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5121

**Checklist of decapod crustaceans from the coast of the São Paulo state (Brazil)  
supported by integrative molecular and morphological data:**

**V. Dendrobranchiata and Pleocyemata [Achelata, Astacidea, Axiidea, Caridea  
(Alpheoidea and Processoidea excluded), Gebiidea, Stenopodidea]**

FERNANDO L. MANTELATTO *ET AL.*

(See full list on page 3)



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## Abstract

This checklist is the fifth and last compilation on the decapod crustaceans reported to São Paulo (Brazil) coastal area, resulting from long-term multidisciplinary projects, which combined morphological analyses and molecular techniques. The current research includes 75 decapod species, herein referred as shrimps/lobsters-like (shrimps, ghost-shrimps, lobsters, and related groups), reported to São Paulo coastal area. These species occur in marine, estuarine, and amphidromous habitats and are classified into 21 families as follow: Aristeidae (2 spp., 2 genera), Atyidae (4 spp., 2 genera), Axianassidae (1 sp., 1 genus), Callianassidae (1 sp., 1 genus), Callichiridae (6 spp., 4 genera), Crangonidae (1 sp., 1 genus), Glyphocrangonidae (1 sp., 1 genus), Luciferidae (2 spp., 2 genera), Nephropidae (4 spp., 2 genera), Palaemonidae (15 spp., 9 genera), Palinuridae (2 spp., 1 genus), Pandalidae (1 sp., 1 genus), Pasiphaeidae (1 sp., 1 genus), Penaeidae (10 spp., 6 genera), Sergestidae (3 spp., 3 genera), Sicyoniidae (4 spp., 1 genus), Scyllaridae (5 spp., 3 genera), Solenoceridae (4 spp., 3 genera), Stenopodidae (2 spp., 1 genus), and Upogebiidae (6 spp., 1 genus). We generated new sequences of cytochrome oxidase subunit I (barcode region) and 16S genes (51 and 54, respectively) of 54 species. Our examination concluded that 75 shrimps/lobsters-like species are reported to the São Paulo coast. We excluded *Leander tenuicornis* (Palaemonidae), *Penaeus setiferus* (Penaeidae), *Philocheras gorei* (Crangonidae), and *Rhynchocinetes typus* (Rhynchocinetidae) from this list.

**Key words:** Biodiversity, ghost-shrimp, lobster, shrimp, COI and 16S mtDNA genes

## Introduction

During the last 12 years our team dedicated an effort to improve the taxonomic knowledge of decapod fauna inhabiting the marine and closely related environments (such as estuaries, mangroves, and coastal rivers) of São Paulo state, Brazil. This challenge was mainly motivated due to the lack of specific and updated literature summarizing this fauna (Mantelatto *et al.* 2018). It was built with taxonomic accuracy to serve as baseline of all kinds of biological studies, particularly on ecology, reproduction, taxonomy, systematics, morphology, phylogeny, and biogeography that some time present inconsistent or doubtful reports of species. Our aspiration became possible with the development of long-term multidisciplinary projects that received continuous and solid support from “São Paulo Research Foundation” (Biota-FAPESP Program—2011 to 2015 and 2019 to 2024) and supplementary support from “Coordination for the Improvement of Higher Education Personnel” (CAPES/CIMAR II Program—2014 to 2019) to carry out an integrative analysis combining morphological and molecular tools.

A remarkable fauna was discovered during the development of these projects, including new species, new records, and distribution (see references here in). Due to the high diversity and number of species, we decided to split our findings into a series of five checklists (including the present one) to organize our results and to fit with the interests of the readers. The first two checklists included the caridean shrimps of the superfamilies Alpheoidea and Processoidea (Almeida *et al.* 2018; Terossi *et al.* 2018); the third one compiled the crabs of the Infraorder Brachyura (Mantelatto *et al.* 2020); and the fourth one comprised the heterogenous Infraorder Anomura (Mantelatto *et al.* 2021).

This last checklist includes a highly speciose fauna obtained during our surveys (see Mantelatto *et al.* 2018), i.e., the shrimps-like forms (1) Suborder Dendrobranchiata, Superfamilies Penaeoidea (Families Aristeidae, Penaeidae, Sicyoniidae and Solenoceridae) and Sergestoidea (Families Luciferidae and Sergestidae); (2) Suborder Pleocyemata, Infraorders Caridea (Families Atyidae, Crangonidae, Glyphocrangonidae, Palaemonidae, Pandalidae and Pasiphaeidae); Stenopodidea (Family Stenopodidae); and the lobsters-like of (3) Suborder Pleocyemata, Infraorders Achelata (Families Palinuridae and Scyllaridae), Astacidea (Family Nephropidae), Axiidea (Families Callianassidae and Callichiridae), and Gebiidea (Families Axianassidae and Upogebiidae). From here on referred to as shrimps and lobsters-like (including shrimps, ghost-shrimps, lobsters, blind lobsters, slipper lobsters, spiny lobsters, and related members), and following the current taxonomic classification.

To date, the total number (2,570) of extant species within each of the above families accepted and registered worldwide by the World Register of Marine Species (WoRMS 2022) accounts for 1,966 species of shrimps-like (Aristeidae = 26, Atyidae = 18, Crangonidae = 233, Glyphocrangonidae = 93, Luciferidae = 7, Palaemonidae = 769, Pandalidae = 194, Pasiphaeidae = 102, Penaeidae = 229, Sergestidae = 97, Sicyoniidae = 52, Solenoceridae = 81, Stenopodidae = 38) and 631 lobsters-like species (Axianassidae = 17, Callianassidae = 112, Callichiridae = 97, Nephropidae = 59, Palinuridae = 61, Scyllaridae = 91, Upogebiidae = 194).

Members of these groups are cosmopolitan, occurring in marine/estuarine areas throughout the world, and commonly found in tropical and subtropical regions. They have colonized a wide diversity of ecosystems as freshwaters, anchialine caves, coral reefs and can be found from the shallow to deep areas. A large part of its representatives exhibits great commercial and ecological importance, such as species from the family Penaeidae (Holthuis 1980; Dall *et al.* 1990; Pérez Farfante & Kensley 1997). To illustrate this scenario in the Brazilian coast, only two *Farfantepenaeus* shrimp species (*F. brasiliensis* and *F. paulensis*) represent approximately 18% of the total marine crustacean landings (57,344 t) along the shallow water coast (IBAMA 2011a); the mean annual production of the spiny lobsters *Panulirus meripurpuratus* (as *P. argus* in most of the literature) and *P. laeviscauda*, along the Northern and Northeastern, the two most productive regions of Brazil, in the 1991-2004 period, was 7,889 t (IBAMA 2008; Giralde & Smyth 2016; Dias-Neto 2017). Consequently, these groups have attracted the attention of many researchers during the past decades due to the interest in its population and fisheries characteristics and its taxonomic and phylogenetic contextualization (Holthuis 1985, 2002; Baldwin *et al.* 1998; Dall’Occo & Tavares 2004; Chan 2010; Bracken-Grissom *et al.* 2014; Camargo *et al.* 2016, 2017; Giralde & Smyth 2016; Palero *et al.* 2016; Teodoro *et al.* 2016; Cheng *et al.* 2018; Timm *et al.* 2019; Hurzaid *et al.* 2020; França *et al.* 2021; and other references along the text).

Our effort in this fifth compilation is to provide an updated checklist of the shrimps and lobsters-like species from twenty-one families of the coast of São Paulo state, based on the accurate analysis of newly collected material, as well as on a survey of the literature and material deposited in scientific collections. We generated DNA sequences

(COI—cytochrome oxidase subunit I—and 16S mtDNA genes) of the sampled species as additional data to confirm identifications, previously based only on morphology.

## Material and methods

The methodology was exhaustively described in the past four papers of this series (Almeida *et al.* 2018; Terossi *et al.* 2018; Mantelatto *et al.* 2020, 2021), in which details can be checked. We furnished here a short version to contextualize and permit the reader to follow the main idea and replicability.

Decapods from coastal freshwater, estuarine/intertidal to 45 m deep regions were sampled from the five major regions of the São Paulo coast from 2011 to 2015: (1) Ubatuba, (2) Caraguatatuba, (3) São Sebastião, and Ilhabela (Ilha de São Sebastião), (4) Santos and São Vicente, and (5) Cananéia and Ilha Comprida (see Terossi *et al.* 2018: 78, fig. 1). In the followed years (2016–2022) we carried out some sporadic field trips to complete our set of samples. Qualitative fieldworks, with neither standard design nor predetermined frequency, with a team (5–10 people) effort during activities, covered these regions.

Some sampling was carried out using a commercial fishing boat equipped with otter-trawl and double-rig nets, mesh size 20 mm and 18 mm, respectively, with a 5 m opening. Other specimens were collected manually or using small hand nets in estuarine and marine microhabitats such as burrows in fine sand and mud, on the roots of mangrove trees, marginal vegetation in estuarine areas, including littoral freshwater river, under rocks or other hard substrates, and in association with any kind of substrate, including algae and other invertebrates (as colonies of bryozoan, sponges, and corals). Mud and fine-sand burrows were sampled by using a suction pump made of PVC pipe 50 mm in diameter. Some specimens were captured using snorkeling or SCUBA diving in rocky, coral, or sandy areas, including some coastal islands, in which all individuals found were captured by hand.

Additionally, we performed one five days long survey on board the Research Vessel Soloncy Moura (CEPSUL/ICMBio—Centro Nacional de Pesquisa e Conservação da Biodiversidade Marinha do Sudeste e Sul, Instituto Chico Mendes de Conservação da Biodiversidade, Ministério do Meio Ambiente), which comprised fourteen sample stations (from 61 to 132 m depth; see Mantelatto *et al.* 2020: 9, Table 1) when every potential substrate obtained during the survey, such as pieces of wood, coral, invertebrate colonies, rocks, among others, was carefully inspected.

The collected individuals were anesthetized and euthanized by chilling, conserved in 80% ethanol, and deposited in the Crustacean Collection of the Department of Biology of FFCLRP, University of São Paulo, Ribeirão Preto, Brazil (CCDB/FFCLRP/USP). Some specimens were frozen in seawater to be photographed and register their color patterns. Specimens previously catalogued in the CCDB or in the Museum of Zoology of the University of São Paulo, São Paulo, Brazil (MZUSP) were used in our analyses to both confirm the identity of new records in São Paulo state and to generate DNA sequences. Additional material was obtained from Coleção de Crustáceos do Laboratório de Biologia de Camarões Marinhos e de Água Doce, Faculdade de Ciências, Universidade Estadual Paulista, Bauru, Brazil (CCLC). Only individuals obtained from our field work were included as part of the “Material examined section”. The information “None” was added in species detail (material examined item) when its record in São Paulo is mentioned in the literature, but no specimen was sampled by us. Many of these cases refer to hard to find or deep-water species (this later was not our focus during the surveys). When necessary, some complementary material collected previously to our project and from São Paulo state and other localities was used either for molecular and morphological comparison or to confirm geographic distribution. All these materials were not included in the “Material examined section”, however the main information is available in the “Remarks section”. Finally, we decided to exclude from the São Paulo list any species with dubious records (no specimens sampled, no specimens deposited in reference collection, and previous report clearly dubious or listed in grey literature).

DNA was extracted with salting-out method (Miller *et al.* 1988), Chelating Ion Exchange Resin (Chelex® 100) (Estoup *et al.* 1996) or Qiagen DNeasy Blood and Tissue Kit (Qiagen), according to the protocol provided by the manufacturer. Final concentration of extracted DNA was measured using a spectrophotometer (NanoDrop® 2000/2000c). A ~500 base pairs (bp) region of the 16S gene and ~650 bp region of the barcode region of COI were amplified using the primers: 1472/16SL2 (Schubart *et al.* 2000, 2002) and H916S-br/L916S-ar (Palumbi *et al.* 1991) for 16S; COL6b/COH6 (Schubart & Huber 2006), COIAL1m/COIAH1m, COIAL2o/COIAH2m, COIAL2o/COIAH2o (Mantelatto *et al.* 2016a), and LCO1490/HCO2198 (Folmer *et al.* 1994) for COI. A consensus sequence was obtained by sequencing both forward and reverse strands using the computational program Geneious v2021.2



(Kearse *et al.* 2012). In order to confirm their identities, the DNA consensus sequences were aligned on BLAST system for comparison with the assembly of NCBI database (<http://blast.ncbi.nlm.nih.gov/blast.cgi>). All new sequences were deposited in GenBank (accession numbers were included in the remarks for each species).

The detailed checklist presented here was based on an exhaustive analysis of the vast literature published up to the end of 2021. As in our previous checklists, sources with unclear or doubtful information were not used as valid baseline. The classification adopted here is intended to be a catalogue of shrimps/lobsters-like species without a phylogenetic treatment. Therefore, due to the consolidated use of the Suborder levels among the taxonomists and other research fields, we prepared the list split in Suborder Dendrobranchiata (with superfamilies) and Pleocyemata (with infraorders), and all families are listed in alphabetical order; within families, all genera are also listed alphabetically. The names currently in use for extant taxa follow Holthuis (1950a, b, 1952a, 1991), Williams (1984), Abele & Kim (1986), Pérez Farfante & Kensley (1997), D’Incao & Martins (2000), Costa *et al.* (2000, 2003), Vereshchaka (2000), Fransen & Almeida (2009), Dall’Occo (2010), Ma *et al.* (2011), Pileggi & Mantelatto (2012), Torati & Mantelatto (2012), De Grave & Ashelby (2013), Almeida *et al.* (2014), Vereshchaka *et al.* (2014, 2016a), Giraldes & Smyth (2016), Poore *et al.* (2019), Carvalho *et al.* (2020), Hurzaid *et al.* (2020), Robles *et al.* (2020), Katneni *et al.* (2021) and currently adopted by WoRMS (2022). A special situation deals with some genus *Penaeus* and allies: in a review of the suborder Dendrobranchiata, Pérez Farfante & Kensley (1997) elevated the six subgenera of the genus *Penaeus* (*Farfantepenaeus*, *Fenneropenaeus*, *Litopenaeus*, *Marsupenaeus*, *Melicertus* and *Penaeus sensu stricto*) to the level of genus, and this proposal appears in the vast majority of the cited references. However, some recent molecular phylogenetic studies (Lavery *et al.* 2004; Ma *et al.* 2011; Katneni *et al.* 2021) propose to include the aforementioned genera back into the single genus *Penaeus*. However, none of the cited studies included a taxonomic reassignment with a proper nomenclatural act. Curiously, both database websites, WoRMS (2022) and GenBank, adopted using the proposed single genus *Penaeus* nomenclature, with no clear justification. Considering the non-consolidated opinion among carcinologists and to avoid taxonomic instability, we maintained Pérez Farfante & Kensley (1997) nomenclature here (*i.e.*, *Farfantepenaeus* and *Litopenaeus*) until there is a taxonomic treatment of the family.

Examined material was listed by number of specimens (spec.), and when the number is high, we estimated the amount (*i.e.*, > 1000 spec.); sex (♂ = male; ♀ = female; ♀ov = ovigerous females; j = juvenile; ni = non-identified sex), catalog number, following letter abbreviations for collections [(CCDB, MZUSP, CCLC), location (when available, the name of the expedition), station (abbreviated as st.), depth and coord. = coordinate, collector (s) (abbreviated as coll. (s)), and collection date]. Abbreviations used: R/V = Research Vessel; IO/USP = Instituto Oceanográfico da Universidade de São Paulo; CEBIMar/USP = Centro de Biologia Marinha da Universidade de São Paulo; pl. = plate; fig. = figure.

## Results

### Systematics

#### Suborder Dendrobranchiata Spence Bate, 1888

#### Superfamily Penaeoidea Rafinesque, 1815

#### Family Aristeidae Wood-Mason, 1891

#### Genus *Aristaeomorpha* Wood-Mason, 1891

#### *Aristaeomorpha foliacea* (Risso, 1827)

*Penaeus foliacea* Risso, 1827: 69; pl. 2, fig. 6.

**Material examined.** None

**Distribution.** Western Atlantic—USA (Massachusetts, North Carolina, South Carolina, Florida, Louisiana),

Gulf of Mexico, Caribbean Sea, Venezuela, Guyana, and Brazil (Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul). Eastern Atlantic—Bay of Biscay (France) to South Africa, including the Mediterranean Sea. Indo-West, northern and southern Pacific—Mozambique, Madagascar, Tanzania, Maldives Islands, Sri Lanka, Indonesia, Japan, Fiji Islands and New Zealand (Pérez Farfante & Kensley 1997; D’Incao 1998; Dall 2001; Serejo *et al.* 2007; Tavares & Serejo 2007).

**Remarks.** Previous records of the coast of São Paulo, between 700 and 800 m deep and 23°S and 25°S, caught by commercial trawling fishery off Brazil, between 2000 and 2007 (Dallagnolo *et al.* 2009; Pezzuto 2016).

## Genus *Aristaeopsis* Wood-Mason [in Wood-Mason & Alcock, 1891]

### *Aristaeopsis edwardsiana* (Johnson, 1868)

*Penaeus edwardsianus* Johnson, 1868: 897.

**Material examined.** None.

**Distribution.** Western Atlantic—Bermuda, Gulf of Mexico, Caribbean Sea to French Guiana, and Brazil (Amapá, Pará, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul). Eastern Atlantic—Portugal (Azores and Madeira Islands), Spain (Canary Islands), Morocco, Western Sahara to South Africa, Madagascar, Arabian Sea. Indo-West, northern and southern Pacific—Bay of Bengal, Andaman Sea, Indonesia, Japan, South China Sea, Australia, Wallis, and Futuna Islands (Pérez Farfante & Kensley 1997; Dall 2001).

**Remarks.** Previous records of the coast of São Paulo, between 700 and 800 m deep and 23°S and 25°S, caught by commercial trawling fishery off Brazil, between 2000 and 2007 (Dallagnolo *et al.* 2009; Pezzuto 2016). There are 16S and COI sequences (AY601734 and KX196551, respectively) available on GenBank of a specimen from Gulf of Mexico by Vázquez-Bader *et al.* (2004).

## Family Penaeidae Rafinesque, 1815

### Genus *Artemesia* Spence Bate, 1888

#### *Artemesia longinaris* Spence Bate, 1888

(Fig. 1A)

*Artemesia longinaris* Spence Bate, 1888: 281; pl. 90.

**Material examined.** Brazil, São Paulo: 13 ♀, CCDB 327, Ubatuba, coll. F. Mantelatto, 01.iii.1997; 2 ♂, 3 ♀, CCDB 315, Ubatuba, coll. F. Mantelatto, 19.xi.2002; 5 ♂, 16 ♀, CCDB 3429, Ubatuba, colls. A. Castilho *et al.*, 7.vii.2011; 10 ♀, CCDB 3806, Ubatuba, coll. R. Costa, xii.2011; 1 ♂, 1 ♀, CCDB 4008, Santos, colls. A. Carvalho-Batista *et al.*, 24.x.2011; 2 ♂, 3 ♀, CCDB 3655, Cananéia, colls. R. Costa *et al.*, 9.xi.2011; 1 ♀, CCDB 6914, Ubatuba, colls. J. Perroca *et al.*, 18.i.2022.

**Distribution.** Western Atlantic—Brazil (Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), Uruguay, and Argentina (Boschi 1963; Mistakidis & Neiva 1964; Boschi *et al.* 1992; Zolessi & Philippi 1995; D’Incao 1998; Costa *et al.* 2000).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, Santos—São Vicente Bay, and Cananéia (Costa *et al.* 2000; Castilho *et al.* 2008a; Carvalho-Batista *et al.* 2011, 2014; Furlan *et al.* 2013; Bochini *et al.* 2019; Santos *et al.* 2021). Sequences accession number (GenBank): CCDB 3429—16S (MF490228), COI (KF572080) (Carvalho-Batista *et al.* 2014; Mantelatto *et al.* 2018).

## Genus *Farfantepenaeus* Burukovsky, 1997

### *Farfantepenaeus brasiliensis* (Latreille, 1817)

(Fig. 1B)

*Penaeus brasiliensis* Latreille, 1817a: 156.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 329, Ubatuba, coll. F. Mantelatto, 01.iii.1997; 5 ♀, CCDB 335, Ubatuba, coll. F. Mantelatto, 01.ix.1997; 8 ♀, CCDB 2916, Ubatuba, coll. F. Mantelatto, 12.v.2010; 2 ♂, 3 ♀, CCDB 60, Ubatuba, coll. D. Rosa, 22.iv.2011; 1 ♀, CCDB 3767, Ubatuba, coll. D. Rosa, 17.viii.2011; 4 ♀, CCDB 334, Caraguatatuba, coll. F. Mantelatto, 24.vii.2002; 3 ♀, CCDB 4532, Santos, coll. R. Costa, 2012; 1 ♀, CCDB 3231, Cananéia, colls. R. Costa & A. Castilho, 18.iv.2011; 4 ♂, 8 ♀, CCDB 1210, Cananéia, colls. R. Costa *et al.*, 29.vii.2011; 2 ♂, 2 ♀, CCDB 3646, Cananéia, colls. R. Costa *et al.*, 9.xi.2011; 2 ♂, 2 ♀, CCDB 4478, Cananéia, coll. R. Costa, 2012; 1 ♀, CCDB 5191, Cananéia, colls. R. Costa *et al.*, 11.iii.2012; 1 ♀, CCDB 4910, Cananéia, colls. R. Costa *et al.*, 22.vii.2012; 1 ♂, 1 ♀, CCDB 4719, Cananéia, coll. R. Costa, 27.xi.2012.

**Distribution.** Western Atlantic—Bermuda, USA (North Carolina, South Carolina, Florida), Mexico (Campeche, Yucatan), Bahamas, Cuba, Haiti, Jamaica, Puerto Rico, Virgin Islands, Antigua, Guadeloupe, Aruba, Curaçao, Trinidad and Tobago, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Suriname, French Guiana, Brazil (Amapá, Pará, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul), and Uruguay (Pérez Farfante 1969, 1971; Williams 1984; Kawahara 1985; Abele & Kim 1986; Zolessi & Philippi 1995; D’Incao 1998; Cortés & Campos 1999; Vargas & Cortés 1999a; Costa *et al.* 2000; Coelho *et al.* 2006, Spivak *et al.* 2019).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, São Sebastião, Santos, and Cananéia (D’Incao 1995a; Costa *et al.* 2000; Reigada *et al.* 2006; Castilho *et al.* 2008a; Bochini *et al.* 2019; Salvati *et al.* 2021). Sequence accession number (GenBank): CCDB 3640—16S (KY449063), COI (KF783862) (Carvalho-Batista *et al.* 2014, 2019).

### *Farfantepenaeus paulensis* (Pérez Farfante, 1967)

(Fig. 1C)

*Penaeus (Melicertus) paulensis* Pérez Farfante, 1967: 84; figs. 1a–d.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 328, Ubatuba, coll. F. Mantelatto, 01.iii.1997; 2 ♂, 1 ♀, CCDB 2351, Ubatuba, colls. F. Mantelatto *et al.*, 02.vi.2008; 1 ♀, CCDB 3774, Ubatuba, coll. D. Rosa, 15.viii.2011; 1 ♀, CCDB 5192, Ubatuba, colls. F. Mantelatto *et al.*, 23.iv.2012; 1 ♀, CCDB 332, Caraguatatuba, coll. F. Mantelatto, 24.vii.2002; 1 ♂, 9 ♀, CCDB 4482, Santos, coll. R. Costa, 2012; 4 ♀, CCDB 4585, Santos, coll. R. Costa, 2012; 6 ♀, CCDB 3773, São Vicente, colls. A. Castilho *et al.*, 23.x.2011; 1 ♂, CCDB 3230, Cananéia, colls. R. Costa & A. Castilho, 18.iv.2011; 2 ♀, CCDB 3235, Cananéia, colls. R. Costa & A. Castilho, 18.iv.2011; 10 ♂, 1 ♀, 1 j, CCDB 3645, Cananéia, colls. R. Costa *et al.*, 09.xi.2011; 2 ♀, CCDB 4911, Cananéia, colls. R. Costa *et al.*, 11.iii.2012; 1 ♂, CCDB 5177, Cananéia, colls. R. Costa *et al.*, 11.iii.2012.

**Distribution.** Western Atlantic—Brazil (Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), Uruguay, and Argentina (Pérez Farfante 1969; Boschi *et al.* 1992; D’Incao 1998; Costa *et al.* 2000; Coelho *et al.* 2006).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, São Sebastião, Santos, and Cananéia (D’Incao 1995a; Costa *et al.* 2000; Reigada *et al.* 2006; Castilho *et al.* 2008a; Bochini *et al.* 2019; Salvati *et al.* 2021). Sequence accession number (GenBank): CCDB 970—16S (KY449062), COI (KF783861) (Carvalho-Batista *et al.* 2014, 2019).

### *Farfantepenaeus subtilis* (Pérez Farfante, 1967)

*Penaeus aztecus subtilis* Pérez Farfante, 1967: 89; figs. 2a–b, 3a–c.

**Material examined.** Brazil, São Paulo: 1 ♂, 1 ♀, CCDB 4676, Cananéia, coll. R. Costa, 23.vi.2013.

**Distribution.** Western Atlantic—Cuba, Haiti, Dominican Republic, Jamaica, Puerto Rico, Virgin Islands, Antigua, Guadeloupe, Saint Lucia, Aruba, Curaçao, Trinidad and Tobago, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil (Amapá, Pará, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo) (Pérez Farfante 1967; Coelho & Ramos-Porto 1980; Beltran 1982; D’Incao 1998; Vargas & Cortés 1999a; Coelho *et al.* 2006; Teodoro *et al.* 2016; Nóbrega *et al.* 2021).

**Remarks.** Previous records from the coast of São Paulo include only Cananéia (Teodoro *et al.* 2016). A remarkably similar species *Farfantepenaeus isabellae* Tavares & Gusmão, 2016 was described from one of the two morphotypes of *F. subtilis* just after that record. Tavares & Gusmão (2016) reported that it was not possible to confirm the identification of the specimen presented by Teodoro *et al.* (2016) since molecular analyzes were performed in distinct regions of mitochondrial DNA. However, França *et al.* (2020) confirmed the identification of a single specimen collected by Teodoro *et al.* (2016) as *F. subtilis*. Sequence accession number (GenBank): CCDB 4676—16S (MF490143), COI (KX421864) (Teodoro *et al.* 2016; Mantelatto *et al.* 2018).

### Genus *Litopenaeus* Pérez Farfante, 1969

#### *Litopenaeus schmitti* (Burkenroad, 1936)

(Fig. 1D)

*Penaeus schmitti* Burkenroad, 1936: 315; figs. 1–3.

**Material examined.** Brazil, São Paulo: 2 ♂, 1 ♀, CCDB 1927, Ubatuba, colls. F. Mantelatto *et al.*, 04.iv.2011; 8 ♂, 3 ♀, CCDB 3456, Ubatuba, colls. A. Castilho *et al.*, 7.vii.2001; 1 ♂, 2 ♀, CCDB 3775, Ubatuba, coll. D. Rosa, 15.viii.2011; 8 ♂, 7 ♀, CCDB 336, Caraguatatuba, coll. F. Mantelatto, 24.vii.2002; 1 ♂, 3 ♀, CCDB 1212, Cananéia, colls. R. Costa *et al.*, 30.viii.2011; 1 j, CCDB 3223, Cananéia, colls. R. Costa *et al.*, 17.iv.2011; 1 ♂, CCDB 4912, Cananéia, colls. R. Costa *et al.*, 22.vii.2012; 1 ♀, CCDB 5218, Cananéia, colls. R. Costa *et al.*, 11.iii.2011.

**Distribution.** Western Atlantic—Cuba, Haiti, Jamaica, Guadeloupe, Trinidad and Tobago, Belize, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Suriname, Brazil (Amapá, Pará, Piauí, Maranhão, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), and Uruguay (Coelho & Ramos-Porto 1980; Beltran 1982; D’Incao 1998; Vargas & Cortés 1999a; Costa *et al.* 2000; Coelho *et al.* 2006; Spivak *et al.* 2019; Nóbrega *et al.* 2021).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, Santos—São Vicente Bay, Peruíbe, and Cananéia (D’Incao 1995a; Costa *et al.* 2000; Reigada *et al.* 2006; Castilho *et al.* 2008a; Gama *et al.* 2016; Barioto *et al.* 2017; Bochini *et al.* 2014, 2019). Sequence accession number (GenBank): CCDB 3456—16S (MF490229), COI (MH737717) (Mantelatto *et al.* 2018).

#### *Litopenaeus vannamei* (Boone, 1931)

*Penaeus vannamei* Boone, 1931: 173; fig. 16.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 5844, Santos, coll. R. Costa, 10.vii.2014.

**Distribution.** Western Atlantic—USA (South Carolina, Texas), Mexico (Tabasco), Venezuela, and Brazil (Piauí, Rio Grande do Norte, Pernambuco, São Paulo, Santa Catarina). Eastern Pacific—Mexico (Gulf of California, Nayarit, Jalisco, Colima, Guerrero, Oaxaca, Chiapas), Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, and Peru (Tumbes). Hawaii and Indo-West Pacific—Thailand (Holthuis 1980; Balboa *et al.* 1991; Wenner & Knott 1992; Landa-Jaime *et al.* 1997; Vargas & Cortés 1999b; Ramos-Cruz 2000;

Santos & Coelho 2002; Valles-Jimenez *et al.* 2004; Barbieri & Melo 2006; Pereira & Netto 2007; Pérez *et al.* 2007; Senanan *et al.* 2007; Carlton & Eldredge 2009; Loebmann *et al.* 2010; Wakida-Kusunoki *et al.* 2011; Bastida-Zavala *et al.* 2013; Corgos *et al.* 2013; Barbieri *et al.* 2016).

**Remarks.** Previous records from the coast of São Paulo include Iguape, Ilha Comprida, and Cananéia (Barbieri & Melo 2006; Barbieri *et al.* 2016). *Litopenaeus vannamei* is native from Eastern Pacific (Holthuis 1980) and was introduced in Brazil as a cultivated species in shrimp farming (Silva & Barros 2011). Records presented here refer to individuals collected in natural environment. Sequence accession number (GenBank): CCDB 5844—16S (OM720043), COI (OM672408) (present study).

## Genus *Parapenaeus* Smith, 1885

### *Parapenaeus americanus* Rathbun, 1901

(Fig. 1E)

*Parapenaeus americanus* Rathbun, 1901: 102; pl. 2.

**Material examined.** Brazil, São Paulo: 1 ♂, 1 ♀, CCDB 5783, R/V Soloncy Moura Expedition, st. 1, 61 m, colls. F. Zara *et al.*, 17.viii.2015; 2 ♂, 4 ♀, CCDB 5777, R/V Soloncy Moura Expedition, st. 8, 89 m, colls. F. Zara *et al.*, 18.viii.2015; 4 ♀, CCDB 5823, R/V Soloncy Moura Expedition, st. 6, 132 m, colls. F. Zara *et al.*, 18.viii.2015; 4 ♀, CCDB 5792, R/V Soloncy Moura Expedition, st. 11, 84 m, colls. F. Zara *et al.*, 19.viii.2015; 7 ♂, 33 ♀, CCDB 5795, R/V Soloncy Moura Expedition, st. 13, 113 m, colls. F. Zara *et al.*, 19.viii.2015; 1 ♀, CCDB 5827, R/V Soloncy Moura Expedition, st. 9, 66 m, colls. F. Zara *et al.*, 19.viii.2015.

**Distribution.** Western Atlantic—USA (Florida), Gulf of Mexico, Bahamas, Cuba, Puerto Rico, Guadeloupe, Martinique, Saint Lucia, Belize, Brazil (Rio Grande do Norte, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), and Uruguay (Bukenroad 1934; Springer & Bullis 1956; Mistakidis & Neiva 1966; Pérez Farfante 1977b; Lemaitre 1984; Abele & Kim 1986; D’Incao 1998; Yang *et al.* 2015; Alves-Júnior *et al.* 2019).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba and São Sebastião (Mistakidis & Neiva 1966; D’Incao 1995a). Sequence accession number (GenBank): CCDB 5827—16S (KX196597), COI (KX196539) (Rossi 2016).

## Genus *Rimapenaeus* Pérez Farfante & Kensley, 1997

### *Rimapenaeus constrictus* (Stimpson, 1871)

(Fig. 1F)

*Penaeus constrictus* Stimpson, 1871: 135.

**Material examined.** Brazil, São Paulo: 4 ♀, CCDB 173, Ubatuba, coll. D. Rosa, 22.iv.2011; 2 ♂, 12 ♀, CCDB 3771, Ubatuba, coll. D. Rosa, 15–17.viii.2011; 1 ♀, CCDB 4152, Ubatuba, coll. D. Rosa, 15–17.viii.2011; 5 ♂, 10 ♀, CCDB 3947, Ubatuba, coll. R. Costa, 23.iv.2012; 8 ♂, 19 ♀, CCDB 3651, São Vicente, colls. R. Costa *et al.*, 24.x.2011; 1 ♂, 5 ♀, CCDB 3234, Cananéia, colls. R. Costa & A. Castilho, 29.viii.2011; 2 ♂, 4 ♀, CCDB 3639, Cananéia, colls. R. Costa *et al.*, 09.xi.2011; 2 ♂, 2 ♀, CCDB 3649, Cananéia, colls. R. Costa *et al.*, 09.xi.2011; 1 ♂, 1 ♀, CCDB 5189, Cananéia, colls. R. Costa *et al.*, 11.iii.2012; 1 ♀, CCDB 4914, Cananéia, colls. R. Costa *et al.*, 22.vii.2012.

**Distribution.** Western Atlantic—Canada (New Scotia), Bermuda, USA (Virginia, North Carolina, South Carolina, Georgia, Florida), Gulf of Mexico, Puerto Rico, Guadeloupe, Venezuela, Suriname, French Guiana, and Brazil (Amapá, Pará, Maranhão, Ceará, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina) (Huff & Cobb 1979; Coelho & Ramos-Porto 1980; Beltran 1982; Pérez Farfante 1988; Markham *et al.* 1990; D’Incao 1995a; Pérez Farfante & Kensley 1997; Costa *et al.* 2000; Felder *et al.* 2009).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, Santos-São Vicente

Bay, and Cananéia (Costa *et al.* 2000; Reigada *et al.* 2006; Hiroki *et al.* 2011; Garcia *et al.* 2016; Bochini *et al.* 2019; Santos *et al.* 2021). Sequence accession number (GenBank): CCDB 3639—16S (OM720038), COI (KF783863) (present study; Carvalho-Batista *et al.* 2014).

## Genus *Xiphopenaeus* Smith, 1869

### *Xiphopenaeus dincao* Carvalho-Batista, Terossi, Zara, Mantelatto & Costa, 2020

*Xiphopenaeus dincao* Carvalho-Batista, Terossi, Zara, Mantelatto & Costa, 2020: 597.

**Material examined.** Brazil, São Paulo: 2 ♂, 5 ♀, CCLC 418, Cananéia, coll. R. Costa, x.2014.

**Distribution.** Western Atlantic—Colombia, Suriname, French Guiana, and Brazil (Amapá, Pará, Rio Grande do Norte, Alagoas, Bahia, São Paulo) (Gusmão *et al.* 2006, 2013; Piergiorgio *et al.* 2014; Carvalho-Batista *et al.* 2019; Kerkhove *et al.* 2019;).

**Remarks.** *Xiphopenaeus dincao* was recently described and the only record from São Paulo, under the current name, was collected in Cananéia (see above) and appear in the species description (Carvalho-Batista *et al.* 2019). However, there are some previous records from São Paulo, which were discovered through molecular studies performed with samples from Ubatuba and Cananéia as *Xiphopenaeus* sp. 2 (Gusmão *et al.* 2006; Piergiorgio *et al.* 2014). Sequences accession number (GenBank): CCDB 6839—16S (OM720042), CCLC 418—COI (KY449130) (present study; Carvalho-Batista *et al.* 2019).

### *Xiphopenaeus kroyeri* (Heller, 1862)

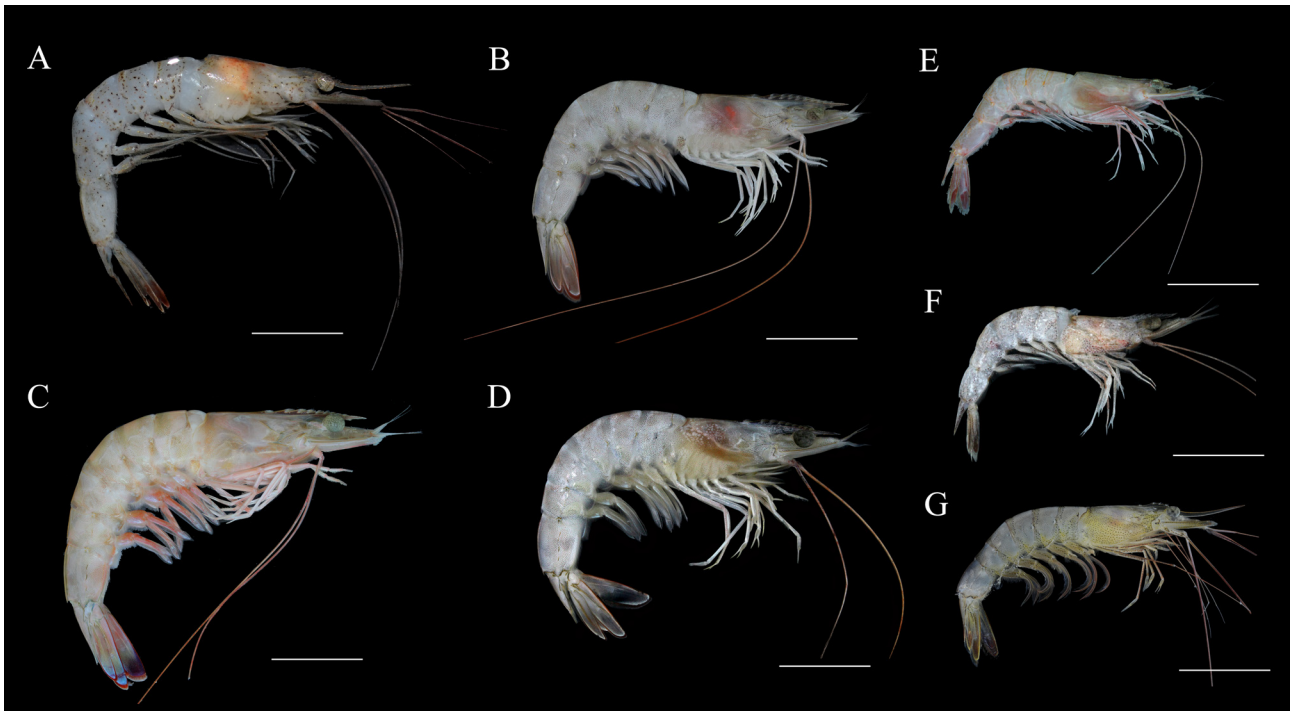
(Fig. 1G)

*Penaeus kroyeri* Heller, 1862: 425; pl.2, fig. 51.

**Material examined.** Brazil, São Paulo: 5 ♂, 9 ♀, CCDB 2917, Ubatuba, coll. F. Mantelatto, 12.v.2010; 1 ♀, CCDB 3290, Ubatuba, colls. F. Mantelatto *et al.*, 04.iv.2011; 4 ♂, 15 ♀, CCDB 3440, Ubatuba, colls. A. Castilho *et al.*, 07.vii.2001; 8 ♂, 7 ♀, CCDB 3950, Ubatuba, coll. R. Costa, 23.iv.2012; 1 ♂, CCDB 5216, Ubatuba, colls. F. Mantelatto *et al.*, 16.x.2012; 20 ♂, 17 ♀, 6 j, CCDB 3699, Bertioga, colls. N. Rossi *et al.*, 24.x.2011; 2 ♀, CCDB 4009, Santos, colls. A. Carvalho-Batista *et al.*, 24.x.2011; 2 ♂, 9 ♀, CCDB 3247, Cananéia, colls. R. Costa *et al.*, 17.iv.2011; 1 ♂, 1 ♀, CCDB 5190, Cananéia, colls. R. Costa *et al.*, 11.iii.2012; 1 ♀, CCDB 4917, Cananéia, colls. R. Costa *et al.*, 22.vii.2012.

**Distribution.** Western Atlantic—Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil (Maranhão, Rio Grande do Norte, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina) (Gusmão *et al.* 2006; Piergiorgio *et al.* 2014; Carvalho-Batista *et al.* 2019; Kerkhove *et al.* 2019).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Santos-São Vicente, and Cananéia (Gusmão *et al.* 2006; Piergiorgio *et al.* 2014; Carvalho-Batista *et al.* 2019). The geographical range of the species can be wider and the all-previous records (before 2019) of some populations must be cautiously considered because these studies did not differentiate *Xiphopenaeus kroyeri* from the other two congeneric Atlantic species, *X. dincao* Carvalho-Batista, Terossi, Zara, Mantelatto & Costa, 2020 and *X. baueri* Carvalho-Batista, Terossi, Zara, Mantelatto & Costa, 2020. Recently, *X. kroyeri* was recorded in Egypt, Mediterranean Sea (Khafage & Taha 2019). However, we compared those COI sequences, deposited by Khafage & Taha (2019) in GenBank as *X. kroyeri* from Egypt, with other available sequences of the same genus and concluded that Khafage & Taha sequences belong to *X. baueri*, a recently described species from the Gulf of Mexico and north of South America (Carvalho-Batista *et al.* 2019, 2020). Sequences accession numbers (GenBank): CCDB 5018—16S (KY449065), COI (KX196599) (Carvalho-Batista *et al.* 2019).



**FIGURE 1.** Family Penaeidae. A) *Artemesia longinaris* Spence Bate, 1888 (CCDB 6914). B) *Farfantepenaeus brasiliensis* (Latreille, 1817) (CCDB 4910). C) *Farfantepenaeus paulensis* (Pérez Farfante, 1967) (CCDB 5813). D) *Litopenaeus schmitti* (Burkenroad, 1936) (CCDB 4912). E) *Parapenaeus americanus* Rathbun, 1901 (CCDB 5825). F) *Rimapenaeus constrictus* (Stimpson, 1871) (CCDB 4914). G) *Xiphopenaeus kroyeri* (Heller, 1862) (ULLZ 15974). Animals from Brazil, São Paulo, Ubatuba (A), Cananéia (B—D; F, G), R/V Soloncy Moura Expedition, st. 12 (E). Sex: female (A, B, E—G), male (C, D). Scale bars (mm): A—15; B—38; C—37; D—40; E—50; F—24; G—44. Photographs by J. Perroca (A), R.C. Buranelli (B—G).

## Family Sicyoniidae Ortmann, 1898

### Genus *Sicyonia* H. Milne-Edwards, 1830

#### *Sicyonia dorsalis* Kingsley, 1878

(Fig. 2A)

*Sicyonia dorsalis* Kingsley, 1878: 97.

**Material examined.** Brazil, São Paulo: 1 ♂, 1 ♀, CCDB 4932, Ubatuba, colls. F. Mantelatto *et al.*, 15.vi.2003; 2 ♀, CCDB 3948, Ubatuba, coll. R. Costa, 23.iv.2012; 1 ♀, CCDB 1969, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 03.v.2007; 3 ♀, CCDB 2206, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 18.viii.2007; 2 ♀, CCDB 3877, Ubatuba, Enseada de Ubatuba, colls. F. Mantelatto *et al.*, 23.iv.2012; 1 ♂, 44 ♀, CCDB 3430, Ubatuba, Praia do Cedro, colls. A. Castilho *et al.*, 7.vii.2011; 1 ♀, CCDB 6676, Ubatuba, Praia do Cedro, coll. F. Mantelatto, 16.x.2012; 9 ♂, 3 ♀, CCDB 348, Caraguatatuba, Enseada de Caraguatatuba, coll. F. Mantelatto, 24.vii.2002; 2 ♂, 53 ♀, CCDB 3656, São Vicente, colls. R. Costa *et al.*, 24.x.2011; 8 ♀, CCDB 849, Cananéia, Cananéia estuary, colls. R. Costa *et al.*, 29.viii.2011; 1 ♂, 5 ♀, CCDB 3648, Cananéia, colls. R. Costa *et al.*, 09.xi.2011; 1 ♂, 3 ♀, CCDB 4987, Cananéia, colls. A. Castilho *et al.*, 09.xi.2011; 2 ♀, CCDB 5202, Cananéia, colls. R. Costa *et al.*, 11.iii.2012; 1 ♀, CCDB 4915, Cananéia, colls. R. Costa *et al.*, 22.vii.2012; 1 ♂, CCDB 3233, Cananéia, Ilha do Bom Abrigo, colls. R. Costa & A. Castilho, 18.iv.2011.

**Distribution.** Western Atlantic—USA (North Carolina, South Carolina, Florida, Louisiana), Venezuela, Guyana, and Brazil (Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina) (D’Incao 1995b; Pérez Farfante & Kensley 1997; Costa *et al.*

2003; Costa & Simões 2016).

**Remarks.** Previous records from the coast of São Paulo include the Ubatuba, Santos—São Vicente, and Cananéia (Pires 1992; Costa *et al.* 2000, 2003, 2005; Fransozo *et al.* 2002, 2012; Castilho *et al.* 2008a, b, c; Furlan *et al.* 2013; Mantelatto *et al.* 2016b; Bochini *et al.* 2019; Santos *et al.* 2021). This species is commonly caught, as bycatch, with other commercial shrimps (Costa *et al.* 2000; Fransozo *et al.* 2002; Castilho *et al.* 2008a). Sequences accession number (GenBank): CCDB 3948—16S (KX196485), COI (KX196551) (Camargo *et al.* 2016, 2017).

### *Sicyonia laevigata* Stimpson, 1871

*Sicyonia laevigata* Stimpson, 1871: 131.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 4931, Ubatuba, colls. F. Mantelatto *et al.*, 12.v.2010; 2 ♀, CCDB 5431, Ubatuba, Enseada de Ubatuba, coll. R. Costa, 11.ii.2014; 1 ♂, MZUSP 14077, northern São Paulo.

**Distribution:** Western Atlantic—USA (North Carolina, South Carolina, Florida), Mexico (Gulf of Mexico to Yucatan), Cuba, Jamaica, Haiti, Puerto Rico, Antigua, Nicaragua, Panama, Colombia, Venezuela, and Brazil (Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (D’Incao 1995b; Pérez Farfante & Kensley 1997; Costa *et al.* 2003; Costa & Simões 2016).

**Remarks.** Previous records from São Paulo state are around the Ubatuba region and south of São Paulo state coast (Corrêa & Silva 1995; D’Incao 1995b; Costa *et al.* 2000, 2003; Fransozo *et al.* 2002, 2012; Castilho *et al.* 2008a; Mantelatto *et al.* 2016b). Sequences accession number (GenBank): CCDB 5431—16S (KX196504), COI (KX196558) (Camargo *et al.* 2016, 2017).

### *Sicyonia parri* (Burkenroad, 1934)

*Eusicyonia parri* Burkenroad, 1934: 80, fig. 22.

**Material examined.** Brazil, São Paulo: 1 ♀, MZUSP 13295, Ubatuba, 20.ii.1996.

**Distribution:** Western Atlantic—Mexico, Gulf of Mexico, Cuba, Puerto Rico, Antigua, Venezuela, Suriname, Guyana, and Brazil (Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (D’Incao 1995b; Pérez Farfante & Kensley 1997; Costa *et al.* 2003; Costa & Simões 2016).

**Remarks.** Previous records from São Paulo state are around the Ubatuba region and south of São Paulo state coast (Costa *et al.* 2000; Mantelatto *et al.* 2016b). Sequences accession number (GenBank): MZUSP 13295—16S (KX196515) (Camargo *et al.* 2016).

### *Sicyonia typica* (Boeck, 1864)

(Fig. 2B)

*Synhimantites typicus* Boeck, 1864: 189.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 4930, Ubatuba, coll. F. Mantelatto, 20.xii.1989; 3 ♂, 8 ♀, CCDB 3681, Ubatuba, offshore, coll. D. Rosa, 15.viii.2011; 2 ♂, 9 ♀, CCDB 3603, Ubatuba, offshore, coll. D. Rosa, 05.ix.2011; 1 ♂, CCDB 4916, Ubatuba, offshore, coll. D. Rosa, 17.x.2012; 1 ♀, CCDB 5064, Ubatuba, offshore, coll. D. Rosa, 17.x.2012; 2 ♂, 2 ♀, CCDB 5430, Ubatuba, offshore, coll. D. Rosa, 12.ix.2014; 1 ♀, CCDB 5707, Ubatuba, off shore, coll. D. Rosa, v.2015; 3 ♂, 5 ♀, CCDB 343, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 01.iii.1997; 5 ♀, CCDB 341, Ubatuba, Enseada de Ubatuba, coll. R. Costa, 01.viii.1999; 1 ♀, CCDB 1948, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 03.v.2007; 11 ♀, CCDB 3488, Ubatuba, Palmas, coll. D. Rosa, 22.iv.2011; 1 ♂, 2 ♀, CCDB 3951, Ubatuba, Palmas, coll. R. Costa, 23.iv.2012; 2 ♂, 3 ♀, CCDB 340, Caraguatatuba, Enseada de Caraguatatuba, coll. R. Costa, 24.vii.2002.

**Distribution:** Western Atlantic—USA (North Carolina, South Carolina, Georgia, Florida, Louisiana, Missisipi,



Texas), Mexico, Gulf of Mexico, Cuba, Puerto Rico, Antigua, Venezuela, Suriname, Guyana, and Brazil (Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (D’Incao 1995b; Pérez Farfante & Kensley 1997; Costa *et al.* 2003; Costa & Simões 2016).

**Remarks.** Previous records from the coast of São Paulo, include the Ubatuba region and south of São Paulo state coast (Pires 1992; Corrêa & Silva 1995; D’Incao 1995b; Costa *et al.* 2000, 2003; Fransozo *et al.* 2002; 2012; Castilho *et al.* 2008a, c; Mantelatto *et al.* 2016b). This species is commonly caught with other commercial shrimps as bycatch (Costa *et al.* 2000; Fransozo *et al.* 2002; Castilho *et al.* 2008a). Sequences accession number (GenBank): CCDB 341—16S (KT935433–KT935436), COI (KX196577) (Camargo *et al.* 2016, 2017).



**FIGURE 2.** Family Sicyoniidae. A) *Sicyonia dorsalis* Kingsley, 1878 (CCDB 4915). B) *Sicyonia typica* (Boeck, 1864) (CCDB 4916). Animals from Brazil, São Paulo, Cananéia (A), Ubatuba (B). Sex: females. Scale bars (mm): A—11; B—17. Photographs by R.C. Buranelli.

#### Family Solenoceridae Wood-Mason in Wood-Mason & Alcock, 1891

#### Genus *Mesopenaeus* Pérez Farfante, 1977

## *Mesopenaeus tropicalis* (Bouvier, 1905)

*Parartemesia tropicalis* Bouvier, 1905a: 748.

**Material examined.** None.

**Distribution.** Western Atlantic—USA (North Carolina, South Carolina, Georgia, Florida, Alabama), Mexico (Quintana Roo), Gulf of Mexico, Bahamas, Cuba, Dominican Republic, Puerto Rico, Dominica, Barbados, Belize, Nicaragua, Panama, Colombia, Venezuela, and Brazil (Amapá, Pará, Maranhão, Rio Grande do Norte, Espírito Santo, Rio de Janeiro, São Paulo, Rio Grande do Sul) (Lindner & Anderson 1941; Pérez Farfante 1977a; Huff & Cobb 1979; Coelho & Ramos-Porto 1980; Lemaitre 1984; Williams 1984; D’Incao 1995a; Pérez Farfante & Kensley 1997; Ramos-Porto *et al.* 2000; Coelho *et al.* 2006; Alves-Júnior *et al.* 2017a).

**Remarks.** Previous records from São Paulo include Ubatuba and São Sebastião (Mistakidis & Neiva 1966; Pires 1992). However, information about the collection where the specimens were deposited was not provided. The occurrence of this species in São Paulo seems doubtful, since we could not examine specimens deposited in any collection, neither obtain individuals in our samples. There are some gaps in the Brazilian coast distribution (from Rio Grande do Norte to Espírito Santo and from São Paulo to Rio Grande do Sul) (see references above). In addition, D’Incao (1995a) argues that the reason of these gaps is the difficulty on sampling deep waters, since most of the records of this species occur in depths greater than 100 m. Such depth was not our main target during our surveys. There is 16S sequence available on GenBank (JX403849) of a specimen from Gulf of Mexico by Bracken-Grissom *et al.* (2012).

## Genus *Pleoticus* Spence Bate, 1888

### *Pleoticus muelleri* (Spence Bate, 1888)

(Fig. 3)

*Philonicus mülleri* Spence Bate, 1888: 275; pl. 39, figs. 1–2.

**Material examined.** Brazil, São Paulo: 10 ♀, CCDB 4007, Ubatuba, coll. R. Costa, xii.2011; 1 ♀, CCDB 4913, Ubatuba, colls. F. Mantelatto *et al.*, 16.x.2012; 2 ♀, CCDB 3768, Ubatuba, offshore, coll. D. Rosa, 15–17.viii.2011; 1 ♂, 11 ♀, CCDB 3776, Ubatuba, offshore, coll. D. Rosa, 17.viii.2011; 2 ♀, CCDB 4153, Ubatuba, offshore, coll. D. Rosa, 15–17.viii.2011; 1 ♀, CCDB 4151, Ubatuba, offshore, coll. D. Rosa, 15–28.viii.2011; 2 ♀, CCDB 320, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 19.xi.1997; 2 ♀, CCDB 1110, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 23.vii.2002; 2 ♂, 4 ♀, CCDB 2211, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 18.viii.2007; 2 ♂, 5 ♀, CCDB 2361, Ubatuba, Enseada de Ubatuba, colls. F. Mantelatto *et al.*, 2.vi.2008; 1 ♀, CCDB 2911, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 12.v.2010; 3 ♂, 4 ♀, CCDB 6547, Ubatuba, Enseada de Ubatuba, colls. J. Teles & N.F. França, 11.ix.2019; 12 ♂, 10 ♀, CCDB 3439, Ubatuba, Praia do Cedro, colls. A. Castilho *et al.*, 07.vii.2001; 7 ♂, CCDB 172, Ubatuba, Ilha das Palmas, coll. D. Rosa, 22.iv.2011; 2 ♂, 18 ♀, CCDB 1521, Santos, colls. A. Castilho *et al.*, 24.x.2011; 3 ♂, 2 ♀, CCDB 6437, São Vicente, Bahia de Santos, coll. R. Costa, vii.2008; 1 ♂, CCDB 5183, Cananéia, colls. R. Costa *et al.*, 11.iii.2012; 13 ♂, 13 ♀, CCDB 3676, Cananéia, colls. R. Costa *et al.*, 09.xi.2011; 1 ♀, CCDB 5804, R/V Soloncy Moura Expedition, st. 2, 72 m, colls. F. Zara *et al.*, 17.viii.2015; 2 ♀, CCDB 5803, R/V Soloncy Moura Expedition, st. 4, 117 m, colls. F. Zara *et al.*, 18.viii.2015.

**Distribution.** Western Atlantic—Brazil (Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), Uruguay, and Argentina (Pérez Farfante & Kensley 1997; Boschi 1989; D’Incao 1995a, 1999; Costa *et al.* 2003; IBAMA 2011a; Santos *et al.* 2016).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Santos—São Vicente, and Cananéia (Pires 1992; Costa *et al.* 2000, 2003, 2004; D’Incao *et al.* 2002; Fransozo *et al.* 2002, 2012; Castilho *et al.* 2008a, d, 2012; Carvalho-Batista *et al.* 2011, 2018; Lopes *et al.* 2014; Mantelatto *et al.* 2016b; Bochini *et al.* 2019; Santos *et al.* 2021). Sequences accession number (GenBank): CCDB 3438—16S (MF490231), COI (MF490134) (Mantelatto *et al.* 2018).



**FIGURE 3.** Family Solenoceridae. *Pleoticus muelleri* (Spence Bate, 1888) (CCDB 5804). Animal from Brazil, São Paulo, R/V Soloncy Moura Expedition, st. 2. Sex: female. Scale bar (mm): 13. Photograph by R.C. Buranelli.

### **Genus *Solenocera* Lucas, 1849**

#### ***Solenocera atlantidis* Burkenroad, 1939**

*Solenocera atlantidis* Burkenroad, 1939: 10; figs. 5–10.

**Material examined.** None.

**Distribution.** Western Atlantic—USA (North Carolina to Florida), Gulf of Mexico, West Indies, Caribbean coast of Central and South America, and Brazil (Amapá, Pará, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Sergipe, Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo) (D’Incao 1995a, 1998b).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba and a not mentioned locality (Pires 1992; D’Incao 1995a, 1998b; Costa *et al.* 2000).

#### ***Solenocera necopina* Burkenroad, 1939**

*Solenocera necopina* Burkenroad, 1939: 10; figs. 5–10.

**Material examined.** None.

**Distribution.** Western Atlantic—USA (North Carolina, South Carolina, Georgia, Florida), Gulf of Mexico, Bahamas, Caribbean Sea, Brazil (Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), and Uruguay (D’Incao 1995a; Pérez Farfante & Kensley 1997).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba and a not mentioned locality (Pires 1992; D’Incao 1995a; Costa *et al.* 2000). There is a 16S sequence available on GenBank (JX403853) of a specimen from Gulf of Mexico by Bracken-Grissom *et al.* (2012).

## Superfamily Sergestoidea Dana, 1852

### Family Luciferidae Dana, 1852

#### Genus *Belzebub* Vereshchaka, Olesen & Lunina, 2016

##### *Belzebub faxoni* (Borradaile, 1915)

(Fig. 4A)

*Lucifer faxoni* Borradaile, 1915: 228, 230.

**Material examined.** Brazil, São Paulo: 8 ♂, 7 ♀, 3 ni, CCDB 4634, Ubatuba, Enseada de Ubatuba, coll. D. Rosa, 08.ii.2006; 6 ♂, 3 ♀, CCDB 5407, Ubatuba, Enseada de Ubatuba, coll. F. Zara, 14.ix.2014; 6 ♂, 5 ♀, 20 adults, CCDB 5695, Cananéia, IO/USP coll. F. Zara, 14.ix.2014; 8 ♂, 9 ♀, 1 j, CCDB 5905, R/V Soloncy Moura Expedition, st. 2, 72 m, colls. F. Zara *et al.*, 17.viii.2015; 2 ♂, 3 ♀, CCDB 5908, R/V Soloncy Moura Expedition, st. 1, 61 m, colls. F. Zara *et al.*, 17.viii.2015; 10 ♂, 2 ♀, > 50 spec., CCDB 5906, R/V Soloncy Moura Expedition, st. 6, 132 m, colls. F. Zara *et al.*, 18.viii.2015; 7 ♂, 5 ♀, > 100 spec., CCDB 5907, R/V Soloncy Moura Expedition, st. 3, 113 m, colls. F. Zara *et al.*, 18.viii.2015; 3 ♀, CCDB 5909, R/V Soloncy Moura Expedition, st. 5, 130 m, colls. F. Zara *et al.*, 18.viii.2015; 3 ♀, CCDB 5910, R/V Soloncy Moura Expedition, st. 8, 89 m, colls. F. Zara *et al.*, 18.viii.2015; 1 ♀, CCDB 5911, R/V Soloncy Moura Expedition, st. 6, 132 m, colls. F. Zara *et al.*, 18.viii.2015; 1 ♂, CCDB 5930, R/V Soloncy Moura Expedition, st. 3, 113 m, colls. F. Zara *et al.*, 18.viii.2015.

**Distribution.** Western Atlantic—Canada (New Scotia), Bermuda, USA (Florida), Gulf of Mexico, Antilles, north of South America, and Brazil (Amapá, Pará, Pernambuco, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul). Eastern Atlantic—off Senegal, and Congo (D’Incao 1995a, 1997; Melo *et al.* 2014; Vereshchaka *et al.* 2016b).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Santos, Cananéia, and a not mentioned locality (López 1966; Costa & Prandi 1971; Alvarez 1985; Teodoro *et al.* 2012, 2014). Sequences accession number (GenBank): CCDB 5407—16S (KY449064), COI (KY449077) (Carvalho-Batista *et al.* 2019).

#### Genus *Lucifer* Thompson, 1829

##### *Lucifer typus* H. Milne-Edwards, 1837 [in H. Milne Edwards, 1834–1840]

(Fig. 4B)

*Leucifer typus* H. Milne Edwards, 1837: 469.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 5904, R/V Soloncy Moura Expedition, st. 6, 132 m, colls. F. Zara *et al.*, 17–18.viii.2015.

**Distribution.** Western Atlantic—Bermuda, USA (Florida), Gulf of Mexico, Antilles, north of South America, and Brazil (Amapá, Pará, Pernambuco, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul). Eastern Atlantic—Mediterranean Sea, off Cape of Good Hope, east coast of South Africa. Indo-West Pacific—Bay of Bengal, East and South China Seas, Philippines, Malaysia, Queensland, and Australia (D’Incao 1995a; Melo *et al.* 2014; Vereshchaka *et al.* 2016b).

**Remarks.** Previous records from offshore São Paulo are from northern limit of the state to Santos (Costa &

Prandi 1971; D’Incao 1995a). There is a COI sequence (GU183792) available on GenBank of a specimen from northern Atlantic by Bucklin *et al.* (2010).

## Family Sergestidae Dana, 1852

### Genus *Acetes* H. Milne Edwards, 1830

#### *Acetes americanus americanus* Ortmann, 1893

(Fig. 4C)

*Acetes americanus* Ortmann, 1893: 39, tab. II, fig. 2.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 5931, Ubatuba, coll. G. Bochini, 22.x.2014; 1 ♂, 10 ♀, CCDB 4939, São Vicente, coll. A. Castilho, 3.ix.2012; 1 ♂, 7 ♀, CCDB 4952, São Vicente, coll. A. Castilho, 3.ix.2012; 2 ♂, 4 ♀, CCDB 4953, São Vicente, coll. A. Castilho, 3.ix.2012; 3 ♂, 14 ♀, CCDB 3251, Cananéia, estuary, colls. R. Costa *et al.*, 17.iv.2011; 3 ♀, CCDB 3761, Cananéia, coll. A. Castilho, 11.iii.2012; 1 ♀, CCDB 5643, Cananéia, coll. R. Costa, 20.v.2012; 2 ♀, CCDB 4955, Cananéia, colls. A. Castilho *et al.*, vii.2013; 1 ni, CCDB 6027, Cananéia, colls. R. Costa *et al.*, 22.iv.2014.

**Distribution.** Western Atlantic—USA (North Carolina), Gulf of Mexico, Caribbean Sea, Puerto Rico, Panama, Venezuela, Suriname, French Guiana, and Brazil (Pará, Maranhão, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Bahia, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (Holthuis 1959; Chace 1972; Omori 1975; Coelho & Ramos-Porto 1980; Coelho *et al.* 1986; D’Incao 1995a; Pérez Farfante & Kinsley 1997; Costa *et al.* 2000, 2003; D’Incao & Martins 2000; Barros & Pimentel 2001; Vasques *et al.* 2003; Boos *et al.* 2012; Melo Júnior *et al.* 2016; Mantelatto *et al.* 2018).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Guarujá, and Ilha Comprida (Costa *et al.* 2000, 2003; D’Incao & Martins 2000; Severino-Rodrigues *et al.* 2002; Simões *et al.* 2012; Mantelatto *et al.* 2018). On the coast of São Paulo, *A. a. americanus* is captured preferably in lower depths and high temperatures (23.5–28.5°C) (Simões *et al.* 2013). Although it may be captured incidentally as bycatch with other shrimps, and the consumption of specimens of the same genus occurs in the northern Brazil, these were not considered significant threats to the species (Costa & Simões 2016). The taxonomic status of this genus has been under debate for long time and some subspecies are still considered valid as *Acetes a. carolinae* and *A. a. americanus* (Holthuis 1948; WoRMS 2022). A molecular study in progress by our team (Simões *et al.* in progress) will shed light in the taxonomic status and the identity of *A. a. americanus*, as well as its relationship with other congeners from western Atlantic. Sequences accession number (GenBank): CCDB 4939—16S (KX196538), COI (KX196595) (Mantelatto *et al.* 2018).

### Genus *Peisos* Burkenroad, 1945

#### *Peisos petrunkevitchi* Burkenroad, 1945

(Fig. 4D)

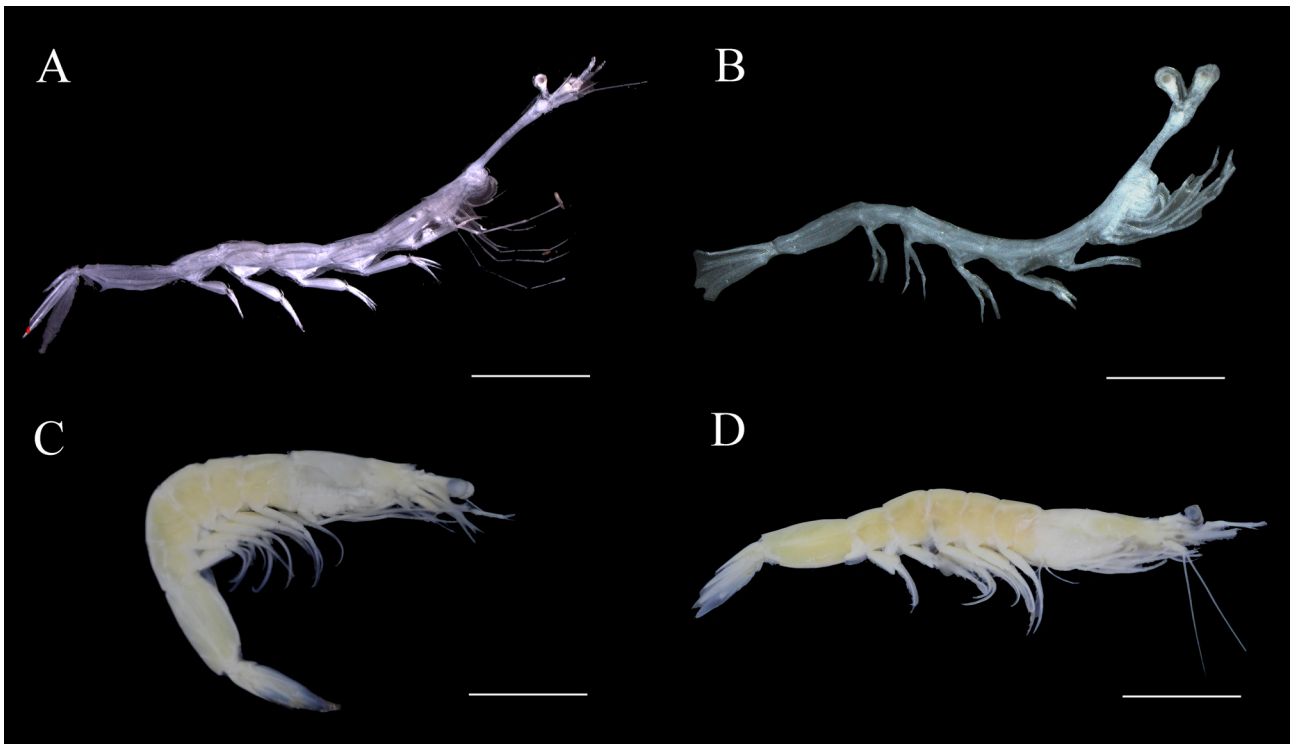
*Peisos petrunkevitchi* Burkenroad, 1945: 554.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 5932, Ubatuba, coll. R. Costa, 11.ii.2013; 14 ♀, CCDB 4958, Ubatuba, colls. R. Costa *et al.*, 28.xi.2013; 12 ♀, CCDB 4959, Ubatuba, colls. R. Costa *et al.*, 28.xi.2013; 1 ♂, 6 ♀, CCDB 4940, São Vicente, coll. A. Castilho, 3.ix.2012.

**Distribution.** Western Atlantic—Brazil (Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), Uruguay, and Argentina (Boschi 1979; Pérez Farfante & Kinsley 1997; D’Incao & Martins 2000; Costa *et al.* 2003; Robert *et al.* 2007; Boos *et al.* 2012; Mantelatto *et al.* 2018).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba (D’Incao & Martins 2000; Costa *et al.* 2003; Simões *et al.* 2012; Mantelatto *et al.* 2018); it is usually captured in low temperatures (< 20 °C) (Simões

*et al.* 2013). Although it may be captured incidentally as bycatch of some commercial shrimps, this species is not considered as endangered or under threats (Costa & Simões 2016). The monotypic genus *Peisos* had its phylogenetic status tested in relation to other sergestids genera *Sicyonella* Borradaile, 1910 and *Acetes* (Vereshchaka *et al.* 2016a). These authors combined all species of *Acetes* and *P. petrunkevitchi* into a single monophyletic genus and consider *Peisos* as a junior synonym of *Acetes* (Vereshchaka *et al.* 2016a). *Peisos petrunkevitchi* with *A. a. americanus* are sympatric species in southeastern and southern Brazil, which has led to mistaken identifications on previous records (D’Incao & Martins 2000). Currently, *Peisos petrunkevitchi* is still accepted (WoRMS 2022), and considering the non-consolidated opinion among carcinologists and to avoid taxonomic instability, we maintained nomenclature here until there is a consolidated taxonomic treatment of the genus. Sequences accession number (GenBank): CCDB 4940—16S (KX196598), COI (KX196540) (Mantelatto *et al.* 2018).



**FIGURE 4.** Families Luciferidae and Sergestidae. A) *Belzebub faxoni* (Borradaile, 1915) (CCDB 5930). B) *Lucifer typus* H. Milne-Edwards, 1837 (CCDB 5904). C) *Acetes americanus americanus* Ortmann, 1893 (CCDB 5931). D) *Peisos petrunkevitchi* Burkenroad, 1945 (CCDB 5932). Animals from Brazil, São Paulo, R/V Soloncy Moura Expedition, st. 3 (A), st. 6 (B), Ubatuba (C, D). Sex: male (A, B), female (C, D). Scale bars (mm): A—2, B—2; C—5; D—8. Photographs by R.C. Buranelli.

## Genus *Robustosergia* Vereshchaka, Olesen & Lunina, 2014

### *Robustosergia robusta* (Smith, 1882)

*Sergestes robustus* Smith, 1882: 97, pl. 16, figs. 5–8.

**Material examined.** None.

**Distribution.** Western Atlantic—Canada (New Scotia), Bermuda, USA (Massachusetts), Gulf of Mexico, Caribbean Sea, Suriname, French Guiana, Brazil (São Pedro and São Paulo Archipelago, São Paulo, Rio Grande do Sul), and Uruguay. Eastern Atlantic—Norway, Denmark, Faroe Islands, Scotland, Ireland, Azores, Canary Islands, Cape Verde Islands, Madeira Islands, Mediterranean Sea, Greece, Congo, Angola, and South Africa (Holthuis 1952b; D’Incao 1995a; Pérez Farfante & Kinsley 1997; Vereshchaka 2000; Cardoso *et al.* 2014; Judkins 2014; Araújo & Wirtz 2015; Kondylatos *et al.* 2020; Timm *et al.* 2020).

**Remarks.** The coordinates of previous records from the coast of São Paulo refers to *Sergia robustus* and are 24°16’S/44°00’W, which is close to Ubatuba (D’Incao 1995a). This species was first described as *Sergestes*

*robustus* (Smith, 1882), and reclassified as *Sergia robusta* afterward (Vereshchaka 2000; De Grave & Franssen 2011). Vereshchaka *et al.* (2014) describes a new genus *Robustosergia* Vereshchaka, Olesen & Lunina, 2014 including the four species of *S. robusta* species complex (*S. robusta*, *S. regalis*, *S. extenuata*, *S. vityazi*). We did not collect this species, since it is known to occur at depths of 200 and 5,000 m (D’Incao 1995a), predominantly between 600 and 1,000 m (Timm *et al.* 2020); they are sampled with demersal and pelagic trawls (Cardoso *et al.* 2014). We did not reach such depths or use such collecting gear. There is a COI sequence (JSDPX79-05 = JQ306179) available on GenBank by Matzen da Silva *et al.* (2011).

## Suborder Pleocyemata Burkenroad, 1963

### Infraorder Achelata Scholtz & Richter, 1995

#### Superfamily Palinuroidea Latreille, 1802

#### Family Palinuridae Latreille, 1802

#### Genus *Panulirus* White, 1847

#### *Panulirus laevicauda* (Latreille, 1817)

*Panulirus laevicauda* Latreille, 1817b: 295.

**Material examined.** None.

**Distribution.** Western Atlantic —Bermuda, USA (Florida), Mexico (Yucatan), Gulf of Mexico, Caribbean Sea, Antilles, Central America, Bahamas, Suriname, French Guiana, and Brazil (Rocas Atoll, Fernando de Noronha, Abrolhos, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina) (Moreira 1901; Luederwaldt 1929; Oliveira 1940 as *Senex laevicauda*; as *P. laevicauda* by Holthuis 1959, 1991; Coelho & Ramos 1972; Ramos-Porto *et al.* 1978; Coelho & Ramos-Porto 1980, 1994, 1998; Abele & Kim 1986; Coelho *et al.* 1986; Williams 1986; Melo 1999; Coelho *et al.* 2007; Alves *et al.* 2008; Dall’Occo 2010; Boos *et al.* 2012; Teschima *et al.* 2012; Faria Jr. *et al.* 2013; Gaeta *et al.* 2015; Giraldes & Smyth 2016). An episodic occurrence in Bahía de la Ascensión, Mexico (Briones-Fourzán *et al.* 2019).

**Remarks.** Previous records from the coast of São Paulo include Ilhabela (Ilha de São Sebastião) (Luederwaldt 1929) and 24°4’S 44°24’W (MNRJ 3561 in Dall’Occo 2010). It seems there is no special commercial fishery for it, even if it is caught as bycatch throughout its range (Holthuis 1991) together with *P. argus* (Holthuis 1991; Gaeta *et al.* 2015); the yield of its fishery seems to be largest in Brazil (Holthuis 1991) as bycatch of *P. meripurpuratus*. As well as the case of *P. meripurpuratus*, episodic recruitment can explain the rare occurrences of *P. laevicauda* in Bahía de la Ascensión (Mexico), persistent adult populations are unlikely to occur in this region (Briones-Fourzán *et al.* 2019).

#### *Panulirus meripurpuratus* Giraldes & Smyth, 2016

*Panulirus meripurpuratus* Giraldes & Smyth, 2016: 354, figs. 1–3, 4B, 5.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 1546, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 20.vi.1998.

**Distribution.** Western Atlantic—Brazil (São Pedro and São Paulo Archipelago, Rocas Atoll, Fernando de Noronha, Abrolhos, Amapá, Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina) (Moreira 1901; Oliveira 1940 as *Senex argus*; as *P. argus* by Luederwaldt 1919, 1929; Williams 1965; Coelho & Ramos 1972; Ramos-Porto *et al.* 1978; Coelho & Ramos-Porto 1980; Williams 1984; Abele & Kim 1986; Coelho *et al.* 1990; Holthuis 1991; Coelho & Ramos-Porto 1994–1995; Melo 1999; Barros & Pimentel 2001; Coelho *et al.* 2007; Serejo *et al.* 2007; Silva *et al.* 2007; Alves

*et al.* 2008; Dall’Occo 2010; Teschima *et al.* 2012; Tourinho *et al.* 2012; Faria Jr. *et al.* 2013; Silva *et al.* 2013; Gaeta *et al.* 2015; Giraldes & Smyth 2016 as *P. meripurpuratus*; Cintra *et al.* 2017; Gaeta & Cruz 2019; Silva *et al.* 2020 as *P. argus*). Records from Cape Verde and Caribbean Sea-Florida are considered as not identified population (Freitas & Castro 2005; Tourinho *et al.* 2012; Giraldes & Smyth 2016). There is an episodic occurrence in Bahía de la Ascensión, Mexico (Briones-Fourzán *et al.* 2019).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Ilhabela (Ilha de São Sebastião), and Santos (Moreira 1901; Luederwaldt 1919; Mantelatto *et al.* 2018 as *P. argus*). *Panulirus* is one of the most abundant and economically exploited genera of crustacean in the Americas and Caribbean waters (Holthuis 1991; Sarver *et al.* 2000); being *P. meripurpuratus* the target species of the Brazilian fishery (Giraldes & Smyth 2016; Gaeta & Cruz 2019). Sarver *et al.* (1998; 2000) found two distinct clades under material identified as *P. argus*, one with Caribbean distribution (*P. argus argus*) and another distributed in the USA, Venezuela, and Brazil (*P. argus westonii*); these authors, however, did not provide any nomenclatural act resulting of those studies. Naro-Maciel *et al.* (2011) and Tourinho *et al.* (2012) recognized these two subspecies as two distinct lineages. Tourinho *et al.* (2012) suggested that *P. argus* is a Caribbean species, whereas the southwestern Atlantic species was considered an undescribed species of *Panulirus*. Even though, populations of *P. argus* from these areas have been currently treated as a single species by governments and international fisheries organizations (Tourinho *et al.* 2012). Giraldes & Smyth (2016) found differences in both color pattern and morphology and described *P. meripurpuratus* from Brazilian waters, considering *P. argus* restricted to North American and Caribbean waters. The Amazon-Orinoco plume was pointed out as the main factor leading to allopatric speciation (Sarver *et al.* 1998, 2000; Tourinho *et al.* 2012), separating *P. argus* and *P. meripurpuratus* into genetically different populations (Giraldes & Smyth 2016). Chan (2019) highlighted that Giraldes & Smyth (2016) did not consider details regarding some old synonyms in *P. argus* when described *P. meripurpuratus*, such as *P. ricordi* Guérin-Méneville, 1836, and *P. americanus* H. Milne Edwards, 1837 (Holthuis 1991; Chan 2010), and despite this comment, the author made no suggestion whatsoever about whether or not a future nomenclatural check is necessary. For this reason, we considered *P. meripurpuratus* as valid species in the present study. The episodic occurrence of two individuals of *P. meripurpuratus* in Bahía de la Ascensión (Mexico) probably is linked with the high potential for larval retention in this area, but persistent populations of adult are unlikely to occur (Briones-Fourzán *et al.* 2019). Sequences accession number (GenBank): CCDB 1546—16S (MF490147), COI (MF490043) (Mantelatto *et al.* 2018).

## Family Scyllaridae Latreille, 1825

### Genus *Parribacus* Dana, 1852

#### *Parribacus antarcticus* (Lund, 1793)

*Scyllarus antarcticus* Lund, 1793: 22.

**Material examined.** None.

**Distribution.** Western Atlantic—USA (Florida), Antilles, Central America, Guyana, French Guiana, and Brazil (Rocas Atoll, Fernando de Noronha, Amapá, Pará, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo). Central, Indo-West and southern Pacific—Hawaii, southeastern South Africa to Polynesia (Rathbun 1897; Fausto Filho *et al.* 1966; Coelho & Ramos 1972; Holthuis 1985; Abele & Kim 1986; Coelho *et al.* 1990; Holthuis 1991; Coelho & Ramos-Porto 1994-1995, 1998; Melo 1999; Coelho *et al.* 2007; Silva *et al.* 2007, 2013, 2020; Alves *et al.* 2008; Dall’Occo 2010; Gaeta *et al.* 2015; Cintra *et al.* 2017; Gaeta & Cruz 2019).

**Remarks.** Previous records from the coast of São Paulo include Santos Bay (MZUSP 10892 in Dall’Occo 2010). This species is locally consumed, but there is no special fishery for it on a commercial scale (Holthuis 1991); it is captured as bycatch with the pink shrimp *Farfantepenaeus subtilis* in the north coast of Brazil (Cintra *et al.* 2017). Sequences accession number (GenBank): CCDB 5741—16S (MF490150), COI (MF490044) (Mantelatto *et al.* 2018)—this sequenced sample is a female collected from Ipojuca, Pernambuco, Brazil.



## Genus *Scyllarides* Gill, 1898

### *Scyllarides brasiliensis* Rathbun, 1906

*Scyllarides brasiliensis* Rathbun, 1906a: 113.

**Material examined.** None.

**Distribution.** Western Atlantic—Antilles and Brazil (Pará, Maranhão, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, São Paulo, Santa Catarina) (Fausto Filho *et al.* 1966; Coelho & Ramos 1972; Williams 1986; Holthuis 1991; Coelho & Ramos-Porto 1994-1995, 1998; Melo 1999; Santos & Freitas 2002; Coelho *et al.* 2007; Dall’Occo *et al.* 2007; Serejo *et al.* 2007; Dall’Occo 2010; Duarte *et al.* 2010; Rodríguez-Rey *et al.* 2014; Cintra *et al.* 2021).

**Remarks.** Previous records from the coast of São Paulo include Santos and Guarujá (Severino-Rodrigues *et al.* 2007; Duarte *et al.* 2010). In Brazil, there is no established fishery for any of the *Scyllarides* Gill, 1898 Western Central Atlantic species, which are fished locally or caught incidentally as bycatch during spiny lobster fisheries and may be sold in local markets (Duarte *et al.* 2010). Nevertheless, *S. brasiliensis* is becoming one of the most commercially important species in South America, especially in the north-east region (Santos & Freitas 2002; Rodríguez-Rey *et al.* 2014). The genetic homogeneity among the populations of *S. brasiliensis* along the 2700 km from Ceará to Espírito Santo coasts could be explained based on traits that favor dispersion, such as high fecundity and long planktonic phases associated with ocean currents (Rodríguez-Rey *et al.* 2014). Knowledge about this species is scarce, information about its biology and fishery is still lacking. Furthermore, this species has no economic importance despite being caught in association with other lobsters (Fausto Filho *et al.* 1966; Holthuis 1991; Melo 1999; Santos & Freitas 2002). The occurrence of *S. brasiliensis* and the distribution limits along the Brazilian coast proposed by Melo (1999, Fig. 301, p. 448) suggest that this species is more prevalent to the north of São Paulo, in the 23°30’S 43°00’W to 24°19’S 45°09’W, and in 45–130 m depths (Duarte *et al.* 2010; Cintra *et al.* 2021) and it is more frequent and abundant in the northeast region (Santos & Freitas 2002).

### *Scyllarides deceptor* Holthuis, 1963

(Fig. 5A)

*Scyllarides deceptor* Holthuis, 1963: 57.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 5528, Ubatuba, 03.xii.2014; 4 ♂, 6 ♀, 2 j, CCDB 3604, Ubatuba, offshore, coll. D. Rosa, 05.ix.2011; 1 ♀, CCDB 4187, Ubatuba, offshore, coll. D. Rosa, 15.i.2012; 1 ♀, 1 j, CCDB 4188, Ubatuba, offshore, coll. D. Rosa, 15.i.2012; 1 j, CCDB 4190, Ubatuba, offshore, coll. D. Rosa, 15.i.2012; 1 ♂, 2 ♀, CCDB 5434, Ubatuba, offshore, coll. D. Rosa, 13.ix.2014; 1 ♂, CCDB 646, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 1.vi.2001; 1 ♂, CCDB 5280, Ubatuba, Ilha das Couves, colls. F. Mantelatto *et al.*, 19.x.2012; 2 ♂, 2 ♀, CCDB 2726, Ubatuba, Mar Virado, colls. D. Rosa & F. Mantelatto, 29.xi.2009; 4 ♂, 2 ♀, CCDB 3686, Bertioga, colls. N. Rossi *et al.*, 24.x.2011; 1 ♂, CCDB 5820, R/V Soloncy Moura Expedition, st. 3, 113 m, colls. F. Zara *et al.*, 18.viii.2015; 1 ♀, CCDB 5779, R/V Soloncy Moura Expedition, st. 8, 89 m, colls. F. Zara *et al.*, 18.viii.2015; 1 ♂, 5 ♀ (1 ♀ov), CCDB 5817, R/V Soloncy Moura Expedition, st. 10, 76 m, colls. F. Zara *et al.*, 19.viii.2015.

**Distribution.** Western Atlantic—Brazil (Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul), and Argentina (Holthuis 1963, 1991; Williams 1986; Coelho & Ramos-Porto 1998; Melo 1999; Keunecke *et al.* 2007; Dall’Occo 2010).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, Bertioga, Santos, Guarujá, Cananéia and 23°30’S 43°00’W to 24°19’S 45°09’W (Santos) (Holthuis 1963; Keunecke *et al.* 2007; Severino-Rodrigues *et al.* 2007; Dall’Occo 2010; Duarte *et al.* 2010). This species is not specially fished for economic interest (Holthuis 1991). However, it is very abundant in São Paulo coast, and it is captured as bycatch of the pink shrimp (*Farfantepenaeus brasiliensis* and *F. paulensis*) (Keunecke *et al.* 2007; Duarte *et al.* 2010). Sequences accession number (GenBank): CCDB 4190—16S (MF490148), COI (MF490045) (Mantelatto *et al.* 2018).

## Genus *Scyllarus* Fabricius, 1775

### *Scyllarus americanus* (Smith, 1869)

*Arctus Americanus* Smith, 1869: 119.

**Material examined.** None.

**Distribution.** Western Atlantic—Bermuda, USA (North Carolina to Florida), Gulf of Mexico, Puerto Rico, Antilles, Venezuela, and Brazil (Amapá, Pará, Paraíba, Pernambuco, Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo) (Verril 1922; Schmitt 1935; Rouse 1970; Abele & Kim 1986; Coelho & Ramos-Porto 1994-1995, 1998; Tavares 1997; Melo 1999; Coelho *et al.* 2007; Dall’Occo 2010).

**Remarks.** Previous records from the coast of São Paulo include Santos region (Tavares 1997; Dall’Occo 2010). It is a species found in shallow waters up to 70 m deep (Schmitt 1935; Coelho & Ramos-Porto 1994-1995; Melo 1999).

### *Scyllarus depressus* (Smith, 1881)

(Fig. 5B)

*Arctus depressus* Smith, 1881: 429.

**Material examined.** Brazil, São Paulo: 2 ♀, CCDB 3625, Ubatuba, offshore, coll. D. Rosa, 05.ix.2011; 1 ♂, CCDB 4168, Ubatuba, offshore, coll. D. Rosa, 15.xi.2011; 1 ♂, CCDB 4172, Ubatuba, offshore, coll. D. Rosa, 15.xi.2011; 1 ♂, 1 ♀, CCDB 5775, R/V Soloncy Moura Expedition, st. 8, 89 m, colls. F. Zara *et al.*, 18.viii.2015.

**Distribution.** Western Atlantic—USA (Massachusetts to Florida), Gulf of Mexico, Antilles, Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil (Amapá, Pará, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul) (Coelho & Ramos 1972; Williams 1984; Abele & Kim 1986; Coelho & Ramos-Porto 1998; Melo 1999; Coelho *et al.* 2007; Dall’Occo *et al.* 2007; Serejo *et al.* 2007; Dall’Occo 2010; Puciarelli & Rego 2016).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, Ilha Vitória, Santos, and Guarujá (Severino-Rodrigues *et al.* 2007; Dall’Occo 2010). According to Yang *et al.* (2012) the genus *Scyllarus* Fabricius, 1775 is paraphyletic. This species is not specially fished for economic interest (Holthuis 1991). This is very abundant in São Paulo coast and it is captured as bycatch of pink shrimp (*Farfantepenaeus brasiliensis* and *F. paulensis*) (Keunecke *et al.* 2007). Sequences accession number (GenBank): CCDB 4172—16S (MF490149), COI (MF490046) (Mantelatto *et al.* 2018).

## Infraorder Astacidea Latreille, 1802

### Superfamily Nephropoidea Dana, 1852

#### Family Nephropidae Dana, 1852

### Genus *Metanephrops* Jenkins, 1972

#### *Metanephrops rubellus* (Moreira, 1903)

(Fig. 5C)

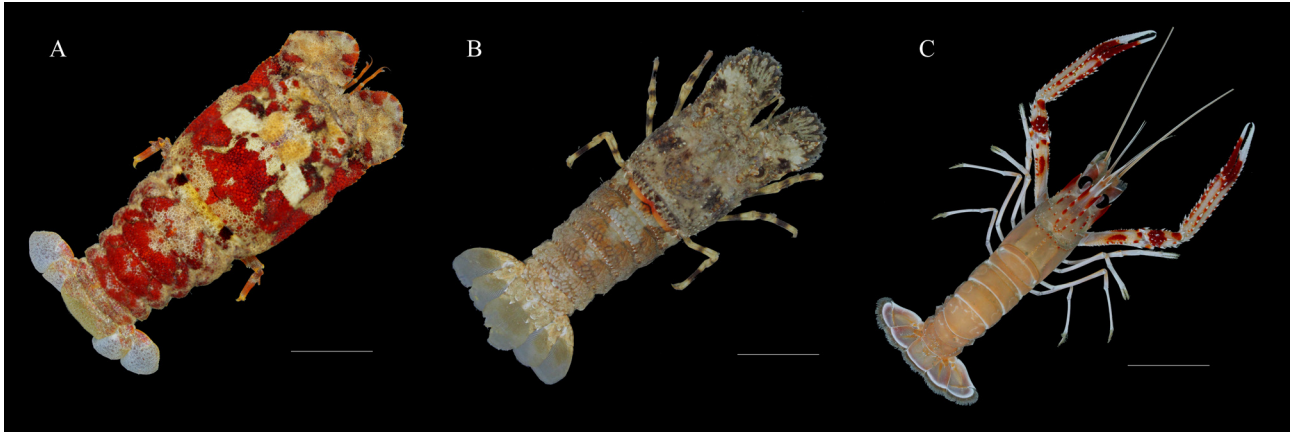
*Nephrops rubellus* Moreira, 1903: 7.

**Material examined.** Brazil, São Paulo: 3 ♂, 4 ♀, CCDB 1757, Santos, offshore, coll. F. Mantelatto, 1.ix.1998; 1 ♂, 3 ♀, CCDB 2690, Cananéia, colls. F. Mantelatto *et al.*, 10.vii.2009; 5 ♂, 5 ♀, CCDB 479, Cananéia, colls. F.

Mantelatto *et al.*, 10.vii.2011; 4 ♂, 1 ♀, CCDB 5819, R/V Soloncy Moura Expedition, st. 5, 130 m, colls. F. Zara *et al.*, 18.viii.2015; 3 ♂, 4 ♀ (3 ♀ov), CCDB 5810, R/V Soloncy Moura Expedition, st. 12, 104 m, colls. F. Zara *et al.*, 19.viii.2015; 1 ♀, CCDB 5787, R/V Soloncy Moura Expedition, st. 13, 113 m, colls. F. Zara *et al.*, 19.viii.2015; 9 ♀ov, CCDB 5788, R/V Soloncy Moura Expedition, st. 13, 113 m, colls. F. Zara *et al.*, 19.viii.2015; 2 ♂, 1 ♀ov, CCDB 5796, R/V Soloncy Moura Expedition, st. 14, 79 m, colls. F. Zara *et al.*, 19.viii.2015.

**Distribution.** Western Atlantic—Brazil (Espírito Santo, Rio de Janeiro, São Paulo, Rio Grande do Sul), Uruguay, and Argentina (Moreira 1906; Coelho & Ramos 1972; Holthuis 1974, 1991; Tavares 1998; Melo 1999).

**Remarks.** Previous records from the coast of São Paulo include Ilhabela (Ilha de São Sebastião), Guarujá, and Santos (Moreira 1906; Holthuis 1974; Severino-Rodrigues *et al.* 2007). This species is particularly important in commercial fishing, with greater fishing effort along the southeast and south of Brazilian coast (Williams 1986; Dall’Occo *et al.* 2007; Santana *et al.* 2016). Sequences accession number (GenBank): CCDB 479—16S (MF490164), COI (OM672400) (Mantelatto *et al.* 2018; present study).



**FIGURE 5.** Families Scyllaridae and Nephropidae. A) *Scyllarides deceptor* Holthuis, 1963 (CCDB 5280). B) *Scyllarus depressus* (Smith, 1881) (CCDB 5775). C) *Metanephrops rubellus* (Moreira, 1903) (CCDB 5796). Animals from Brazil, São Paulo, Ubatuba (A), R/V Soloncy Moura Expedition, st. 8 (B), st. 14 (C). Sex: male (A, C), female (B). Scale bars (mm): A—23; B—18; C—40. Photographs by R.C. Buranelli.

## Genus *Nephropsis* Wood-Mason, 1872

### *Nephropsis aculeata* S.I. Smith, 1881

*Nephropsis aculeata* Smith, 1881: 431.

**Material examined.** None.

**Distribution.** Western Atlantic—Bermuda, USA (New Jersey to Florida), Gulf of Mexico, Bahamas, Antilles, Central America, Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil (Amapá, Pará, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina) (Bouvier 1925; Roe 1966; Holthuis 1974, 1991; Lemaitre 1984; Abele & Kim 1986; Melo 1999; Guéguen 2000; Tavares & Young 2002; Coelho *et al.* 2007; Dall’Occo *et al.* 2007; Serejo *et al.* 2007; Silva *et al.* 2013, 2020).

**Remarks.** Previous records from the coast of São Paulo include Guarujá and Santos as bycatch of *M. rubellus* fishery (Severino-Rodrigues *et al.* 2007). *Nephropsis aculeata*, *N. agassizii*, and *N. rosea* are uncommon species in Brazilian coast, with few samples collected and no frequent appearances during exploratory operations (Silva *et al.* 2007, 2013).

### *Nephropsis agassizii* A. Milne-Edwards, 1880

*Nephropsis agassizii* A. Milne-Edwards, 1880: 1.

**Material examined.** None.

**Distribution.** Western Atlantic—Bahamas, Gulf of Mexico, Antilles, Trinidad and Tobago, and Brazil (Ceará, Rio Grande do Norte, Bahia, Espírito Santo, Rio de Janeiro, São Paulo) (Bouvier 1925; Holthuis 1974, 1991; Tavares 1998; Melo 1999; Tavares & Young 2002; Coelho *et al.* 2007; Serejo *et al.* 2007; Alves-Júnior *et al.* 2016).

**Remarks.** Previous records from the coast of São Paulo include the locality 25°13'S 44°33'W (Holthuis 1974). *Nephropsis agassizii* and *N. rosea* occur offshore, mostly on mud or fine sand substrates among 580–2,900 m depth from Bahia to São Paulo (Serejo *et al.* 2007) and *N. rosea* was found in the north coast of Brazil between 41–626 m (Silva *et al.* 2013). Furthermore, due to its depths habit and relatively small size, *N. agassizii* is an unlikely target for fishing (Holthuis 1991; Santana *et al.* 2016).

### *Nephropsis rosea* Spence Bate, 1888

*Nephropsis rosea* Spence Bate, 1888: 178.

**Material examined.** None.

**Distribution.** Western Atlantic—Bermuda to French Guiana, including Bahamas, Gulf of Mexico, Caribbean Sea, and Brazil (Amapá, Pará, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina) (Verril 1922; Holthuis 1974; Guéguen 2000; Tavares & Young 2002; Coelho *et al.* 2007; Dall'Occo *et al.* 2007; Serejo *et al.* 2007; Silva *et al.* 2007, 2013, 2020; Santana *et al.* 2016).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião (Holthuis 1991; Dall'Occo *et al.* 2007—REVIZEE, st. 1129, São Sebastião, 24°55'S 44°33'W, 605–621 m, 19.iv.2002, 2 males, MZUSP 15252). *Nephropsis rosea* is found at great depths from 420 to 1,260 m in mud or fine sand substrate, and it is not fished in Brazil, and considered rare (Silva *et al.* 2007; Santana *et al.* 2016). We suggest that the absence of *N. rosae*, *N. agassizii* and *N. aculeata* in the material sampled herein is due to their restriction to waters deeper than 40 m, where we did not concentrate our sampling efforts. Even though we sampled at depths of up to 130 m, it was not enough to capture them.

## Infraorder Axiidea de Saint Laurent, 1979

### Family Callianassidae Dana, 1852

#### Genus *Biffarius* Manning & Felder, 1991

#### *Biffarius delicatulus* Rodrigues & Manning, 1992

*Biffarius delicatulus* Rodrigues & Manning, 1992: 324–330, fig. 1.

**Material examined.** None.

**Distribution.** Western Atlantic—Brazil (Ceará, São Paulo) (Rodrigues & Manning 1992; Robles *et al.* 2020).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião (Rodrigues & Manning 1992; Melo 1999; Amaral *et al.* 2010 as *Callianassa delicatula*). The type of material from São Paulo is deposited in the USNM and MZUSP collections (1 ♂, paratype, USNM 252546, São Sebastião, Praia de Enseada, coll. S. Rosso, 3.vi.1981; 6 ♂, 2 ♀, holotype, MZUSP 10582, São Sebastião, Araçá mangrove, coll. S. Rodrigues 18.v.1985). There are some additional gene sequences generated (18S—MN237875; 12S—MN238359; H3—MN238080) by Robles *et al.* (2020). Sequences accession number (GenBank): NHMW 25542—16S (MN237680—from Ceará) (Robles *et al.* 2020).

### Family Callichiridae Manning & Felder, 1991

#### Genus *Audacallichirus* Poore, Dworschak, Robles, Mantelatto & Felder, 2019

## *Audacallichirus mirim* (Rodrigues, 1971)

*Callianassa* (*Callichirus*) *mirim* Rodrigues, 1971: figs. 77–98.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 2975, Ubatuba, Praia do Perequê-Açu, colls. D. Peiró *et al.*, 24.xi.2008.

**Distribution.** Western Atlantic—Brazil (Ceará, Bahia, São Paulo, Rio Grande do Sul), Uruguay, and Argentina (Rodrigues 1971; Melo 1999).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, and Santos (Rodrigues 1971 as *Callianassa*; Rodrigues 1984 a, b as *Callichirus*; Pires-Vanin *et al.* 2014 as *Sergio mirim*; Mantelatto *et al.* 2018). There are additional genes sequenced (12S—MN238453; 18S—MN237994; H3—MN238232) generated by Robles *et al.* (2020). Sequences accession number (GenBank): CCDB 2975—16S (MF490166), COI (MF490066) (Mantelatto *et al.* 2018).

## Genus *Callichirus* Stimpson, 1866

### *Callichirus major* (Say, 1818)

(Fig. 6A)

*Callianassa major* Say, 1818: 238.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 2858, Ubatuba, Praia da Fazenda, coll. R. Castro, 6.ii.1997; 5 ♂, 2 ♀, CCDB 4124, Ubatuba, Praia do Perequê-Açu, coll. F. Mantelatto, 01.ix.2004; 2 ♂, 2 ♀, CCDB 1928, Ubatuba, Enseada de Ubatuba, colls. F. Mantelatto *et al.*, 5.iv.2011; 1 ♀ov, CCDB 356, Ubatuba, Praia do Lázaro, coll. F. Mantelatto, 10.xii.2000; 1 ♀, CCDB 2193, Ubatuba, Praia do Lázaro, coll. D. Cavallari, 15.vii.2007; 4 ♀, CCDB 2872, Ubatuba, Praia do Lázaro, coll. D. Peiró, 17.ix.2008; 4 ♂, 11 ♀, CCDB 2661, Ubatuba, Praia do Lázaro, coll. D. Peiró, 23.xi.2008; 1 ♀ intersex, CCDB 3848, Ubatuba, Praia do Lázaro, colls. R. Robles & N. Grilli, 22.ii.2011; 5 spec., CCDB 712, Caraguatatuba, Foz do rio Juqueriquerê, colls. D. Peiró & E. Mossolin, 1.v.2009; 1 ♀ intersex, CCDB 2871, São Sebastião, Praia do Segredo, coll. D. Peiró, 4.xi.2006; 1 ♂, 1 ♀, CCDB 5639, São Sebastião, Praia Barequeçaba, colls. F. Mantelatto & D. Peiró, 9.xi.2004; 1 ♂, CCDB 5640, São Sebastião, Praia Barequeçaba, colls. F. Mantelatto & D. Peiró, 9.xi.2004; 1 ♀, CCDB 5641, São Sebastião, Praia Barequeçaba, colls. F. Mantelatto & D. Peiró, 9.xi.2004; 5 ♂, 4 ♀ (1 ♀ov), CCDB 452, São Sebastião, Praia de Barequeçaba, coll. D. Esposito, 1.v.2005; 7 ♀ov, CCDB 2887, São Sebastião, Praia de Barequeçaba, colls. F. Mantelatto & D. Peiró, 11.xi.2007; 5 ♂, 11 ♀, CCDB 2677, São Sebastião, Praia de Barequeçaba, colls. D. Peiró *et al.*, 24.xi.2008; 8 ♂, 15 ♀ (8 ♀ov), CCDB 5497, São Sebastião, Praia Barequeçaba, colls. F. Mantelatto *et al.*, 2.xii.2014; 1 ♂, 1 ♀, CCDB 2870, Mongaguá, Praia de Mongaguá, coll. G. Baba, 27.xi.2003; 3 ♀, CCDB 4630, São Itanhaém, Praia de São Fernando, coll. C. Silveira, 14.ii.2013; 1 ♀, CCDB 5084, Ilha Comprida, colls. F. Mantelatto & R. Robles, 22.vii.2012; 1 ♂, CCDB 5841, Ilha Comprida, Praia Boqueirão Sul, colls. F. Mantelatto & R. Robles, 22.vii.2012.

**Distribution.** Western Atlantic—USA (North Carolina to Florida), Gulf of Mexico (from Texas to Mississippi), and Brazil (Pará, Piauí, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, São Paulo, Paraná, Santa Catarina) (Rodrigues 1983; Williams 1984; Coelho & Ramos-Porto 1986; Manning & Felder 1986; Coelho & Coelho-Santos 1993; Staton & Felder 1995; Rodrigues & Shimizu 1997; Souza *et al.* 1998; Melo 1999; Strasser & Felder 1999; Dworschak 2000; Alves *et al.* 2005; Coelho *et al.* 2007; Souza *et al.* 2020; Rosa 2021).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, and Santos Bay (Rodrigues 1965, 1966, 1967, 1976, 1983, 1985; Rodrigues & Shimizu 1997; Pedrucci & Borges 2009; Peiró & Mantelatto 2011; Peiró *et al.* 2014; Pires-Vanin *et al.* 2014; Moschetto *et al.* 2020, Santos *et al.* 2021). There are additional genes sequenced (ULLZ 6056: 12S—EU875028, H3—MN238261, 16S—EU882918; ULLZ 6055: 18S—MN238018) by Felder & Robles (2009) and Robles *et al.* (2020). Sequences accession number (GenBank): CCDB 2938—16S (JX878478), COI (MF490064) (Mantelatto *et al.* 2018; present study).

**Genus *Corallianassa* Manning, 1987**

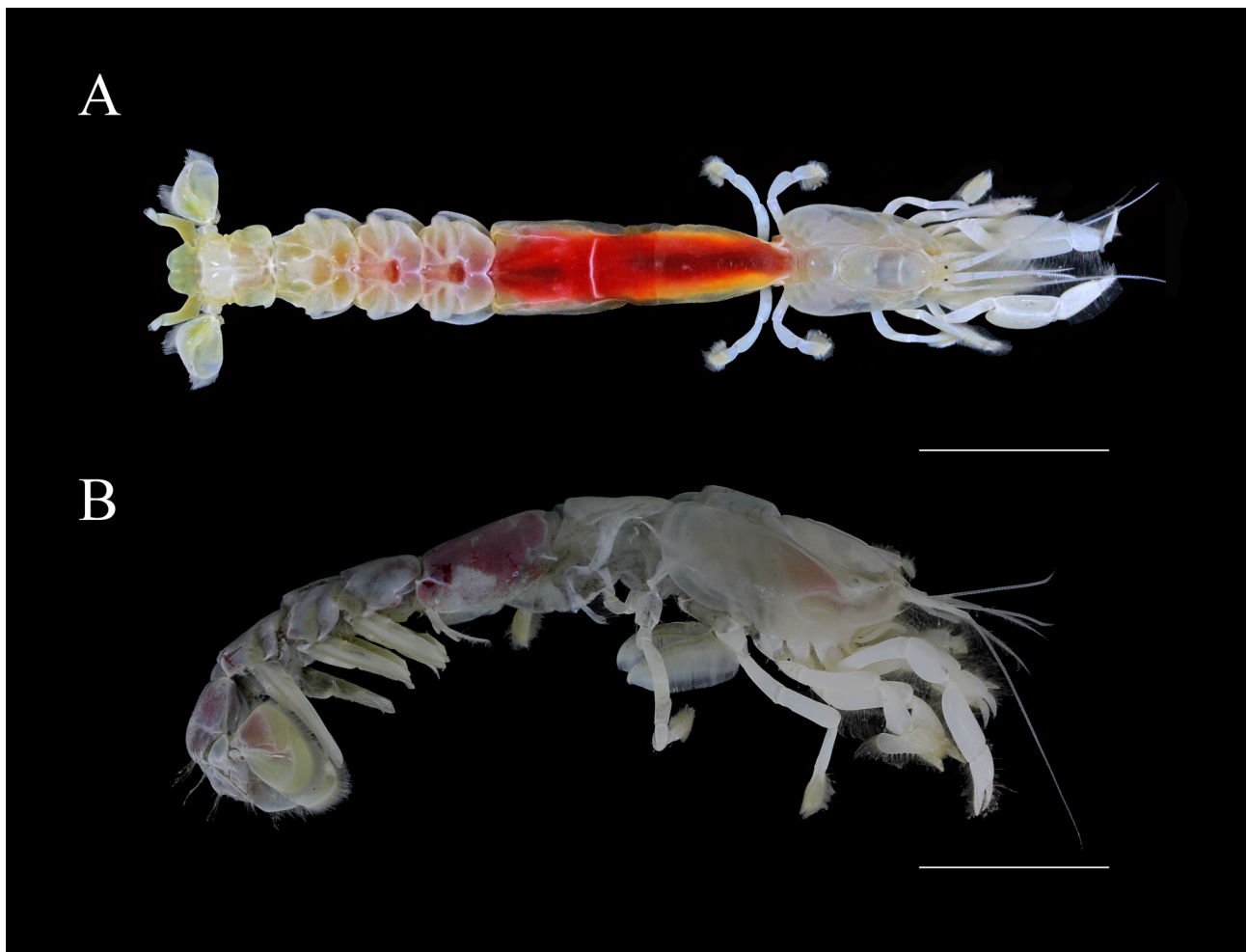
***Corallianassa longiventris* (A. Milne-Edwards, 1870)**

*Callianassa longiventris* A. Milne-Edwards, 1870: 92–93.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 3098, Ubatuba, Ilha Anchieta, Praia Sul, colls. F. Mantelatto & R. Biagi, 18.i.2004.

**Distribution.** Western Atlantic—Jamaica, Martinique, Brazil (São Paulo). Central Atlantic—Ascension Island (Robles *et al.* 2020).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba (Robles *et al.* 2020). Sequences accession number (GenBank): CCDB 3098—16S (MN237729).



**FIGURE 6.** Family Callichiridae. A) *Callichirus major* (Say, 1818) (CCDB 5084). B) *Neocallichirus guassutunga* (Rodrigues, 1971) (CCDB 5516). Animals from Brazil, São Paulo, Ilha Comprida (A), São Sebastião (B). Sex: female (A), male (B). Scale bars (mm): A—22; B—21. Photographs by R.C. Buranelli.

**Genus *Neocallichirus* Sakai, 1988**

***Neocallichirus guara* (Rodrigues, 1971)**

*Callianassa* (*Callichirus*) *guara* Rodrigues, 1971: figs. 61–76.

**Material examined.** None.

**Distribution.** Western Atlantic—Brazil (Pará, Maranhão, São Paulo) (Coelho & Ramos-Porto 1972; Melo 1999).

**Remarks.** Previous record from the coast of São Paulo includes Guarujá (Rodrigues 1971 as *Callianassa*).

### *Neocallichirus guassutinga* (Rodrigues, 1971)

(Fig. 6B)

*Callianassa* (*Callichirus*) *guassutinga* Rodrigues, 1971: 204, figs. 41–60.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 5516, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 2.xii.2014.

**Distribution.** Western Atlantic—USA (Florida), Antilles, and Brazil (Pernambuco, São Paulo, Santa Catarina) (Coelho & Ramos-Porto 1972; Melo 1999).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião (Amaral *et al.* 2010 as *Sergio guassutinga*; Mantelatto *et al.* 2018, Robles *et al.* 2020). There are additional genes sequenced (18S—MN237996; H3—MN238234) by Robles *et al.* (2020). Sequences accession number (GenBank): CCDB 5516—16S (MN237799), COI (MF490065) (Mantelatto *et al.* 2018; Robles *et al.* 2020).

### *Neocallichirus maryae* Karasawa, 2004

*Callianassa* (*Callichirus*) *rathbunae* Schmit 1935: 15–17, pl. 1, fig 5; pl. 2, fig. 2; p1. 3, fig. 1; pl. 4, fig. 2.

**Material examined.** None.

**Distribution.** Western Atlantic—USA (Florida), Antilles, Panama, and Brazil (Amapá, Pernambuco, São Paulo) (Manning & Heard 1986; Botter-Carvalho *et al.* 1995; Melo 1999; Robles *et al.* 2020).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião (Mantelatto *et al.* 2018; Robles *et al.* 2020). Sequences accession number (GenBank): CCDB 5516—16S (MN237799), COI (MF490065) (Mantelatto *et al.* 2018; Robles *et al.* 2020).

## Infraorder Caridea Dana, 1852

### Superfamily Atyoidea De Haan, 1849 [in De Haan, 1833–1850]

### Family Atyidae De Haan, 1849 [in De Haan, 1833–1850]

### Genus *Atya* Leach, 1816

### *Atya gabonensis* Giebel, 1875

(Fig. 7A)

*Atya gabonensis* Giebel, 1875: 52.

**Material examined.** None.

**Distribution.** Western Atlantic—Mexico, Venezuela, Suriname, and Brazil (Maranhão, Piauí, Alagoas, Sergipe, Rio de Janeiro, São Paulo). Eastern Atlantic—Senegal, Mali, Liberia, Ghana, Nigeria, Cameroon, St. Thomas and Prince, Gabon, and Congo (Giebel 1875; Hobbs 1980; Hobbs & Hart 1982; Ramos-Porto & Coelho 1998; Melo 2003; De Grave & Mantelatto 2013; Mantelatto *et al.* 2016c).

**Remarks.** Previous records from the coast of São Paulo include Registro city (MZUSP 11443). There were doubts about the wide distribution of this species in the literature, but it has recently been confirmed to be amphiatlantic (see Oliveira *et al.* 2021 for review). Sequences accession number (GenBank): MZUSP 11443—16S (KY582529), COI (KY582538) (Oliveira *et al.* 2021).

## *Atya scabra* (Leach, 1816)

(Fig. 7B)

*Atys scaber* Leach, 1816: 345.

**Material examined.** Brazil, São Paulo: 1 j, CCDB 4383, Ubatuba, colls. F. Carvalho *et al.*, 23.ix.2012; 1 ♀ ov, CCDB 5529, Ubatuba, coll. F. Zara, 03.i.2015; 5 ♂, 7 ♀ (4 ♀ ov), 2 j, CCDB 2852, São Sebastião, Rio Guaecá, colls. F. Mantelatto *et al.*, 11.vii.2006; 2 ♂, 6 ♀ (2 ♀ ov), CCDB 2851, São Sebastião, Rio Guaecá, colls. F. Mantelatto *et al.*, 10.xi.2007; 1 ♂, 5 j, CCDB 2157, Ilhabela (Ilha de São Sebastião), Rio da Toca, coll. E. Mossolin, 13.vii.2006; 1 ♂, CCDB 2151, Ilhabela (Ilha de São Sebastião), Rio Castelhana, coll. E. Mossolin, 07.v.2007; 1 ♂, CCDB 2160, Ilhabela (Ilha de São Sebastião), coll. E. Mossolin, 19.vii.2007.

**Distribution.** Western Atlantic—Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Cuba, Haiti, Dominican Republic, Jamaica, Puerto Rico, Saint Kitts and Nevis, Montserrat, Guadeloupe, Dominica, Martinique, St. Lucia, Grenada, Curaçao, Trinidad and Tobago, Colombia, Venezuela, and Brazil (Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul). Eastern Atlantic—Liberia to Angola and Cape Verde islands to Annobón (Rathbun 1901; Bouvier 1904, 1909; Hart 1961; Chace & Hobbs 1969; Rodriguez 1980; Hobbs & Hart 1982; Abele & Kim 1989; Pereira de Barros & Braun 1997; Ramos-Porto & Coelho 1998; Bond-Buckup & Buckup 1999; De Grave *et al.* 2013; Pileggi *et al.* 2013; Oliveira *et al.* 2019).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, Ilhabela (Ilha de São Sebastião), Peruíbe, and Cananéia (Ilha do Cardoso) (Rocha & Bueno 2004; Herrera-Correal *et al.* 2013; Oliveira *et al.* 2019). Specimens found on the Pacific side of America are probably the result of anthropic introductions, with the exception of them from Panama (Hobbs & Hart 1982; Mantelatto *et al.* 2016c). This species has a huge genetic variability (Oliveira *et al.* 2019), and two distinct lineages (Atlantic/Caribbean/Pacific and Gulf of Mexico) were detected by Oliveira *et al.* (2021). Sequences accession number (GenBank): CCDB 2852—16S (KM670921), COI (KM670943) (Oliveira *et al.* 2019).

## Genus *Potimirim* Holthuis, 1954

### *Potimirim brasiliiana* Villalobos, 1959

(Fig. 7C)

*Potimirim brasiliiana* Villalobos, 1959: 275; figs. 1–5.

**Material examined.** Brazil, São Paulo: 12 ♀, CCDB 3467, Ubatuba, Rio Puruba, colls. F. Mantelatto *et al.*, 06.xii.2011; 1 ♀ ov, 33 adults, CCDB 6496, Ubatuba, Córrego Praia Félix, colls. F. Mantelatto *et al.*, 11.ix.2019; 2 ♂, 9 ♀, 12 adults, 5 j, CCDB 3940, Ubatuba, Córrego Praia Itaguá, colls. F. Mantelatto *et al.*, 06.xii.2011; 1 ♀, 1 ♀ (parental with larvae), CCDB 49, Caraguatatuba, Rio Claro, coll. F. Mantelatto, 09.xi.2007; 7 ♂, 3 ♀, 6 adults, CCDB 1972, São Sebastião, Rio Guaecá, colls. L. Torati & E. Mossolin, 18.xi.2006; 1 ♂, 1 j, CCDB 4091, Ilhabela (Ilha de São Sebastião), Rio Cachoeira da Toca, colls. F. Mantelatto *et al.*, vi.2011; 6 ♂, 3 ♀, 14 adults, CCDB 4090, Ilhabela (Ilha de São Sebastião), Rio Castelhana, colls. F. Mantelatto *et al.*, ii.2011; 1 ♂, 2 ♀, CCDB 2386, Iguape, colls. F. Mantelatto *et al.*, 13.v.2006; 6 ♀ (2 ♀ ov), CCDB 3213, Cananéia, Rio Iriaria-Mirim, coll. F. Mantelatto, 18.iv.2011.

**Distribution.** Western Atlantic—Brazil (Pernambuco, Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina) (Villalobos 1959; Smalley 1963; Ramos-Porto & Coelho 1998; Torati & Mantelatto 2012).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, Ilhabela (Ilha de São Sebastião), Peruíbe, and Iguape (Villalobos 1959; Smalley 1963; Rocha & Bueno 2004; Torati & Mantelatto 2012; Rocha *et al.* 2013; Grilli *et al.* 2014; Machado *et al.* 2020). Sequences accession number (GenBank): CCDB 1972—16S (JN228974), CCDB 6494—COI (OM672403) (Torati & Mantelatto 2012; present study).



***Potimirim potimirim* (Müller, 1881)**

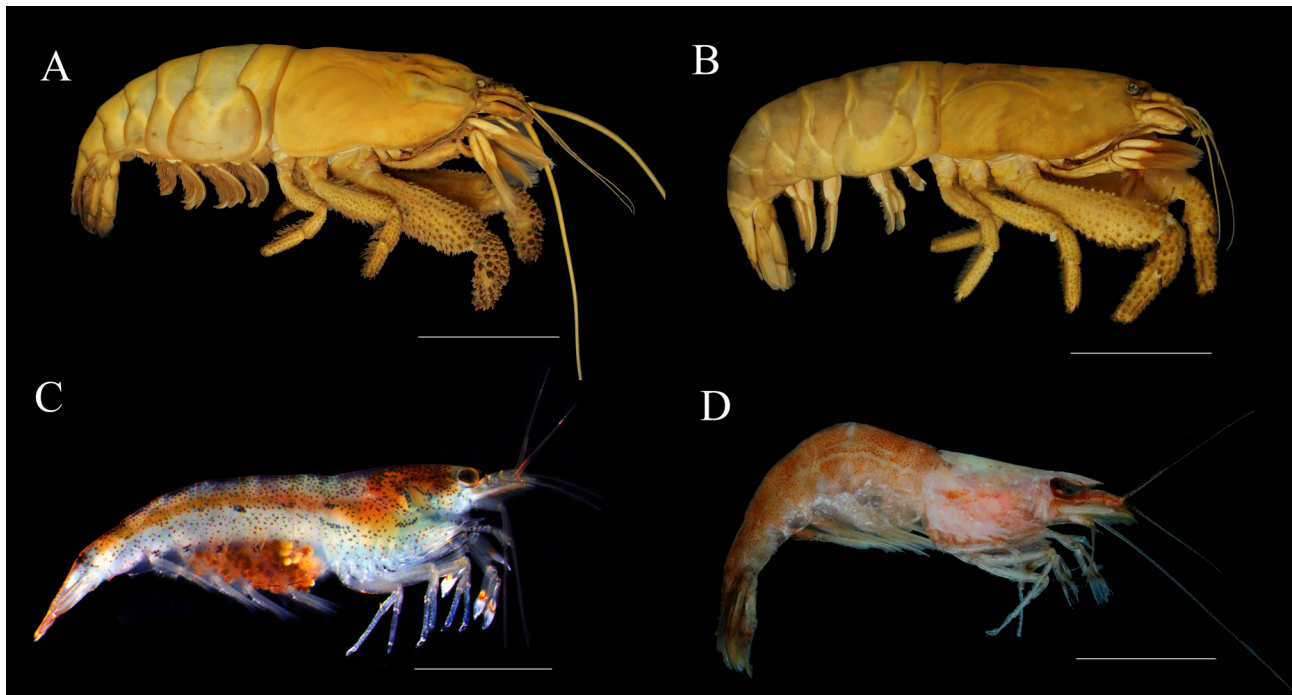
(Fig. 7D)

*Atyoida potimirim* Müller, 1881: 117.

**Material examined.** Brazil, São Paulo: 12 ♂, 10 ♀, > 300 spec., CCDB 3942, Ilhabela (Ilha de São Sebastião), Rio Cachoeira da Toca, colls. F. Mantelatto *et al.*, 07.vii.2011; 6 ♂, 15 ♀ (5 ♀ ov), > 84 spec., CCDB 3943, Ilhabela (Ilha de São Sebastião), Rio Castelhanos, colls. F. Mantelatto *et al.*, ii.2011; 1 ♀, CCDB 3743, Pariquera-Açu, Rio Cachoeira do Pitu, colls. F. Carvalho *et al.*, 09.xi.2011; 5 ♂, 16 ♀ ov, CCDB 3741, Cananéia, Ariri, colls. F. Carvalho *et al.*, 10.xi.2011; 2 ♂, 6 ♀, CCDB 3722, Cananéia, Rio Iririaia-Açu, F. Mantelatto *et al.*, 29.vii.2011; 11 ♀, CCDB 5926, Cananéia, Rio Iririaia-Mirim, colls. F. Mantelatto *et al.*, 22.vii.2012; 6 ♂, 3 ♀, CCDB 5927, Cananéia, Rio Iririaia-Mirim, colls. F. Mantelatto *et al.*, 22.vii.2012; 5 ♂, 11 ♀ (1 ♀ ov), 59 adults, CCDB 3720, Cananéia, Rio Itapitanguí, colls. F. Mantelatto *et al.*, 29.viii.2011.

**Distribution.** Western Atlantic—USA (Florida, as introduced species), Cuba, Puerto Rico, Guadeloupe, Dominica, Martinique, Trinidad and Tobago, Costa Rica, Panama, Venezuela, and Brazil (Rio Grande do Norte, Pernambuco, Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina) (Müller 1881; von Ihering 1897; Rathbun 1901; Bouvier 1904, 1909; Luederwaldt 1929; Sawaya 1946; Villalobos 1959; Abele 1972; Rodriguez 1980; Starmühlner & Therezien 1982a, b; Abele & Kim 1986; Coelho *et al.* 1990; López & Pereira 1994; Pereira de Barros & Braun 1997; Ramos-Porto & Coelho 1998; Lima & Oshiro 1999; Page *et al.* 2008; Sampaio *et al.* 2009; Torati & Mantelatto 2012; Moraes *et al.* 2017).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, Ilhabela (Ilha de São Sebastião), Santos, São Vicente, Peruíbe, Iguape, and Pariquera-Açu (von Ihering 1897 as *Atoidea potimirim*; Luederwaldt 1929 as *Ortmannia potimirim*; Sawaya 1946 as *Ortmannia mexicana*; Rocha & Bueno 2004; Grilli *et al.* 2014; Machado *et al.* 2021). Sequences accession number (GenBank): CCDB 5926—16S (OM720036), COI (MF490131) (present study; Mantelatto *et al.* 2018).



**FIGURE 7.** Family Atyiidae. A) *Atya gabonensis* Giebel, 1875 (CCDB 5264). B) *Atya scabra* (Leach, 1816) (CCDB 2153). C) *Potimirim brasiliana* Villalobos, 1959 (CCDB 6496). D) *Potimirim potimirim* (Müller, 1881) (CCDB 5926). Animals from Brazil, Rio de Janeiro, São Fidelis (A); São Paulo, São Sebastião (B), Ubatuba (C), Cananéia (D). Sex: female (A), male (B, D), ovigerous female (C). Scale bars (mm): A—31; B—24; C—5; D—7. Photographs by R.C. Buranelli (A, B, D), and J.A.F. Pantaleão (C).

## Superfamily Crangonoidea Haworth, 1825

### Family Crangonidae Haworth, 1825

#### Genus *Pontocaris* Spence Bate, 1888

##### *Pontocaris boschii* (Christoffersen, 1988)

*Aegaeon boschii* Christoffersen, 1988: 49, figs. 2–3.

**Material examined.** None.

**Distribution.** Western Atlantic—Brazil (Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul), Uruguay, and Argentina (Christoffersen 1988; Chan 1995; Alves-Júnior *et al.* 2018).

**Remarks.** This species was previously recorded in São Paulo state as *Aegaeon boschii* by Christoffersen (1988), but the exact locality was not mentioned. According to Christoffersen (1988) the specimens were collected at 60 m, in sand and mud, 15.56 °C.

### Family Glyphocrangonidae Smith, 1884

#### Genus *Glyphocrangon* A. Milne-Edwards, 1881

##### *Glyphocrangon aculeata* A. Milne-Edwards, 1881

*Glyphocrangon aculeata* A. Milne-Edwards, 1881: 521, pl. 94, fig. 1.

**Material examined.** None.

**Distribution.** Western Atlantic—USA (North Carolina), Gulf of Mexico, Caribbean Sea, Venezuela, and Brazil (Ceará, Rio Grande do Norte, Pernambuco, Bahia, Espírito Santo, Rio de Janeiro, São Paulo) (Spence Bate 1888; Moreira 1901; Holthuis 1971; Coelho & Ramos 1972; Ramos-Porto & Coelho 1998; Komai 2004; Felder *et al.* 2009; Alves-Júnior *et al.* 2017b).

**Remarks.** Previous records from São Paulo include Santos found from 800 to 1,200 m (Boschi 1973) and a single specimen collected in Enseada de Ubatuba, Ubatuba (MZUSP 15431), but not examined.

## Superfamily Palaemonoidea Rafinesque, 1815

### Family Palaemonidae Rafinesque, 1815

#### Genus *Brachycarpus* Spence Bate, 1888

##### *Brachycarpus biunguiculatus* (Lucas, 1846)

*Palaemon biunguiculatus* Lucas, 1846: pls. 1–8.

**Material examined.** None.

**Distribution.** Western Atlantic—Brazil (Rocas Atoll, Fernando de Noronha, Amapá, Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná) (Nizinski 2003; Cardoso 2006; Coelho *et al.* 2006; Ferreira *et al.* 2010; Fransozo *et al.* 2012; Soledade *et al.* 2015).

**Remarks.** Previous record from São Paulo includes Ubatuba (Fransozo *et al.* 2012), but there is no material deposited in the museums visited during this work.

## Genus *Cuapetes* Clark, 1919

### *Cuapetes americanus* (Kingsley, 1878)

(Fig. 8A)

*Anchistia americana* Kingsley, 1878: 96.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 5508, Ubatuba, Praia do Itaguá, colls. F. Mantelatto *et al.*, 30.xi.2014; 1 ♀, CCDB 2358, Ubatuba, Saco do Codó, Enseada do Flamengo, colls. F. Mantelatto & E. Mossolin, 02.vi.2008; 2 ♀ov, CCDB 5473, Ubatuba, Praia do Lamberto, coll. F. Carvalho, 09.iv.2013; 2 ♂, CCDB 6295, Ubatuba, Ilha Vitória, colls. A. Castilho *et al.*, vii.2015; 1 ♂, 1 ♀ov, CCDB 6293, Santos, Laje de Santos, colls. A. Castilho *et al.*, vii.2015; 2 ♂, CCDB 6294, Santos, Laje de Santos, colls. A. Castilho *et al.*, iii.2016.

**Distribution.** Western Atlantic—Bermuda, USA (North Carolina, Florida), Mexico, Cuba, Jamaica, Puerto Rico, Virgin Islands, Trinidad and Tobago, Aruba, Panama, Colombia, Venezuela, and Brazil (Amapá, Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Bahia, São Paulo) (Holthuis 1951; Barba *et al.* 2005; Coelho *et al.* 2006; Almeida *et al.* 2007a; Vieira *et al.* 2012; De Grave & Anker 2017).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Vitória Island and Laje de Santos (Forneris 1969; Moraes *et al.* 2020a). Although Coelho & Ramos (1972) report the species from Pará to São Paulo, we have not found records of material examined for the states of Sergipe and Espírito Santo. There was also no record of material examined for Honduras, cited by Vieira *et al.* (2012). Sequences accession number (GenBank): CCDB 5508—16S (OM720037), COI (OM672402) (present study).

## Genus *Leander* Desmarest, 1849

### *Leander paulensis* Ortmann, 1897

(Fig. 8B)

*Leander paulensis* Ortmann, 1897: 192, pl. 1, fig. 14.

**Material examined.** Brazil, São Paulo: 1 ♂, 3 ♀ov, CCDB 4316, Ubatuba, coll. F. Mantelatto, 16.x.2012; 1 ♂, 7 ♀, 14 adults, CCDB 4908, Ubatuba, coll. D. Rosa, 10.ix.2013; 1 ♀, CCDB 2218, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 18.viii.2007; 1 ♀, CCDB 4576, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 09.iv.2013; 2 ♀ov, CCDB 4620, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 09.iv.2013; 2 ♂, 13 ♀ (10 ♀ov), CCDB 3428, Ubatuba, Enseada de Ubatuba, Praia do Cedro, colls. R. Costa *et al.*, 07.vii.2011; 1 ni, CCDB 3436, Ubatuba, Enseada de Ubatuba, Praia do Cedro, coll. A. Castilho, 07.vii.2011; 1 ♂, 3 ♀, CCDB 5038, Ubatuba, Praia do Lamberto, coll. F. Carvalho, 09.iv.2013; 2 ♀, CCDB 3225, Cananéia, estuary, colls. R. Costa *et al.*, 17.iv.2011; 2 ♀ (1 ♀ov), CCDB 3289, Cananéia, estuary, colls. R. Costa *et al.*, 17.iv.2011; 2 ♀ov, CCDB 742, Cananéia, estuary, colls. R. Costa *et al.*, 29.viii.2011; 7 ♀ (6 ♀ov), CCDB 847, Cananéia, estuary, colls. R. Costa *et al.*, 30.viii.2011; 1 ♀, CCDB 3841, Cananéia, colls. A. Castilho *et al.*, 03.xi.2012; 1 ♀ (parental with larvae), CCDB 6156, Cananéia, coll. R. Costa, 14.iv.2013.

**Distribution.** Western Atlantic—USA (Florida), Puerto Rico, Guadeloupe (as *Palaemonetes karukera*), Curaçao, Panama, and Brazil (Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Bahia, São Paulo, Paraná, Santa Catarina) (Ortmann 1897; Rathbun 1901; Luederwaldt 1919; Schmitt 1924; Manning 1961; Fausto-Filho 1968; Carvacho 1979; Abele & Kim 1989; Ramos-Porto & Coelho 1990; Ferreira *et al.* 2010; Machado *et al.* 2010; Carvalho *et al.* 2014).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, and Cananéia (Luederwaldt 1919; Costa *et al.* 2000; Carvalho *et al.* 2014; Mantelatto *et al.* 2016b). Sequences accession number (GenBank): CCDB 3436—16S (KP179007), COI (MF490132) (Mantelatto *et al.* 2018).

## Genus *Macrobrachium* Spence Bate, 1868

### *Macrobrachium acanthurus* (Wiegman, 1836)

(Fig. 8C)

*Palaemon acanthurus* Wiegmann, 1836: 150.

**Material examined.** Brazil, São Paulo: 2 ♀, CCDB 3468, Ubatuba, Rio Puruba, colls. F. Mantelatto *et al.*, 06.xii.2011; 1 ♂, CCDB 2134, São Sebastião, Rio da Praia do Pinto, colls. F. Mantelatto *et al.*, 12.vii.2006; 1 ♂, CCDB 384, Ilhabela (Ilha de São Sebastião), Cachoeira da Toca, colls. F. Mantelatto *et al.*, 07.vii.2011; 6 ♂, CCDB 3748, Bertioga, Ribeirão dos Alhos, colls. I. Leone *et al.*, 24.x.2011; 2 ♂, CCDB 3203, Iguape, Rio Mar Pequeno, ponte Iguape-Ilha Comprida, colls. F. Mantelatto *et al.*, 18.iv.2011; 7 ♀, 26 j, CCDB 3206, Ilha Comprida, Rio Praia Boqueirão Norte, colls. F. Mantelatto *et al.*, 18.iv.2011; 1 ♂, 1 ♀, 22 j, CCDB 3228, Ilha Comprida, Rio Praia Boqueirão Sul, colls. F. Mantelatto *et al.*, 17.iv.2011; 9 ♂, 3 ♀, 11 j, CCDB 5021, Cananéia, Rio Cantagalo, colls. R. Costa *et al.*, 21.v.2012; 2 ♂, 1 ♀, 25 j, CCDB 5888, Cananéia, Riacho estrada bairro São Paulo, colls. F. Mantelatto *et al.*, 22.vii.2012; 1 ♂, CCDB 3644, Cananéia, Estrada Pariquera-Açu, tributary of Rio Baguaçu, colls. F. Carvalho *et al.*, 10.xi.2011.

**Distribution.** Western Atlantic—USA (North Carolina, South Carolina, Georgia, Florida, Mississippi, Louisiana, Texas), Mexico, Cuba, Haiti, Jamaica, Puerto Rico, St. Martin, U.S. Virgin Islands, Antigua and Barbuda, Guadeloupe, Dominica, Martinique, Trinidad and Tobago, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Suriname, and Brazil (Amapá, Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (von Ihering 1897; Rathbun 1901; Luederwaldt 1929; Sawaya 1946; Holthuis 1952a, 1959; Hart 1961; Coelho 1963; Williams 1965; Mistakidis 1966; Chace & Hobbs 1969; Melo-Filho 1971; Chace 1972; Coelho & Ramos-Porto 1980; Rodriguez 1980; Abele & Kim 1986, 1989; Bond-Buckup & Buckup 1989, 1999; Coelho *et al.* 1990; Pereira De Barros & Braun 1997; Ramos-Porto & Coelho 1998; Bowles *et al.* 2000; Valencia & Campos 2007; Almeida *et al.* 2013; Pileggi *et al.* 2014; Pimentel *et al.* 2014; Poupin 2018).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, Ilhabela (Ilha de São Sebastião), Cubatão, Santos, Itanhaém, Peruíbe, Registro, Iguape, Ilha Comprida, and Pariquera-Açu (von Ihering 1897 as *Palaemon acanthurus*; Luederwaldt 1929; Sawaya 1946; Valenti *et al.* 1989; Rocha & Bueno 2004; Ferreira *et al.* 2010; Pileggi & Mantelatto 2010; Pileggi *et al.* 2014; Mossolin *et al.* 2016). Sequences accession number (GenBank): CCDB 2134—16S (GU929449), COI (GU929470) (Vergamini *et al.* 2011).

### *Macrobrachium carcinus* (Linnaeus, 1758)

(Fig. 8D)

*Cancer carcinus* Linnaeus, 1758: 631.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 3453, Ubatuba, road Pier Itaguá, colls. F. Mantelatto *et al.*, 06.xii.2011; 1 ♂, CCDB 2136, Ubatuba, Rio Praia do Lamberto, colls. L. Pileggi & A. Costa, 25.iv.2005; 1 ♂, 1 ♀, CCDB 2486, Ubatuba, Rio Praia do Lamberto, colls. L. Pileggi & A. Costa, 03.v.2007; 1 ♂, CCDB 2141, São Sebastião, Rio Guaecá, colls. F. Mantelatto *et al.*, 01.xi.2004; 2 ♀ov, CCDB 2144, São Sebastião, Rio Paúba, coll. A. Meireles, iii. 2006; 1 ♂, 1 ♀, CCDB 2121, Ilhabela (Ilha de São Sebastião), Rio da Toca, coll. E. Mossolin, 12.xi.2007; 1 ♀, CCDB 2163, Ilhabela (Ilha de São Sebastião), coll. E. Mossolin, 13.xii.2006; 1 ♂, CCDB 2162, Ilhabela (Ilha de São Sebastião), Estrada Praia Jabaquara, coll. E. Mossolin, 22.ix.2006; 1 ♂, CCDB 2161, Ilhabela (Ilha de São Sebastião), Rio Praia Jabaquara, coll. E. Mossolin, 22.ix.2006.

**Distribution.** Western Atlantic—USA (Florida, Mississippi, Texas), Mexico, Cuba, Haiti, Jamaica, Puerto Rico, Saint Martin, U.S. Virgin Islands, Antigua and Barbuda, Guadeloupe, Dominica, Martinique, St. Lucia, St. Vincent and the Grenadines, Barbados, Grenada, Aruba, Curaçao, Bonaire, Trinidad and Tobago, Guatemala, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Suriname, and Brazil (Amapá, Pará, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (Smith 1869; von Ihering 1897; Moreira 1901; Rathbun 1901; Luederwaldt 1929;

Sawaya 1946; Holthuis 1952a, 1959; Hart 1961; Coelho 1963; Mistakidis 1966; Chace & Hobbs 1969; Chace 1972; Anderson & Fillingame 1980; Rodriguez 1980; Abele & Kim 1986, 1989; Bond-Buckup & Buckup 1989, 1999; Coelho *et al.* 1990; Lopes & Pereira 1994; Ramos-Porto & Coelho 1998; Bowles *et al.* 2000; Valencia & Campos 2007; Sampaio *et al.* 2009; Ferreira *et al.* 2010; Pileggi & Mantelatto 2010; Pileggi *et al.* 2014; Poupin 2018; Moraes *et al.* 2021).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, Ilhabela (Ilha de São Sebastião e Ilha dos Búzios), Bertioga, Cubatão, Santos, São Vicente, Itanhaém, Peruíbe, Registro, Iguape, and Cananéia (von Ihering 1897 as *Palaemon jamaicensis*; Luederwaldt 1929; Sawaya 1946 as *M. jamaicense*; Rocha & Bueno 2004; Ferreira *et al.* 2010; Pileggi & Mantelatto 2010; Pileggi *et al.* 2014; Mossolin *et al.* 2016 as *M. carcinus*). Sequences accession number (GenBank): CCDB 2136—16S (HM352449), COI (HM352491) (Pileggi & Mantelatto 2010).

### ***Macrobrachium heterochirus* (Wiegman, 1836)**

(Fig. 8E)

*Palaemon heterochirus* Wiegmann, 1836: 149.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 2730, Ubatuba, Rio da Praia do Lamberto, colls. L. Pileggi & A. Costa, 05.vi.2006; 2 ♀, CCDB 2494, Ubatuba, Rio da Praia do Lamberto, colls. L. Pileggi & A. Costa, 03.v.2007; 1 ♂, CCDB 5090, Ubatuba, Rio da Praia do Lamberto, coll. F. Carvalho, 22.iv.2012; 1 ♂, CCDB 2479, São Sebastião, Rio Guaecá, colls. F. Mantelatto *et al.*, 19.xi.2006; 1 ♀, CCDB 2137, Ilhabela (Ilha de São Sebastião), Rio do Engenho D'água, colls. F. Mantelatto *et al.*, 03.v.2007; 1 ♀, CCDB 2482, Ilhabela (Ilha de São Sebastião), Rio São Pedro, colls. F. Mantelatto *et al.*, 01.v.2006; 1 ♂, CCDB 2158, Ilhabela (Ilha de São Sebastião), Cachoeira da Toca, coll. E. Mossolin, 13.vii.2006; 1 ♀, CCDB 2488, Ilhabela (Ilha de São Sebastião), Rio do Engenho, colls. F. Mantelatto *et al.*, 01.xii.2007; 1 ♂, CCDB 1447, Cananéia, Rio Irirriaia-Açu, colls. F. Mantelatto *et al.*, 29.viii.2011; 1 ♀, 2 j, CCDB 3658, Cananéia, Rio Cachoeira do Pitu, colls. F. Carvalho *et al.*, 09.xi.2011.

**Distribution.** Western Atlantic—USA (Florida), Mexico, Haiti, Jamaica, Puerto Rico, Guadeloupe, Dominica, Martinique, St. Vincent and Granadines, Grenada, Curaçao, Guatemala, Costa Rica, Panama, Colombia, Venezuela, and Brazil (Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul) (Holthuis 1952a, 1980; Hart 1961; Coelho 1963; Chace & Hobbs 1969; Chace 1972; Rodriguez 1980; Abele & Kim 1989; Bond-Buckup & Buckup 1989, 1999; Ramos-Porto & Coelho 1998; Bowles *et al.* 2000; Valencia & Campos 2007; Pileggi *et al.* 2013, 2014; Poupin 2018).

**Remarks.** Previous records from the coast of São Paulo include Ilhabela (Ilha de São Sebastião), Peruíbe, and Cananéia (Ilha do Cardoso) (Rocha & Bueno 2004; Pileggi & Mantelatto 2010; Mossolin *et al.* 2016). The occurrence in Rio Grande do Norte and Pernambuco states (northeastern Brazil) is doubtful since it was mentioned in compilation studies without documented records (see Pileggi *et al.* 2013 for details). Sequences accession number (GenBank): CCDB 2137—16S (HM352454), COI (HM352494) (Pileggi & Mantelatto 2010).

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

(Fig. 8F)

*Palaemon olfersii* Wiegmann, 1836: 150.

**Material examined.** Brazil, São Paulo: 2 ♂, 8 ♀ (5 ♀ ov), 15 adults, 24 j, CCDB 3469, Ubatuba, Rio Puruba, colls. F. Mantelatto *et al.*, 06.vii.2011; 1 ♂, CCDB 5250, Ubatuba, Rio da Praia do Lamberto, colls. F. Carvalho *et al.*, 22.iv.2012; 1 ♂, 5 ♀ (4 ♀ ov), CCDB 5976, Ubatuba, Rio Praia do Lamberto, colls. F. Carvalho *et al.*, 09.iv.2013; 1 ♂, CCDB 2138, São Sebastião, Rio do Curral, colls. F. Mantelatto *et al.*, 26.vi.2006; 6 ♂, 1 ♀, CCDB 3142, Ilhabela (Ilha de São Sebastião), Rio Castelhana, colls. F. Mantelatto *et al.*, 21.ii.2011; 2 ♂, 7 ♀ (3 ♀ ov), 96 j, CCDB 3749, Santos, Rio Preto, colls. F. Carvalho *et al.*, 23.x.2011; 5 ♂, 6 ♀ (1 ♀ ov), 1 j, CCDB 3750, Santos, Rio Branco, colls. F. Carvalho *et al.*, 23.x.2011; 2 ♂, CCDB 5342, Praia Grande, Rio Branco, colls. N. Rossi *et al.*, 23.x.2011; 6 ♂, 5 ♀ (1 ♀ ov), CCDB 3215, Pariquerá-Açú, Rio Irirriaia-Mirim, colls. F. Mantelatto *et al.*, 18.iv.2011; 5 ♂, 8 ♀ (5 ♀ ov),

4 j, CCDB 3670, Cananéia, tributary of the Rio Baguaçu, colls. T. Magalhães *et al.*, 10.xi.2011; 4 ♂, 10 ♀ (8 ♀ ov), 12 adults, 49 j, CCDB 318, Cananéia, Rio Itapitanguí, colls. F. Mantelatto *et al.*, 29.viii.2011.

**Distribution.** Western Atlantic—USA (North Carolina, Florida, Mississippi, Louisiana, Texas), Mexico, Puerto Rico, Curaçao, Bonaire, Guatemala, Nicaragua, Costa Rica, Panama, Colombia, Venezuela, Guyana, Suriname, French Guiana, and Brazil (Amapá, Pará, Piauí, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (von Ihering 1897; Moreira 1901; Rathbun 1901; Luederwaldt 1929; Sawaya 1946; Holthuis 1952a, 1959; Coelho 1963; Anderson & Fillingame 1980; Rodriguez 1980; Williams 1984; Abele & Kim 1986, 1989; Bond-Buckup & Buckup 1989, 1999; Coelho *et al.* 1990; Pereira de Barros & Braun 1997; Ramos-Porto & Coelho 1998; Bowles *et al.* 2000; Valencia & Campos 2007; Rossi & Mantelatto 2013; Poupin 2018).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, São Sebastião, Ilhabela (Ilha de São Sebastião e Ilha dos Búzios), Cubatão, Santos, Peruíbe, Pariquera-Açu, Iguape, Ilha Comprida, and Cananéia (Ilha do Cardoso) (von Ihering 1897 as *Palaemon olfersi*; Luederwaldt 1929; Sawaya 1946; Rocha & Bueno 2004; Melo & Brossi-Garcia 2005 as *Macrobrachium birai*; Ferreira *et al.* 2010; Pileggi & Mantelatto 2010, 2012; Pileggi *et al.* 2014; Mossolin *et al.* 2016). Due numerous examples in the literature (taxonomic and non-taxonomic studies) of spelling variants, the correct spelling of this species was standardized to *M. olfersii* (see Rossi *et al.* 2016 for details). Sequences accession number (GenBank): CCDB 2138—16S (GU929466), COI (GU929554) (Vergamini *et al.* 2011).

### ***Macrobrachium potiuna* (Müller, 1880)**

*Palaemon potiuna* Müller, 1880: 152.

**Material examined.** Brazil, São Paulo: 3 ♂, 3 ♀ (1 ♀ ov), CCDB 2231, Ubatuba, tributary of the Rio Ubatumirim, 15.viii.2007; 1 ♂, CCDB 3143, Ilhabela (Ilha de São Sebastião), Rio Castelhana, colls. F. Mantelatto *et al.*, 21.ii.2011; 6 ♂, 5 ♀ (4 ♀ ov), 26 adults, 13 j, CCDB 3745, Bertioga, Rio João Pereira, colls. F. Carvalho *et al.*, 24.x.2011; 10 ♂, 10 ♀, > 20 adults, > 20 j, CCDB 3747, Praia Grande, Rio Preto, colls. F. Carvalho *et al.*, 23.x.2011; 4 ♂, 2 ♀ ov, CCDB 2131, Eldorado, Rio das Ostras (Caverna do Diabo), coll. E. Mossolin, 01.x.2004; 8 ♂, 2 ♀, > 20 j, CCDB 3664, Pariquera-Açu, Rio da Cachoeira do Encanto, colls. F. Carvalho *et al.*, 10.xi.2011; 4 ♂, 4 ♀ (3 ♀ ov), CCDB 3653, Cananéia, Rio Cachoeira do Pitu, colls. F. Carvalho *et al.*, 09.xi.2011; 7 ♂, 2 ♀, 12 j, CCDB 1092, Cananéia, road Prefeito José Herculano de Oliveira Rosa, colls. F. Mantelatto *et al.*, 29.viii.2011; 6 ♂, 7 ♀ (6 ♀ ov), CCDB 1569, Cananéia, Rio da Cachoeira do Encanto, colls. F. Mantelatto *et al.*, 29.viii.2011.

**Distribution.** Western Atlantic—Brazil (Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (Müller 1892; Moreira 1901; Holthuis 1952a; Melo *et al.* 1988; Bond-Buckup & Buckup 1989, 1999; Ramos-Porto & Coelho 1998; Pileggi & Mantelatto 2012; Carvalho *et al.* 2013).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Caraguatatuba, Ilhabela (Ilha de São Sebastião), Bertioga, Cubatão, Praia Grande, Peruíbe, Sete Barras, Tapiraí, Eldorado, Iporanga, Pariquera-Açu, Iguape, Ilha Comprida, and Cananéia (Holthuis 1952a; Melo *et al.* 1988 as *M. petronioi*; Rocha & Bueno 2004; Pileggi & Mantelatto 2012; Carvalho *et al.* 2013; Mossolin *et al.* 2016). Carvalho *et al.* (2013) detected two distinct lineages in material previously identified as *M. potiuna*. Therefore, the possibility of cryptic species in the Brazilian drainages should be investigated. Sequences accession number (GenBank): CCDB 2131—16S (HM352438), COI (KM101564) (Pileggi & Mantelatto 2010; Pileggi *et al.* 2014).

### **Genus *Nematopalaemon* Holthuis, 1950**

#### ***Nematopalaemon schmitti* (Holthuis, 1950)**

*Palaemon schmitti* Holthuis, 1950: 97–98.

**Material examined.** Brazil, São Paulo: 1 ♂, 2 ♀, CCDB 2217, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 18.viii.2007; 1 ♀, CCDB 3313, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 16.ix.2010; 9 ♂, 19 ♀, CCDB

3432, Ubatuba, Enseada de Ubatuba, colls. R. Costa *et al.*, 07.vii.2011; 3 ♀, 2 ni, CCDB 3404, Ubatuba, Enseada de Ubatuba, coll. F. Mantelatto, 12.v.2012; 3♂, 10 ♀ (3 ♀ov), CCDB 6549, Ubatuba, Enseada de Ubatuba, colls. J. Teles & N. França, 11.ix.2019; 2 ♂, 1 ♀, CCDB 3293, Cananéia, Ilha Bom Abrigo, colls. R. Costa & A. Castilho, 18.iv.2011.

**Distribution.** Western Atlantic—Suriname and Brazil (Amapá, Pará, Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina, Rio Grande do Sul) (Holthuis 1952a; Fausto-Filho 1967; Ramos-Porto & Coelho 1990; Coelho *et al.* 2006; Ferreira *et al.* 2010; Almeida *et al.* 2017b).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, Guarujá, and Cananéia (Severino-Rodrigues *et al.* 1985, 2002; Fransozo *et al.* 2009; Bochini *et al.* 2019). Although Ramos-Porto & Coelho (1990) reports the species to the Guianas and to the entire coast of northeastern Brazil, no records of material examined were found for the Guianas and the Piauí state (Brazil). Sequences accession number (GenBank): CCDB 3404—16S (MF490225), COI (MF490128) (Mantelatto *et al.* 2018).

## Genus *Neopontonides* Holthuis, 1951

### *Neopontonides brucei* Fransen & Almeida, 2009

(Fig. 8G)

*Neopontonides brucei* Fransen & Almeida, 2009: 838.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 6157, Cananéia, colls. R. Costa *et al.*, 12.xi.2013.

**Distribution.** Western Atlantic—Panama and Brazil (Bahia, São Paulo) (Fransen & Almeida 2009).

**Remarks.** Previous records from the coast of São Paulo were mentioned only in the original description for Ubatuba (Fransen & Almeida 2009).

## Genus *Palaemon* Weber, 1795

### *Palaemon northropi* (Rankin, 1898)

(Fig. 8H)

*Leander northropi* Rankin, 1898: 245; pl. 30, fig. 4.

**Material examined.** Brazil, São Paulo: 1 ♂, 1 ♀, CCDB 4909, Ubatuba, coll. F. Carvalho, 22.iv.2012; 1 ♀, CCDB 1128, Ubatuba, Praia Grande, coll. F. Mantelatto, 01.iv.2002; 1 ♂, CCDB 2380, Ubatuba, Praia Grande, coll. F. Mantelatto, 04.vi.2008; 3 ♂, 5 ♀, CCDB 5209, Ubatuba, Praia do Lambert, coll. F. Carvalho, 22.iv.2012; 1 ♂, 1 ♀, CCDB 76, São Sebastião, Araçá mangrove, coll. F. Mantelatto, 11.vii.2006; 6 ♀ (4 ♀ov), CCDB 3315, São Sebastião, Praia do Segredo, coll. L. Pardo, 10.xi.2007; 2 ♀ov, CCDB 1036, São Sebastião, Praia do Segredo, colls. F. Mantelatto *et al.*, 10.ii.2011; 5 ♀ov, CCDB 2623, São Sebastião, Rio Guaecá, coll. F. Mantelatto, 01.i.2002; 2 j, CCDB 3227, Ilha Comprida, Praia Boqueirão Sul, colls. F. Mantelatto *et al.*, 17.iv.2011; 2 ♂, 2 ♀, CCDB 713, Ilha Comprida, Praia da Balsa, colls. F. Mantelatto *et al.*, 30.viii.2011; 1 ♂, 1 ♀, CCDB 703, Cananéia, colls. F. Mantelatto *et al.*, 29.viii.2011; 5 ♂, 7 ♀ (1 ♀ov), > 57 adults, CCDB 848, Cananéia, IO/USP, colls. F. Carvalho & F. Mantelatto, 28.viii.2011; 2 ♀, CCDB 5348, Cananéia, IO/USP, coll. F. Mantelatto, 10.iii.2012.

**Distribution.** Western Atlantic—Bermuda, USA (Florida), Mexico (Quintana Roo), Bahamas, Cuba, Haiti, San Domingo, Dominican Republic, Puerto Rico, Virgin Islands, Jamaica, Guadeloupe, Curaçao, Panama, Venezuela, Brazil (Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina), and Uruguay (Holthuis 1952a; Chace 1972; Coelho *et al.* 2006; Ferreira *et al.* 2010; De Grave & Anker 2017; Carvalho, *et al.* 2020).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, São Vicente, Ilha Comprida, and Cananéia (Sawaya 1946 as *Palaemon brachylabis*; Pralon & Negreiros-Fransozo 2006; Ferreira *et al.* 2010; Carvalho *et al.* 2020). Sequences accession number (GenBank): CCDB 713—16S (KP179141), COI (KP179176) (Carvalho *et al.* 2020).

## *Palaemon pandaliformis* (Stimpson, 1817)

(Fig. 8I)

*Leander pandaliformis* Stimpson, 1871: 130.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 2234, Ubatuba, Rio Itamambuca, colls. F. Mantelatto *et al.*, 15.viii.2007; 5 ♂, 13 ♀ (7 ♀ ov), 16 adults, CCDB 3873, Ubatuba, Praia Dura mangrove, coll. F. Carvalho, 23.iv.2012; 5 ♂, 3 ♀ (2 ♀ ov), 3 j, CCDB 3316, São Sebastião, Rio Una, coll. F. Mantelatto, 14.xii.2007; 2 ♂, 2 ♀, 3 j, 1 ni, CCDB 3185, Ilha Comprida, Praia Boqueirão Sul, colls. F. Mantelatto *et al.*, 17.iv.2011; 2 ♂, 6 ♀, CCDB 813, Ilha Comprida, road Praia da Trincheira, colls. F. Mantelatto *et al.*, 30.viii.2011; 6 ♂, 3 ♀, 1 ni, CCDB 3197, Ilha Comprida, Praia da Trincheira, colls. R. Costa *et al.*, 17.iv.2011; 8 ♂, 9 ♀ (4 ♀ ov), CCDB 3647, Ilha Comprida, Praia do Pontal, colls. F. Carvalho *et al.*, 10.xi.2011; 1 ♂, 6 ♀ (2 ♀ ov), CCDB 3216, Pariquera Açu, Rio Iririaia Mirim, colls. F. Mantelatto *et al.*, 18.iv.2011; 9 ♂, 4 ♀ (1 ♀ ov), 1 j, CCDB 693, Cananéia, colls. F. Mantelatto *et al.*, 29.viii.2011; 4 ♂, 2 ♀ ov, 1 j, CCDB 2331, Cananéia, Ponte General Euclides O. Figueiredo, colls. F. Mantelatto *et al.*, 13.v.2008; 2 ♂, 3 ♀ (1 ♀ ov), CCDB 3222, Cananéia, estuary of Rio Bagaçu, colls. T. Davanzo *et al.*, 17.iv.2011; 1 ♂, 1 ♀, CCDB 3657, Cananéia, Ariri, tributary of the Rio Bagaçu, colls. F. Carvalho *et al.*, 10.xi.2011.

**Distribution.** Western Atlantic—Cuba, Puerto Rico, Virgins Islands, Barbados, Guadeloupe, Trinidad and Tobago, Guatemala, Nicaragua, Panama, Venezuela, and Brazil (Pará, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina, Rio Grande do Sul) (Holthuis 1952a; Coelho *et al.* 2006; Ferreira *et al.* 2010; Carvalho *et al.* 2020).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, Bertioga, Santos, São Vicente, Peruíbe, Pariquera-Açu, Ilha Comprida, and Cananéia (Luederwaldt 1919 as *Palaemon potitinga*; Sawaya 1946 as *Palaemon potitinga*; Abreu 1980; Rocha & Bueno 2004; Reigada *et al.* 2006; Ferreira *et al.* 2010; Mortari *et al.* 2010; Carvalho *et al.* 2020). Sequences accession number (GenBank): CCDB 813—16S (KF923713), COI (KP179186) (Carvalho *et al.* 2020).

## Genus *Periclimenes* Costa, 1844

### *Periclimenes paivai* Chace, 1969

*Periclimenes paivai* Chace, 1969: 259, figs. 5–7.

**Material examined.** Brazil, São Paulo: 3 ♂, 6 ♀ (5 ♀ ov), CCDB 367, Cananéia, coll. A. Morandini, iv.1990; 1 ♀ ov, CCDB 3288, Cananéia, estuary, colls. R. Costa *et al.*, 17.iv.2011; 2 ni, CCDB 3292, Cananéia, Ilha do Cardoso, colls. R. Costa & A. Castilho., 18.iv.2011; 1 ♀ ov, CCDB 3839, Cananéia, colls. R. Costa *et al.*, 09.xi.2011; 1 ♀, CCDB 4592, Cananéia, coll. J. Pantaleão, 29.viii.2011; 1 ♀, CCDB 6196, Cananéia, coll. R. Costa, 20.v.2012.

**Distribution.** Brazil (Paraíba, Rio de Janeiro, São Paulo, Santa Catarina) (Chace 1969; Ramos-Porto & Coelho 1998; Pantaleão *et al.* 2016; Baeza *et al.* 2017).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, São Sebastião, Santos, and Cananéia (Chace 1969; Martinelli *et al.* 2008). Sequences accession number (GenBank): CCDB 3292—16S (MF490226) (Mantelatto *et al.* 2018)

## Genus *Typton* Costa, 1844

### *Typton distinctus* Chace, 1972

*Typton distinctus* Chace, 1972: 49, figs. 13–14.

(Fig. 8J)

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 6707, Ubatuba, Itaguá, Porto de Itaguá, colls. R. Santos & I. Moraes, i.2019; 1 ♂, CCDB 6713, Cananéia, Ilha da Figueira, colls. R. Santos & I. Moraes, 27.xi.2020.



**Distribution.** Western Atlantic—USA (Florida), Mexico (Yucatan Peninsula), Cuba, and Brazil (Pernambuco, Rio de Janeiro, São Paulo) (Chace 1972; Abele & Kim 1986; Camp *et al.* 1998; Coelho *et al.* 2006; Duris *et al.* 2009; Vieira *et al.* 2012; Pachelle *et al.* 2015; Moraes *et al.* 2020b).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, in Pier do Porto in Itaguá (Moraes *et al.* 2020b). It is found in shallow waters associated with sponges (Chace 1972; Ramos-Porto & Coelho 1998; Vieira *et al.* 2012; Pachelle *et al.* 2015; Moraes *et al.* 2020b). In general, shrimps of the genus dwell deep in sponge canals (Duris *et al.* 2011; Anker *et al.* 2021). Probably due to these, its small size (carapace length: 1.53–2.71 mm) and the relationship among the shrimp's color and the sponge host (Moraes *et al.* 2020b), it is hard to sample. There is available material from São Paulo coast in other collections such as MZUSP 40095 and 40096, and it is deposited in the Biological Collection from São Paulo State University—Zoology Department, Botucatu-SP (Moraes *et al.* 2020a). Sequences accession number (GenBank): CCDB 6713—16S (OM720040), COI (OM672405) (present study).



**FIGURE 8.** Family Palaemonidae. A) *Cuapetes americanus* (Kingsley, 1878) (CCDB 5508). B) *Leander paulensis* Ortmann, 1897 (CCDB 4908). C) *Macrobrachium acanthurus* (Wiegman, 1836) (CCDB 5925). D) *Macrobrachium carcinus* (Linnaeus, 1758) (CCDB 2162). E) *Macrobrachium heterochirus* (Wiegman, 1836) (CCDB 5090). F) *Macrobrachium olfersii* (Wiegman, 1836) (CCDB 5250). G) *Neopontonides brucei* Fransen & Almeida, 2009 (CCDB 6157). H) *Palaemon northropi* (Rankin, 1898) (CCDB 4909). I) *Palaemon pandaliformis* (Stimpson, 1817) (CCDB 5929). J) *Typton distinctus* Chace, 1972 (CCDB 6713). K) *Typton fapespae* Almeida, Anker & Mantelatto, 2014 (CCDB 6712). Animals from Brazil, São Paulo, Ubatuba (A, B, E, F, H), Cananéia (C, G, I, J, K), São Sebastião (D). Sex: male (A, D, E, F, J), female (B, C, G, H, I), ovigerous female (K). Scale bars (mm): A—5; B—9; C—9; D—33; E—22; F—17; G—2; H—8; I—6; J—4; K—5. Photographs by R.C. Buranelli (A—C, E, F, H, I), and J.A.F. Pantaleão (D, G, J, K).

## ***Typton fapespae* Almeida, Anker & Mantelatto, 2014**

(Fig. 8K)

*Typton fapespae* Almeida, Anker & Mantelatto, 2014: 111, figs. 1–5.

**Material examined.** Brazil, São Paulo: paratype, 1 ♂, CCDB 4486, Ubatuba, Praia do Cedro, coll. F. Zara, 13.viii.2012; paratype, 1 ♀, CCDB 3413, Ubatuba, Praia do Itaguá, coll. I. Leone, 5.iv.2011; 1 ni, CCDB 1096, Ubatuba, Praia do Itaguá, coll. F. Mantelatto, 1.i.2003; 1 ♀ov (parental with larvae), CCDB 6712, Cananéia, Ilha da Figueira, colls. R. Santos & I. Moraes, 26.xi.2020.

**Distribution.** Western Atlantic—Brazil (Rio de Janeiro, São Paulo, Santa Catarina) (Almeida *et al.* 2014; Pachellet *et al.* 2015; Ferreira *et al.* 2021).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba, and São Sebastião (Almeida *et al.* 2014). It is found in association with sponges, including *Mycale* (*Zygomycale*) *angulosa* (Duchassaing & Michelotti, 1864); a specimen was extracted from a colony of the bryozoan *Schizoporella errata* (Waters, 1878) (Almeida *et al.* 2014). Sequences accession number (GenBank): CCDB 6712—16S (OM720039), COI (OM672404) (present study).

## **Superfamily Pandaloidea Haworth, 1825**

### **Family Pandalidae Haworth, 1825**

#### **Genus *Plesionika* Spence Bate, 1888**

#### ***Plesionika longicauda* (Rathbun, 1901)**

(Fig. 9)

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 5778, R/V Soloncy Moura Expedition, st. 8, 89 m, colls. F. Zara *et al.*, 18.viii.2015.

**Distribution.** Western Atlantic—Gulf of Mexico, from Bahamas to the Antilles, and Brazil (Pará, Pernambuco, Alagoas, Bahia, Espírito Santo, São Paulo). Eastern Atlantic—from Madeira to off Congo (Coelho & Ramos 1972; Lemaitre & Gore 1988; Cruz & Fransen 2004; Viana 2005; Furlan 2010; Quaresma & Martinelli-Lemos 2020).

**Remarks** Previous records from São Paulo state include Ubatuba from 11 to 16 m (Furlan 2010—4 specimens were collected in Ubatumirim and Mar Virado Bays). Unfortunately, this material was not deposited in any museum collection (Furlan pers. com.). Sequence accession number (GenBank): CCDB 5778—16S (MF490227), COI (OM672401) (Mantelatto *et al.* 2018; present study).



**FIGURE 9.** Family Pandalidae. *Plesionika longicauda* (Rathbun, 1901) (CCDB 5809). Animal from Brazil, São Paulo, R/V Soloncy Moura Expedition, st. 8. Sex: ovigerous female. Scale bar (mm): 20. Photograph by R.C. Buranelli. *Pandalus longicauda* Rathbun, 1901: 117.

## Superfamily Pasiphaeoidea Dana, 1852

### Family Pasiphaeidae Dana, 1852

#### Genus *Leptochela* Stimpson, 1860

#### *Leptochela serratorbita* Spence Bate, 1888

*Leptochela serratorbita* Spence Bate, 1888: 859; pl. 139.

**Material examined.** Brazil, São Paulo: 2 ♀ (1 ♀ov), 1 ni, CCDB 4120, Cananéia, colls. R. Costa *et al.*, 09.xi.2011.

**Distribution.** Western Atlantic—USA (North Carolina, Florida), Gulf of Mexico, Puerto Rico, Barbuda, Dominica, Virgin Islands, Leeward Islands, and Brazil (Amapá, Pará, Maranhão, Piauí, Ceará, Pernambuco, Bahia, São Paulo) (Coelho & Ramos 1972; Coelho & Ramos-Porto 1980; Soares & Apelbaum 1994; Porto & Coelho 1995; Nizinski 2003; Cardoso 2006; Coelho-Filho 2006; Coelho *et al.* 2006).

**Remarks.** Previous record from São Paulo includes Santos, found at 45 m (Coelho & Ramos 1972). Sequence accession number (GenBank): CCDB 4120—16S (MF490224), COI (OM672406) (Mantelatto *et al.* 2018; present study).

## Infraorder Gebiidea de Saint Laurent, 1979

### Family Axianassidae Schmitt, 1924

#### Genus *Axianassa* Schmitt, 1924

## *Axianassa australis* Rodrigues & Shimizu, 1992

(Fig. 10A)

*Axianassa australis* Rodrigues & Shimizu, 1992: 317–323, figs. 1–32.

**Material examined.** Brazil, São Paulo: 1 ♀ov, CCDB 357, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 1.xii.2000; 1 ♂, CCDB 354, São Sebastião, Araçá mangrove, coll. F. Mantelatto, 10.xii.2000; 1 ♀ov, CCDB 353, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 11.xii.2000; 1 ♀ov, CCDB 3847, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 24.xi.2008; 1 ♂, 6 ♀, CCDB 1037, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 21.ii.2011; 1 ♂, CCDB 5620, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 2.xii.2014; 3 ♂, 2 ♀, 2 j, CCDB 5632, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 2.xii.2014; 5 ♂, 16 ♀ (14 ♀ov), CCDB 6577, São Sebastião, Araçá mangrove, colls. F. Mantelatto *et al.*, 2.xii.2019.

**Distribution.** Western Atlantic—USA (Florida, Texas), southwestern Gulf of Mexico, Caribbean Sea, Colombia, and Brazil (Ceará, Pernambuco, Sergipe, Bahia, Espírito Santo, São Paulo, Paraná) (Rodrigues & Shimizu 1992; Felder 2001; Melo *et al.* 2006; Coelho *et al.* 2007; Anker 2010; Rosa & Almeida 2012).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião (Rodrigues & Shimizu 1992; Kihara *et al.* 2005). The complete mitochondrial data was recently provided by Tan *et al.* (2019, MH234568). Sequences accession number (GenBank): CCDB 1037—16S (MF490232), COI (MF490135) (Mantelatto *et al.* 2018).

## Family Upogebiidae Borradaile, 1903

### Genus *Upogebia* Schmitt, 1814

#### *Upogebia brasiliensis* Holthuis, 1956

(Fig. 10B)

*Upogebia brasiliensis* Holthuis, 1956: 173–181, figs. 1–2.

**Material examined.** Brazil, São Paulo: 1 ♀, CCDB 449, São Sebastião, Araçá mangrove, 27.v.2006; 1 ♂, 1 ♀ov, CCDB 3846, São Vicente, São Vicente estuary, colls. A. Castilho *et al.*, 23.x.2011; 2 ♂, CCDB 3870, Ilha Comprida, Praia da Balsa, rocky shore, colls. F. Mantelatto *et al.*, 30.viii.2011; 1 ♀, CCDB 5774, Ilha Comprida, Praia da Balsa, rocky shore, colls. F. Mantelatto *et al.*, 22.vii.2011; 1 ♂, 3 ♀, CCDB 5833, Ilha Comprida, Praia da Balsa, rocky shore, colls. F. Mantelatto *et al.*, 22.vii.2011; 1 ♂, 1 ♀, CCDB 3261, Cananéia, IO/USP, colls. F. Mantelatto *et al.*, 16.iv.2011; 1 ♂, 1 ♀, CCDB 3262, Cananéia, IO/USP, colls. F. Carvalho & E. Souza-Carvalho, 8.xi.2011.

**Distribution.** Western Atlantic—Belize, French Guiana, Suriname, and Brazil (Pará, Maranhão, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Bahia, São Paulo, Paraná, Santa Catarina) (Gomes Corrêa 1968; Williams 1993; Melo 1999; Coelho *et al.* 2007).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião Channel and Cananéia (Holthuis 1956; Nucci *et al.* 2001; Amaral *et al.* 2003). Sequences accession number (GenBank): CCDB 3261—16S (MF490233), COI (MF490136) (Mantelatto *et al.* 2018).

#### *Upogebia marina* Coelho, 1973

*Upogebia marina* Coelho, 1973: 345.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 5849, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 22.iv.2012.

**Distribution.** Western Atlantic—Venezuela and Brazil (Pará, Piauí, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe, São Paulo) (Coelho 1973; Coelho & Ramos-Porto 1987; Coelho & Rattacaso 1988; Williams 1993; Melo 1999; Coelho *et al.* 2007).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião Channel, São Sebastião (Nucci *et al.* 2001; Amaral *et al.* 2003).

### *Upogebia noronhensis* Fausto-Filho, 1969

(Fig. 10C)

*Upogebia noronhensis* Fausto-Filho, 1969: 1–7, pl. I, figs. 1–15.

**Material examined.** Brazil, São Paulo: 1 ♂, 1 ♀ov, CCDB 3864, Ubatuba, offshore, coll. D. Rosa, 15–28.xii.2011; 1 ♂, CCDB 5619, Ubatuba, Ilha das Couves, 19.x.2012; 1 ♂, CCDB 3161, São Sebastião, Praia do Segredo, CEBIMar/USP, colls. F. Mantelatto *et al.*, 20.ii.2011; 2 ♀ov, CCDB 3163, São Sebastião, Praia do Segredo, CEBIMar/USP, colls. Mantelatto *et al.*, 20.ii.2011; 1 ♂, 2 ♀, CCDB 3162, Ilhabela (Ilha de São Sebastião), Praia do Engenho D'água, coll. E. Mossolin, 1.v.2007; 2 ♂, 4 ♀ (2 ♀ov), CCDB 3863, Ilhabela (Ilha de São Sebastião), Praia do Engenho D'água, colls. F. Mantelatto & E. Mossolin, 12.vii.2006.

**Distribution.** Western Atlantic—Brazil (Fernando de Noronha, Maranhão, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Bahia, São Paulo) (Pocock 1890 as *Gebia spinigera*; Fausto-Filho 1970; Williams 1993; Melo 1999; Coelho *et al.* 2007).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião (Rodrigues & Shimizu 1992; Nucci *et al.* 2001; Amaral *et al.* 2003). Sequences accession number (GenBank): CCDB 3864—16S (MF490234), COI (MF490137) (Mantelatto *et al.* 2018).

### *Upogebia omissa* Gomes Corrêa, 1968

(Fig. 10D)

*Upogebia omissa* Gomes Corrêa, 1968: 97–109.

**Material examined.** Brazil, São Paulo: 2 ♀, CCDB 515, Ubatuba, coll. E. Ragozana, 29.viii.1992; 4 ♂, 2 ♀, CCDB 6170, Ubatuba, Praia do Lamberto, coll. F. Mantelatto, 15.vi.2003; 4 ♂, CCDB 3866, Ubatuba, Praia do Lamberto, colls. F. Mantelatto *et al.*, iii.2004; 1 ♂, CCDB 3159, Ubatuba, Praia do Lamberto, colls. F. Mantelatto *et al.*, 3.v.2004; 1 ♂, 2 ♀, CCDB 3158, Ubatuba, Praia do Codó, IO/USP, colls. F. Mantelatto *et al.*, 5.v.2004; 4 ♂, CCDB 3869, Ubatuba, Praia do Codó, IO/USP, colls. F. Mantelatto *et al.*, 25.iv.2005; 2 ♂, 1 ♀, CCDB 3155, Ubatuba, Praia do Codó, IO/USP, colls. F. Mantelatto *et al.*, 25.iv.2005; 1 ♀ov, CCDB 3865, Ubatuba, Praia do Codó, IO/USP, colls. F. Mantelatto *et al.*, 25.iv.2005; 2 ♂, CCDB 2826, Ubatuba, Saco do Codó, Enseada do Flamengo, coll. F. Mantelatto, 11.vii.2006; 1 ♀, CCDB 3156, Ubatuba, Praia do Codó, Enseada do Flamengo, colls. F. Mantelatto *et al.*, 27.v.2009; 6 ♂, 2 ♀, CCDB 3152, Ubatuba, Praia do Codó, Enseada do Flamengo, colls. F. Mantelatto *et al.*, 13.v.2010; 6 spec., CCDB 3868, Ubatuba, Praia do Codó, Enseada do Flamengo, colls. F. Mantelatto *et al.*, 13.v.2010; 1 ♀ov, CCDB 4388, Ubatuba, Praia do Codó, IO/USP, colls. F. Mantelatto *et al.*, 22.iv.2012; 1 ♂, CCDB 5771, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 22.iv.2012; 1 ♂, CCDB 5773, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 22.iv.2012; 1 ♀, CCDB 5882, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 22.iv.2012; 2 ♂, CCDB 5867, Ubatuba, Praia do Lamberto, coll. F. Mantelatto, 9.iv.2013; 4 ♀, CCDB 5886, Ubatuba, Praia do Lamberto, colls. F. Mantelatto *et al.*, 9.iv.2013; 1 ♂, CCDB 5868, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 31.iv.2014; 1 ♂, CCDB 5885, Ubatuba, Enseada do Flamengo, coll. F. Mantelatto, 31.iii.2014; 1 ♂, CCDB 3153, São Sebastião, Araçá mangrove, coll. D. Peiró, 27.v.2006; 1 ♀, CCDB 2192, São Sebastião, Araçá mangrove, coll. D. Peiró, 11.vii.2006; 3 ♂, 3 ♀ (2 ♀ov), CCDB 3151, São Sebastião, Praia do Segredo CEBIMar/USP, colls. F. Mantelatto *et al.*, 20.ii.2011; 4 ♀ (1 ♀ov), CCDB 3154, São Sebastião, Praia do Segredo CEBIMar/USP, colls. F. Mantelatto *et al.*, 20.ii.2011; 1 ♂, CCDB 3157, Ilhabela (Ilha de São Sebastião), Praia do Engenho D'água, coll. E. Mossolin, 1.v.2007; 1 ♀, CCDB 3867, Cananéia, colls. R. Costa *et al.*, 29.viii.2011; 1 ♀ov, CCDB 6711, Cananéia, Ilha da Figueira, colls. R. Santos & I. Moraes, 26.xi.2020.

**Distribution.** Western Atlantic—USA (Florida), Dominican Republic, Puerto Rico, Panama, Colombia, Venezuela, Trinidad and Tobago, Brazil (Maranhão, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná, Santa Catarina) (Coelho 1966 as *Upogebia* sp.; Fausto-Filho 1970; Williams 1993; Melo 1999; Coelho *et al.* 2007).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião and Santos (Rodrigues & Shimizu 1992; Williams 1993; Dworschak & Rodrigues 1997; Nucci *et al.* 2001; Amaral *et al.* 2003). Sequences accession number (GenBank): CCDB 6711—16S (OM720041), COI (OM672407) (present study).

## *Upogebia paraffinis* Williams, 1993

(Fig. 10E)

*Upogebia paraffinis* Williams, 1993: 317–323, fig. 26.

**Material examined.** Brazil, São Paulo: 1 ♀ov, CCDB 3517, Ubatuba, colls. J. Freitas & F. Glauco, 29.viii.1992; 3 ♀ (1 ♀ov), CCDB 3518, Ubatuba, coll. E. Ragozana, 29.viii.1992; 1 ♂, CCDB 1543, Ubatuba, Praia do Lamberto, coll. F. Mantelatto, 12.iv.1997; 1 ♂, 2 ♀, CCDB 3519, Ubatuba, Saco do Codó, coll. F. Mantelatto, 1.vi.1999; 3 ♂, 1 ♀, CCDB 1526, Ubatuba, Praia do Lamberto, colls. F. Mantelatto *et al.*, 15.vi.2003; 1 ♂, CCDB 1614, Ubatuba, Praia do Lamberto, colls. F. Mantelatto *et al.*, 15.vi.2003; 1 ♂, CCDB 3160, Ubatuba, Praia do Lamberto, colls. F. Mantelatto *et al.*, 3.iii.2007; 8 ♂, 3 ♀ (1 ♀ov), CCDB 3871, Ubatuba, Praia do Codó, Enseada do Flamengo, colls. F. Mantelatto *et al.*, 13.v.2010; 2 ♂, CCDB 5772, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 22.iv.2012; 8 ♂, 3 ♀, CCDB 5840, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 22.iv.2012; 30 ♂, 24 ♀ (13 ♀ov), CCDB 5842, Ubatuba, Saco do Codó, colls. F. Mantelatto *et al.*, 22.iv.2012.

**Distribution.** Western Atlantic—Brazil (Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, São Paulo, Paraná) (Rathbun 1900 as *Upogebia affinis*; Williams 1993; Melo *et al.* 2004; Coelho *et al.* 2007).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba and São Sebastião (Williams 1993; Dworschak & Coelho 1999; Pires-Vanin *et al.* 2014). Sequences accession number (GenBank): CCDB 3519—16S (MF490235), COI (MF490138) (Mantelatto *et al.* 2018).

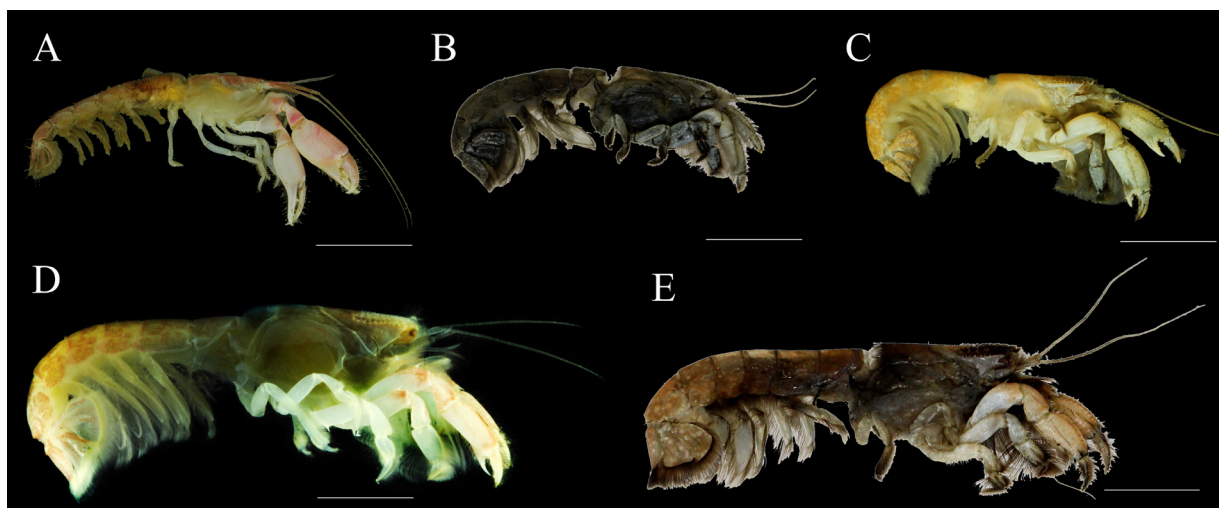
## *Upogebia vasquezi* Ngoc-Ho, 1989

*Upogebia vasquezi* Ngoc-Ho, 1989: 865–878, figs. 1–2.

**Material examined.** None.

**Distribution.** Western Atlantic—USA (Florida), Mexico (Eastern Yucatan Peninsula), Bahamas, Turks and Caicos Island, Dominican Republic, Lesser Antilles, Netherlands Antilles, Panama, Colombia, and Brazil (Maranhão, Ceará, Rio Grande do Norte, Paraíba, Bahia, São Paulo) (Williams 1993; Nucci *et al.* 2001; Coelho *et al.* 2007; Pires-Vanin *et al.* 2014).

**Remarks.** Previous records from the coast of São Paulo include São Sebastião (Nucci *et al.* 2001; Pires-Vanin *et al.* 2014). Despite this previous record we did not collect any material during our survey.



**FIGURE 10.** Families Axianissidae and Upogebidae. A) *Axianassa australis* Rodrigues & Shimizu, 1992 (CCDB 5620). B) *Upogebia brasiliensis* Holthuis, 1956 (CCDB 5774). C) *Upogebia noronhensis* Fausto-Filho, 1969 (CCDB 5619). D) *Upogebia omissa* Gomes Correa, 1968 (CCDB 6711). E) *Upogebia paraffinis* Williams, 1993 (CCDB 5772). Animals from Brazil, São Paulo, São Sebastião (A), Ilha Comprida (B), Ubatuba (C, E), Cananéia (D). Sex: male (A, C, E), female (B), ovigerous female (D). Scale bars (mm): A—14; B—8, C—8, D—8; E—6. Photographs by R.C. Buranelli (A—C, E), and J.A.F. Pantaleão (D).

## Infraorder Stenopodidea Spence Bate, 1888

### Family Stenopodidae Claus, 1872

#### Genus *Stenopus* Latreille, 1819

##### *Stenopus hispidus* (Olivier, 1811)

(Fig. 11A)

*Palaemon hispidus* Olivier, 1811: 666.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 5520, Ubatuba, coll. F. Zara, 4.ii.2015; 1 ♂, CCDB 5521, Ubatuba, coll. F. Zara, 4.ii.2015; 1 ♂, CCDB 5548, Ubatuba, coll. F. Zara, 4.ii.2015.

**Distribution.** Western Atlantic—Bermuda, USA (North Carolina, Florida, Mississippi), Mexico (Quintana Roo), Bahamas, Cuba, Puerto Rico, Jamaica, Saint Lucia, Curaçao, Belize, Costa Rica, Panama, French Guiana, and Brazil (Fernando de Noronha, Abrolhos, Trindade and Martin Vaz, Amapá, Ceará, Rio Grande do Norte, Pernambuco, Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Santa Catarina). Central Atlantic—Ascension and Santa Helena Islands. Indo-West and northern Pacific—South Africa, Mozambique, Mauritius, Seychelles, Tanzania, Red Sea, Sri Lanka, Maldives, China Sea, Japan, Philippines, Malaysia, Singapore, Indonesia, Northern Mariana Islands, Guam, Micronesia, Papua-New Guine, Australia (Christmas Island, Western Australia, Northern Territory, Queensland, New South Wales, Lord Howe Island), New Caledonia, Vanuatu, New Zeland, Fiji, Kiribati, Palmyra Athol, Hawaii, and French Polynesia (Tuamotu Islands). Eastern Pacific—Panama (Adams & White 1848; Richters 1880; Spence Bate 1888; Ortmann 1894; Borradaile 1900; Rathbun 1901, 1906b; Lenz 1905; Calman 1909; Parisi 1919; Edmondson 1923; Kubo 1940; Holthuis 1946, 1953, 1959; Johnson 1961, 1976; McNeill 1968; Kruczynski & Jenner 1969; Lukens 1977; Kensley 1981; Lamaitre 1984; Manning & Chace Jr. 1990; Markhan *et al.* 1990; Goy 1992; Nomura *et al.* 1996; Vargas & Cortés 1999a; Davie 2002; Coelho *et al.* 2006; Coelho Filho 2006; Gregati *et al.* 2006; Alves *et al.* 2008; Brown 2014; Soledade *et al.* 2015; De Grave & Anker 2017; Tavares *et al.* 2017; Dudoit *et al.* 2018; Bispo *et al.* 2021).

**Remarks.** Previous record from the coast of São Paulo includes Ubatuba (Gregati *et al.* 2006). Sequence accession number (GenBank): CCDB 5520—16S (MF490146), COI (MF490041) (Mantelatto *et al.* 2018).

##### *Stenopus spinosus* Risso, 1827 in [Risso, 1826–1827]

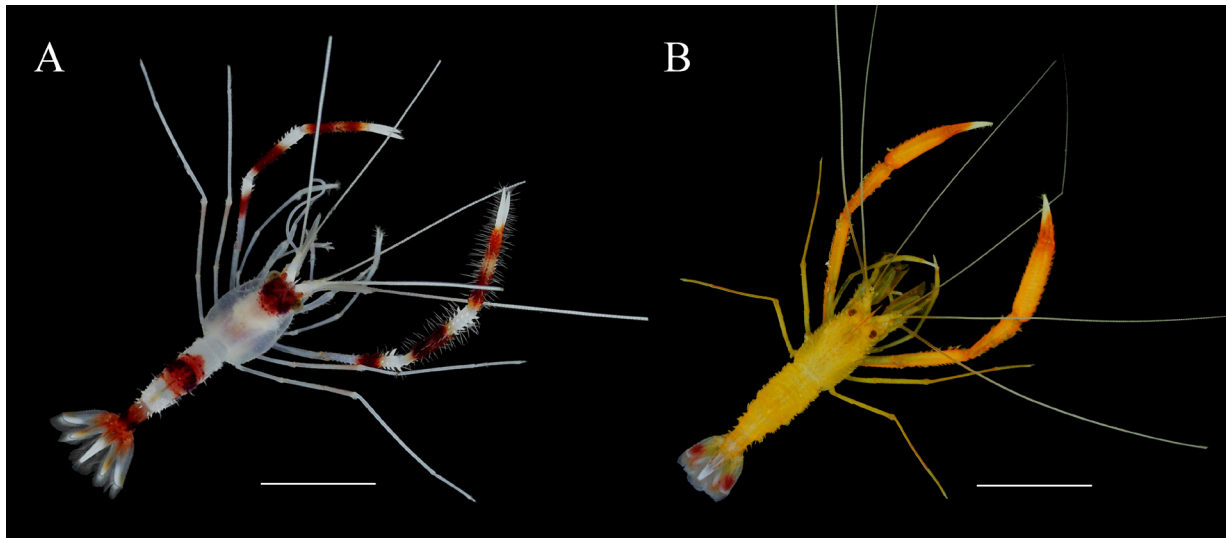
(Fig. 11B)

*Stenopus spinosus* Risso, 1827: 66, pl. 3, fig. 8.

**Material examined.** Brazil, São Paulo: 1 ♂, CCDB 1525, Ubatuba, colls. F. Mantelatto & R. Biagi, 1.iii.2001; 1 ♂, CCDB 5780, R/V Soloncy Moura Expedition, st. 8, 89 m, colls. F. Zara *et al.*, 18.vii.2015.

**Distribution.** Western Atlantic—USA (Florida, Mississippi, Louisiana), and Brazil (São Paulo, Santa Catarina). Eastern Atlantic—Portugal (Azores Island), Mediterranean Sea — Spain (Canary Islands), France, Monaco, Italy, Croatia, Albania, Greece, Turkey, Israel, and Algeria), Cape Verde, Cameroon, and Congo (Risso 1827; Carus 1885; Karlovac 1953; Figueira 1959; Neves 1969; Carpini 1970; Crosnier 1971; Relini-Orsi & Relini 1972; Lewinsohn & Holthuis 1978; Iliffe *et al.* 1984; Massuti 1985; Seridji 1990; Paula *et al.* 1992; Vaso & Gjikhuri 1993; Kocataş & Katađan 2003; McLaughlin *et al.* 2005; Thessalou-Legaki 2007; Felder *et al.* 2009; Giraldes & Freire 2015; Wirts 2019).

**Remarks.** Previous records from the coast of São Paulo include Ubatuba (Mantelatto *et al.* 2018). The present study confirms, with detailed information, the presence of this species in São Paulo and extends the northern limit of the species in the western Atlantic superficially mentioned by Mantelatto *et al.* (2018). Sequence accession number (GenBank): CCDB 1525—16S (MF490145), COI (MF490042) (Mantelatto *et al.* 2018).



**FIGURE 11.** Family Stenopodidae. A) *Stenopus hispidus* (Olivier, 1811) (CCDB 5521). B) *Stenopus spinosus* Risso, 1827 (CCDB 5780). Animals from Brazil, São Paulo, Ubatuba (A), R/V Soloney Moura Expedition, st. 8 (B). Sex: males. Scale bars (mm): A—16; B—12. Photographs by R.C. Buranelli.

## Discussion

Herein we confirmed the occurrence of 50 shrimps-like and 25 lobsters-like species, which correspond to a considerable portion of main shallow water biodiversity registered to the São Paulo state. According to our five checklists, the actual number of decapod crustaceans distributed in this area is now estimated to be around 364 species (Almeida *et al.* 2018—39 spp., Terossi *et al.* 2018—19 spp., Mantelatto *et al.* 2020—168 spp., Mantelatto *et al.* 2021—63 spp., and present study—75 spp.). This number is obviously incomplete since new taxonomic arrangements and revisions came out with consequent new or synonymized species propositions, as well as some entities collected in areas not covered and/or deposited in collections not analyzed during our research. Regardless of this dynamic scenario, we can affirm that our findings bring an increase of ~12% to the knowledge of decapod fauna in the region (previously estimated with 322 species by Fransozo & Negreiros-Fransozo 1999). This is one more example that integrative taxonomy, with incorporation of molecular data into taxonomic field to build accurate checklists, is an important practice that should be adopted to increase the knowledge of faunal biodiversity.

### Shrimps-like species

The Penaeoidea was one of the most diverse groups that we registered during our study. It was represented by 20 species. According to the last updated literature, there are 64 species of Dendrobranchiata recorded along the Brazilian coast, 44 of them belong to Penaeoidea and 19 of which were reported to São Paulo (Costa *et al.* 2003; Dallagnolo *et al.* 2009; Pezzuto 2016; Teodoro *et al.* 2016; Carvalho-Batista *et al.* 2019). Therefore, this checklist added one new Penaeoidea record for São Paulo (*Litopenaeus vannammei*).

The internal classification of Dendrobranchiata has been stable for some time (De Grave & Fransen 2011) and some recent taxonomic contributions (Tavares & Gusmão 2016; Carvalho-Batista *et al.* 2019, 2020) have increased the number of species to 537 in the world. It is notorious that some of the registered species, despite their commercial importance, have not been studied by integration of the morphological and molecular data to clarify their taxonomic status. Using such tools, Carvalho-Batista *et al.* (2019) were able to erect a new species of *Xiphopenaeus*, that remained cryptic for many years. These taxonomical contributions are necessary because they increase our knowledge on decapod taxonomy but also because it helps to preserve the existing species. In the case of *Xiphopenaeus*, our lack of knowledge about the presence of an undescribed cryptic species places into question all the ecological studies of *X. kroyeri* to date, since all of them assumed the presence of a single species distributed in Brazil. This species, commonly known as “camarão sete-barbas”, is the most caught by artisanal fishing in the



São Paulo state and has been suffering a decline in fishing stocks, due to the increasing number of fishing boats and sampling effort for its capture (PMAP-IP, 2021). Since we now are aware of the presence of not one but two species of *Xiphopenaeus*, it is important to train fisherman in the correct identification of the two species, which are captured indistinctly along the Brazilian coast, in order to clarify the impact of commercial fishing on both species and propose effective management and conservation projects.

We do not recognize records of *Litopenaeus setiferus* (as *Penaeus setiferus*) from São Paulo coast. For this species there is only one register (without specific collection data), by Luederwald (1919). After that, *L. setiferus* has not been found along the Brazilian coast. D’Incao (1998) did not find records in scientific collections and therefore he did not consider *L. setiferus* for the Brazilian coast, only on the the north Atlantic. Coelho *et al.* (2006) did not list *L. setiferus* on the north and northeast coasts of Brazil. Specimens previously reported as *L. setiferus* by Rathbun (1900) were reclassified as *L. schmitti*, with no detailed information on the examined material. Recently, Santos *et al.* (2021) pointed out the occurrence of *L. setiferus* in Santos Bay, but only based on the previous record of Luederwald (1919).

From the 23 species of caridean shrimps recorded here, the Palaemonidae are a supernumerary group with 15 species, reflecting the speciosity of this family with more than 400 species worldwide (De Grave & Fransen 2011). In summary, the caridean reported herein can be split into three groups: one group with 11 species of amphidromous shrimps [*e.g.*, genera *Atya* (2 spp.), *Macrobrachium* (5 spp.), *Palaemon* (2 spp.), *Potimirim* (2 spp.)], whose taxonomy has been updated in recent years (see Pileggi & Mantelatto 2010, 2012; Torati & Mantelatto 2012; Rossi & Mantelatto 2013; Oliveira *et al.* 2019, 2021; Carvalho *et al.* 2020)]; the second group with 9 marine shallow-coastal (till 50 m depth) shrimp species [*e.g.* genera *Brachycarpus* (1 sp.), *Cuapetes* (1 sp.), *Leander* (1 sp.), *Leptochela* (1 sp.), *Nematopalaemon* (1 sp.), *Neopontonides* (1 sp.), *Periclimenes* (1 sp.), *Typton* (2 spp.)]; and the third group of 3 marine deep-water (below 50 m depth) shrimps species [*e.g.*, genera *Glyphocrangon* (1 sp.), *Plesionika* (1 sp.), *Pontocaris* (1 sp.)].

It is noteworthy that we do not recognize *Rhynchocinetes typus* Milne Edwards, 1837 as a species distributed in São Paulo. Our evidences are based on the only previous record of a single specimen deposited in the MZUSP (10913), reported by Melo (2007) and a species of Pacific distribution that has not been caught after Melo (2007), despite the enormous sampling effort made by different researchers in the target area of study. Its one and only presence in Brazil was probably introduced, intentionally or not, by humans.

Additionally, we did not find records of *Leander tenuicornis* (Say, 1818) during our fieldwork efforts nor find reference material from São Paulo deposited in any examined scientific collection. Holthuis (1952a) and Ferreira *et al.* (2010) reported the species for the São Paulo state; although Holthuis (1952a) mentioned a place of occurrence (São Sebastião Island), attributing this occurrence to the studies of Ihering (1897), Ortmann (1897), and Luederwaldt (1919), such records probably refer to *Leander paulensis*, which appears on the synonymic list of *L. tenuicornis* in Holthuis (1952a). Finally, *Philocheras gorei* (Dardeau, 1980) presented scattered records (Maranhão and Rio de Janeiro) and no additional material was observed in the checked collections. So, pending additional findings during sampling and/or museum collections, we exclude these species from the São Paulo decapod list.

### Lobsters-like

With no doubt, lobsters and some related groups are main targets of the Brazilian commercial fishery trade aiming the international exporting and different strategies for fishing management. Plan, laws, studies, and mitigation of overexploitation have been a window of debate (see Alencar *et al.* 2021 for recent revision) for exploitation of these groups. Beside the economic importance of the lobster-like species (Holthuis 1991; Sarver *et al.* 2000), the description of a new red lobster species, *Panulirus meripurpuratus* was a great taxonomic finding (Giraldes & Smith 2016), since all previous ecological and commercial fishery information available during many years was refereed under the name of the former taxon *Panulirus argus* (Holthuis 1991; Sarver *et al.* 2000; Tourinho *et al.* 2012), which does not occur in Brazil (Holthuis 1991; Gaeta *et al.* 2015). This discovery was somehow similar in importance to that of *Xiphopenaeus* spp., including the two new entities (Carvalho-Batista *et al.* 2019) discussed earlier herein. Other species such as *Parribacus antarcticus*, *Scyllarides brasiliensis*, *Scyllarides deceptor*, and *Scyllarus depressus* are sampled as bycatch of commercially important shrimps (Keunecke *et al.* 2007; Duarte *et al.* 2010; Cintra *et al.* 2017) or in spiny lobster fisheries (Duarte *et al.* 2010), they may be locally consumed, but are not yet exploited on a commercial scale (Holthuis 1991; Duarte *et al.* 2010). Our set of samples from São Paulo is exceedingly small and a study focused on this group would be extremely important, since we are aware of the presence of these lob-

sters in several rocky areas of the state and both species (*P. meripurpuratus* and *S. deceptor*) are subject of artisanal fishing already witnessed in our field trips. Among the Nephropidae, *Metanephrops rubellus* is the most important in commercial fishing (Williams 1986; Dall'Occo *et al.* 2007; Santana *et al.* 2016b), the other species *Nephropsis aculeata*, *N. agassizii*, and *N. rosea* are uncommon in Brazilian coast and are not fisheries target (Silva *et al.* 2007, 2013; Santana *et al.* 2016b).

The ghost-shrimps received a very special attention regarding taxonomic updating with the recent publications of Dworschak & Poore (2018), Poore *et al.* (2019), and Robles *et al.* (2020). Our study resulted in the identification of 14 species currently known to occur within the São Paulo coast, showing a well-grounded taxonomy for most of them. One exception is *Callichirus major*, that appears to be more than one species, but the definitions on specific status inside the complex remain pending of a clear solution. In addition, considering the burrowing habits, we felt a lack of data about species that live in deeper areas or that require specific sampling methods (traps) to obtain samples, as shown by Dworschak (2015), and that should be explored in the future.

### Final conclusions and take-home directions on checklists

Decapods, not only shrimps and lobsters, have been the target of fishery activities (including commercial and bycatch procedures) and have been captured by artisanal and commercial fisheries for a long time. However, in the last few decades, several indicators have shown a decline in the number of individuals caught because of a decrease of natural stocks. The main threats in these stocks come from industrial fishing, land-based activities, pollution, and global changes. Therefore, these indications have led to changes in International Union for Conservation of Nature (IUCN) classification and the laws that regulate fishing in order to achieve sustainable exploitation. Most of these aspects regarding the Brazilian species and fishing activities have been pointed out and defended by different authors (see IBAMA 2008, 2011b; Duarte *et al.* 2016; Pinheiro & Boos 2016; Santana *et al.* 2016a, b; Blasiak *et al.* 2020; Cardoso *et al.* 2021; Magris *et al.* 2021 for details).

Studying and knowing the diversity of species are essential conditions to be able to preserve the species and to promote sustainable development before it is at risk of extinction or even be extinct. According to McCauley *et al.* (2015), about 20 marine species are known to have gone extinct over the past 500 years, yet this is an underestimate given that little is known about how many species inhabit the marine environment (Blasiak *et al.* 2020).

With these series of decapod checklists of São Paulo concluded, including this fifth list here, we reached one of the main purposes of our long-term research: to review, based on robust taxonomic criteria the previous information and studies, establish regional records, and summarize the taxonomic information available on each species treated. This was not an easy task as it required strategic planning. Most of this success is due to the perseverance and commitment of a continuous group of researchers and substantial support by agencies carried out for long periods. As a conclusive result of this effort, our findings confirmed that São Paulo coast, with 364 recorded species, is undoubtedly a high biodiversity area housing ~64% of the Brazilian decapod fauna [estimated in 566 species according to last compilation by Fransozo & Negreiros-Fransozo (1999)], with a limited extension area that represents ~ 4.7% (*i.e.* 430 km of extension) when compared with the 9.200 km of the Brazilian littoral coast. By analogy, this area fits with the premises postulated by Magris *et al.* (2021) regarding the developing strategies to protect crucial areas from degradation and emerging efforts to known and maintain their biodiversity values, as in the case of some southwest Atlantic Ocean regions.

We do hope that our efforts facilitate and lead to new research as well as help to better known and preserve Brazilian fauna. In objective words, we also advocate in favor that: (a) other similar initiatives of investigation (*i.e.* a collaborative team of researchers from local or different institutions, working with intensity, constancy, and during long periods) to be replicated to specific/target areas (as the less sampled deep regions) or ecoregions (as high biodiversity potential areas), and (b) that material obtained during surveys be replicated and deposited in more than one recognized scientific collections that present solid structure of maintenance and allow the dynamic access to the deposited material, including online catalogue to facilitate the prior compilation. These minimal insights are needed to construct a robust decapod biodiversity survey that will serve as a baseline for all kinds of studies that use the taxon as a model of investigation, including genetic and populational variability and precise taxonomic investigations to support a more robust legislation that regulates fishing in regional areas. The challenge for the next decade is to extend the survey of the decapod fauna along the complete Brazilian coast.

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