO Charts; Santos *et al.* 2016). For the Amapá boundary and Hydrographic basins, we used shapefiles from the Amapá Environment Secretary (Secretaria de Estado do Meio Ambiente do Amapá (SEMA-AP), 2000.

The collection of crustaceans had been authorized by Instituto Brasileiro do Meio Ambiente e dos Recursos

Naturais Renováveis – IBAMA (Brazilian Institute for the Environment and Renewable Natural Resources- IBAMA) (170/2002, 03/2004, 14/2004, 018/2005, 086/2004, 195/2005, 36754-2/2014), and Instituto Chico Mendes de Conservação da Biodiversidade - ICMBIO (Chico Mendes Institute for Biodiversity Conservation - ICMBIO) (39381, 42042/2014/2017).

Results

According to the samples examined, 22 species of freshwater and estuarine shrimp were identified and distributed in 6 families, with a predominance of Palaemonidae species represented by the genera *Macrobrachium*, *Nematopalaemon*, *Palaemon*, *Pseudopalaemon* and *Leander*. The Euryrhynchidae family had one genus (*Euryrhynchus*) and four species, while the Lysmatidae (*Exhippolysmata*), Penaeidae (*Xiphopenaeus*), Alpheidae (*Alpheus*) and Sergestidae (*Acetes*) families are represented by one genus and one species (Table 1).

TABLE 1. Species of freshwater and estuarine shrimps (Decapoda: Caridea, Dendrobranchiata) from the state of Amapá, in eastern Brazilian Amazon region.

Taxa	No. specimens	Freshwater	Estuarine
Family Alpheidae Rafinesque, 1815			
<i>Alpheus nuttingi</i>	107	0	107
Family Euryrhynchidae Holthuis, 1950			
<i>Euryrhynchus amazoniensis</i>	397	397	0
<i>Euryrhynchus burchelli</i>	786	786	0
<i>Euryrhynchus tomasi</i>	19	19	0
<i>Euryrhynchus wrzesniowskii</i>	217	217	0
Familia Palaemonidae Rafinesque, 1815			
<i>Macrobrachium acanthurus</i>	11	2	9
<i>Macrobrachium amazonicum</i>	2960	2818	142
<i>Macrobrachium brasiliense</i>	550	550	0
<i>Macrobrachium carcinus</i>	38	38	0
<i>Macrobrachium jelskii</i>	1,724	1,622	102
<i>Macrobrachium inpa</i>	96	96	0
<i>Macrobrachium olfersii</i>	74	32	42
<i>Macrobrachium surinamicum</i>	4,648	4,577	71
<i>Nematopalaemon schmitti</i>	498	0	498
<i>Palaemon carteri</i>	2,410	2,389	21
<i>Pseudopalaemon amazoniensis</i>	10	10	0
<i>Pseudopalaemon chryseus</i>	234	234	0
<i>Leander tenuicornis</i>	2	0	2
Family Lysmatidae			
<i>Exhippolysmata oplophoroides</i>	2	0	2
Family Penaeidae Rafinesque, 1815			
<i>Xiphopenaeus kroyeri</i>	42	0	42
Family Sergestidae Dana, 1852			
<i>Acetes marinus</i>	4	2	2
<i>Acetes paraguayensis</i>	-	x	
Total	14,829	13,789	1,040

Infraorder Caridea Dana, 1852

Superfamily Alpheoidea Rafinesque, 1815

Family Alpheidae Rafinesque, 1815

Genus *Alpheus* Fabricius, 1798

Alpheus nuttingi (Schmitt, 1924)

Examined material. Municipality of Amapá. Maracá-Jipioca Ecological Station, beach from Jacal (02°08'20.24"N, 50°25'10.35"W), 22.xi.1995, H.P. Belo and J.O. Cardoso, 1 male and 1 female (IEPA 54); idem, stream Herculano (02°06'34.21"N, 50°24'29.78"W), 26.xi.1995, H.P. Belo and J.O. Cardoso, 4 males, 4 females and 4 females with eggs (IEPA 55); left margin from Igarapé Herculano, 26.xi.1995, H.P. Belo and J.O. Cardoso, 3 males and 1 female (IEPA 56); estuary of Sucuriju River (01°40'04.21"N, 49°55'101.45"W), 25.vii.1996, H.P. Belo, J.O. Cardoso and I.M. Vieira, 1 male, 4 females and 4 females with eggs (IEPA 95); estuary of Sucuriju River (01°40'17.0"N, 49°55'06.0"W), 25.ix.1996, H.P. Belo, J.O. Cardoso and I.M. Vieira, 14 males, 6 females and 15 females with eggs (IEPA 110) estuary of Sucuriju River, xi.1996, H.P. Belo, J.O. Cardoso and I.M. Vieira, 12 males and 8 females (IEPA 122); estuary of Sucuriju River, 03.iv.1997, H.P. Belo, J.O. Cardoso and I.M. Vieira, 10 males, 2 females and 13 females with eggs (IEPA 128) (Figure 2).

Geographic distribution. Western Atlantic, South Florida, Southwest Gulf of Mexico and West Indies to Brazil (States of Ceará to Santa Catarina) (Coelho *et al.* 2006; Anker 2007; Santos *et al.* 2012; Soledade & Almeida 2013).

Distribution in Amapá. Oceanic island of Maracá-Jipioca and mouth of the Sucuriju River.

Previous records. present study

Ecological notes. Species found in small tunnels built in more compacted soil mixed with decomposing vegetation in the mangrove, in the intertidal bands. Its presence in the environment is noticed by the emission of clicks caused by its fingers.

Remarks. The morphology of the specimens in this study corresponds to the descriptions by De Grave *et al.* (2008).

Superfamily Palaemonoidea Rafinesque, 1815

Family Euryrhynchidae Holthuis, 1950

Genus *Euryrhynchus* Miers, 1878

Euryrhynchus amazoniensis Tiefenbacher, 1978

Examined material. Municipality of Macapá: Environmental Protection area of Curiaú, Wetland Curralinho (00°07'26.74"N, 51°06'50.18"W), 22.ii.2002, I.M. Vieira and O.A. Alencar, 2 males, 5 females and 10 females with eggs (IEPA 346); idem (00°09'23.9"N, 51°02'09.5"W), 25.viii.2002, O.A. Alencar and A.C.R. Araújo, 9 males, 15 females and 2 juveniles (IEPA 375); same collection location (00°09'23.9"N, 51°02'09.5"W), 22.ii.2002, I.M. Vieira and O.A. Alencar, 3 males and 5 females (IEPA 379); Wetland Tacacá (00°02'14.7"S, 51°05'47.7"W), idem, 18.vii.2002, O.A. Alencar, D. Filocreão, O.M. Costa, 5 males and 8 females (IEPA 396); at the same point as the previous collection, 18.vii.2002, O.A. Alencar, D. Filocreão, O.M. Costa, 3 juveniles (IEPA 397); idem, (00°02'13.11"S, 51°05'39.2"W), 18.vii.2002, O.A. Alencar, D. Filocreão, O.M. Costa, 1 specimen (IEPA 400); idem (00°02'14.0"S, 51°05'46.7"W), 7.i.2004, I.M. Vieira, 1 female (IEPA 502). Municipality of Ferreira Gomes: Floresta Nacional do Amapá (Amapá National Forest), tributary stream of the Santo Antônio River (01°06'37"N, 51°53'37"W), 6.iii.2005, I.M. Vieira and D.C.C. Vieira, 1 male and 1 female with eggs (IEPA 817); idem, (01°06'37"N, 51°53'37"W), 5.iii.2005, I.M. Vieira and D.C.C. Vieira, 1 male and 3 females (IEPA 841); same

collection location, 1 male and 3 females (IEPA 849); stream in savanna, near farm Aricari, BR156, km 147, gallery forest (00°55'35"N, 51°15'45"W), 31.i.2006, I.M. Vieira and D.C.C. Vieira, 25 specimens (IEPA 1668); same place and date of previous collection (0°55'35"N, 51°15'45"W), 10 females with eggs and 35 specimens (IEPA 1690); 28.i.2006, I.M. Vieira and D.C.C. Vieira, stream with sandy bed, transparent water and gallery forest (0°56'08"N, 51°13'12"W), 1 female with eggs (IEPA 1671); stream inside the forest, close to the residence of the Aricari farm (0°57'04"N, 51°14'56"W), 30.i.2006, colls. I.M. Vieira and D.C.C. Vieira, 11 females and 29 specimens (IEPA 1676).—Municipality of Laranjal do Jari: Sustainable Development Reserve of the Iratapuru River, Stream Baliza (00°18'36"N, 52°26'24"W), 6.v.2005, I.M. Vieira and D.C.C. Vieira, 3 females (IEPA 872); same point of previous collection, 11.v.2005, colls. I.M. Vieira and D.C.C. Vieira, 3 females with eggs and 15 specimens (IEPA 1195); idem, 8.v.2005, I.M. Vieira, 5 females with eggs and 36 specimens (IEPA 1266); stream in the interior of the Baliza tributary forest, 10.v.2005, 2 juveniles and 2 females with eggs (IEPA 1269); same point of previous collection, 2 juveniles e 16 specimens (IEPA 1317); 3 females with eggs and 7 specimens (IEPA 1318); Jari River (0°51'17"S, 52°32'53"W), stream on the right bank of the Jari River (0°51'17"S, 52°32'53"W), 3.xii.2009, I.M. Vieira, 7 specimens (IEPA 1245); same point of previous collection, 17.vi.2010, I.M. Vieira and E.F. Araújo, 2 specimens (IEPA 1386); small stream on the left bank of the Jari River (0°50'46"S, 52°32'35"W), 12.ix.2009, I.M. Vieira, 1 specimen (IEPA 1246); tributary stream from Jari River (0°50'44"S, 52°32'53"W), 4.ix.2009, I.M. Vieira, 2 specimens (IEPA 1254); Stream Riacho Doce (0°50'05"S 52°32'34"W), 17.vi.2010, I.M. Vieira and E.F. Araújo, 1 female with eggs (IEPA 1393).—Municipality of Pedra Branca do Amapari: Sustainable Development Reserve of the Iratapuru River, stream on the right margin of the Cupixi River (0°34'20"N, 52°18'36"W), 28.vii.2005, I.M. Vieira and D.C.C. Vieira, 33 specimens (IEPA 900); stream on the right margin of the Cupixi River (0°34'11"N, 52°18'28"W), 28.vii.2005, I.M. Vieira and D.C.C. Vieira, 5 specimens (IEPA 903); tributary stream of Cupixi River, with sandy bed and in other stretches with mud, unstable and deep (0°34'52"N, 52°19'12"W), 6.viii.2005, I.M. Vieira, 1 specimen (IEPA 1232); stream with sandy bed and in some parts with rocks, very narrow, transparent, water level approximately 40 cm deep, Cupixi River (0°34'40"N, 52°18'04"W), 4.viii.2005, I.M. Vieira, 2 specimens (IEPA 1433).—Municipality of Oiapoque: National Park of Tumucumaque Mountains, shallow stream forming a swamp during the dry season, tributary of the Anotaié River (3°12'47"N 52°02'22"W), 9.ix.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 948); Anotaié River (3°12'55"N, 52°00'55"W), 12.ix.2005, I.M. Vieira and D.C.C. Vieira, 3 specimens (IEPA 1209); stream of the right bank of the Anotaié River (3°13'55"N, 52°01'02"W), 7.ix.2005, I.M. Vieira and D.C.C. Vieira, 2 specimens (IEPA 1213); stream of the right bank of the Anotaié River (03°14'50"N, 52°01'04"W), 5.ix.2005, I.M. Vieira and D.C.C. Vieira, 2 specimens (IEPA 1215); stream of the right bank of the Anotaié River (3°15'56"N, 52°01'09"W), 8.ix.2005, I.M. Vieira and D.C.C. Vieira, 1 specimen (IEPA 1216) stream of the right bank of the Anotaié River (3°13'55"N, 52°01'02"W), 7.ix.2005, I.M. Vieira and D.C.C. Vieira, 13 specimens (IEPA 1219).—Municipality of Calçoene: National Park of Tumucumaque Mountains, stream of tributary from Mutum River (1°23'51"N, 51°56'04"W), 6.xi.2005, I.M. Vieira and D.C.C. Vieira, 5 specimens (IEPA 1008); stream on the left bank of the Mutum River (1°23'22"N, 51°56'01"W), 4.xi.2005, I.M. Vieira and D.C.C. Vieira, 1 specimen (IEPA 1015).—Municipality of Pedra Branca do Amapari and Serra do Navio: stream on the right bank of the Anacuí River (1°49'43"N, 52°45'09"W), 6.iii.2006, I.M. Vieira and D.C.C. Vieira, 4 females with eggs and 1 specimen (IEPA 1442); tributary stream from Anacuí River (1°50'37"N, 52°45'04"W), 7.iii.2006, I.M. Vieira and D.C.C. Vieira, 4 females and 12 specimens (IEPA 1445); tributary stream from Anacuí River (1°50'58"N, 52°45'59"W), 8.iii.2006, I.M. Vieira and D.C.C. Vieira, 3 females and 7 females with eggs (IEPA 1449); Rio Araguari, stream at the Capivara waterfall, 20.viii.1992, coll. C. Magalhães (INPA-CRU 001081); Serra do Navio, Rod Cachaça, Stream Piçarra, Fazendinha, 22.iii.1991, (INPA-CRU 001214) (Figure 1).

Geographic distribution. Orinoco and Amazon River basins, Venezuela, Colombia, Peru and Brazil (states of Amapá, Amazonas, Pará and Roraima) (García-Dávila & Magalhães 2003; Kensley & Walker 1982; Pachel & Tavares 2018; Pimentel & Magalhães 2014; Santos *et al.* 2018; Valencia & Campos 2010; Vieira 2008; Pereira 1991;; López & Pereira 1998).

Distribution in Amapá state. Amapá state basin of the rivers Curiaú, Iratapuru, Jari, Cupixi, Anotaié, Mutum, Amapari and Anacuí.

Previous records. Pimentel & Magalhães (2014); Santos *et al.* (2018); Vieira (2003, 2008).

Ecological notes. Species collected in streams with beds containing a lot of leaf litter and shaded.

Remarks. The specimens analyzed in this study correspond to the descriptions of Melo (2003), Garcia-Dávila & Magalhães (2003); Pachel & Tavares (2018) and Pimentel & Magalhães (2014).

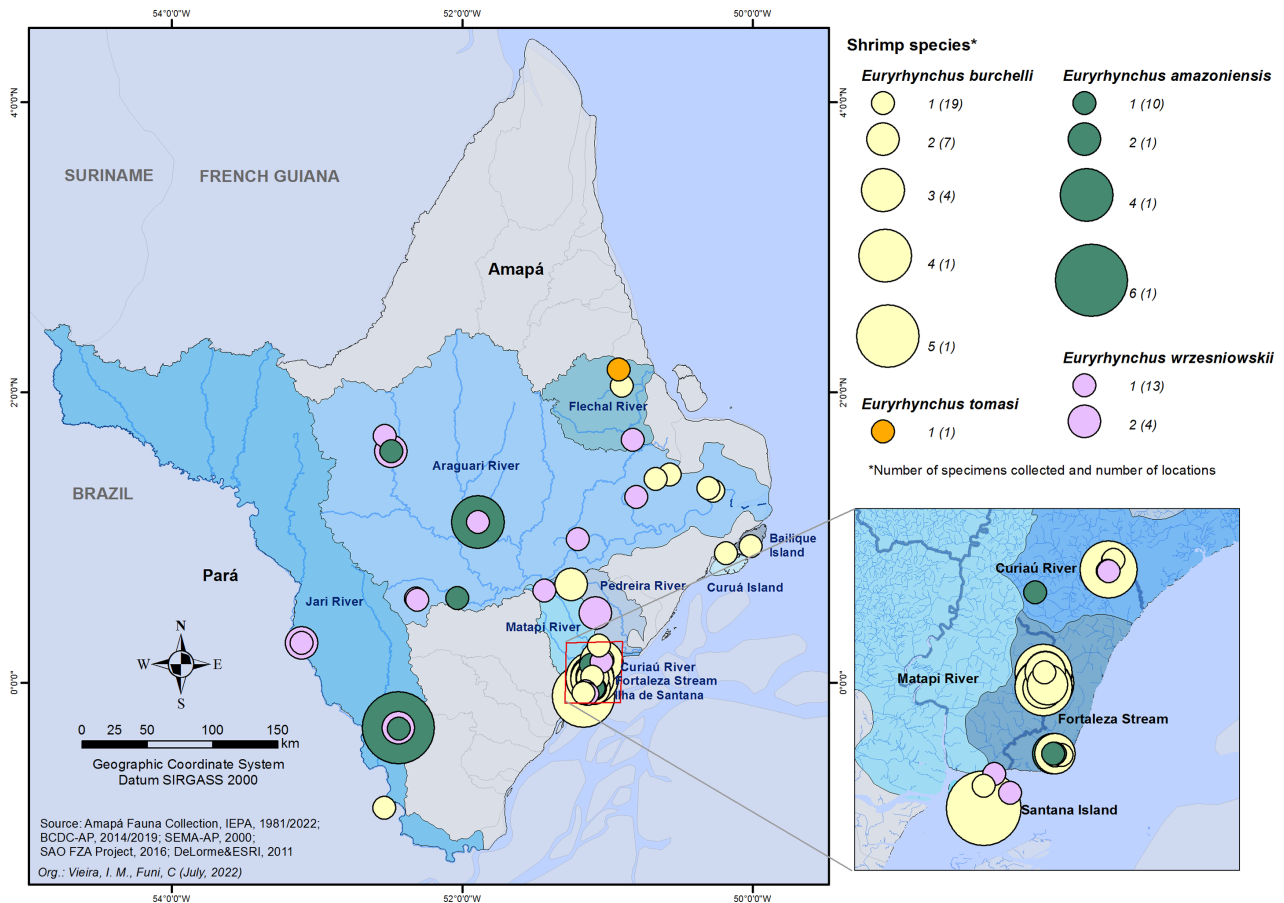


FIGURE 1. Geographic distribution map of *Euryrhynchus amazoniensis* Tiefenbacher, 1987; *E. burchelli* Calman, 1907; *E. tomasi* De Grave, 2007 and *E. wrzesniewskii* Miers, 1877 from the state of Amapá, in eastern Brazilian Amazon region.

Euryrhynchus burchelli Calman, 1907

Examined material. Municipality of Macapá: Campus Fazendinha from Instituto de Pesquisas Científicas e Tecnológicas do Estado do Amapá - IEPA (Institute for Scientific and Technological Research of the State of Amapá), Amazon well (00°02'20.21"S, 51°05'40.37"W), 17.v.1990, col. S. Borges, 3 specimens (IEPA 27); at the same location as the previous collection, 18.xi.1995, coll. H.P. Belo, 1 specimen (IEPA 50); Environmental Protection Area of Curiaú River, Curralinho (00°07'26.74"N, 51°06'50.18"W); at the same location as the previous collection, 22.ii.2002, cols. I.M. Vieira, O.A. Alencar and M. Abdon, 26 females with eggs (IEPA 344); stream in gallery forest (0°09'23,8"N, 51°02'09,5"W), 25.viii.2002, I.M. Vieira, O.A. Alencar and A.C.R.Araújo, 32 specimens (IEPA 377); floodplain of Curiaú River (00°09'21.7"N, 51°02'12.9"W), 25.vii.2002, col. I.M. Vieira, 17 males, 13 females, 10 juveniles and 7 females with eggs (IEPA 380); idem local (00°09'23,8"N, 51°02'09,5"W), 25.vii.2002, col. I.M. Vieira, 153 specimens (IEPA 457); region near balneary from Curiaú River (00°08'48"N, 51°02'27.4"W), 1 female (IEPA 416); at the same location as the previous collection, 26.vii.2002, colls. O.A. Alencar, A.C. Rabelo and O.T. Arnaud, 33 females and 11 juveniles (IEPA 420); at the same location as the previous collection, 4.v.2002, col. I.M. Vieira, 2 females with eggs and 3 specimens (IEPA 432); at the same location as the previous collection, 31.viii.2002, I.M. Vieira, 2 males, 5 females, 2 juveniles and 3 females with eggs (IEPA463); Wetland Tacacá: (00°02'14.7"S, 51°05'44.7"W), 18.vii.2002, colls. O.A. Alencar, A.C. Rabelo and O.T. Arnaud, 23 specimens (IEPA 386); Wetland Tacacá (00°02'14"S, 51°05'46,7"W), 18.vii.2002, colls.. O.A. Alencar, A.C. Rabelo and O.T. Arnaud, 67 specimens (IEPA 387); at the same location as the previous collection, (00°02'13.11"S, 51°05'39.2"W), 11 specimens (IEPA 393); at the same location as the previous collection, (00°02'14"S, 51°05'46,7"W), 2 males, 5 females, 2 juveniles and 2 females with eggs (IEPA 394); at the same location as the previous collection (00°02'13.01"S, 51°05'39.2"W), 3 males, 1 female, 2 juveniles and 1 female with eggs (IEPA 501); Lagoon of

Índios (00°01'48.4"N, 51°06'20.3"W), 3.iv.2004, A.C.R. Araújo and O.T.C. Arnaud, 12 males, 36 females and 18 females with eggs (IEPA 496); idem (00°01'42.8"N, 51°06'22.4"W), 23 females, 11 juveniles and six females with eggs (IEPA 497); at the same location as the previous collection (00°02'37.4"N, 51°06'19.0"W), 22.v.2004, A.C.R. Araújo, O.T.C. Arnaud and I.M. Vieira, 5 males, 7 females and 3 juveniles (IEPA 511); at the same location as the previous collection, (00°01'48.4"N, 51°06'20.3"W), 22.v.2004, A.C.R. Araújo, O.T.C. Arnaud and I.M. Vieira, 7 males, 14 females and 9 females with eggs (IEPA 514); at the same location as the previous collection (00°01'45.1"N, 51°06'20.1"W), 22.v.2004, colls. A.C.R. Araújo, O.T.C. Arnaud and I.M. Vieira, 1 male, 3 females and 2 females with eggs (IEPA 515); at the same location as the previous collection (00°02'41.4"N, 51°06'18.0"W), 22.v.2004, A.C.R. Araújo, O.T.C. Arnaud and I.M. Vieira, 5 females and 5 females with eggs (IEPA 523). Municipality of Amapá: Stream Manoel Capu na BR156, Farm Espírito Santo (02°02'47"N, 50°54'09"W), 18.vi.2002, colls. I.M. Vieira, O.A. Alencar and O.M. Costa, 1 female with eggs (IEPA 358).—Municipality of Ferreira Gomes: stream in gallery forest, Farm Itatupã (00°40'43"N, 51°14'60"W), 7.vi.2002, colls. I.M. Vieira, O.A. Alencar and O.M. Costa, 2 males, 4 females, 1 juvenile and 2 females with eggs (IEPA 376).—Municipality of Cutias: Bom Jesus do Tabaco (01°19'23"N, 50°16'23"W), 27.iv.2004, I.M. Vieira and C.S. Gama, 4 specimens (IEPA 1297); at the same location as the previous collection (01°20'31"N, 50°18'20"W), 24.iv.2004, I.M. Vieira and C.S. Gama, 4 specimens (IEPA 1411).—Municipality of Tartarugalzinho: Lake Novo (01°26'10.3"N, 50°34'22.7"W), 25.iv.2004, coll. I.M. Vieira, 1 male (IEPA 575); Lake Novo (01°23'19.79"N, 50°38'52.14"W), 25.x.2004, coll. I.M. Vieira, 3 specimens (IEPA 764).—Municipality of Laranjal do Jari: Jari River (0°50'05"S, 52°32'34"W), 26.x.2007, coll. I.M. Vieira, 35 specimens (IEPA 1164); lake on the right bank of the Jari River, close to the Padaria Community (0°50'40"S, 52°28'48"W), 29.x.2007, coll. I.M. Vieira, 7 specimens (IEPA 1165); tributary stream of River Jari (0°51'36.20"S, 52°32'18.11"W), 15.vii.2008, colls. I.M. Vieira and J.E.M. Wanzeler, 2 specimens (IEPA 1206); right bank of the Jari River (0°51'36.4"S, 52°32'11.7"W), 8.iv.2008, colls. I.M. Vieira, C.S. Gama and D.C.C. Vieira, 2 females (IEPA 1370).—Municipality of Santana: lake in Santana Island (00°04'53.63"S, 51°09'39.14"W), 21.ii.2012, colls. A.G. Santiago and E.O. Galeno, 21 females with eggs and 63 specimens (IEPA 1558); at the same location as the previous collection, 7 females with eggs and 17 specimens (IEPA 1566), Amapá Grande River, Cachoeira Grande, small stream downstream of the waterfall, 26/08/1992, colls. C. Magalhães and Roberval (INPA-CRU 001082) (Figure 1).

Geographic distribution. Suriname, French Guyana, Guyana and Brazil (states of Amapá, Amazonas, Roraima and Pará) (Magalhães 2016; Melo 2003; Pachelles & Tavares 2018; Pimentel & Magalhães 2014; Tiefenbacher 1978; Vieira 2003).

Distribution in Amapá state. Basins form rivers Curiaú, Igarapé Fortaleza, Araguari and Lago Novo.

Previous records. Vieira (2003); Pachelles & Tavares (2018); Pimentel & Magalhães (2014) and Santos *et al.* (2018).

Ecological notes. This specie is found in clear and underground waters, and in lower regions.

Remarks. The specimens analyzed in this study correspond to the descriptions of (Melo 2003; Pachelles & Tavares 2018; Santos *et al.* 2018).

Euryrhynchus tomasi De Grave, 2007

Examined material. Municipality of Calçoene: tributary stream on the right bank of the Amapá Grande River, downstream of Cachoeira Grande, Calafate (2°9'30.98"N, 50°55'19.83"W), 22.ix.2021, colls. I.M. Vieira and A.G.S. de Almeida and D.P. de Almeida, 14 males and 5 females (IEPA 2099).

Geographic distribution. French Guiana, Brazil (Amapá state, northwest and north of the city of Amapá, Vilarejo and Balneário Cachoeira Grande, Amapá Grande River and Cachoeira Grande, according to De Grave (2007) and Pachelles & Tavares (2018) (Figure 1).

Distribution in Amapá state. Affluent stream of the Amapá Grande River, downstream and upstream of Cachoeira Grande.

Previous records. Pachelles & Tavares (2018)

Ecological notes. Collected in shallow and shaded stream, with plenty of leaf litter, dry season, pH (6.08), water temperature (25.5°C), dissolved oxygen (60.7%) and conductivity (10 µS/cm).

Remarks. *Euryrhynchus tomasi* is distinguished from *E. burchelli* by presenting the pereopod carpus 2 unarmed and the grouper with a spine on each side of the distoventral region; while females have an internal appendage from the third to the fifth pleopod (Pachelles & Tavares 2018).

Euryhynchus wrzesniowski Miers, 1877

Examined material. Municipality of Ferreira Gomes: dam km 54, Far North (00°28'60"N, 51°04'59"W), 04.vi.2002, C.S. Gama, 1 female with eggs (IEPA 324); at the same location as the previous collection (0°28'60"N, 51°04'59"W), 06.vi.2002, I.M. Vieira, 2 juveniles (IEPA 327); Private Natural Heritage Reserve, stream in gallery forest, savannah, near Fazenda Aricari (00°59'31,8"N, 51°12'14,8"W), 04.ix.2002, I.M. Vieira, 1 female (IEPA 557); idem, Stream (00°56'49.20"N, 51°14'49.71"W), 31.i.2006, I.M. Vieira and D.C.C. Vieira, 7 specimens (IEPA 1672); 27.i.2006, I.M. Vieira and D.C.C. Vieira, 1 specimen (IEPA 1692); 29.i.2006, I.M. Vieira and D.C.C. Vieira, 3 juveniles (IEPA 1693); Floresta Nacional do Amapá, Stream Santo Antônio (1°06'37"N, 51°53'37"W), 14.iii.2005, I.M. Vieira and D.C.C. Vieira, 14 specimens (IEPA 810); 05.iii.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 842); 05.iii.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 846).—Municipality of Tartarugalzinho: Farm São Bento, Aporema River (01°16'54"N, 50°48'04"W), 11.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 3 specimens (IEPA443).—Municipality of Macapá: Matapi settlement, tributary of the Matapi River (00°38'15.3"N, 51°26'05"W), 03.ix.2002, I.M. Vieira, C.S. Gama and D. A. Halboth, 5 males and 14 females (IEPA 473); Environmental Protection Area of Curiaú River (00°08'44.16"N, 51°02'32.77"W), 25.ix.2002, I.M. Vieira, 7 specimens (IEPA 474);—Municipality of Pedra Branca: National Park of Tumucumaque Mountains, Amapari River (1°35'45"N, 52°29'32"W), 17.ix.2004, I.M. Vieira, C.S. Gama, 4 males and 10 females (IEPA 653); Stream of Anacuí River (01°50'41.29"N, 52°44'28.65"W), 07.iii.2006, I.M. Vieira, 2 males (IEPA 1443); 08.iii.2006, I.M. Vieira, 1 juvenile (IEPA 1447); Sustainable Development Reserve of the Iratapuru River, Cupixi River (00°34'48"N, 52°19'17"W), 05.viii.2005, I.M. Vieira and D.C.C. Vieira, 20 specimens (IEPA 844); (0°34'11"N, 52°18'28"W), 28.viii.2005, I.M. Vieira and D.C.C. Vieira, 2 specimens (IEPA 901); idem, entrance of a small stream, forming a pond, a lot of submerged litter (0°34'33"N, 52°18'59"W), 06.viii.2005, I.M. Vieira and D.C.C. Vieira, 3 specimens (IEPA 935); stream left bank of the Cupixi River (0°34'11"N, 52°18'28"W), 28.viii.2005, I.M. Vieira and D.C.C. Vieira, 1 juvenile (IEPA 1295); Stream (0°34'11"N, 52°18'28"W), 03.vii.2005, I.M. Vieira and D.C.C. Vieira, 1 specimen (IEPA 1352).—Municipality of Serra do Navio: National Park of Tumucumaque Mountains, confluence of the Amapari and Anacuí River, stream (01°35'45"N, 52°29'32"W), 22.ix.2004, I.M. Vieira and E.A. Oliveira, 35 specimens (IEPA 682); 19.ix.2004, I.M. Vieira, D. R. J. Cardoso and J. M. Pereira, 15 specimens (IEPA 685).—Municipality of Pracuúba: Pracuúba Lake (01°40'27"N, 50°49'32"W), 22.x.2004, I.M. Vieira, 1 specimen (IEPA 733). Municipality of Oiapoque: National Park of Tumucumaque Mountains, Anotaié River (3°29'51.55"N, 52°18'0.66"W), 14.ix.2004, 3 specimens (IEPA 945); tributary stream of Anotaié River (3°15'18"N, 52°01'15"W), 07.ix.2005, I. M. Vieira, 02 specimens (IEPA 1263); (3°29'51.55"N, 52°18'0.66"W), 1 specimen (IEPA 1214); 1 specimen (IEPA 1224).—Municipality of Calçoene: National Park of Tumucumaque Mountains, Mutum River (1°23'13.83"N, 51°55'39.05"W), 06.xi.2005, I.M. Vieira and D.C.C. Vieira, 01 female (IEPA 1079). Municipality of Laranjal do Jari: Jari River (00°51'36.20"S, 52°32'18.11"W), 16.vii.2008, I.M. Vieira and J.E.M. Wanzeler, 5 specimens (IEPA1202); Sustainable Development Reserve of the Iratapuru River, Stream Baliza (0°18'36"S, 52°26'24"W), 09.v.2005, I.M. Vieira and D.C.C. Vieira, 3 females with eggs (IEPA 1338), 10.v.2005, I.M. Vieira and D.C.C. Vieira, 3 specimens (IEPA 1340); Jari River (00°16'35.21"N, 53°06'24.48"W), 06.xi.2004, I.M. Vieira and E.A. Oliveira 3 females (IEPA 567); 18.xi.2004, I.M. Vieira and E.A. Oliveira 8 males and 5 females (IEPA 1474); Jari River (0°51'17"S, 52°32'53"W), 16.viii.2008, I.M. Vieira, 7 specimens (IEPA1479); Stream Riacho Doce (00°47'54.85"S, 52°31'49.65"W), 25.v.2007, I.M. Vieira and E.F. Araújo, 3 specimens (IEPA 1366); Stream Riacho Doce (00°47'54.85"S, 52°31'49.65"W), 17.vi.2010, I.M. Vieira and E.F. Araújo, 1 specimen (IEPA 1416); 1 specimen (IEPA 1419); Stream Água Limpa (00°47'54.85"S, 52°31'49.65"W), 29.x.2007, I.M. Vieira, 1 specimen (IEPA 1462).—Municipality of Santana: Vila Amazonas, Private Reserve of Natural Heritage Vila Amazonas, Stream Mangueirinha, Amazon River (00°03'26.83"S, 51°09'17.5"W), 29.i.2009, I.M. Vieira, 3 females with eggs and 6 specimens (IEPA1360); Santana Island, Amazon River (00°04'34.62"S, 51°08'21.69"W), 26.ii.2007, A.G. Santiago, 1 female with eggs and 4 specimens (IEPA 1454) (Figure 1).

Geographic distribution. Suriname, French Guyana, Guyana and Brazil (states of Amazonas, Amapá, Pará and Roraima) (Kensley & Walker 1982; Melo 2003; Pachellet & Tavares 2018; Pimentel & Magalhães 2014; Santos *et al.* 2018).

Distribution in Amapá state. Streams in gallery forests in savannas; basins of rivers Santo Antônio, Aporema, Curiaú, Matapi, Cupixi, Mutum, Amapari, Anacuí, Anotaié, Jari, Baliza stream (tributary of the Iratapuru River) and Pracuúba Lake.

Previous records. Pachelles & Tavares (2018); Pimentel & Magalhães (2014); Santos *et al.* (2018) and Vieira (2003, 2008)

Ecological notes. Species collected in streams with beds with a lot of leaves and shaded.

Remarks. The specimens analyzed in this study correspond to the descriptions of (Melo 2003; Pachelles & Tavares 2018; dos Santos *et al.* 2018).

Family Lysmatidae Christoffersen, 1990; Baeza, 2009

Genus *Exhippolysmata* Stebbing, 1915

Exhippolysmata oplophoroides Holthuis, 1948

Examined material. Municipality of Oiapoque: Parque Nacional do Cabo Orange, Oiapoque river estuary (4°24'11,11"N, 51°34'13,71"W), 22.viii.2013, I.M. Vieira, A.G. Santiago and E. O. Galeno, 1 female with eggs and 1 juvenile (IEPA2026) (Figure 2).

Geographic distribution. Western Atlantic, North Carolina, Gulf of Mexico, Venezuela, Suriname and French Guiana. In Brazil it occurs from the state of Amapá to Rio Grande do Sul; Uruguay (Christoffersen 1979; Christoffersen 2016; Ramos-Porto *et al.* 2003).

Distribution in Amapá state. Estuary of the Oiapoque River, in the municipality of Oiapoque.

Previous records. (Ramos-Porto & Coelho 1991; Christoffersen 1979, Christoffersen 2016)

Ecological notes. It occurs in both mud and sand bottoms (José Fausto-Filho & Neto 1976), (José Fausto-Filho 1979) but predominates in the first type of substrate. In this study, they were collected in an estuarine environment with a muddy bottom, mangroves, and specimens were collected with a sieve (54 cm in diameter) at high tide.

Remarks. The two specimens examined correspond to descriptions of Cervigon *et al.* (1992).

Family Palaemonidae Rafinesque, 1815

Genus *Macrobrachium* Bate, 1868

Macrobrachium acanthurus Wiegmann, 1836

Examined material. Municipality of Amapá: District of Sucuriju, village of Sucuriju (01°40'35,7"N, 49°55'53,92W), 18.iv.2001, I.M. Vieira and O.M. Costa, 2 males and one female (IEPA 260); estuary of the Sucuriju River (01°40'23,9"N, 49°54'56,7"W), 22.ii.2002, I.M. Vieira and O.M. Costa, 2 males and 1 female with eggs (IEPA 488); 2 male (IEPA 490); estuary of the Sucuriju River (01°40'09,18"N, 49°55'07,34"W), 01.v.2004, I.M. Vieira and C.S. Gama, 1 male (IEPA 505).—Municipality of Macapá: stream Aterro, streams in gallery forests, in savanna (00°15'29"N, 51°03'39"W), 05.vi.2002, I.M. Vieira, 1 female (IEPA 329).—Municipality of Calçoene: waterfall of Henrique, Flexal River (01°45'56,5"N, 51°58'48,0"W), 30.vii.2003, C.S. Gama and D.A. Halboth, 1 specimen (IEPA 494) (Figure 3).

Geographic distribution. Western Atlantic Ocean: USA (North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas), Mexico, Honduras, Nicaragua, Panama, Bahamas, Cuba, Jamaica, Haiti, Dominican Republic, Puerto Rico, Islands Virgins, Colombia, Venezuela, Suriname, Brazil (state of Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul) (Bond-buckup & Buckup 1989; Coelho *et al.* 2006; Coelho & Ramos-Porto 1984; Ferreira *et al.* 2010; Holthuis 1952; Melo 2003; Bond-Buckup 1989; Delgado *et al.* 1997; Bowles *et al.* 2000; Barros & Pimentel 2001).

Distribution in Amapá state. Sucuriju River Basin, Flexal River and streams in gallery forests, savannas.

Previous records. Pimentel & Magalhães (2014)

Ecological notes. Collected in clear water streams and estuaries, brackish waters, in muddy substrate, and in the ebb period it is found in tide pools (Coelho *et al.* 2006)

Remarks. The specimens analyzed in this study correspond to the descriptions of Holthuis (1952) and Melo (2003).

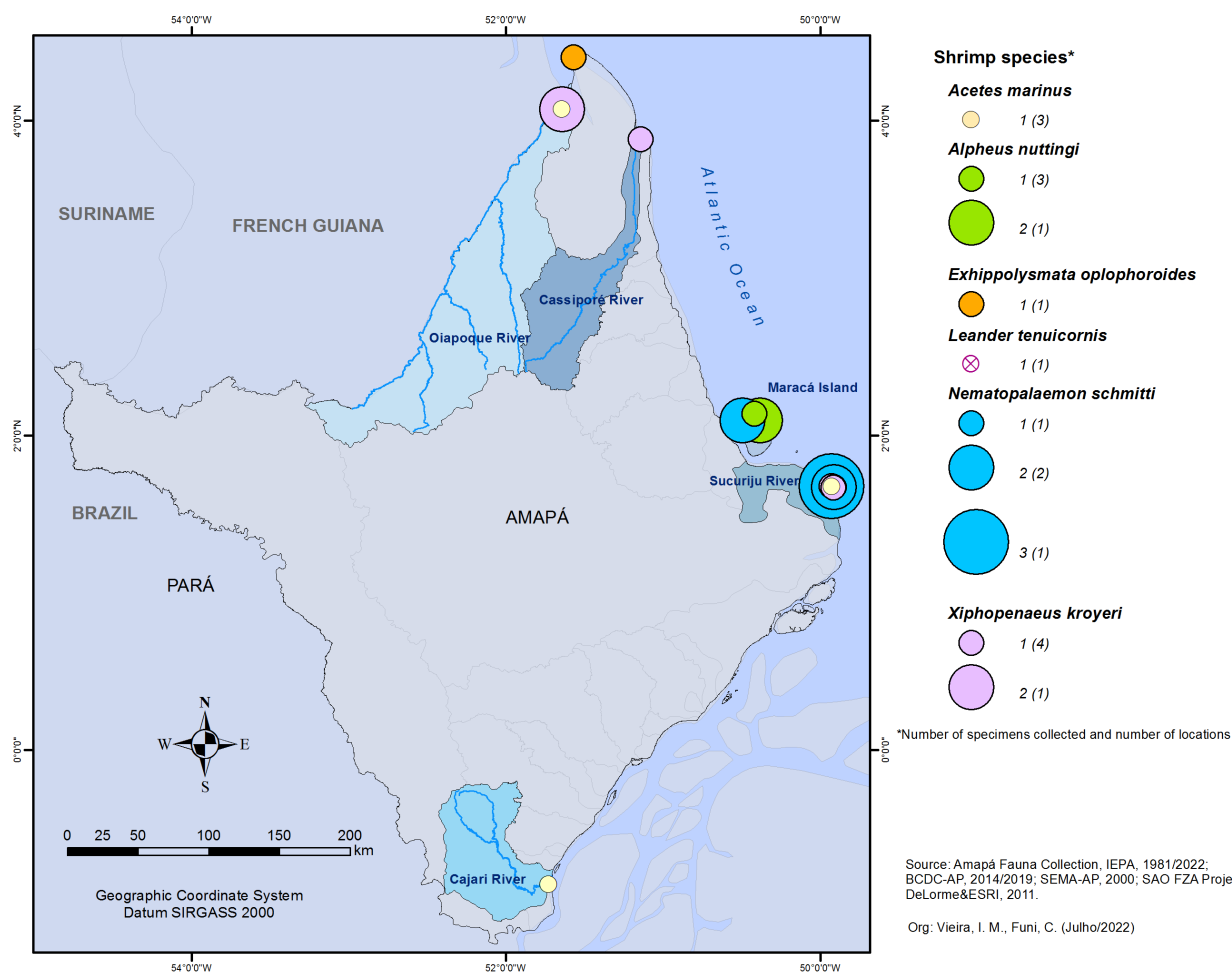


FIGURE 2. Geographic distribution map of *Acetes marinus* Omori, 1975; new records of *Alpheus nuttingi* (Schmitti, 1924); *Exhippolysmata oplophoroides* (Holthuis, 1948); new records of *Leander tenuicornis* (Say, 1918); *Nematopalaemon schmitti* (Holthuis, 1948) and *Xiphopenaeus kroyeri* (Heller, 1862) from the state of Amapá, in eastern Brazilian Amazon region.

Macrobrachium amazonicum Heller, 1862

Examined material. Municipality of Pracuúba: Pracuúba Lake (1°44'03"N, 50°47'35"W), vii.1981, coll. M.A.S. Lima, 28 specimens (IEPA 07).—Municipality of Macapá: Fazendinha District, Amazon River, Cascalheira (00°03'18.89"S, 51°07'09.40"W), 25.v.1990, coll. J.C.S. Oliveira, 7 specimens (IEPA 12), idem, 25.v.1990, J.C.S. Oliveira, 4 male and three females (IEPA 21), idem, 06.v.1990, coll. J.C.S. Oliveira, 11 specimens (IEPA 20); Archipelago of Bailique, Stream Franco Grande (00°55'56.1"N, 50°02'04.3"W), 24.viii.1995, colls. J. Cardoso, N. Farripas and I.M. Vieira, 105 males, 280 females and 46 females with eggs (IEPA 42); idem, Stream (00°56'29.7"N, 50°00'49.4"W), 25.viii.1995, colls. J. Cardoso, N. Farripas and I.M. Vieira, 28 males, 66 females and 09 females with eggs (IEPA 43); idem, Stream Franco Grande (00° 57'39.3"N, 49°59'46.1"W), 31.viii.1995, colls. J. Cardoso, N. Farripas and I.M. Vieira, 47 males, 51 females and 02 females with eggs (IEPA 44); idem, Amazon River, Cubana (00°52'37,3"N, 50°08'56,6"W), 23.ix.2000, colls. I.M. Vieira, O.A. Alencar, O.M. Costa and D.A. Halboth, 07 males and 13 females (IEPA 226); at the same location as the previous collection, Stream Faustino (00°53'36.9"N, 50°11'01.9"W), 30.viii.1995, colls. L. Ramos, H.P. Belo, J. Cardoso, I.M. Vieira and N. Farripas, 328 specimens (IEPA 46); Amazon River, Cascalheira Mirim (00°03'03.76"S, 51°05'52.85"W), 23.IV.1996, colls. J. Cardoso, I.M. Vieira, O.M. Costa and H.P. Belo, 05 males, 30 females and 15 females with eggs (IEPA 132); Fazendinha Beach (00°03'03,76"S, 51°05'52,85"W), 14.vi.1996, colls. J. Cardoso, I.M. Vieira, O.M. Costa and H.P. Belo, 04 males and 24 females (IEPA 133); Wetland Tacacá (00°02'20.7"S, 51°05'35.2"W), 19.vii.2002, colls. O.A. Alencar, D.

Filocreão, A.C.R. de Araújo, O.T.C. Arnaud, 01 male and 01 female (IEPA 392).—Municipality of Amapá: Mouth of Sucuriçu River (01°40'17.0"N, 49°55'00.06"W), 26.ix.1996, O.M. Costa, H.P. Belo and I.M. Vieira, 01 male, 22 females and 03e females with eggs (IEPA 116); idem (01°40'35.7"N, 49°55'53.92"W), 18.iv.2001, I.M. Vieira, and O.M. Costa, 01 female (IEPA 261); idem (01°40'23.9"N, 49°54'56.7"W), 22.viii.2002, I.M. Vieira, and O.M. Costa, 08 females with eggs (IEPA 449); idem (01°40'04.21"N, 49°55'01.45"W), 04.v.2004, I.M. Vieira, 31 males and 73 females (IEPA 533); Piratuba Lake (01°41'35"N, 50°00'30.6"W), 02.v.2004, I.M. Vieira and C.S. Gama, 08 males and 129 females (IEPA 760). Municipality of Santana: Santana Island, Amazon River (00°05'13.84"S, 51°09'06.98"W), 14.iv.2000, I.M. Vieira, O.A. Alencar, O.M. Costa and J. Cardoso, 29 males, 25 females and 06 females with eggs (IEPA 211); idem, 14.iv.2000, I.M. Vieira, O.A. Alencar, O.M. Costa and J. Cardoso, 05 males, 39 females and 23 juveniles (IEPA 213); idem, I.M. Vieira, O.A. Alencar, O.M. Costa and J. Cardoso, 01 e males, 7 females and 22 juveniles (IEPA 249); idem, Recanto da Aldeia (00°05'43,58"S, 51°10'23,56"W), 19.ii.2012, A.G. Santiago and E.O. Galeno, 53 males, 32 females and 05 and females with eggs (IEPA 1549); idem previous collection, Dourado Lake (00°04'32.3"S, 51°09'44.4"W), 21.ii.2012, A.G. Santiago and E.O. Galeno, 15 males and 05 females (IEPA 1554); at the same location as the previous collection, Beach Encanto (00°03'51,63"S, 51°10'29,27"W), 20.xii.2012, A.G. Santiago and E.O. Galeno, 12 males and 11 females (IEPA 1556); idem coleta anterior, Beach Ponte (00°04'40,30"S, 51°08'27,51"W), 40 males, 16 females and 20 females with eggs (IEPA 1557); Matapi River (00°00'35.92"S, 51°12'09.76"W), 13.iv.2002, I.M. Vieira and C.S. Gama, 6 males, 20 females and 10 juveniles (IEPA 289), idem, 13.iv.2002, I.M. Vieira and C.S. Gama, 19 males, 42 females and 06 females with eggs (IEPA 293); Matapi River (00°00'55.93"S, 51°12'14,23"W), 13.iv.2002, I.M. Vieira and C.S. Gama, 02 males and 03 females (IEPA 430). Municipality of Cutias: Reserva Biológica do Lago Piratuba (Biological Reserve of Lake Piratuba), Araguari River, Tabaco (01°19'23"N, 50°16'44"W), 03.v.2004, I.M. Vieira and C.S. Gama, 20 males and 51 females (IEPA 535); Stream Jacaré (01°20'29.8"N, 50°14'41.6"W), 29.iv.2004, I.M. Vieira, 1 male and 13 female (IEPA 736); at the same location as the previous collection, Retiro Santa Margarida, Araguari River (01°19'50.9"N, 50°15'56.7"W), 29.iv.2004, I.M. Vieira, 2 males and 25 females (IEPA 758); Stream of Costa (01°19'26.6"N, 50°16'36.0"W), 26.iv.2004, I.M. Vieira, 08 males and 05 females (IEPA 769); Parazinho Biological Reserve (00°52'41"N, 49°59'29"W), 14.i.2006, I.M. Vieira, 411 males, 353 females, 3 juveniles and 35 females with eggs (IEPA1000).—Municipality of Calçoene: Beach of Goiabal, Mouth of Calçoene River (02°35'51.13"N, 50°50'43.13"W), 20.vi.2006, I.M. Vieira, 2 males and 01 female (IEPA 1226).—Municipality of Laranjal do Jari: Jari River (00°45'18.55"S, 52°30'13.16"W), 04.xii.2009, 01 female (IEPA 1374). Municipality Mazagão: Cajari River Extractive Reserve, Lower Cajari River (00°43'17.9"S, 51°40'40.5"W), 29.v.2014, I.M. Vieira and A.G. Santiago, 01 male and 02 females (IEPA 1605). Municipality of Ferreira Gomes: dam (00°28'60"N, 51°04'59"W), 06.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, four females (IEPA 332). Reserva Particular do Patrimônio Natural (Private Natural Heritage Reserve), stream (00°56'49.20"N, 51°14'49.71"W), 04.ii.2006, I.M. Vieira and D.C.C. Vieira, 15 males, 95 females and 03 females with eggs (IEPA 1663); stream (00°55'35"N, 51°15'45"W), 31.i.2006, I.M. Vieira and D.C.C. Vieira, 2 males and 4 females (IEPA 1670); represa (00°56'49.20"N, 51°14'49.71"W), 01.ii.2006, I.M. Vieira and D.C.C. Vieira, 04 males and 03 females (IEPA 1683); idem, stream (00°56'49.20"N, 51°14'49.71"W); 05/02/2006, I.M. Vieira and D.C.C. Vieira, 01 male and 18 females (IEPA 1686); Araguari River, Ferreira Gomes Hydroelectric Power Plant dam (0°51'33.51"N, 51°11'47.01"W), 21.i.2011, I.M. Vieira, 04 females, 05 juveniles and 01 female with eggs (IEPA 1787), Araguari River (0°53'55.56"N, 51°15'16.92"W), 24.ii.2012. I.M. Vieira, A.G. Santiago, E.O. Galeno and K.J.G. Corrêa, 2 males (IEPA 1792); Araguari River, Vista Alegre, Biological Reserve of Lake Piratuba, 3 immature females, 1 immature male, 7 females adults, 6 male adults, 15.viii.1992, colls. C. Magalhães, (INPA-CRU 001059); Amapá Grande River, Cachoeira Grande, 1 fêmea, 26.viii.1992, coll. C. Magalhães (INPA-CRU 001061) (Figure 3).

Geographic distribution. It has a wide distribution, ranging from large hydrographic basins such as the Amazon and Paraná-Paraguay River, to smaller coastal basins in different phytophysiognomic domains. Occur in Venezuela, Guyana, Suriname, French Guyana, Peru, Brazil (states of Amapá, Amazonas, Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco and Mato Grosso do Sul), Argentina, Bolivia, Paraguay, Ecuador and Peru (García-Dávila & Magalhães 2003; Holthuis 1952; Kensley & Walker 1982; Melo 2003; Pileggi *et al.* 2013; Pimentel & Magalhães 2014; Santos *et al.* 2018; Gomes-Corrêa 1977; Rodriguez 1982; Ramos-Porto & Coelho, 1990; Pettovello 1996; Delgado *et al.*, 1997;)

Distribution in Amapá state. Basins of rivers Amazon, Faustino, Sucuriçu, Matapi, Araguari, Stream Jacaré, Calçoene River and Jari River.

Previous records. Melo (2003); Pileggi *et al.* (2013); Pimentel & Magalhães (2014)

Ecological notes. Females have numerous eggs and are small, reach 150 mm in size, occur in white, black and clear waters, being abundant at the mouth of the Amazon River, where they form an important fishing resource for the state of Amapá.

Remarks. The morphology of the specimens cited in this study is in accordance with the descriptions of Holthuis (1952); Kensley & Walker (1982); Melo (2003).

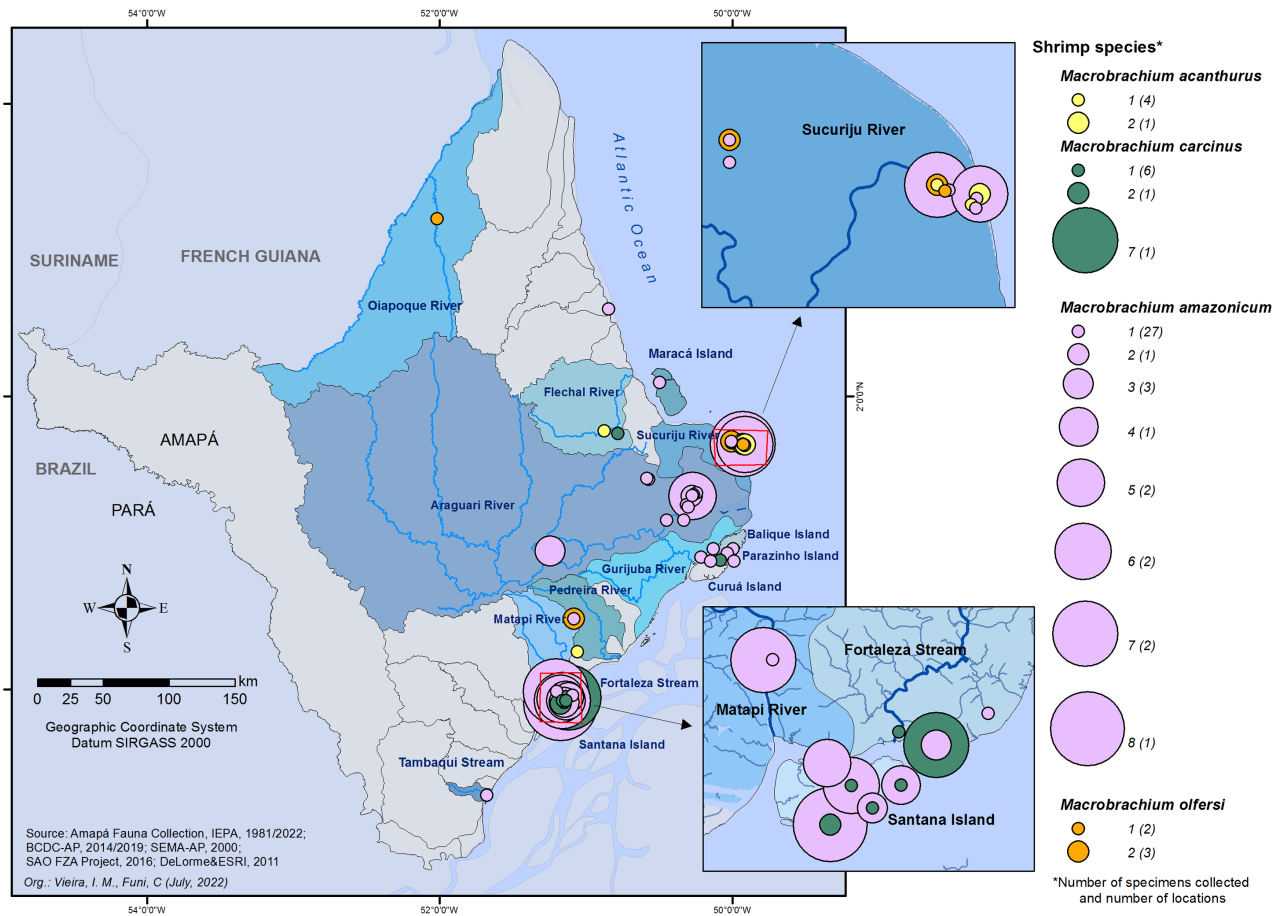


FIGURE 3. Geographic distribution map of *Macrobrachium acanthurus* Wiegmann, 1836; *M. amazonicum* (Heller, 1862); *M. carcinus* (Linnaeus, 1758) and *M. olfersii* (Wiegmann, 1836) from the state of Amapá, in eastern Brazilian Amazon region.

Macrobrachium brasiliense Heller, 1862

Examined material. Municipality of Ferreira Gomes: dam at km 54, Extremo Norte (00°28'60"N, 51°04'59"W), 06.vi.2002, coll. I.M. Vieira, 06 males and 18 females (IEPA 333); Floresta Nacional do Amapá (Amapá National Forest,) Stream Braço (01°18'07"N; 51°35'17"W), 24.vii.2004, coll. I.M. Vieira, 01 male and 15 females (IEPA 537); idem, 08.viii.2004, I.M. Vieira, 04 males and 30 females (IEPA 551); idem, 11.viii.2004, coll. I.M. Vieira, 15 specimens (IEPA 559); idem, 11.viii.2004, I.M. Vieira, 02 females (IEPA 564); 14.viii.2004, colls. M. Vieira and J.O. Cardoso, 02 male and 01 female (IEPA 610); Floresta Nacional do Amapá, Stream Santo Antônio, pond in açai occurrence area (*Euterpe oleracea* Mart.) (01°06'37"N, 51°53'37"W), 07.iii.2005, colls. I.M. Vieira and D.C.C. Vieira, 01 male (IEPA 780); idem, 22.vii.2002, colls. I.M. Vieira and D.C.C. Vieira, 59 males, 03 females and 01e female with eggs (IEPA 787); 13.iii.2005, colls. I.M. Vieira and D.C.C. Vieira, 13 males and 03 females (IEPA 793), stream with transparent water, bottom with sand and small black stones, with strong current (1°06'39"N, 51°53'18"W) 07.iii.2005, I.M. Vieira and D.C.C. Vieira, 05 males (IEPA 800).—Municipality of Laranjal do Jari: Sustainable Development Reserve of the Iratapuru River, Jari River (00°16'35.21"N, 53°06'24.48"W), 12.xi.2004, I.M. Vieira and E.A. Oliveira, 72 males and 10 females (IEPA 580); stream left bank of the Jari River (00°16'35.21"N, 53°06'24.48"W), 21.xi.2004, I.M. Vieira and E.A. Oliveira, 5 males and 4 females (IEPA 620);

idem, 15.xi.2004, I.M. Vieira and , 03 males, 12 females and 1 juvenile (IEPA 1065); right bank of the river Jari (0°51'47"S, 52°31'26"W), 27.x.2007, I.M. Vieira, 31 males and 11 females (IEPA 1169); stream Baliza (0°18'36"S, 52°26'24"W), 12.v.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 1272); idem, 10.v.2005, I.M. Vieira and D.C.C. Vieira, 1 female (IEPA 1325); National Park of Tumucumaque Mountains, Mapaoni River, transparent water, under leaf litter bordering the river (02°11'36"N, 54°35'15"W), 11.i.2005, I.M. Vieira and E.A. Oliveira, 1 male (IEPA 712); idem, 05.i.2005, I.M. Vieira and E.A. Oliveira, 7 males, 03 females, 04 juvenis and 2 females with eggs (IEPA 1187). Municipality of Serra do Navio: National Park of Tumucumaque Mountains, confluence of rivers Amapari and Anacuí, with small waterfalls, rocks on the river bed, strong current (01°35'45"N, 52°29'32"W), idem previous collection, 22.ix.2004, I.M. Vieira and Z. A. de Paiva, 1 male and 1 female (IEPA 657); idem, Stream with rocky bottom (1°36'13"N, 52°29'52"W), 17.ix.2004, I.M. Vieira, C.S. Gama, D. R. J. Cardoso and J. M. Pereira, 05 males, 05 females and 01 female with eggs (IEPA 664); idem, stream tributary of Amapari River, black water, sandy bottom, shallow and with leaves in decomposition (1°36'13"N, 52°29'36"W), 20.ix.2004, I.M. Vieira and E.A. Oliveira, 3 males and 6 females (IEPA 684); idem, igarapé (1°35'43"N, 52°29'18"W), 24.ix.2004, I.M. Vieira and E.A. Oliveira, 1 male and 4 females (IEPA 686), Anacuí River (01°50'41.29"N, 52°44'28.65"W), 02.iii.2006, I.M. Vieira and D.C.C. Vieira, 9 males (IEPA 1039).—Municipality of Pedra Branca do Amapari: stream (01°08'53.6"N, 52°26'43.7"W), 01.ix.2002, I.M. Vieira, 5 males, 13 females, 31 juveniles (IEPA 828); Sustainable Development Reserve of the Iratapuru River, tributary of Cupixi River, swamp (0°34'09"N, 52°19'30"W), 29.vii.2005, I.M. Vieira and D.C.C. Vieira, 1 female (IEPA 899), idem, 02.viii.2005, I.M. Vieira and D.C.C. Vieira, 1 female (IEPA 914); Cupixi River (00°34'45"N, 52°19'21"W), 01.viii.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 905); tributary stream of the Cupixi River (0°35'00"N, 52°19'28"W), 6.viii.2005, I.M. Vieira and D.C.C. Vieira, 1 female (IEPA 936).—Municipality of Oiapoque: National Park of Tumucumaque Mountains, Anotaíé River (3°07'27"N, 52°01'28"W), 5.ix.2005, I.M. Vieira and D.C.C. Vieira, 12 males and 17 females (IEPA 943); tributary of the Anotaíé River, 5000 m trail (3°12'47"N, 52°02'22"W), 9.ix.2005, I.M. Vieira and D.C.C. Vieira, 3 males and 9 females (IEPA 949); (3°29'09"N, 52°19'14"W), 12.ix.2005, I.M. Vieira and D.C.C. Vieira, 1 male and 12 females (IEPA 954); Anotaíé River (1°29'51,55"N, 52°18'0,66"W), 13.ix.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 955); idem, 13.ix.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 956); idem, 13.ix.2005, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 958).—Municipality of Calçoene: National Park of Tumucumaque Mountains, Mutum River (1°23'13.83"N, 51°55'39.05"W), 6.xi.2005, I.M. Vieira and D.C.C. Vieira, 5 males and 23 females (IEPA 1010); Mutum River (1°23'13.83"N, 51°55'39.05"W), 2.xi.2005, I.M. Vieira and D.C.C. Vieira, 6 males and 11 females (IEPA 1025); tributary of Mutum River, left margin (1°23'51"N, 51°56'04"W) 6.xi.2005, I.M. Vieira and D.C.C. Vieira, 1 specimen (IEPA 1055); tributary stream of the Mutum River (1°23'51"N, 51°56'04"W), 2 males and 3 females (IEPA 1072).—Municipality of Mazagão: Extractive reserve of Rio Cajari, Stream Caroço (00°23'21.8"S, 52°03'13.7"W), 7.vii.2013, I.M. Vieira, 4 males, 1 females and 1 female with eggs (IEPA 1634); Araguari River, Marcirio upstream of Porto Grande, 18.viii.1992, colls. C. Magalhães and M. Jeju (INPA-CRU 001070); BR-156 furo do Henrique, 27.viii.1992, coll. C. Magalhães (INPA-CRU 001072); Araguari River, stream in waterfall Capivara, 20.viii.1992, coll. C. Magalhães (INPA-CRU 001074); rio Amapá Grande, 26.viii.1992 (INPA-CRU 001076); Stream igarapé Munguba, 23.iii.1991 (INPA-CRU 001207); municipality of Serra do Navio, Stream Água Branca, 22.iii.1991 (INPA-CRU 001211) (Figure 4).

Geographic distribution. Colombia, Venezuela, Ecuador, Peru, Suriname, Guyana, French Guyana and Brazil (states of Amapá, Pará, Amazonas, Maranhão, Bahia, Mato Grosso, Mato Grosso do Sul, Goiás, Minas Gerais, Roraima, São Paulo and Paraná). (Holthuis 1952; Pileggi *et al.* 2013; Pimentel & Magalhães 2014)

Distribution in Amapá state. Streams Braço, Água Branca, Munguba and Santo Antônio, rivers Jari, Araguari, Mapaoni, Amapari, Anacuí, Cupixi, Anotaíé, Mutum, Amapá Grande, Davi and Tracajatuba.

Previous records. Melo (2003); Pimentel & Magalhães (2014).

Ecological notes. In the state of Amapá, it occurs in clear, transparent waters, in ponds, streams and rivers with waterfalls where there is strong current.

Remarks. The morphology of the specimens can be verified in Holthuis (1952); Melo (2003).

Macrobrachium carcinus Linnaeus, 1758

Examined material. Municipality of Macapá: District Fazendinha, Amazon River (00°03'18.89"S, 51°07'09.40"W), 26.v.1990, J.C.S. de Oliveira, 1 male and 1 female (IEPA 10); idem, 26.v.1990, coll. J.C.S. de Oliveira, 01

specimen (IEPA 11); idem, 25.v.1990, coll. J.C.S. de Oliveira, 03 males and 01 females with eggs (IEPA 13); idem, 25.v.1990, coll. J.C.S. de Oliveira, 1 female with eggs (IEPA 14); idem, 1 male (IEPA 15); idem, 06.v.1990, coll. J.C.S. de Oliveira, 1 female with eggs (IEPA 16); idem, 06.v.1990, J.C.S. de Oliveira, 03 females and 1 female with eggs (IEPA 17); Archipelago of Bailique, Faustino River (00°53'36.9"N, 50°11'01.9"W), 31.viii.1995, L.Ramos H.P.Belo, J.O. Cardoso and I.M. Vieira, 1 male (IEPA 48); idem, 01 female (IEPA 49); idem, Amazon River (00°52'59.34"N, 50°04'56.51"W), 23.vi.2000, I.M. Vieira, O.A. Alencar and O.M. Costa, 1 female with eggs (IEPA 221).—Municipality of Santana: Igarapé Fortaleza River (00°38'40.55"N, 52°30'30.71"W), 4.ii.1997, O.M. Costa, 02 males and 01 female (IEPA 125); idem, (0°02'42.01"S, 51°08'10.38"W), 10.xi.1998, I.M. Vieira, 1 male (IEPA 824); Santana Island, Amazon River (00°05'13.84"S, 51°09'06.98"W), 15.iv.2000, I.M. Vieira, O.A. Alencar O.M. Costa and J.O. Cardoso, 04 females (IEPA 208), Santana Island, Dourado Lake (00°04'32.2"S, 1°09'44.4W), 21.iv.2012, A.G.Santiago and E.O.Galeno, 1 male (IEPA 1561); idem, Amazon River, Recanto da Aldeia (00°04'43.8"S, 51°09'53.7"W), 15.viii.2012, A.G.Santiago and E.O.Galeno, 1 male (IEPA 1576), idem, Amazon River, Recanto da Aldeia (00°04'43.8"S, 51°09'53.7"W), 16.xi.2012, A.G.Santiago and E.O.Galeno, 2 males and 2 females (IEPA 1588); idem, Amazon River, Praia da Ponte (00°02'318.0"S, 51°05'38.7"W), 27.x.2012, A.G. Santiago and E.O. Galeno, 2 males (IEPA 1587). Municipality of Pracuúba: Pracuúba Lake (1°45'01.21"N, 50°49'15.40"W), 18.xi.1990, J.C.S.Oliveira, 2 males and 3 females (IEPA 258) (Figure 3).

Geographic distribution. Eastern Atlantic Ocean, USA (Florida, Mississippi, Louisiana and Texas) Mexico, Cuba, Guatemala, Costa Rica, Panamá, Cuba, Porto Rico, Jamaica, Barbados, Lesser Antilles, Colombia, Ecuador, Peru, Venezuela, Guyana, Suriname and Brazil (states of Pará, Pernambuco, Alagoas, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina and Rio Grande do Sul) (Ferreira *et al.* 2010; Holthuis 1952; Melo 2003; Pimentel & Magalhães 2014; (Delgado *et al.* 1997; Ramos-porto & Coelho 1998; Bowles *et al.* 2000).

Distribution in Amapá state. Amazon River (Fazendinha, Archipelago of Bailique, Santana Island); Faustino River (tributary of the Araguari River) and Pracuúba Lake.

Previous records. Pimentel & Magalhães (2014)

Ecological notes. The shrimp of the species inhabit backwaters in rivers with strong turbulence; under trunks and rocks, nocturnal, found in rivers of the Atlantic drainage.

Remarks. The species can reach 300 mm in body length and weigh up to 1 kg, while ovigerous females generally range from 130–170 mm. The carpus of the second pair of pereopods is clearly shorter than the mere (Bowles *et al.* 2000)

Macrobrachium jelskii (Miers 1878)

Examined material. Municipality of Amapá: Sucuriju District, Sucuriju River (01°41'35.0"N, 50°00'30.6"W), 17 males and 23 females (IEPA 130), idem, ix.1997, J.O. Cardoso, I.M. Vieira and O.M. Costa, 15 males and 9 females (IEPA 141); idem, ix.1997, J.O. Cardoso, I.M. Vieira and O.M. Costa, 3 males and 5 females (IEPA 142); idem, 21.iii.1998, I.M. Vieira and O.M. Costa and A.C. Sousa, 1 females (IEPA 164); xi.1997, I.M. Vieira, J.O. Cardoso and O.M. Costa, 3 males, 5 females and 6 juveniles (IEPA 131); idem (01°40'35,7"N, 49°55'53,92W), xi.1997, I.M. Vieira, J.O. Cardoso and O.M. Costa, 3 males (IEPA 175); idem, xi.1997, I.M. Vieira, J.O. Cardoso and O.M. Costa, 1 female (IEPA 197); Sucuriju River (01°40'35.0"N, 50°00'30.6"W), xi.1997, I.M. Vieira, J.O. Cardoso and O.M. Costa, 1 male (IEPA 245); Mouth of Sucuriju River (01°40'23.9"N, 49°54'56.7"W), 22.vii.2002, I.M. Vieira and O.M. Costa, 6 males, 12 females, 7 juveniles and 5 females with eggs (IEPA 365), idem, 22.vii.2002, I.M. Vieira and O.M. Costa, 2 males, 3 females and 2 juveniles (IEPA 487); idem (01°40'14.6"N, 49°55'21.35"W), v.2004, I.M. Vieira, 36 specimens (IEPA 735); Sucuriju River (1°40'47.26"N, 49°56'33.34"W), 26.vi.2005, I.M. Vieira, 4 specimens (IEPA 1311).—Municipality of Macapá: Wetland Tacacá, (00°02'20.7"S, 51°05'35.2"W), 29.vi.2000, C. Robds, 4 juveniles (IEPA 253); (00°02'12.25"S, 51°05'49.76"W); 19.vii.2002, D. Filocreão, O.A. Alencar, A.C.R. de Araújo, O.T.C. Arnaud, 1 male (IEPA 363); (00°02'20.7"S, 51°05'34.7"W), 18.vii.2002, D. Filocreão, O.A. Alencar, A.C.R. de Araújo, O.T.C. Arnaud, 3 males and 5 females (IEPA 391); (00°02'17.3"S, 51°05'34.7"W), 07.i.2004, A.C.R. de Araújo, F.J.S. Costa, O.T.C. Arnaud, R.N.G. Mendes, 3 males, 7 females, 1 juvenile and 01 female with eggs (IEPA 500); Environmental Protection Area of the Curiaú River, Currallinho, (00°07'26.74"N, 51°06'50.18"W), 08.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 1 male and 1 female (IEPA 336); (00°08'43.2"N, 51°02'31.9"W), 19.viii.2002, D. Filocreão, O.A. Alencar, and O.T.C. Arnaud, 57 males, 2 females

and 25 females with eggs (IEPA 370); (00°09'23.8"N, 51°02'09.5"W), 25.viii.2002, O.A. Alencar and O.T.C. Arnaud, 3 males, 16 females and 5 juveniles (IEPA 373); (00°08'43.83"N, 51°02'31.44"W), 31.viii.2002, I.M. Vieira, 18 males, 11 females and 1 juvenile (IEPA 462); (00°08'44.16"N, 51°02'32.77"W), 25.ix.2002, I.M. Vieira, 3 females (IEPA 476); igarapé (00°15'29"N, 51°03'39"W), 05.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 1 male and 3 females (IEPA 348); (00°15'29"N, 51°03'39"W), 5.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 6 males and 10 females (IEPA 330); Davi River (01°55'52.9"N, 50°51'38.7"W), 18.VI.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 25 juveniles and 3 females with eggs (IEPA 359); Wetland Fazendinha (00°03'00.27"S, 51°07'00.72"W), 18.vii.2002, D. Filocreão, O.A. Alencar, and O.T.C. Arnaud, 4 females (IEPA 362); Lagoon of Índios (00°21'41.9"N, 51°06'15.5"W), 23.vii.2002, D. Filocreão, O.A. Alencar, and O.T.C. Arnaud, 19 males, 12 females and 1 juvenile (IEPA 407); 23.vii.2002, D. Filocreão, O.A. Alencar, and O.T.C. Arnaud, 3 males, 16 females and 1 juvenile (IEPA 411); (00°02'37.6"N, 51°06'19.2"W), 08.v.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 3 males and 2 juveniles (IEPA 433); (00°02'38.4"N, 51°06'18.0"W), 22.v.2002, A.C.R. Araújo, I.M. Vieira and O.T.C. Arnaud, 33 males, 52 females (IEPA 526); (00°02'40.4"N, 51°06'14.6"W), 22.v.2002, A.C.R. Araújo, I.M. Vieira, O.T.C. Arnaud and F.J.S. Costa, 1 male, 14 females and 2 juveniles (IEPA 506); (0°02'38.4"N, 51°06'18.8"W), 19.vi.2004, A.C.R. Araújo and O.T.C. Arnaud, 5 males, 27 females and 20 juveniles (IEPA 627); (00°02'37.4"N, 51°06'20.3"W), 19.vi.2004, A.C.R. Araújo and O.T.C. Arnaud, 3 males, 6 females and 1 female with eggs (IEPA 588); (00°01'48.4"N, 51°06'20.3"W), 19.vi.2004, A.C.R. Araújo and O.T.C. Arnaud, 5 females and 2 juveniles (IEPA 589); (00°01'42.8"N, 51°08'22.4"W), 19.vi.2004, A.C.R. Araújo and O.T.C. Arnaud, 4 males, 9 females (IEPA 602); 23.vii.2004, O.T.C. Arnaud, 14 males, 23 females, 7 female with eggs and 3 juveniles (IEPA 613); (00°01'55.3"N, 51°06'07.2"W), 14 males, 23 female and 5 juveniles (IEPA 601); (00°01'48.4"N, 51°06'20.3"W), 28.vii.2004, A.C.R. Araújo and O.T.C. Arnaud, 23 males, 28 females and 3 juveniles (IEPA 609); (00°02'39.5"N, 51°06'16.7"W), 21.xi.2004, A.C.R. Araújo and O.T.C. Arnaud, 19 males, 32 females and 1 juvenile (IEPA 619); (00°02'41.4"N, 51°06'14.6"W), 23.vii.2004, A.C.R. Araújo and O.T.C. Arnaud, 25 males, 37 females and 4 juveniles (IEPA 635).—Municipality of Santana: Maruanum River (0°10'49.193"N, 51°16'30.544"W), 02.iv.2002, I.M. Vieira and O.M. Costa, 1 male (IEPA 320).—Municipality of Ferreira Gomes: stream in gallery forest (0°28'60"N, 51°04'59"W), 04.vi.2002, I.M. Vieira and O.M. Costa, 1 female (IEPA 325); Manuel Capu Stream (02°02'47"N, 50°54'09"W), 18.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 32 specimens (IEPA 360).—Municipality of Porto Grande: creek in the resort of Porto Grande (00°44'56"N, 51°04'59"W), 18.vi.2002, I.M. Vieira, 1 male (IEPA 347).—Municipality of Tartarugalzinho: Farm São Bento, Eusébio River (01°16'57"N, 50°48'15"W), 11.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 2 males and 4 females (IEPA 353); Farm São Bento, lake (01°16'54"N, 50°48'04"W), 6.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 19 specimens (IEPA 436); 11.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 5 specimens, 5 females and males (IEPA 492); stream (1°01'16"N, 51°12'56"W), 4.ii.2006, I.M. Vieira and D.C.C. Vieira, 52 males (IEPA 1687).—Municipality Cutias: Bom Jesus do Tabaco, Araguari River (01°26'10.3"N, 50°34'22.7"W), iv.2004, I.M. Vieira, 9 males, 36 females and 13 females with eggs (IEPA 534); Stream of Costa (01°19'26.6"N, 50°16'36.0"W), v.2004, I.M. Vieira, 2 males and 26 females (IEPA 554); idem coleta anterior (01°19'26.6"N, 50°16'36.0"W), 26.iv.2004, I.M. Vieira, 47 specimens (IEPA 768); Araguari River (01°20'31.1"N, 50°18'90.8"W), v.2004, I.M. Vieira, 3 males, 3 females and 1 female with eggs (IEPA 570); Araguari River (01°26'10.3"N, 51°06'20.3"W), iv. 2004, I.M. Vieira, 9 males, 36 females and 13 females wit eggs (IEPA 578); Fazenda Santa Margarida, Araguari River (01°19'50.3"N, 50°15'56.7"W), 29.iv.2004, I.M. Vieira, 2 females (IEPA 746); 29.iv.2004, I.M. Vieira, 1 male and 3 females (IEPA 752); Bom Jesus do Tabaco (01°19'23"N, 50°16'23"W), 26.iv.2004, I.M. Vieira, 1 male and 18 females (IEPA 1298); (1°19'59.5"N, 50°14'57.5"W), 29.iv.2004, I.M. Vieira, 1 male and 1 female (IEPA 1302); Stream (01°20'29.8"N, 50°14'41.6"W), 29.iv.2004, I.M. Vieira 20 specimens (IEPA 1404); Stream Jacaré (01°20'31.1"N, 50°18'20"W), 24.iv.2004, I.M. Vieira, 1 specimens (IEPA 1410);—Municipality of Pracuúba: Pracuúba Lake (1°45'01.21"N, 50°49'15.40"W), vii.1981, M.A.S. Lima, 24 females and 9 juveniles (IEPA 06); Pracuúba Lake (01°44'41.49"N, 50°47'31.50"W), 21.x.2004, I.M. Vieira, 100 specimens (IEPA 730); Pracuúba Lake (01°44'36.11"N, 50°47'40.27"W), 22.x.2004, I.M. Vieira, 173 specimens (IEPA 731).—Municipality of Laranjal do Jari: Jari River (0°08'37.09"S, 53°04'08.87"W) 26.x.2007, I.M. Vieira, 13 males and 15 females (IEPA 1161); Jari River (00°38'02.5"S, 52°00'29.2"W), 29.x.2008, I.M. Vieira, 11 males and 18 females (IEPA 1163); Jari River (00°51'36.20"S, 52°32'18.11"W), 15.vii.2008, I.M. Vieira, 1 specimen (IEPA 1204); Jari River, PBA P08 (00°41'23.85"S, 52°30'52.40"W), 27.x.2007, I.M. Vieira, 1 male (IEPA 1235); Balneário Riacho Doce, Jari River (00°50'03.12"S, 52°32'33.29"W), 28.x.2008, I.M. Vieira, 1 female (IEPA 1239); Jari River, Waterfall of Santo Antônio (0°38'42.47"S, 52°30'27.95), 04.xii.2009, I.M. Vieira,

8 males and 14 females (IEPA 1243); tributary stream of Jari River (00°45'02"S 52°30'27"W), 04.ix.2009, I.M. Vieira, 1 female (IEPA 1251); Jari River (00°45'02"S, 52°30'27"W), 27.v.2007, I.M. Vieira, 6 females (IEPA 1466); Riacho Doce creek, tributary of the river Jari (00°47'54.85"S, 52°31'49.65"W), 02.ix.2009, I.M. Vieira, 2 males (IEPA 1472).—Municipality of Calçoene: Beach of Goiabal (02°37'28.51"N, 50°51'03.3"W), 23.vi.2006, I.M. Vieira, 4 females (IEPA 1357); Beach of Goiabal (02°37'28.51"N, 50°51'03.3"W), 20.v.2006, I.M. Vieira, 3 juveniles (IEPA 1359); stream on the left bank of the Jari River, (00°50,822"S, 52°32,545"W); 3 males and 4 female, I.M. Vieira (IEPA 1469).—Municipality of Tartarugalzinho: stream of riparian forest (0°56'49.20"N, 51°14'40.71"W), 01.ii.2006, I.M. Vieira and D.C.C. Vieira, 5 males and 31 females (IEPA 1667).—Municipality of Ferreira Gomes: stream (0°56'49.20"N, 51°14'49.71"W), 31.i.2006, I.M. Vieira and D.C.C. Vieira, 5 males and 8 females (IEPA 1669); Amapá Grande River, Waterfall Grande, 2 immature females, 10 immature males, 2 juveniles, 25.viii.1992, C. Magalhães (INPA-CRU 001060); Araguari River, Biological Reserve of Lake Piratuba that connects to the larger lakes, 25.viii.1992, C. Magalhães (INPA-CRU 001065); Region of the lakes, Pracuúba lake, 1 female, 00.vii.1984, M.S. Lima, (INPA-CRU 001066) (Figure 4).

Geographic distribution. Venezuela, Suriname, Guyana, French Guyana, Trinidad, Bolivia and Brazil (states of Amapá, Pará, Amazonas, Roraima, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Minas Gerais, Espírito Santo, Mato Grosso, Santa Catarina, São Paulo and Paraná) (Magalhães 2002; Pileggi *et al.* 2013; Ramos-Porto 1985; Santos *et al.* 2018;)

Distribution in Amapá state. Basins of the rivers Sucuriçu, Curiaú, Davi, Maruanum, Manuel Capu, Araguari, Euzébio, Jari, Lagoon of Indios.

Previous records. Melo (2003); Pileggi *et al.* (2013); Pimentel & Magalhães (2014).

Ecological notes. Inhabits clear, black and white waters reaching higher regions, a little above 100 m, cohabit with *Macrobrachium amazonicum* in the lower regions (García-Dávila & Magalhães 2003).

Remarks. The morphological characters of the specimens evaluated in this study correspond to the descriptions of García-Dávila & Magalhães (2003); Holthuis (1952); Melo (2003).

***Macrobrachium inpa* Kensley & Walker, 1982**

Examined material. Municipality of Ferreira Gomes: Stream Braço, tributary of Falsino River, Floresta Nacional do Amapá (Amapá National Forest) (01°17'43"N, 51°36'52"W), 8.vii.2004, I.M. Vieira, 8 males (IEPA 561).—Municipality of Pedra Branca do Amapari: Sustainable Development Reserve of the Iratapuru River, Cupixi River (00°34'45.8"N, 52°19'08.3"W), 25.vii.2005, I.M. Vieira and D.C.C. Vieira, 10 males and 8 females (IEPA 883).—Municipality of Laranjal do Jari: Cajari River Extractive Reserve, Stream Caroço, very reduced, with currentless and rocky bottom (00°23'21.8"S, 52°03'13.7"W), 8.vii.2013, I.M. Vieira and K.J.G. Corrêa, 4 males, 1 female and 1 female with eggs (IEPA 1624); Waterfall of Santo Antônio, Jari River (00°38'42.47"S, 52°30'27.95"W), 3.xii.2009, I.M. Vieira, 4 males and 26 females (IEPA 1244); Waterfall of Santo Antônio, Jari River (00°38'42.47"S, 52°30'27.95"W), 17.vi.2010, I.M. Vieira and E.F. Araújo, 5 males and 29 females (IEPA 1390) (Figura 4).

Geographic distribution. Costa Rica, Venezuela, Trinidad, Guyana, French Guyana, Suriname, Bolivia and Brazil (states of Amapá, Amazonas and Pará) (Chevalier *et al.* 2020; Kensley & Walker 1982; Melo 2003).

Distribution in Amapá state. Basins of the rivers Falsino (stream of Braço), Jari (Waterfall Santo Antônio) and Cupixi, and stream Caroço.

Previous records. Pimentel & Magalhães (2014)

Ecological notes. Collected in rivers with strong turbulence and in waterfalls.

Remarks. The morphological characters of the specimens evaluated in this study correspond to the descriptions of Melo (2003).

***Macrobrachium olfersii* (Wiegmann, 1836)**

Examined material. Municipality of Amapá: District of Sucuriçu, estuary of the Sucuriçu River (01°40'35.7"N, 49°55'53.92"W), xi.1997, I.M. Vieira and O.M. Costa, 12 females and 2 juveniles (IEPA 173); Sucuriçu River (1°41'05.14"N 49°57'46.80"W), xi.1996, , I.M. Vieira and O.M. Costa, 2 females with eggs (IEPA 244);

(1°41'05.14"N 49°57'46.80"W), xi.1997, I.M. Vieira, J.C. de Oliveira and O.M. Costa, 1 female with eggs (IEPA 246); (01°40'35.7"N, 49°55'53.92"W), 18.iv.2001, I.M. Vieira, J.C. de Oliveira and O.M. Costa, 2 females (IEPA 262); Sucuriju River (01°40'27.53"N, 49°55'42.70"W), 24.x.2004, I.M. Vieira, 6 males, 11 females and 6 females with eggs (IEPA 786).—Municipality of Ferreira Gomes: Davi River (00°28'60"N, 51°04'59"W), 7.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 2 female and 1 female with eggs (IEPA 351); stream (00°28'60"N, 51°04'59"W), 7.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 2 males and 5 females (IEPA 354).—Municipality of Oiapoque: National Park of Tumucumaque Mountains, Anotaié River (3°08'53"N 52°01'29"W), 5.IX.2005, I.M. Vieira and D.C.C. Vieira, 3 males (IEPA 819); waterfall on the river Anotaié (3°12'58"N, 52°01'11"W), 10.ix.2005, I.M. Vieira and D.C.C. Vieira, 7 males and 1 female (IEPA 820); (3°12'58"N, 52°01'11"W), 11.ix.2005, I.M. Vieira and D.C.C. Vieira, 3 males and 2 females (IEPA 951); Anotaié River (3°12'49"N 52°00'56"W), 13.ix.2005, I.M. Vieira and D.C.C. Vieira, 2 males (IEPA 957); Anotaié River (3°14'31"N 52°01'01"W), 6.ix.2005, I.M. Vieira and D.C.C. Vieira, 3 males (IEPA 1156); idem, 1 male (IEPA 1223); Waterfall Grande, 26.viii.2002, C. Magalhães (INPA-CRU 001073); Waterfall Grande, 25.viii.2002, C. Magalhães (INPA-CRU 001077); Waterfall Grande, 25.viii.2002, C. Magalhães (INPA-CRU 001078); Amapá Grande River, Waterfall Grande, 00/09/2002, no information (INPA-CRU 001103) (Figure 3).

Geographic distribution. North Carolina, Florida, Texas, Central America, Colombia, Venezuela, Suriname and French Guyana and Brazil (states of Pará, Piauí, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Sergipe, Bahia, Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina and Rio Grande do Sul) (Gomes-Corrêa 1977; Ferreira *et al.* 2010; Holthuis 1952; Melo 2003; Pimentel & Magalhães 2014);

Distribution in Amapá state. Basins of the rivers Sucuriju, Davi and Anotaié.

Previous records. Pimentel & Magalhães (2014).

Ecological notes. Inhabits rivers with strong turbulence, under rocks.

Remarks. The morphological characters of the specimens evaluated in this study correspond to the descriptions of Melo (2003).

***Macrobrachium surinamicum* Holthuis, 1948**

Examined material. Municipality of Santana: Igarapé Fortaleza River (00°02'49.81"S, 51°08'16.78"W), vi.1990, J.C.S. Oliveira, 1 specimen (IEPA 22); idem, (00°02'49.81"S, 51°08'16.78"W), vi.1990, J.C.S. Oliveira, 2 males (IEPA 23); Amazon River, Santana Island (00°05'13.84"S, 51°09'06.98"W), 15.iv.2000, I. M. Vieira, O.A. Alencar and O.M. Costa, 1 female with eggs (IEPA 250); Matapi River (00°00'46.43"S, 51°12'11.61"W), 13 à 14. Iv. 2002, I. M. Vieira, 17 male, 37 females and 2 females with eggs (IEPA 288), Matapi River (00°00'46.43"S, 51°12'11.61"W), 13 à 14. Iv. 2002, I. M. Vieira, 2 male, 1 female and 1 female with eggs (IEPA 292); Matapi River (00°00'46.43"S, 51°12'11.61"W), 13 à 14. Iv. 2002, I. M. Vieira, 16 males, 37 females and 2 female with eggs (IEPA 295); Matapi River (00°00'43.82"S, 51°12'25.97"W), 14. Iv. 2002, I. M. Vieira, 41 males, 113 females and 2 juveniles (IEPA 297); Matapi River (00°00'43.82"S, 51°12'25.97"W), 14. Iv. 2002, I. M. Vieira, 2 females (IEPA 301); Matapi River (00°00'43.82"S, 51°12'25.97"W), 14. iv. 2002, I. M. Vieira, 1 male (IEPA 303); Matapi River (00°00'42.8"S, 51°12'08.4"W), 13.iv.2002, C. S. Gama, 2 females (IEPA 429); Santana Island, Recanto da Aldeia, (00°05'43.40"S, 51°10'23.06"W), 19.ii.2012, A. G. Santiago and E. O. Galeno, 2 males and 1 juveniles (IEPA 1550), Santana Island, (00°04'43.8"S, 51°09'53.7"W), 22.iv.2012, A. G. Santiago and E. O. Galeno, 40 males, 12 females, 1 juvenile and 11 females with eggs (IEPA 1565), Santana Island, Recanto da Aldeia, (00°04'43.8"S, 51°09'53.7"W), 16.vi.2012, A. G. Santiago and E. O. Galeno, 3 males and 3 females (IEPA 1570); Santana Island, Beach Ponte (00°02'318.0"S, 51°05'38.7"W), Santana Island, Beach Ponte (00°02'318.0"S, 51°05'38.7"W), 19.ii.2012, A. G. Santiago and E. O. Galeno, 27 males, 51 females, 10 juveniles and 20 females with eggs (IEPA 1551), Santana Island, Beach Ponte (00°02'318.0"S, 51°05'38.7"W), 21.iv.2012, A. G. Santiago and E. O. Galeno, 35 males, 29 females, 21 spawned females and 39 females with eggs (IEPA 1563), Santana Island, Beach Ponte (00°02'318.0"S, 51°05'38.7"W), 14.viii.2012, A. G. Santiago and E. O. Galeno, 2 females and 20 juveniles (IEPA 1581); Santana Island, Beach Ponte (00°02'318.0"S, 51°05'38.7"W), 27.x.2012, A. G. Santiago and E. O. Galeno, (IEPA 1584), Santana Island, Beach Ponte (00°02'318.0"S, 51°05'38.7"W), 16.xi.2012, A. G. Santiago and E. O. Galeno, 12 males and 8 females (IEPA 1596); Santana Island, Beach Encanto (00°10'58.7"S, 51°44'07.8"W), 20.ii.2012, A. G. Santiago and E. O. Galeno 15 males, 19 females, 11 juveniles and 18 females with eggs (IEPA 1552), Santana Island, Beach Encanto

(00°10'58.7"S, 51°44'07.8"W), 22.iv.2012, A. G. Santiago and E. O. Galeno, 14 males, 23 females, 4 females with eggs (IEPA 1567), Santana Island, Beach Encanto (00°10'58.7"S, 51°44'07.8"W), 14.iv.2012, A. G. Santiago and E. O. Galeno 8 males, 10 females and 4 females with eggs (IEPA 1572); Santana Island, Beach Encanto (00°10'58.7"S, 51°44'07.8"W), 13.viii.2012, A. G. Santiago and E. O. Galeno, 6 males and 14 females (IEPA 1578), Santana Island, Beach Encanto (00°10'58.7"S, 51°44'07.8"W), 16.xi.2012, A. G. Santiago and E. O. Galeno 14 males, 25 females and 20 juveniles (IEPA 1593); Santana Island, Lake Dourado (00°04'32.2"S, 51°09'44.4W), 21.ii.2012, A. G. Santiago and E. O. Galeno 24 males (IEPA 1553), Santana Island, Lake Dourado (00°04'32.2"S, 51°09'44.4W), 16.xi.2012, A. G. Santiago and E. O. Galeno, 1 male (IEPA 1591); Santana Island, Lake Dourado (00°04'32.2"S, 51°09'44.4W), 21.vi.2012, A. G. Santiago and E. O. Galeno 1 male, 4 females and 1 female with eggs (IEPA 1560).—Municipality of Macapá: Archipelago of Bailique (00°52'59.34"N, 50°04'56.51"W), 21 à 16.vi.2000, I. M. Vieira, O.A. Alencar and O.M. Costa, 23 specimens (IEPA 219); Archipelago of Bailique (00°52'37.3"N, 50°08'56.6"W), 23.ix.2000, I. M. Vieira, O.A. Alencar, O.M. Costa and, D. Halboth, 5 specimens (IEPA 227).—Municipality of Porto Grande: açude Km 54, próximo à rodovia AP216 (00°28'60"N, 51°04'59"W), 06.vi.2006, I. M. Vieira, 11 males, 25 females and 10 females with eggs (IEPA 328); Porto Grande beach resort (00°42'20.92"N, 51°24'49.83"W), 04.vi.2002, I. M. Vieira, O.A. Alencar and O.M. Costa, 3 males, 2 females (IEPA 341).—Municipality of Amapá: Stream Piratuba, Sucuriju River (01°40'23.9"N, 49°54'56.7"W), 27.vii.2002, I. M. Vieira, 1 male (IEPA 460); Sucuriju River (01°41'35.0"N, 50°00'30.6"W), v.2004, I. M. Vieira 4 females (IEPA 581); Beach of Mouth of Sucuriju River (01°40'17.01"N, 49°55'06.6"W), 19.vii.2002, I. M. Vieira and O.M. Costa, 1 male and 3 females with eggs (IEPA 636); Sucuriju River (01°41'35.0"N, 50°00'30.6"W), 02.v.2004, I. M. Vieira, 5 specimens (IEPA 747); Flexal River (1°43'44.48" N, 50°58'05.48W), 22.x.2004, I. M. Vieira, 90 males, 37 females and 52 females with eggs (IEPA 1221); Stream Piratuba, Sucuriju River (1°40'26"N, 49°55' 3"W), 27.vi.2002, I. M. Vieira, 27 males, 24 females and 8 females with eggs (IEPA 1310); Farm Santa Rosa, Araguari River (0°28'39.41"N, 50°12'18.27"W), 20.vi.2006, I. M. Vieira and E. Gama, 1 specimen (IEPA 1355) (01°19'59.5"N, 50°14'57.4"W), 29.iv.2004, I. M. Vieira and C. S. Gama, 3 females with eggs (IEPA 1402); Biological Reserve of Piratuba, stream (01°20'31.1"N, 50°18'20"W), 24.iv.2004, I. M. Vieira and C. S. Gama, 2 specimens (IEPA 1403); Biological Reserve of Piratuba Lake, alligator stream (01°20'29.8"N, 50°14'41.6"W), 29.iv.2004, I. M. Vieira and C. S. Gama, 1 male and 3 females (IEPA 1408).—Municipality of Cutias, Farm Santa Isabel (01°09'02.5"N, 50°19'55.4"W), 28.iv.2004, I. M. Vieira and C. S. Gama, 90 males, 37 females, 52 females with eggs (IEPA 498); Retiro Santa Margarida (01°09'50.3"N, 50°15'56.7"W), 29.x.2004, I. M. Vieira, 5 males, 8 females and 10 females with eggs (IEPA 553); Bom Jesus do Tabaco (01°19'23"N, 50°16'23"W), v.2004, I. M. Vieira, 50 males, 32 females and 75 females with eggs (IEPA 595); Tabaco (01°26'10,3" N, 50°34'22,7" W), 25.iv.2004, I. M. Vieira, 23 specimens (IEPA 750); Tabaco (01°26'10,3" N, 50°34'22,7" W), 26.iv.2004, I. M. Vieira, 1 specimen (IEPA 757); Tabaco (01°19'23" N, 50°16'23" W), 25.iv.2004, I. M. Vieira, 50 males, 32 females and 75 females with eggs (IEPA 830); Tabaco (01°19'23"N, 50°16'23" W), 28.iv.2004, I. M. Vieira, 1 female (IEPA 1300); Stream of Costa (01°19'26.6"N, 50°16'13.4"W), 26.iv.2004, I. M. Vieira, C. S. Gama, A. Flexa, 37 males, 22 females and 20 females with eggs (IEPA 633), Stream of Costa (01°19'26.6"N, 50°16'13.4"W), 26.iv.2004, I. M. Vieira, 78 specimens (IEPA 759); Farm Santa Cruz (01°20'03.1"N, 50°15'40.1"W), 29.iv.2004, I. M. Vieira, 12 specimens (IEPA 738); Farm Santa Cruz (01°20'03.1"N, 50°15'40.1"W), 29.iv.2004, I. M. Vieira, 4 specimens (IEPA 742); stream (01°19'59.5"N, 50°14'57.5"W), 26.iv.2004, I. M. Vieira 3 specimens (IEPA 748); Canal de maré (01°09'18.8"N, 50°26'59.3"W), 28.iv.2004, I. M. Vieira 2 males and 1 female (IEPA 755);—Municipality of Laranjal do Jari: Jari River (00°38'02.5"S, 52°00'29.2"W), 27.iv.2007, I. M. Vieira, 1 specimen (IEPA 1184), Cachoeira de Santo Antônio (0°38'45,44"S, 52°30'26,73"W) 03.xii.2009, I. M. Vieira and E. F. Araújo, 26 juveniles (IEPA 1373); Jari River (00°51'36,20"S, 52°32'18,11"W), 15.vii.2008, I. M. Vieira and J. E. M. Wanzeler, 1 specimen (IEPA 1205); Jari River (00°51'26.86"S, 52°32'14.05"W), 09.iv.2009, I. M. Vieira and J. E. M. Wanzeler, 15 females with eggs (IEPA 1240); Jari River (00°51'31.64"S, 52°32'10.29"W), 02 à 14.xii.2009, I. M. Vieira and E. F. Araújo, 19 specimens (IEPA 1309); Jari River, Riacho Doce (0°50'02,00"S, 52°32'33,05"W), 26.x.2007, I. M. Vieira and D. C. C. Vieira, 5 males (IEPA 1367); Jari River, Riacho Doce (0°50'03,33"S, 52°32'33,16"W), 03.xii.2009, I. M. Vieira and E. F. Araújo, 14 specimens (IEPA 1376), Jari River, Riacho Doce (0°50'03,33"S, 52°32'33,16"W), 17.vi.2010, I. M. Vieira and E. F. Araújo, 1 female (IEPA 1396); Jari River, left margin (00°49'26,13"S 52°31'27,50"W), 17.vi.2010, I. M. Vieira and E. F. Araújo, 3 males (IEPA 1389); Jari River, left margin (0°51'41"S, 52°31'51"W), 17.vi.2010, I. M. Vieira and E. F. Araújo, 2 female and 6 females with eggs (IEPA 1400); Jari River (00°50'09.09"S, 52°32'19.37"W), 02.xii.2009, I. M. Vieira and C. S. Gama 105 specimens (IEPA 1371); Jari River (0°50'44"S, 52°32'53"W),

02.xii.2009, I. M. Vieira and E. F. Araújo, 27 juveniles (IEPA 1383); Jari River (0°51'49"S, 52°31'28"W), 04.xii.2009, I. M. Vieira and E. F. Araújo 17 specimens (IEPA 1384); Waterfall of Santo Antônio, Jari Jari (00°38'41.63"S 52°30'27.61"W), 17.vi.2010, I. M. Vieira and E. F. Araújo, 38 males, 9 females and 43 females with eggs (IEPA 1385); Jari River (00°51'45"S, 52°31'27"W), 16.vi.2010, I. M. Vieira and E. F. Araújo 2 females with eggs (IEPA 1414);—Municipality of Calçoene: Beach of Goiabal (02°37'28.51"N, 50°51'03.3"W), 20.vi.2006, I. M. Vieira, 7 specimens (IEPA 1361). Municipality of Ferreira Gomes: Araguari River (0°51'33.51" N, 51°11'47.01" W), 31.v.2011, I. M. Vieira, 126 males, 215 females and 202 females with eggs (IEPA 1744); Araguari River (0°51'33,21" N 51°11'47,01" W), 16.vi.2011, I. M. Vieira 56 males, 101 females, 194 females with eggs and 6 juveniles (IEPA 1752), Araguari River (0°51'33,21"N 51°11'47,01"W), 16.vi.2011, I. M. Vieira, 1 male and 1 female (IEPA 1753), Araguari River (0°51'33,21"N, 51°11'47,01"W), 15.vi.2011, I. M., 47 males, 78 females, 71 females with eggs and 175 juveniles (IEPA 1757), Araguari River (0°51'33.51"N, 51°11'47.01"W), 31.v.2011, I. M. Vieira, 120 males, 317 females, 7 females with eggs and 595 juveniles (IEPA 1764); Araguari River, near Coaracy Nunes Hydroelectric Power Plant (0°53'55.56"N, 51°15'16.92"W), 24.ii.2012, I. M. Vieira; A. G. Santiago; E. O. Galeno and K. J. G. Corrêa, 1 male and 1 female (IEPA 1791); Rio Amapá Grande, Cachoeira Grande, 26.viii.1992, no information (INPA-CRU 001075) (Figure 4).

Geographic distribution. Venezuela, Colombia, Suriname, Guyanas, French Guyanas and Brazil (states of Amapá and Pará) (Holthuis 1952; Melo 2003; Pileggi *et al.* 2013; Pimentel & Magalhães 2014).

Distribution in Amapá state. Basins of the rivers Amazon, Sucuriçu, Davi, Anotáí, Araguari and Jari

Previous records. Melo (2003); Pimentel & Magalhães (2014).

Ecological notes. This species is caught in the *Macrobrachium amazonicum* fishery and inhabits rivers with clear and white waters.

Remarks. The morphological characters of the specimens evaluated in this study correspond to the descriptions of Holthuis (1952); Melo (2003); Pimentel & Magalhães (2014).

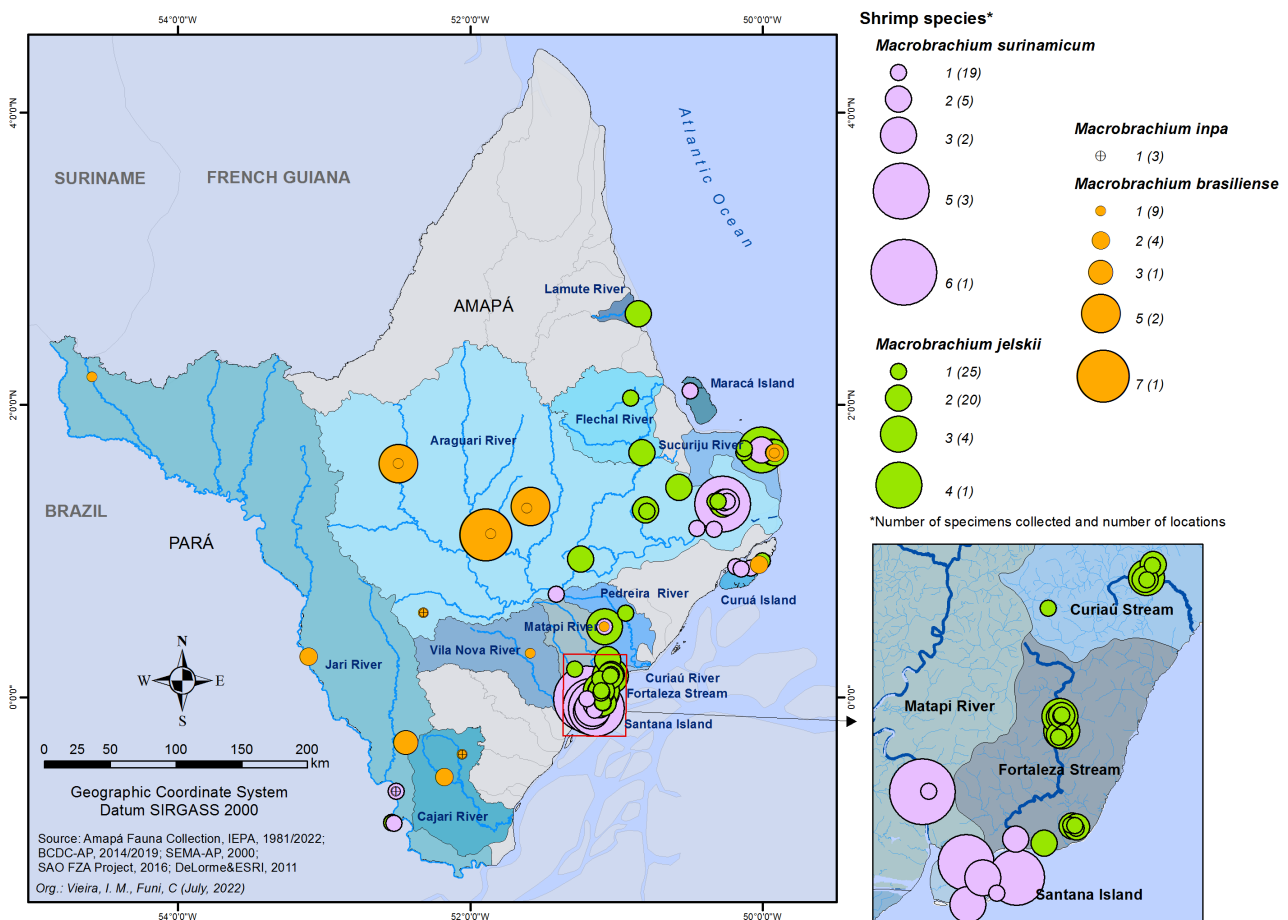


FIGURE 4. Geographic distribution map of *Macrobrachium brasiliense* (Heller, 1862); *M. inpa* Kensley & Walker, 1982; *M. jelskii* (Miers, 1817) and *M. surinamicum* (Hothuis, 1946) from the state of Amapá, in eastern Brazilian Amazon region.

Nematopalaemon schmitti (Holthius, 1950)

Examined material. Municipality of Amapá: Ecological Station of Maracá-Jipioca, Stream Inferno (02°05'47.8"N, 50°29'51.62"W), 25.xi.1995, J.Cardoso and H.P. Belo, 2 males, 18 females (IEPA 59); Stream Inferno (02°05'47.8"N, 50°29'51.62"W), 26.xi.1995, J.Cardoso and H.P. Belo, 34 males, 110 females and 19 females with eggs (IEPA 60); Stream Inferno (02°05'47.8"N, 50°29'51.62"W), 29.xi.1995, I.M. Vieira, 50 males 179 females and 19 females with eggs (IEPA 61); (02°05'47.8"N, 50°29'51.62"W), 26.xi.1995, J.Cardoso, H.P. Belo and I.M. Vieira, 2 males and 4 females (IEPA 84); District of Sucuriju, Stream Piratuba (01°40'17.0"N, 49°55'00.06"W), 26.ix.1996, O.M. Costa, I.M. Vieira and H.P. Belo, 5 males (IEPA 114); Stream Piratuba (01°40'17.0"N, 49°55'00.06"W), xi.1996, O.M. Costa and H.P. Belo, 5 males and 3 females (IEPA 118); Sucuriju River (01°40'35.7"N, 49°55'53.92W), ix.1997, O.M. Costa and H.P. BELO, 2 males and 21 females (IEPA 143), x.1997, O.M. Costa and H.P. BELO, 2 females (IEPA148); (01°40'35.7"N, 49°55'53.92W), iii.1998, I.M. Vieira, O.M. Costa and A.C. Souza, 1 male (IEPA 163); Sucuriju River (01°40'23.9"N, 49°54'56.7W), 22.vii.2002, I.M. Vieira and O.M. Costa, 1 male and 13 females (IEPA 367); Sucuriju River (01°40'23.9"N, 49°54'56.7W), 27.ii.2004, I.M. Vieira, 3 males and 5 females (IEPA 493) (Figure 2).

Geographic distribution. Venezuela, Suriname, French Guyana and Brazil (states of Amapá, Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina and Rio Grande do Sul) (Cervigon *et al.* 1992); Ferreira *et al.* 2010; (Rodriguez 1982); Delgado *et al.* 1997.

Distribution in Amapá state. Estuary of the Sucuriju river and Maracá-Jipioca island.

Previous records. Ferreira *et al.* (2010)

Ecological notes. Inhabits marine and estuarine environments, with muddy and/or sandy bottoms, from 5 to 75 m in depth (Cervigon *et al.* 1992).

Remarks. The species is caught in industrial trawl fisheries or with manual nets, and it has economic importance to Guyana, French Guiana and Suriname (Cervigon *et al.* 1992)

Palaemon carteri (Gordon, 1935)

Examined material. Municipality of Macapá: Curiaú River Environmental Protection Area (APA do Curiaú) (00°09'23.8"N, 51°02'09.5"W), 4.v.2002, I.M. Vieira, 16 males and 11 females (IEPA 323); *idem*, 25.viii.2002, O.A. Alencar and A.C.R. de Araújo, 3 males, 3 females, 2 juveniles (IEPA 372); *idem*, Curralinho (00°07'26.74"N, 51°04'59"W), 22.ii.2002, I.M. Vieira and O.A. Alencar, 44 juveniles and 8 females with eggs (IEPA 343); Curiaú balnearny (00°08'43.2"N, 51°02'31.9"W), 19.viii.2002, O.A. Alencar and A.C.R. de Araújo, 1 male, 2 females, 9 juveniles and 5 females with eggs (IEPA 371); *idem*, (00°08'43.83"N, 51°02'31.44"W), 31.viii.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 4 males and 1 female (IEPA 461); (00°09'21.7"N, 51°02'12.9"W), 25.vii.2002, I.M. Vieira, O.A. Alencar and A.C.R. de Araújo, 14 males, 23 females and 5 females with eggs (IEPA 378); (00°08'48.2"N, 51°02'27.4"W), 26.vii.2002, I.M. Vieira, O.A. Alencar and A.C.R. de Araújo, 5 juveniles (IEPA 382); *idem*, 14 males, 35 females, 1 juvenile and 1 female with eggs (IEPA 414); *idem*, 25 females and 10 females with eggs (IEPA 421); *idem*, (00°09'23.8" N, 51°02'09.5"W), 25.viii.2002, I.M. Vieira, 136 specimens (IEPA 455); (00°08'48"N, 51°02'27.4"W), 26.vii.2002, I.M. Vieira, 2 male and 11 female (IEPA458); *idem*, 8.ii.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 26 females and 15 females with eggs (IEPA 480); Wetland Tacacá (00°02'15.9"S, 51°05'44.2"W), 18.vii.2002, O.A. Alencar, D. Filocreão and A.C.R. de Araújo, 56 specimens (IEPA 385); *idem*, (00°02'14.08"S, 51°05'46.7"W), 18.vii.2002, O.A. Alencar, D. Filocreão and A.C.R. de Araújo, 13 juveniles and 3 females with eggs (IEPA 390); *idem* (00°02'14.7"S, 51°05'47.7"W), 1 female (IEPA 395); *idem* (00°02'17.3"S, 51°05'34.7"W), 18.vii.2002, O.A. Alencar, D. Filocreão and A.C.R. de Araújo, 1 male and 1 female (IEPA399); *idem* (00°02'24.82"S, 51°05'34.52"W), 1 female (IEPA 401); stream Aterro, (00°15'29"N 51°03'39"W), 05.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 19 males and 100 females (IEPA 478); Lagoon of Índios (00°21'41.9"N, 51°06'15.5"W), 23.vii.2002, D. Filocreão, A.C.R. de Araújo, and O.T.C. Arnaud, 1 female (IEPA 406); *idem* (00°02'37.6"N, 51°06'15.5"W), 2 males, 7 females, 1 juvenile and 1 female with eggs (IEPA 412); *idem* (00°02'37.4"N, 51°06'19.0"W), 22.v.2004, A.C.R. de Araújo, I.M. Vieira and O.T.C. Arnaud, 3 males and 9 females (IEPA 512); *idem*, 2 males, 1 female and 1 juvenile (IEPA 513); *idem* (00°01'48.4"N, 51°06'20.3"W), 22.v.2004,

A.C.R. de Araújo, I.M. Vieira and O.T.C. Arnaud, 3 males, 10 females and 2 juveniles (IEPA 516); idem, 19.vi.2004, A.C.R. de Araújo and O.T.C. Arnaud, 18 females (IEPA 544); idem, 23. 2004, O.T.C. Arnaud, 4 males, 3 females, 3 juvenile and 2 females with eggs (IEPA 550); idem (00°02'38.4"N, 51°06'18.0"W), 22.v.2004, A.C.R. de Araújo, I.M. Vieira and O.T.C. Arnaud, 2 males and 6 females (IEPA 532); idem (00°01'55.3"N, 51°06'07.2"W), 22.v.2004, A.C.R. de Araújo, I.M. Vieira, O.T.C. Arnaud and F.J.S. Costa, 1 male, 2 females and 1 juvenile, (IEPA 536); idem (00°02'38.4"N, 51°06'18.0"W), 19.vi.2004, A.C.R. de Araújo and O.T.C. Arnaud, 9 males, 20 females, 2 juveniles and 2 females with eggs (IEPA 538); idem (00°01'55.3"N, 51°06'07.2"W), 23.vii.2004, O.T.C. Arnaud, 3 males and 7 females (IEPA 590); idem, 4 females (IEPA 593); idem, (00°01'45.1"N, 51°06'20.1"W), 19.vi.2004, A.C.R. de Araújo and O.T.C. Arnaud, 4 males, 1 female, 2 females with eggs and 1 juvenile (IEPA 594); idem, (00°02'40.4"N, 51°06'14.6"W), 19.vi.2004, A.C.R. de Araújo and O.T.C. Arnaud, 5 specimens (IEPA 604); idem, (00°01'42.8"N, 51°06'22.4"W), 23.vii.2004, O.T.C. Arnaud, 1 female and 1 juvenile (IEPA 611); idem (00°02'37.4"N, 51°06'20.3"W), 22.vii.2004, A.C.R. de Araújo and O.T.C. Arnaud, 3 males and 9 females (IEPA 626); idem (00°01'42.8"N, 51°06'20.1"W), 19.vi.2004, A.C.R. de Araújo and O.T.C. Arnaud, 2 males and 2 females (IEPA 629); stream in gallery forest, (00°14'51"N, 51°02'33"W), 05.iii.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 2 females (IEPA 1284).—Municipality of Ferreira Gomes: ponte do Capivara, Pedreira River (0°34'16,78"N, 50°59'54,76"W), 5.vi.2002, I.M. Vieira, O.A. Alencar e O.M. Costa, 28 specimens (IEPA 439); stream (00°59'31.8"N, 51°12'14.8"W), 4.ix.2002, I.M. Vieira, 1 male (IEPA 584); stream Aterro, (00°15'29"N, 51°03'39"W), 5.v.2002, I.M. Vieira, 11 specimens (IEPA 771); Floresta Nacional do Amapá, Stream Santo Antônio, Waterfall Arrependido (1°07'07"N, 51°51'36"W), 6.iii.2005, I.M. Vieira and D.C.C. Vieira, 1 male and 7 females (IEPA 801); Stream Santo Antônio (01°06'37"N, 51°53'37"W), 5.iii.2005, I.M. Vieira and D.C.C. Vieira, 8 specimens (IEPA 808); stream Santo Antônio (01°06'37"N, 51°53'37"W), 10.iii.2005, I.M. Vieira and D.C.C. Vieira, 2 males (IEPA 854); 13.iii.2005, I.M. Vieira and D.C.C. Vieira, 6 males and 4 females (IEPA 857); Reserva Particular do Patrimônio Natural Seringal Triunfo, swamp in açazal (00°56'49.20"N, 51°14'49.71"W), 31.i.2006, M. Vieira and D.C.C. Vieira, 47 males, 22 females and 18 females with eggs (IEPA 1662); Private Reserve of Natural Heritage, stream in gallery forest (1°00'59"N, 51°13'03"W), 27.i.2006, I. M. Vieira and D.C.C. Vieira, 11 males, 7 females and 12 females with eggs (IEPA 1666); Private Reserve of Natural Heritage, stream in gallery forest (1°01'34"N, 51°13'49"W), 29.i.2006, I. M. Vieira and D.C.C. Vieira, 6 males, 8 females and 3 females with eggs (IEPA 1673); Private Reserve of Natural Heritage (0°59'29"N, 51°12'18"W), 01.ii.2006, I. M. Vieira and D.C.C. Vieira, 6 males, 4 females and 4 females with eggs (IEPA 1675); 1 male (IEPA 1679); 7 males and 12 females with eggs (IEPA 1680); Private Reserve of Natural Heritage (0°57'04"N, 51°14'56"W), 30.i.2006, I.M. Vieira and D.C.C. Vieira, 33 males, 73 females and 15 females with eggs (IEPA 1682).—Municipality of Laranjal do Jari: Stream Riacho Doce (00°50'02,61"S, 52°32'34,65"W), 25.x.2007, I.M. Vieira, 136 specimens (IEPA 1166); Jari River (PBA P12), 29.x.2007, I. M. Vieira, 271 specimens (IEPA 1175); tributary stream of the river Jari (0°51'10"S 52°32'59"W), 27.x.2007, I. M. Vieira 17 specimens (IEPA 1183); Jari River (0°50'44"S, 52°32'53"W), 27.x.2007, I.M. Vieira, 35 specimens (IEPA 1185); Stream Riacho Doce (00°47'54.85"S, 52°31'49.65"W), 26.x.2007, I.M. Vieira, 2 specimens (IEPA 1176); idem, 2.ix.2009, I.M. Vieira, 12 males and 28 females (IEPA 1460); Jari River (00°45'02"S 52°30'27"W), 26.x.2007, I.M.Vieira, 195 specimens (IEPA 1181); idem, Jari River, 02.xii.2009, I.M. Vieira and E.F. Araújo, 44 males and 77 females (IEPA 1377); Jari River (00°51'36.20"S, 52°32'18.11"W), 15.vii.2008, F. J. S. Costa and E. F. Araujo 3 specimens (IEPA 1203) Jari River (00°38'02.5"S, 52°00'29.2"W), 04.ix.2009, I. M. Vieira, 4 males and 92 females (IEPA 1250); Jari River, beach (0°51'38"S 52°32'09"W), 02.ix.2009, I. M. Veira 1 female (IEPA 1252); Jari River (0°51'01"S, 52°32'55"W), 04.ix.2009, I. M. Vieira 24 females (IEPA 1253); idem, (0°51'17"S, 52°32'53"W), 27.x.2007, I.M. Vieira and D.C.C. Vieira, 1 male (IEPA 1368); stream (0°50'07"S, 52°32'35"W), 17.vi.2010, I.M. Vieira and E.F. Araújo, 1 male and 1 female (IEPA 1417); stream (0°51'10"S, 52°33'02"W), 17.vi.2010, I.M. Vieira and E.F. Araújo, 4 males and 5 females (IEPA 1422); idem, 1 male (IEPA 1475); Jari River, (0°51'45"S, 52°31'27"W), 26.x.2007, I.M. Vieira, 1 female (IEPA 1453); Jari River (0°51'17"S, 52°32'53"W), 27.X.2010, I.M. Vieira, 3 males (IEPA 1458); Jari River (0°51'49"S, 52°31'28"W), 27.10. 2007, I.M. Vieira, 15 specimens (IEPA 1465); stream Serra Pelada (0°40'33.89"S, 52°30'48.22"W), 17.vii.2008, I.M. Vieira, 28 males and 1 female (IEPA 1476); left margin of the Jari River (0°51'26.75"S, 52°32'10.88"W), 17.vii.2007, I.M. Vieira, 1 specimen (IEPA 1477); island in the Jari River (0°50'07"S, 52°32'11"W), 18.vii.2008, I.M. Vieira, 1 male and 2 females (IEPA 1480); left margin of the Jari River (00°47'54.85"S, 52°31'49.65"W), 7.ix.2009, I.M. Vieira and E.F. Araújo, 2 males and 15 females (IEPA 1381); Reserva Extrativista do rio Cajari, Stream Sororoca, BR 156, savanna (00°20'09.8"S, 51°54'22.6"W), 12.vii.2013, I.M. Vieira and K.J.G.Corrêa, 1 male, 4 females and 1 female

with eggs (IEPA 1636); Waterfall of Santo Antônio, rio Jari (0°38'42.47"S, 52°30'27.95"W), 4.xii.2009, I.M. Vieira, 56 specimens (IEPA 1242).—Municipality of Porto Grande: açude na área 36 da Amapá Florestal e Celulose S.A (AMCEL), Tessalônica (00°28'60"N, 51°04'59"W), 6.vi.2002, I.M. Vieira, 6 male, 12 females, 13 juveniles and 2 females with eggs IEPA 331); stream near to fish farm of the AMCEL, (00°42'40"N, 51°23'32"W), 7.vii.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 3 males, 2 males and 3 juveniles (IEPA 352).—Municipality of Tartarugalzinho: Euzébio River, Farm São Bento, (01°15'45"N, 50°48'24"W), 11.vii.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 2 males, 6 females and 1 female with eggs (IEPA 384); idem, (01°51'95"N, 50°48'24"W), 6.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 1 female (IEPA 1082); Farm São Bento (01°16'54"N, 50°48'04"W), 11.vii.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 2 males (IEPA 565); idem (01°16'54"N, 50°48'04"W), 6.vi.2002, I.M. Vieira, O.A. Alencar and O.M. Costa, 1 male (IEPA 566). Municipality of Amapá: stream in gallery forest, savana, (02°00'24.1"N, 50°55'57.9"W), 8 males, 11 females and 6 juveniles (IEPA355); estuary of Sucuriju River (01°40'23.9"N, 49°54'56.7"W), 27.vii.2002, I.M. Vieira, 4 male and 1 female (IEPA 459); idem, 22.vii.2002, I.M. Vieira, 16 specimens (IEPA 485).—Municipality of Cutias: Araguari River, cove with colonization of aquatic macrophytes (01°26'10.3"N, 50°34'22.7"W), 25.iv.2004, I.M. Vieira, 4 males, 3 females and 2 females with eggs (IEPA 576).—Municipality of Pracuúba: Pracuúba Lake (01°40'27"N, 50°49'32"W), 22. x.2004, I.M. Vieira, 3 males and 6 females (IEPA 728); idem, 2 males and five females (IEPA 729); idem, 21.x.2004, I.M. Vieira, 49 specimens (IEPA 732) (Figure 5).

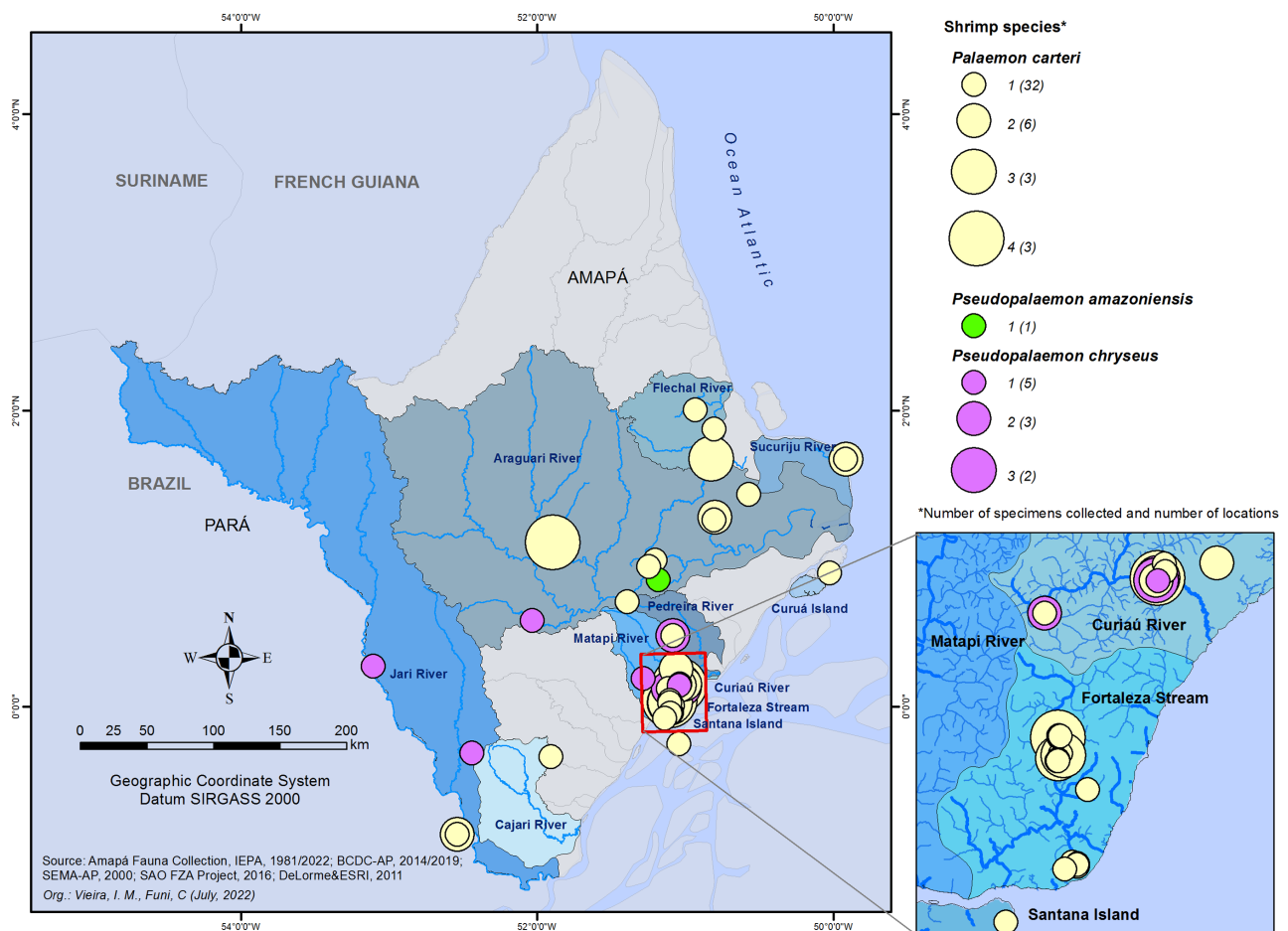


FIGURE 5. Geographic distribution map of *Palaemon carteri* (Gordon, 1935); *Pseudopalaemon amazonensis* Ramos-Porto, 1979; *Pseudopalaemon chryseus* Kensley & Walker, 1982 from the state of Amapá, in eastern Brazilian Amazon region.

Geographic distribution. Venezuela, Colombia, Suriname, Guyana, French Guyana and Brazil (states of Amapá, Amazonas and Pará) (Holthuis 1952; Melo 2003; Pileggi *et al.* 2013; Pimentel & Magalhães 2014).

Distribution in Amapá state. Basins of the rivers Curiaú, Rio Santo Antônio, Igarapé Sororoca (basin of the Cajari River), Sucuriju, Araguari, Amazon, and Lagon of Índios and Lake Pracuúba.

Previous records. Melo (2003); Pileggi *et al.* (2013); Pimentel & Magalhães (2014).

Ecological notes. The species is found in low hydrodynamic environments, along with leaf litter, macrophytes and marginal vegetation (Carvalho 2014). The eggs are big and few (Melo 2003).

Remarks. The morphological characters of the specimens evaluated in this study correspond to the descriptions of (Holthuis (1952); Melo (2003); Pimentel & Magalhães (2014).

Pseudopalaemon amazonensis Ramos-Porto, 1979

Examined material. Municipality of Ferreira Gomes: Araguari River (00°51'34.23"N, 51°10'58.10"W), 2 males, 5 females and 3 females with eggs (IEPA 1627) (Figure 5)

Geographic distribution. Colombia, Venezuela and Brazil (states of Amazonas and Pará) and (Kensley & Walker 1982; Melo 2003; Valencia & Campos 2010, Pereira, 1991; Pereira *et al.* (2010; Pimentel & Magalhães, 2014).

Distribution in Amapá state. Araguari River.

Previous records. This paper

Ecological notes. The species generally lives in open water with sandy substrate, occurring from small rivers to small streams and seasonal streams (Sakihara *et al.*, 2013).

Remarks. the specimens presented here match the descriptions of Kensley & Walker (1982); Melo (2003) and Pimentel & Magalhães (2014).

Pseudopalaemon chryseus Kensley & Walker, 1982

Examined material. Municipality of Macapá: Maruanum River, ripary vegetation (00°11'30.67"N, 51°17'05.65"W), 3.iv.2002, cols. I.M. Vieira and O.M. Costa, 1 female and 1 female with eggs (IEPA 321); Environmental Protection Area of the Curiaú River (APA do Rio Curiaú), Curralinho (00°07'26.74"N, 51°06'50.18"W), 08.vi.2002, cols. I.M. Vieira, O.A. Alencar and O.M. Costa, 1 male and 2 females (IEPA335); Curralinho, in aquatic macrophytes (00°07'26.74"N, 51°06'50.18"W), 22.ii.2002, cols. I.M. Vieira, O.A. Alencar and O.M. Costa, 9 males and 22 females (IEPA345); idem, Curiaú River (00°08'43.2"N, 51°02'31.9"W), 25.ii.2002, cols. O.A. Alencar, D. Filocreão and O.T. Arnaud, 1 male and 1 female (IEPA368); idem (00°08'43.2"N, 51°02'31.9"W), 19.viii.2002, cols. O.A. Alencar, D. Filocreão and O.T. Arnaud, 2 males and 3 females (IEPA369); idem (00°08'48.2"N, 51°02'27.4"W), 26.vii.2002, cols. O.A. Alencar, D. Filocreão and O.T. Arnaud, 3 males and 8 females (IEPA381); idem (00°08'48.2"N, 51°02'27.4"W), 3 males (IEPA415); idem (00°08'48.2"N, 51°02'27.4"W), 26.vii.2002, colls. O.A. Alencar, D. Filocreão and O.T. Arnaud, 1 female with eggs (IEPA419); balneary of the APA of the Curiaú River (00°08'43.83"N, 51°02'31.44"W), 31.viii.2002, colls. I.M. Vieira, 2 females (IEPA464); APA do Rio Curiaú (00°08'44.16"N, 51°02'32.77"W), 25.ix.2002, colls. I.M. Vieira, O.A. Alencar and O.M. Costa, 1 males (IEPA 475);—Municipality of Macapá: Stream of Amapá Florestal and Celulose S.A (AMCEL), savana (00°15'29"N, 51°03'39"W), 7 specimens (IEPA770). Municipality of Porto Grande: stream near to embankment, in area of plantation of Amapá Florestal e Celulose S.A, savana (00°15'29"N, 51°03'39"W), 5.vi.2002, cols. I.M. Vieira, O.A. Alencar and O.M. Costa, 3 males and 4 females (IEPA 340); dam in area 36 of AMCEL, savana (00°28'60"N, 51°04'59"W), 06.vi.2002, cols. I.M. Vieira, O.A. Alencar and O.M. Costa, 1 male and 1 female (IEPA350); idem (00°28'60"N, 51°04'59"W), 1 female (IEPA 634).—Municipality of Porto Grande: Pedreira River with the BR156 (00°42'13"N, 51°21'59"W), 07.VI.2002, col. I.M. Vieira, 35 males, 43 females and 21 females with eggs (IEPA826).—Municipality of Laranjal do Jari: Sustainable Development Reserve of Iratapuru River, Jari River (00°16'35.21"N, 53°06'24.48"W), 11.xi.2004, col. I.M. Vieira, 4 males and 6 females (IEPA568). Municipality of Pedra Branca: Sustainable Development Reserve of Iratapuru River, Cupixi River (00°35'07"N, 52°02'01.07"W), 2.viii.2005, cols. I.M. Vieira and D.C.C. Vieira, 1 juvenile (IEPA 915); National Park of Tumucumaque Mountains, streams that are tributaries of Anacuí River (01°50'41,29"N, 52°44'28.65"W), 9.iii.2006, cols. I.M. Vieira and D.C.C. Vieira, 9 males, 1 females and 2 females with eggs (IEPA 1159). Municipality of Laranjal do Jari: left bank of the Jari River (00°45'18.55"S, 52°30'13.16"W), 8.iv.2008, I.M. Vieira and D.C.C. Vieira, 3 specimens (IEPA 1369); island on the right margin of the Jari River, (00°47'54,85"S, 52°31'49,65"W), 4.xii.2009, I.M. Vieira and E.F. Araújo, 31 specimens (IEPA 1380) roda Macapá, Stream Parana, no information, 20.vii.1991, (INPA-CRU 001215) (Figure 1).

Geographic distribution. Brazil (states of Amapá, Amazonas and Pará) and Colombia (Magalhães & Pereira 2007; Pileggi *et al.* 2013; Pimentel & Magalhães 2014; Valencia & Campos 2010a; Vieira 2003, 2008).

Distribution in Amapá state. Maruanum River, Curiaú River, Curralinho, stream of ripary florest in savanas regions, Pedreira River Jari River, Cupixi River and Anacuí River.

Previous records. Pileggi *et al.* (2013); Pimentel & Magalhães (2014); Vieira (2003, 2008).

Ecological notes. Species found in aquatic macrophytes, and in streams of clear, transparent water.

Remarks. The specimens found here are morphologically similar to descriptions of Kensley & Walker (1982); Melo (2003) and Pimentel & Magalhães (2014).

***Leander tenuicornis* (Say, 1818 [in Say, 1817-1818])**

Examined material. Municipality of Calçoene: Mouth of Cassiporé River, State of Amapá (03°52'53,40"N, 51°08'36,03"W), 1 male and 1 female (IEPA1625) (Figure 2).

Geographic distribution. Western Atlantic Ocean - Canada, USA (Massachusetts, Virginia, Carolina, Florida, Louisiana and Texas), Bermudas, Mexico, Panama, Bahamas, Cuba, Jamaica, Porto Rico, Island Virginia, Colombia, Venezuela, Brazil (states of Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco [Atol das Rocas], Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro and São Paulo), Malvinas Islands. Eastern Atlantic Ocean: Azores archipelago, Portugal. Mediterranean- Spain, France, Italy and Libya. Pacific and Indian Ocean - Red Sea, India, Japan, Papua New Guinea, Australia and New Zealand (Ferreira *et al.* 2010; Herrera-Barquín *et al.* 2018; Ramos-Porto 1985).

Distribution in Amapá state. Estuary of the Cassiporé River.

Previous records. present study

Ecological notes. Species found in shallow waters, up to 72 m deep, on gravel, sandy bottoms with algae meadows and/or phanerogams (Ramos-Porto 1985). In the Cassiporé River estuary, it was found in mangrove areas and river with very mud.

Remarks. *Leander tenuicornis* presents sexual dimorphism in relation to the shape of the face, in the female the rostrum is wider in the ventral part (Ferreira *et al.* 2010).

Superfamília Sergestoidea Dana, 1852

Família Sergestidae Dana, 1852

Gênero *Acetes* Milne-Edwards, 1830

***Acetes marinus* Omori, 1975**

Examined material. Municipality of Amapá: estuary of Sucuriju River (01°40'27.36"N, 49°55'42.32"W), 28.iv.2004, cols. I.M. Vieira and C.S. Gama, 1 female (IEPA 832); Mouth of Sucuriju River (01°40'09.73"N, 49°55'04.95"W), 23.vii.2002, col. I.M. Vieira, 1 specimens (IEPA 1738)—Municipality of Mazagão: Lower Cajari River (00°51'20.9"S, 51°43'41"W), 26.v.2014, cols. A.G.Santiago, 2 specimens (IEPA 1620). Municipality of Oiapoque: Mouth of Oiapoque River (04°04'25.71"N, 51°38'35.31"W), 22.viii.2003, cols. I.M. Vieira, A.G.Santiago and E.O.Galeno, 1 specimens (IEPA 1621) (Figure 2).

Geographic distribution. Guyana, Suriname French Guyana and Brazil (state Amapá, Pará and Tocantins) (Melo 2003; Omori 1975; D'incao 1998; D'incao & Martins 2000; Pimentel & Magalhães 2014).

Distribution in Amapá state. In the estuary of the rivers Sucuriju and Oiapoque and lower Cajari River.

Previous records. Melo (2003); Pimentel & Magalhães (2014).

Ecological notes. This species inhabits slightly brackish waters (Omori 1975).

Remarks. In general, *A. marinus* resembles *A. paraguayensis*, but differs from it by the absence of a large tooth on the thigh of the third pereopod in females and males. (Omori 1975).

Acetes paraguayensis Hansen, 1919

Material examined. Araguari River, biological reserve lake Piratuba, 16viii.1992, C. Magalhães (INPA-CRU 000750).

Geographic distribution. Venezuela, Suriname, Peru, Paraguay, Argentina and Brazil (states of the Amapá, Amazonas, Pará, Goiás, Minas Gerais, Mato Grosso do Sul and Paraná (Melo 2003)

Distribution in Amapá state. Araguari River.

Previous records. Melo (2003)

Ecological notes. The only species of the genus that occurs only in fresh water (Melo 2003)

Remarks. it is part of the list of species originating in Amapá, listed in the INPA's Crustacean collection, provided by Dr. Celio Magalhaes.

Infraorder Penaeidea Rafinesque, 1815

Superfamily Penaeoidea Rafinesque, 1815

Family Penaeidae Rafinesque, 1815

Genus *Xiphopenaeus* Smith, 1869

Xiphopenaeus kroyeri (Heller, 1862)

Examined material. Municipality of Amapá: Sucuriju River (01°40'35.7"N, 49°55'53.92W), iii.1998, cols. I.M. Vieira, O.M.Costa and A.C.Souza, 2 males and 1 female (IEPA162); collection in tidal pools in the Sucuriju River estuary (01°40'23.9"N, 49°54'56.7W), 22.vii.2002, I.M. Vieira and O.M. Costa, 1 male and 36 females (IEPA364); mouth of Sucuriju River (01°40'09.18"N, 49°55'07.34"W), 4.v.2004, I.M. Vieira, 1 male and 3 female (IEPA520). Municipality of Oiapoque: mouth of Oiapoque River (04°04'25.71"N, 51°38'35.31"W), 22.viii.2013, cols. I.M. Vieira, A.G. Santiago and E.O.Galeno, 2 females (IEPA 1617); idem, collection using trap (04°04'25.71"N, 51°38'35.31"W), 21 a 22.viii.2013, cols. I.M. Vieira, A.G.Santiago and E.O.Galeno, 1 male (IEPA 1618); idem (4°19'49.47"N, 51°11'47.01"W), 21 a 22.viii.2013, cols. I.M. Vieira, A.G.Santiago and E.O.Galeno, 1 male (IEPA 1742); Mouth of Cassiporé River (03°52'53.40"N, 51°08'36.03"W), 24.viii.2013, 21 a 22.viii.2013, cols. I.M. Vieira, A.G.Santiago and E.O.Galeno, 3 males (IEPA1619) (Figure 2).

Geographic distribution. Punta Piaxtla, Sinaloa, Mexico to Paita, Peru; North Carolina to Gulf of Mexico, Caribbean Sea to Santa Catarina (Perez-Farfante & Kensley 1997)

Previous records. (Costa *et al.* 2003)

Distribution in Amapá state. Estuaries of the Sucuriju, Oiapoque and Cassiporé rivers.

Ecological notes. Inhabits muddy or sandy bottoms, from 1 to 70 m deep, abundant in depth up to 30 m. Marine but can enter brackish waters and exceptionally fresh waters (Cervigon *et al.* 1992).

Macrobrachium jelskii (Fig. 4), *Palaemon carteri* (Fig. 5), *M. amazonicum* (Fig. 3), *M. surinamicum* (Fig. 4), *M. brasiliense* (Fig. 4) and *E. burchelli* (Fig. 1) were the species with greatest geographic distribution in Amapá. Regarding the sampled habitats, the greatest richness of shrimp occurred in rivers and streams, but these also occurred in Amazonas-wells (Table 3). Considering the habitat types, rivers and streams had high species richness, but streams and estuaries were high in Shannon diversity (Table 3).

Discussion

In Brazil, in general, the freshwater shrimp species belong to the families Atyidae De Haan, 1859; Euryrhynchidae Holthuis 1950; Palaemonidae Rafinesque 1815 e Sergestidae Dana 1852 (Melo 2003; Pileggi *et al.* 2013). In the Amazon basin, these freshwater shrimps add up to at least 20 known species, distributed in three genera: *Macrobrachium* Bate, 1868; *Palaemon* Weber, 1795 and *Pseudopalaemon* Sollaud, 1911. Melo (2003), Pileggi

& Mantelatto (2013) and Pimentel & Magalhães (2014) cited the occurrence of *M. amazonicum*, *M. brasiliense*, *M. jelskii*, *M. surinamicum* and *Pa. carteri* for the state of Amapá, and all these species were also recorded in the present study. *Acetes marinus* that belongs to the Sergestidae family, was registered in this study, along with four specimens collected in the estuary of the Oiapoque River and Sucuriju River and freshwater of the lower Rio Cajari. *Acetes paraguayensis* was registered for the Araguari River, in the Biological Reserve of Lake Piratuba, listed in the INPA collection.

In South America, the family Euryrhynchidae is comprised only of the genus *Euryrhynchus*, with five species (De Grave & Fransen 2011; Magalhães *et al.* 2016). In the present study, we found three species of this genus: *E. amazoniensis*, *E. burchelli* and *E. wrzesniowskii*, which are distributed in the Amazon basin (Melo 2003; Tiefenbacher 1978; Pimentel & Magalhães 2014 and Pachel & Tavares, 2018). Pachel & Tavares (2018) analyzed a batch from the crustacean collection of the Instituto Nacional de Pesquisas da Amazônia (INPA 1082) of *E. burchelli* that was reported by Pimentel & Magalhães (2014) for the state of Amapá and the specimens were identified as *E. tomasi*. Recently, a new collection was carried out at Cachoeira Grande and the aforementioned specimens of *E. tomasi* were recorded in the stream downstream of the waterfall.

However, studies on the diversity of crustaceans from the floodplains of the state of Amapá recorded seven species of these shrimp: *E. amazoniensis*, *E. burchelli*, *E. wrzesniowskii*, *M. amazonicum*, *M. jelskii*, *Pa. carteri* and *Ps. chryseus*. Pimentel & Magalhães (2014) listed 18 species of freshwater shrimp distributed in the Euryrhynchidae, Palaemonidae and Sergestidae families for the eastern Amazon (states of Amapá and Pará), 12 of which were also recorded from the state of Amapá (*E. amazoniensis*, *E. burchelli*, *E. wrzesniowskii*, *M. acanthurus*, *M. amazonicum*, *M. brasiliense*, *M. carcinus*, *M. jelskii*, *M. olfersii*, *M. surinamicum*, *Pa. carteri* and *Ps. chryseus*).

Species of Palaemonidae occupy the most diverse habitats in freshwater and brackish, as well as marine coastal areas (Rodríguez 1981). In this study, the palaemonid shrimps *M. acanthurus*, *M. amazonicum*, *M. carcinus*, *M. jelskii* and *M. olfersii* occurred in continental waters and in estuarine waters of rivers that flow into the ocean (Table 2). These species are characterized by the need to complete their life cycle in brackish waters (Ferreira *et al.* 2010). *Macrobrachium acanthurus* was recorded for the mouth of the Sucuriju River and in streams of savannas areas. *Macrobrachium amazonicum* is a species widely distributed in the state of Amapá and used as a fishing resource, being very abundant in regions bathed by the Amazon River, such as the Bailique Archipelago, Santana Island and the Matapi River, which flows directly into the Amazon River. However, in clear and black freshwater, such as the rivers Araguari and Cajari, and streams located in gallery of forests, their abundance decreases significantly.

In the present study, four species occur only in estuarine waters *Alpheus nuttingi* was recorded for the Sucuriju River estuary and Maracá-Jipioca Ecological Station, in excavated galleries of muddy beaches, in the intertidal range dominated by mangrove vegetation, its presence being identified by the crackles it regularly emits in the environment. This species was also recorded in Brazil from the state of Ceará to Santa Catarina (Almeida *et al.* 2013; Soledade & Almeida 2013); however, this is a new record from the state of Amapá.

The *Nematopalaemon schmitti* of this study was recorded in the Sucuriju River estuary and Island Maracá-Jipioca. Thus considering that the estuaries of the rivers Cassiporé, Amapá, Cunani and Oiapoque have similar structures to the Sucuriju river, it would be an indicator of their presence in these places.

Leander tenuicornis was found in the Cassiporé River estuary, although it is known to be widely distributed in the Brazilian coast from the state of Maranhão to São Paulo (Ferreira *et al.* 2010). This is the first record of the specie in state of Amapá. *Xiphopenaeus kroyeri* was recorded for the Cassiporé, Oiapoque and Sucuriju rivers estuaries, in muddy substrate under the influence of the Amazon River discharges. (Figure 2)

Euryrhynchus amazoniensis, *E. burchelli*, *E. tomasi*, *E. wrzesniowskii*, *M. brasiliense*, *M. inpa*, *Pa. carteri*, *Ps. amazoniensis* and *Ps. chryseus* occurred only in freshwater systems. However, it is important to highlight the presence of *E. burchelli* in wells which were collected in two different periods. It could be seen that the shrimp fauna of the estuarine sector in the state of Amapá is poorly studied and, probably, there may be a greater diversity that is yet to be reported. The great diversity of ecosystems and habitats in the state of Amapá contributes to this unknown diversity, as there are regions in the state dominated by isolated and difficult to access forests, such as a large part of the Amazon region.

This study complements information on the diversity and distribution of 22 shrimp species in the state of Amapá, showing freshwater and estuarine representatives distributed in five families and nine genera. In this way, this work contributes to the expansion of knowledge about the diversity and distribution of shrimp existing in the State of Amapá, serving for comparisons in future studies aimed at the conservation of these natural resources.

TABLE 2. Distribution of shrimp species according to habitat types in the state of Amapá, eastern Brazilian Amazon region.

Habitats x Species	River	Streams	Dams	Floodable field	Lake	Floodplain	Estuary	Rapids	Puddle	Amazon-wells	Total
Sergestidae											
<i>Acetes marinus</i>	2	0	0	0	0	0	2	0	0	0	4
<i>Acetes paraguayensis</i>	0	0	0	0	0	0	0	0	0	0	0
Alpheidae											
<i>Alpheus nuttingi</i>	0	0	0	0	0	0	107	0	0	0	107
Euryrhynchidae											
<i>Euryrhynchus amazoniensis</i>	16	241	0	0	0	69	0	0	71	0	397
<i>Euryrhynchus burchelli</i>	45	44	0	0	119	574	0	0	0	4	786
<i>Euryrhynchus tomasi</i>	0	19	0	0	0	0	0	0	0	0	19
<i>Euryrhynchus wrzesniowskii</i>	76	127	3	0	1	7	0	0	3	0	217
Palaeomonidae											
<i>Macrobrachium acanthurus</i>	0	1	0	0	0	0	9	1	0	0	11
<i>Macrobrachium amazonicum</i>	1,413	1,197	23	0	185	0	142	0	0	0	2,960
<i>Macrobrachium brasiliense</i>	243	280	24	0	0	0	0	0	3	0	550
<i>Macrobrachium carcinus</i>	31	6	0	1	0	0	0	0	0	0	38
<i>Macrobrachium jelskii</i>	324	262	0	0	842	172	102	22	0	0	1,724
<i>Macrobrachium inpa</i>	18	14	0	0	0	0	0	64	0	0	96
<i>Macrobrachium olfersii</i>	12	7	0	0	0	0	42	13	0	0	74
<i>Macrobrachium surinamicum</i>	3,966	418	46	0	31	0	71	116	0	0	4,648
<i>Nematopalaemon schmitti</i>	0	0	0	0	0	0	498	0	0	0	498
<i>Palaemon carteri</i>	834	635	33	0	228	508	21	64	87	0	2,410
<i>Pseudopalaemon amazoniensis</i>	10	0	0	0	0	0	0	0	0	0	10
<i>Pseudopalaemon chryseus</i>	146	26	3	0	0	59	0	0	0	0	234
<i>Leander tenuicornis</i>	0	0	0	0	0	0	2	0	0	0	2
Lysmatidae											
<i>Exhipolysmata oplophoroides</i>	0	0	0	0	0	0	2	0	0	0	2
Penaeidae											
<i>Xiphopenaeus kroyeri</i>	0	0	0	0	0	0	42	0	0	0	42
Total	7,136	3,277	132	1	1,406	1,389	1,040	280	164	4	14,829

TABLE 3. Diversity parameters for the freshwater and estuarine shrimp species from the state of Amapá according to their occurrence in habitat type.

	Habitat		
	Richness	Shannon (H)	Equitability
Rivers	14	1.34	0.508
Streams	13	1.782	0.695
Weirs	4	1.141	0.823
Floodplains	7	1.262	0.648
Lakes	6	1.464	0.817
Várzea	7	1.288	0.662
Estuary	11	1.513	0.631
Rapids	7	1.429	0.734
Puddle	3	0.343	0.312
Amazonas-wells	1	0	-

Acknowledgments

The authors thank the Institute for Scientific and Technological Research of the State of Amapá (IEPA) for allowing access to the Carcinological Collection and the The National Council for Scientific and Technological Development (Conselho Nacional de Desenvolvimento Científico e Tecnológico - CNPq) by the productivity grant for Marcos Tavares-Dias (Process number 303013/ 2015-0).

References

- Almeida, A.O., Costa-Souza, A.C., Cunha, A.M., Santos, P.S., Oliveira, M.V. & Soledade, G.O. (2013) Estuarine caridean shrimps (Crustacea: Decapoda) from Ilhéus, Bahia, Brazil: Updated checklist and a key for their identification. *Check List*, 9 (6), 1396–405.
<https://doi.org/10.15560/9.6.1396>
- Anker, A. (2007) New species and records of Alpheid shrimps, genera *Salmoneus* Holthuis and *Parabetaeus* Coutière, from the tropical western Atlantic (Decapoda, Caridea). *Zootaxa*, 1653 (1), 21–39.
<https://doi.org/10.11646/zootaxa.1653.1.2>
- Anker, A., Hurt, C. & Knowlton, N. (2007) Revision of the *Alpheus nuttingi* (Schmitt) species complex (Crustacea: Decapoda: Alpheidae), with description of a new species complex the tropical eastern Pacific. *Zootaxa*, 1577, 41–60.
- Barros, M.P. & Pimentel, F.R. (2001) Decapoda (Crustácea) do estado do Pará, Brasil: lista preliminar das espécies. *Boletim do Museu Paraense Emílio Goeldi, Série Zoologia*, 17 (1), 15–41.
- Batista, E.M., Souza Filho, P.W.M. & Silveira, O.F.M. (2007) Monitoramento da linha de costa do Parque Nacional do Cabo Orange através da análise multi-temporal de imagens de sensores remotos. *Anais do Simpósio Brasileiro de Sensoriamento Remoto*, 13, 662–6628.
- Bond-Buckup, G. & Buckup, L. (1989) Os Palaemonidae de águas continentais do Brasil meridional (Crustacea, Decapoda). *Revista Brasileira de Biologia*, 49 (4), 883–896.
- Bowles, D.E., Aziz, K. & Knight, C.L. (2000) *Macrobrachium* (Decapoda: Caridea: Palaemonidae) in the contiguous United States: a review of the species and an assessment of threats to their survival. *Journal of Crustacean Biology*, 20 (1), 158–171.
<https://doi.org/10.1163/20021975-99990025>
- Campos, B.R. Branco, J.O. & D'Incao, F. (2011) Crescimento do Camarão-Sete-Barbas (*Xiphopenaeus kroyeri* (Heller 1862), na baía de Tijucas, Tijucas, Sc (Brasil). *Atlântica*, 33, 201–208.
<https://doi.org/10.5088/atl.2011.33.2.201>
- Carvalho, F.L. (2014) *Sistemática do gênero Palaemon Weber, 1795 (Decapoda, Palaemonidae): uma abordagem molecular e morfológica de padrões filogeográficos, evolução de características ecológicas e status taxonômico das espécies do Brasil*. Tese de Doutorado, Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo, Ribeirão Preto, 192 pp.
- Cervigón, F., Cipriani, R., Fischer, W., Garibaldi, L., Hendrickx, M., Márquez, R., Poutiers, J.M., Robaina, G. & Rodriguez, B. (1992) *Guía de campo de las especies comerciales marinas y de aguas salobres de la costa setentrional de Sur America*. Food and Agriculture Organization of the United Nations, Roma, 513 pp.

- Chevalier, J., Guyane, W. & Onikha, S.C. (2020) Les Crevettes de la réserve naturelle régionale Trésor Rapport de mission et perspectives. Available from: <https://docplayer.fr/215573913-Les-crevettes-de-la-reserve-naturelle-regionale-tresor-rapport-de-mission-et-perspectives-johan-chevalier-wano-guyane-simon-clavier-onikha.html> (accessed 22 April 2021)
- Christoffersen, M.L. (1979) Decapod Crustacea: Alpheoidea. Campagnes de la Calypso au large des côtes Atlantiques de l'Amérique du Sud (1961–1962). *I. Résultats Scientifiques de la Campagne de la Calypso*, 1979 (11), 297–377.
- Christoffersen, M.L. (2016) Avaliação de *Exhippolysmata oplophoroides* (Holthuis, 1948) (Decapoda: Lysmatidae). In: Pinheiro, M.A.A. & Boos, H. (Org.), *Livro Vermelho dos Crustáceos do Brasil: Avaliação 2010-2014*. Sociedade Brasileira de Carcinologia—SBC, Porto Alegre, pp. 203–211.
- Coelho, P., Almeida, A., Fidelis, J., Bezerra, L. & Giralde, B. (2006) Diversity and distribution of the marine and estuarine shrimps (Dendrobranchiata, Stenopodidea and Caridea) from North and Northeast Brazil. *Zootaxa*, 1221 (1), 41–62. <https://doi.org/10.11646/zootaxa.1221.1.5>
- Coelho, P.A. & Ramos-Porto, M. (1984) Camarões de água doce do Brasil: distribuição geográfica. *Revista Brasileira de Zoologia*, 2, 405–410. <https://doi.org/10.1590/S0101-81751984000200014>
- Costa, R.C. da, Fransozo, A., Melo, G.A.S. & Freire, F.A. de M. (2003) Chave ilustrada para identificação dos camarões dendrobranchiata do litoral norte do estado de São Paulo, Brasil. *Biota Neotropica*, 3, 1–12. <https://doi.org/10.1590/S1676-06032003000100011>
- Cumberlidge, N., Ng, P.K.L., Yeo, D.C.J., Magalhães, C., Campos, M.R., Alvarez, F., F., Naruse, T., Daniels, S.R., Esser, L.J., Attipoe, F.Y.K., Clotilde-Ba, F.L., Darwall, W., McIvor, A., Baillie, J.E.M., Collen, B. & Ram, M. F., Naruse, T., Daniels, S.R., Esser, L.J., Attipoe, F.Y.K., Clotilde-Ba, F.L., Darwall, W., McIvor, A., Baillie, J.E.M., Collen, B. & Ram, M. (2009) Freshwater crabs and the biodiversity crisis: Importance, threats, status, and conservation challenges. *Biological Conservation*, 142, 1665–1673. <https://doi.org/10.1016/j.biocon.2009.02.038>
- Cunha, H. & Pascoaloto, D. (2009) *Hidroquímica dos rios da Amazônia*. Governo do Estado do Amazonas, Secretaria de Estado da Cultura, Centro Cultural dos Povos da Amazônia, Manaus, 127 pp.
- De Grave, S. (2007) A new species of *Euryrhynchus* Miers, with a discussion of the systematic position of the Euryrhynchidae Holthuis (Crustacea, Decapoda). *Zoologischer Anzeiger*, 246, 193–203. <https://doi.org/10.1016/j.jcz.2007.06.002>
- De Grave, S., Cai, Y. & Anker, A. (2007) Global diversity of shrimps (Crustacea: Decapoda: Caridea) in freshwater. *Hydrobiologia*, 595, 287–293. <https://doi.org/10.1007/s10750-007-9024-2>
- De Grave, S., Cai, Y. & Anker, A. (2008) Global diversity of shrimps (Crustacea: Decapoda: Caridea) in freshwater. *Hydrobiologia*, 595, 287–293. <https://doi.org/10.1007/s10750-007-9024-2>
- De Grave, S. & Fransen, C. (2011) Carideorum catalogus: the recent species of the Dendrobranchiate, Stenopodidean, Procarididean and Caridean Shrimps (Crustacea: Decapoda). *Zoologische Mededelingen Leiden*, 85, 195–589.
- De Grave, S., Pentcheff, N.D., Ah Yong, S.T., Chan, T.-Y., Crandall, K.A., Dworschak, P.C., Felder, D.L., Feldmann, R.M., Fransen, C.H.J.M., Goulding, L.Y.D., Lemaitre, R., Low, M.E.Y., Martin, J.W., Ng, P.K.L., Schweitzer, C.E., Tan, S.H., Tshudy, D. & Wetzer, R. (2009) A classification of living and fossil genera of decapod Crustaceans. *Raffles Bulletin of Zoology*, Supplement 21, 1–109.
- Delgado, J.G., Héctor, J., Severeyn, A.R.G., Reverol, Y.M. & J., J.E. (1997) Camarones dulceacuícolas y estuarinos de Venezuela (Atyidae, Palaemonidae): nuevos registros para los Estados Zulia y Falcón. *Boletín del Centro de Investigaciones Biológicas*, 31 (1), 11–32.
- El-Robrini, M. & Torres, A. (2006) Amapá. In: Muehe, D. (Org.), *Erosão e progradação do litoral brasileiro*. Ministério do Meio Ambiente, MMA, Brasília, pp. 11–40. <https://doi.org/10.13140/RG.2.1.2965.4489>
- ESRI (2014) The shapefile was provided by DeLorme Publishing Company, Inc., with additional attributes from Environmental Systems Research Institute. Available from: <https://resources.arcgis.com/content/data-maps/10> (accessado 23 June 2022)
- Fausto Filho, J. (1978) Crustáceos estomatópodos e decápodos dos substratos de lama do nordeste brasileiro. *Arquivos de Ciências do Mar*, 18 (1/2), 63–71. <https://doi.org/10.32360/acmar.v18i1-2>
- Fausto Filho, F.J. & Neto, J.B.S. (1976) Observações sobre alguns crustáceos estomatópodos e decápodos do norte do Brasil. *Arquivos de Ciências do Mar*, 16 (2), 65–71. <https://doi.org/10.32360/acma--r.v16i2.33439>
- Ferreira, R.S., Vieira, R.R.R. & D'Incao, F. (2010) The marine and estuarine shrimps of the Palaemoninae (Crustacea: Decapoda: Caridea) from Brazil. *Zootaxa*, 2606 (1), 1–24. <https://doi.org/10.11646/zootaxa.2606.1.1>
- Freire, J.L., Bentes, B., Fontes, V.B. & da Silva, E.M. (2017) Morphometric discrimination among three stocks of *Macrobrachium amazonicum* in the Brazilian Amazon. *Limnologia*, 64, 1–10. <https://doi.org/10.1016/j.limno.2017.01.007>
- Gama, C. de S. (2006) Inventário Biológico da Ictiofauna das Áreas Sucuriju e Região dos Lagos, Amapá, Brasil. In: Costa

- Neto, S.V. (Org.). *Inventário Biológico das Áreas do Sucuriju e Região dos Lagos, no Amapá: Relatório Final PROBIO*. IEPA, Macapá, pp. 156–176.
- García-Dávila, C.R. & Magalhães, C. (2003) Revisão taxonômica dos camarões de água doce (Crustacea: Decapoda: Palaemonidae, Sergestidae) da Amazônia Peruana. *Acta Amazonica*, 33, 663–686.
- Gomes-Corrêa, M.M. (1977) Palaemonídeos do Brasil (Crustacea-Decapoda-Natantia). Dissertação de Mestrado. Universidade do Rio de Janeiro, Rio de Janeiro, 191 pp.
<https://doi.org/10.1590/S0044-59672003000400013>
- Herrera-Barquin, H., Leija-Tristán, A. & Favela-Lara, S. (2018) Updated checklist of estuarine caridean shrimps (Decapoda: Caridea) from the southern region of Laguna Madre, Tamaulipas, Mexico, with new records and a key for taxonomic identification. *Check List*, 14, 479–494.
<https://doi.org/10.15560/14.2.479>
- Holthuis, L.B. (1952) A general revision of the Palaemonidae (Crustacea Decapoda Natantia) of the Americas. II. The subfamily Palaemonidae. *Occasional Papers of the Allan Hancock Foundation, Los Angeles*, 12, 1–395.
- Irion, G., Muller, J., Nunes de Mello, J. & Junk, W.J. (1995) Quaternary geology of the Amazonian Lowland. *Geo-Marine Letters*, 15, 172–178.
<https://doi.org/10.1007/BF01204460>
- Junk, W.J., Bayley, P.B. & Sparks, R.E. (1989) The flood pulse concept in river-floodplain systems. *Canadian special publication of fisheries and aquatic sciences*, 106 (1), 110–127.
- Kensley, B. & Walker, I. (1982) Palaemonid shrimps from the Amazon basin, Brazil (Crustacea, Decapoda, Natantia). *Smithsonian Contributions to Zoology, Washington*, 362, 1–28.
<https://doi.org/10.5479/si.00810282.362>
- López, B. & Pereira, G. (1998) Actualización del inventario de crustáceos decápodos del Delta del Orinoco. In: López Sánchez, J.L., Saavedra Cuadra, I.I. & Dubois Martínez, M. (Eds.). *El Rio Orinoco. Aprovechamiento Sustentable*. Universidad Central de Venezuela, Memorias de las Primeras Jornadas Venezolanas de Investigación sobre el río Orinoco, Caracas. Available from: https://www.academia.edu/36980642/El_Rio_Orinoco (accessed 10 May 2022)
- Magalhães, C. (2002) A rapid assessment of the decapod fauna in the Rio Tahuamanu and Rio Manclaroclaruripi Basins, with new records of shrimps and crabs for Bolivia (Crustacea, Decapoda, Palaemonidae, Sergestidae, Trichodactylidae). *Revista Brasileira de Zoologia*, 4 (19), 1091–1103.
<https://doi.org/10.1590/S0101-81752002000400014>
- Magalhães, C. (2016) Abbreviated larval development of *Macrobrachium inpa* Kensley and Walker, 1982 (Crustacea: Decapoda: Palaemonidae) from an Amazon Basin forest stream, Brazil, reared in the laboratory. *Nauplius*, 24, 1–13.
<https://doi.org/10.1590/2358-2936e2016009>
- Magalhães, C. & Pereira, G. (2007) Assessment of the decapod crustacean diversity in the Guayana Shield region aiming at conservation decisions. *Biota Neotropica*, 7 (2), 111–124. Available from: <http://www.biotaneotropica.org.br/v7n2/pt/abstract?article+bn02007022007> (accessed 3 November 2019)
<https://doi.org/10.1590/S1676-06032007000200013>
- Magalhães, C., Pileggi, L.G. & Mantelatto, F.L. (2016) Avaliação dos Eurirrinquídeos (Decapoda: Euryrhynchidae). In: Pinheiro, M.A.A. & Boos, H. (Org.), *Livro Vermelho dos Crustáceos do Brasil: Avaliação 2010-2014*. Sociedade Brasileira de Carcinologia - SBC, Porto Alegre, RS, pp.157–166.
- Martin, J.W. & Davis, G.E. (2001) *An updated classification of the recent Crustacea Vol 39*. Natural History Museum of Los Angeles County, Los Angeles, 129 pp.
- Melo, G.A.S. (2003) Famílias Atyidae, Palaemonidae e Sergestidae. In: Melo, G.A.S. (Ed.), *Manual de identificação dos Crustacea Decapoda de água doce do Brasil*. Editora Loyola, São Paulo, pp. 289–415.
- Omori, M. (1975) The systematics, biogeography, and fishery of epipelagic shrimps of the genus *Acetes* (Crustacea, Decapoda, Sergestidae). *Bulletin of the Ocean Research Institute, University of Tokyo*, 7, 1–91.
- Pachelle, P.P. & Tavares, M. (2018). The freshwater shrimp family Euryrhynchidae Holthuis, 1950 (Crustacea: Decapoda: Caridea) revisited, with a taxonomic revision of the genus *Euryrhynchus* Miers, 1878. *Zootaxa*, 4380 (1), 1–110. <https://doi.org/10.11646/zootaxa.4380.1.1>
- Pereira, G., Lasso, C.A., Mora-Day, J., Magalhães, C., Morales-Betancourt, M.A. & Campos, M. (2009) Lista dos crustáceos decápodos da bacia do rio Orinoco (Colômbia-Venezuela). *Biota Colombiana*, 10(1 y 2), 75–87. Available from: <http://revistas.humboldt.org.co/index.php/biota/article/view/218> (accessed 10 May 2022)
- Pereira, G. (1991) Camarones de agua dulce de Venezuela II: Nuevas adiciones en las familias Atyidae y Palaemonidae (Crustacea: Decapoda: Caridea). *Acta Biológica Venezuelica*, 13 (1/2), 75–88.
- Perez Farfante, I. & Kensley, B. (1997) *Penaeoid and sergestoid shrimps and prawns of the world: Keys and diagnoses for the families and genera. Vol. 175*. Editions du Museum national d’Histoire naturelle, Paris, 233 pp.
- Pettovello, A.D. (1996) First Record of *Macrobrachium Amazonicum* (Decapoda, Palaemonidae) in Argentina1. *Crustaceana*, 69 (1), 113–114. <https://doi.org/10.1163/156854096X00141>
- Pileggi, L.G., Magalhães, C., Bond-Buckup, G. & Mantelatto, F.L. (2013) New records and extension of the known distribution of some freshwater shrimps in Brazil. *Revista Mexicana de Biodiversidad*, 84 (2), 563–574.
<https://doi.org/10.7550/rmb.30504>
- Pileggi, L.G. & Mantelatto, F.L. (2012) Taxonomic revision of doubtful Brazilian freshwater shrimp species of genus

- Macrobrachium (Decapoda, Palaemonidae). *Iheringia. Série Zoologia*, 102, 426–437.
<https://doi.org/10.1590/S0073-47212012005000012>
- Pimentel, F.R. & Magalhães, C. (2014) Palaemonidae, Euryrhynchidae, and Sergestidae (Crustacea: Decapoda): Records of native species from the states of Amapá and Pará, Brazil, with maps of geographic distribution. *Check List*, 10 (6), 1300–1315.
<https://doi.org/10.15560/10.6.1300>
- Ramos-Porto, M. (1985) Revisão das espécies do gênero *Leander* E. Desmarest que ocorrem no litoral brasileiro. *Tropical Oceanography* 19 (1), 1–11.
<https://doi.org/10.5914/tropocean.v19i1.2614>
- Ramos-Porto, M. & Coelho, P.A. (1998) Sinopse dos crustáceos decápodos brasileiros (Infraordem Stenopodidea). *Cadernos Ômega. Série Ciências Aquáticas, Recife*, 4, 109–112.
- Ramos-Porto, M. & Coelho, P.A. (1990) Sinopse dos Crustáceos decápodos Brasileiros (Família Palaemonidae). *Anais da Sociedade Nordestina de Zoologia*, 3, 93–111.
- Ramos-Porto, M. & Coelho, P.A. (1991) Sinopse dos crustáceos decápodos brasileiros (Família Hippolytidae). *Tropical Oceanography*, 22 (1), 181–189.
<https://doi.org/10.5914/tropocean.v22i1.2663>
- Ramos-Porto, M., Muniz, A.P.M., Silva, K.C.A., Cintra, I.H.A. & Viana, G.F.S. (2003) Camarões da Subordem Pleocyemata Burkenroad, 1963 capturados durante pescarias experimentais para o Programa Revizee/Norte (Crustacea, Decapoda). *Boletim Técnico Científico do CEPNOR*, 3 (1), 77–106.
- Rodriguez, G. (1982) Freshwater shrimps (Crustacea, Decapoda, Natantia) of the Orinoco basin and the Venezuelan Guayana. *Journal of Crustacean Biology*, 2 (3), 378–391.
<https://doi.org/10.2307/1548054>
- Rodríguez, G. (1981) Decapoda. In: Hurlbert, S.H., Rodríguez, G. & Santos, N.D. (Eds.), *Aquatic Biota of Tropical South America. Part I. Arthropoda*. San Diego State University, San Diego, California, pp. 41–51.
- Sakihara, T.S., Fransen, C.H. & De Grave, S. (2013) New records of *Vetericaris chaceorum* (Decapoda, Procarididea) from Hawai'i. *Crustaceana*, 86 (5), 625–631.
- Santos, M.A.L.D. (2016) Composição e distribuição da fauna de camarões de água doce (Crustacea: Decapoda) no Estado de Roraima, Brasil. Available from: <https://repositorio.inpa.gov.br/handle/1/11390> (accessed 15 April 2022)
- Santos, M.A.L. dos, Castro, P.M. de & Magalhães, C. (2018) Freshwater shrimps (Crustacea, Decapoda, Caridea, Dendrobranchiata) from Roraima, Brazil: Species composition, distribution, and new records. *Check List*, 14 (1), 21–35.
<https://doi.org/10.15560/14.1.21>
<https://doi.org/10.1163/15685403-00003176>
- Santos, P.S., Soledade, G.O. & Almeida, A.O. (2012) Decapod crustaceans on dead coral from reef areas on the coast of Bahia, Brazil. *Nauplius*, 20, 145–169.
<https://doi.org/10.1590/S0104-64972012000200007>
- Santos, V. F.; Mendes, A.C. & Silveira, O.M. (2016) *Atlas de sensibilidade ambiental ao óleo da Bacia Marítima da Foz do Amazonas*. IEPA, Macapá, 106 pp.
- Silva, A.Q., Sodrê, S.S.V. & Costa, W.J.P. (2001) *Relatório da qualidade ambiental dos recursos hídricos da região sul do Amapá (bacias do rio Jari até o rio Vila Nova)—2000*. MMA/PPG-7/GEA/SEMA, Macapá, 59 pp.
- Soledade, G.O. & Almeida, A.O. (2013) Snapping shrimps of the genus *Alpheus* Fabricius, 1798 from Brazil (Caridea: Alpheidae): updated checklist and key for identification. *Nauplius*, 21, 89–122.
<https://doi.org/10.1590/S0104-64972013000100010>
- Tiefenbacher, L. (1978) Zur Systematik und Verbreitung der Euryrhynchinae (Decapoda, Natantia, Palaemonidae). *Crustaceana*, 35, 177–189.
<https://doi.org/10.1163/156854078X00088>
- Valencia, D.M. & Campos, R. (2010) Freshwater shrimps of the Colombian tributaries of the Amazon and Orinoco rivers (Palaemonidae, Euryrhynchidae, Sergestidae). *Caldasia*, 32 (1), 221–234.
- Vieira, I.M. (2003) Diversidade de crustáceos das ressacas da Lagoa dos Índios, Tacacá e APA do Curiaú. In: Takiyama, L.R. & Silva, A.Q. da (Orgs.) *Diagnóstico das Ressacas do Estado do Amapá: Bacias do Igarapé da Fortaleza e Rio Curiaú*. CPAQ/IEPA, DGEO/SEMA, Macapá, pp. 53–62.
- Vieira, I.M. (2006) Carcinofauna da Floresta Nacional do Amapá obtidas através de dois inventários biológicos rápidos. In: Bernard, E. (Coord.) *Inventários biológicos rápidos da Floresta Nacional do Amapá*. IEPA, Macapá, pp. 100–113.
- Vieira, I.M. (2008) Inventários rápidos da fauna de crustáceos do Parque Nacional Montanhas do Tumucumaque: Expedições I a V. In: Bernard, F. (Ed.), *Inventários Biológicos Rápidos no Parque Nacional Montanhas do Tumucumaque, Amapá, Brasil*. *RAP Bulletin of Biologica*, 2008, pp. 66–71.
- Vieira, M.S. (2015) Base cartográfica contínua do estado do Amapá. *Revista Digital Simonsen*, 3, 47–60.
<https://doi.org/10.17271/2318847232220151160>
- Zhang, Z.-Q. (2013) Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness (Addenda 2013). *Zootaxa*, 3703 (1), 1–82.
<https://doi.org/10.11646/zootaxa.3703.1.1>