

Tanaidacea from Brazil. III. New records and description of a new species collected from REVIZEE-NE Program

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Abstract

A new species of *Paratanais* Dana, 1852, *Paratanais coelhoi* sp. nov., is described and new records for *Paradoxapseudes intermedius* (Hansen, 1895), *Intermedichelia gracilis* Guțu, 1996, *Vestigiramus* sp., *Nototanooides* cf. *trifurcatus* Sieg and Heard, 1985, *Biarticulata* sp. and *Arhaphuroides* sp. are provided from northeastern Brazil based on collections from the REVIZEE-NE Program. This raises the number of tanaidacean species from the Brazilian coast from 45 to 49. *Paratanais coelhoi* sp. nov. shares morphological features such as habitus shape, maxilliped palp setation, and cheliped proportions with *P. oculatus* (Vanhöffen, 1914), *P. martinsi* Bamber and Costa, 2009, *P. tara* Bird, 2011 and *P. euelpis* Barnard, 1920. The new species can, however, be distinguished by a unique combination of characters including: pleonites 1–4 with lateral circumplumose setae while the 5th with simple seta only; antennule article 1 stout; cheliped propodus with one specialized outer ‘S’-shaped broad seta; pereopod 1 merus length with 1.7 times as long as wide; pereopod 2 merus without ventral spiniform seta; uropodal endopod biarticulate, exopod uniarticulate as well as other characters.

Key words: northeastern Brazil, Peracarida, Paratanaidae, *Paratanais*, Tanaidacean.

Introduction

While quite a number of taxonomic papers on the Tanaidacea of Brazil have been published (Krøyer, 1842; Mañé-Garzón, 1949; Lang, 1956; Silva-Brum, 1969, 1971, 1973, 1974, 1978; Băcescu, 1979, 1984, 1986; Masunari and Sieg, 1980; Sieg, 1983; Băcescu and Absalão, 1985; Guțu, 1996, 1998; Larsen, 1999; Santos and Pires-Vanin, 2006;

Santos, 2007; Santos and Hansknecht, 2007; Larsen *et al.*, 2009; Araújo-Silva and Larsen, 2012; Santos *et al.*, 2012), most of species are described from southeastern Brazilian waters or deep-sea habitats. Among 45 species recorded from Brazil, only eleven were published from northeastern coast (Guțu, 1998 ; Araújo-Silva and Larsen, 2012): *Intermedichelia jesseri* Araújo-Silva and Larsen, 2012, *Leptochelia dubia* (Krøyer, 1842), *L. forresti* (Stebbing,

1896), *Makraleptochelia potiguara* Araújo-Silva and Larsen, 2012, *Neotanais tricarinatus* Gardiner, 1975, *Parapagurapseudopsis carinatus* Silva-Brum, 1973, *Parapseudes inermis* (Silva-Brum, 1973), *Paratanais oculatus* (Vanhöffen, 1914), *Psammokalliapseudes granulosus* Silva-Brum, 1973, *Saltipedis (Saltipedis) paulensis* (Silva-Brum, 1971) and *Zeuxo (Parazeuxo) coralensis* Sieg, 1980a. It is unlikely that so little tanaidacean diversity is present in this area, since the northeastern coast represents at least one-third of the entire Brazilian coast. Moreover, tropical environments usually display higher biodiversity than at higher latitudes (Rapoport, 1982), suggesting that the lack of records, are more likely correlated to sampling effort.

At the end of the twentieth century (1995–2000) the REVIZEE Program (Programa de Avaliação do Potencial Sustentável dos Recursos Vivos da Zona Econômica e Exclusiva do Brasil), a survey of the fauna and flora of the exclusive economic zone of the coast of Brazil, was conducted. During this program, collections were made on northeastern coast (NE Score) along the continental shelf and oceanic banks of the Archipelago of Fernando de Noronha and North Chain Banks of Brazil. These collections revealed a number of members of several of tanaidacean families, including the Apeudidae Leach, 1814; Leptocheliidae Lang, 1973; Leptognathiidae Sieg, 1976; Metapseudidae Lang, 1970; Nototanaididae Sieg, 1976; Paratanaididae Lang, 1949 and Tanaellidae Larsen and Wilson, 2002.

The family Paratanaididae currently contains five genera and occurs in both deep (*Bathytanais* Beddard, 1886 and *Pseudobathytanais* Kudinova-Pasternak, 1990) and shallow waters (*Bathytanais*; *Paratanais* Dana, 1852; *Triparatanais* Bamber and Chatterjee, 2010; *Xeplenois* Bamber, 2005), but the majority of species are from shallow water. Bird and Larsen (2009) regarded Paratanaididae as one of the few monophyletic families that has remained stable since its establishment and probably the only one that is not controversial. The genus *Teleotanais* Lang, 1956 was assigned

by Bamber (2008) to a new subfamily principally on the basis of 1–4 circumplumose epimeral pleonal setae; however, this genus is unlike any paratanaid and appears more leptocheliid-like, and it was raised to family-level by Bird and Larsen (2009).

The main diagnostic characters of the family Paratanaididae are the presence of maxilliped endites laterally expanded and wider than basis; pereopod 4–6 carpus with clinging apparatus present as strong spiniform setae and scales (complex or not) but without microtrichial field; pleonites 1–5 (or 1–4) with lateral circumplumose setae (Bird and Larsen, 2009: 155), as well as other characters. Even though these characters seem to be consistent, Sieg (1986: 57) stated that the systematic of the genus *Paratanais* is quite confusing, and that a revision was required. Such a revision is currently under way (G.J. Bird, pers. comm.).

The genus *Paratanais* is represented on the Brazilian coast by *P. oculatus* and was first recorded by Silva-Brum (1973: 4–5) from Bahia (northeastern Brazil) but this identification is uncertain (see remarks of *P. coelhoi* sp. nov.). In this study, a new species of *Paratanais* is described and new records are provided for *Nototanooides* cf. *trifurcatus* Sieg and Heard, 1985, *Biarticulata* sp., *Arhaphuroides* sp., *Paradoxapseudes intermedius* (Hansen, 1895), *Intermedichelia gracilis* Guțu, 1996 and *Vestigiramus* sp., thus increasing the number of tanaidacean species known from the Brazilian coast from 45 to 49. This is the third study on the systematics of the Tanaidacea from Brazil and the first of a series of papers based on the REVIZEE-NE Program collection from the northeastern part of Brazil.

Material and Methods

Specimens were collected from the continental shelf between the mouth of Parnaíba River (Piauí state) and Salvador (Bahia state) during the expeditions Northeast Score I, II, III and IV (NE I, II, III and IV) (1995–2000); these collections were funded by

the Brazilian Government and conducted from the RV 'Antares' (Directorate of Hydrography and Navigation). The material was collected using a dredge with a mesh size of 0.5 mm and capacity of about 70 l of sediment.

Body length was measured from the anterior margin of the rostrum to the tip of the telson in lateral view to avoid bias from a flexed body posture. Body width was measured on the widest part of the carapace in dorsal view. Terminology follows Larsen (2003). Adjectives such as *short* and *long* are quantified relative to the appendages on they are located. Dissections were made with chemically-sharpened tungsten wire needles and then placed on slides with glycerine, covered by a cover slip and sealed with nail polish. Whole-animal illustrations were made from holotype while appendages were dissected and drawn from paratypes via a *camera lucida* attached to a Leica compound microscope. Type material are kept at the Carcinological Collection of the 'Museu de Oceanografia Petrônio Alves Coelho', Universidade Federal de Pernambuco, Recife, Brazil (MOUFPE).

Results and Discussion

Systematics

Order Tanaidacea Dana, 1849
 Suborder Tanaidomorpha Sieg, 1980b
 Family Paratanaidae Lang, 1949
 Genus *Paratanais* Dana, 1852
Paratanais coelhoi sp. nov.
 (Figs. 1–2)

Type material: Holotype: one adult female without oostegites, 1.9 mm [MOUFPE 14.385]. Collected from sand sediment on 20th November 2000, station NE IV #131; 02°13'48"S 39°53'24"W. Depth 40 m. Paratypes: one adult female with oostegites (dissected) [MOUFPE 14.386]. Eight adult females without oostegites [MOUFPE 14.387], same locality. *Type locality*: Ceará state, continental shelf, Brazil.

Diagnosis: *Pleonites* 1–4 with lateral circumplumose setae while 5th with simple seta. *Antennule* article 1 stout, about 1.3 times as long as wide; article 2 at least twice as wide as long. *Antenna* article 2 about 1.2 times as long as wide. *Maxilliped* palp article 2 with three inner distal simple setae which distal one is stouter, no spiniform serrated seta present. *Cheliped* propodus with one outer 'S'-shaped broad seta and one inner bipinnate seta; fixed finger with five denticles. *Pereopod 1* merus 1.7 times as long as wide; *pereopod 2* merus without ventral spiniform seta; *pereopods 4–6* with three to four distal carpal spiniform setae. *Uropod* endopod biarticulate, exopod uniaarticulate, about 1.2 times as long as first article of endopod.

Etymology: This species is named in honour of the recently deceased Professor Petrônio Alves Coelho, in recognition of his many contributions to crustacean research in Brazil.

Description: Based on holotype (length, 1.9 mm) and paratype. Paratype, adult female with oostegites (body measurements extracted from the holotype and dissected appendages of the paratype).

Body (Fig. 1A): dorsoventrally flattened, about 6.9 times as long as wide.

Cephalothorax: about 1.2 times as long as wide, naked. Rostrum blunt and rounded at tip.

Pereon: straight and naked, about 4.3 times as long as wide and about 62% of total body length. Pereonites 1–6 respectively, 0.5, 0.8, 0.8, 0.8, 0.8 and 0.7 as long as wide. *Pleon* as wide as pereonites 5–6, about 21% of total body length. Pleonites 1–5 subequal, with circumplumose setae on lateral margins of pleonites 1–4 while simple on 5th pleonite. Pleotelson (Fig. 1B) as long as two first pleonites combined, with two pairs of simple setae on posterior margin.

Antennule (Fig. 1I): article 1 stout, about 1.3 as long as wide, outer distal margin with four setulated and two simple setae, one simple seta on inner distal margin. Article 2 about 0.4 times as long as wide, with two setulated setae on inner distal margin. Article 3 naked, about 0.6 times as long as wide. Article 4 slender, about 0.9 times as long as article 1 and 3.1 times as long as wide, with one outer distal simple seta. Article 5 minute, with one simple seta and two aesthetascs on distal margin.

Antenna (Fig. 1J): article 1 short, with one simple seta on inner distal margin. Article 2 about 1.2 times as long as wide, with one tiny spiniform seta on outer distal margin and one simple seta on inner distal margin. Article 3 about 0.6 times as long as article 2, with one long spiniform seta on outer distal margin. Article 4 longest, about 2.5 times as long as wide, with one pair of setulated setae on each distal margin. Article 5 with two simple setae on outer distal margin. Article 6 minute (hardly visible), with three long simple setae on distal margin.

Mouthparts (Figs. 1C–H): *labrum* (Fig. 1H) typical of genus, rounded with several fine simple setae distally. *Mandibles* (Figs. 1C, D) left mandible molar process with notch in the middle and two ‘tooth-like’ projections in middle; right mandible with molar process broad and denticles on distal margin. Left mandible (Fig. 1C) incisor as long as *lacinia mobilis* with six distal denticles, *lacinia mobilis* flattened with eight distal denticles. Right mandible (Fig. 1D) incisor broad, with seven denticles on distal margin. *Labium* (Fig. 1E) with fine simple setae on anterior and lateral margins. *Maxillule* (Fig. 1G) slender, palp uniaarticulate (not illustrated). Endite with fine setae on outer and ventral margins, with seven spiniform setae on distal margin. *Maxilliped* (Fig. 1F) endite broad, with short spines (hardly visible) and one fine simple seta on outer distal margin, inner distal margin with two flattened setae and one long simple seta. Basis with one distal simple seta. Palp article 1 naked, about 1.2 times as long as wide; article

2 slightly longer than article 1, with one simple seta on outer distal margin and three inner distal simple setae which distal one stouter (spiniform serrated seta absent); article 3 with three bipinnate setae on inner distal margin; article 4 short, inner distal margin with five bipinnate setae and four fine setae, one outer distal simple seta. *Epignath* not recovered.

Cheliped (Fig. 1K): attached via triangular sclerite (not illustrated). Basis short, with one dorsodistal simple seta, about 1.2 times as long as wide. Merus triangular, with one ventromedial simple seta. Carpus about 1.8 times as long as wide, dorsal margin with one proximal and one distal simple seta, one pair of ventromedial simple setae. Propodus with one ‘S’-shaped broad outer distal seta, inner margin with one bipinnate seta and a row of fine setae. Dactylus with one dorsal simple seta, unguis slightly curved internally. Fixed finger with two ventral simple setae, inner margin with five denticles and three simple setae. Unguis well developed.

Pereopod 1 (Fig. 2A): coxa with one simple seta. Basis slender, about 3.4 times as long as wide, with one dorsoproximal simple seta. Ischium with one ventral simple seta. Merus about 1.7 times as long as wide, as long as carpus, with one ventrodistal simple seta. Carpus with two dorsodistal simple setae and one ventrodistal simple seta. Propodus about 3.1 times as long as wide, with two dorsodistal simple setae and one ventrodistal simple seta. Dactylus and unguis combined as long as propodus. Unguis about twice as long as dactylus.

Pereopod 2 (Fig. 2B): coxa as pereopod 1. Basis about 2.7 times as long as wide, with one dorsoproximal simple seta. Ischium as pereopod 1. Merus short, about 1.2 times as long as wide, with two ventrodistal simple setae (spiniform seta absent). Carpus as long as merus, each distal margin with one spiniform and one simple seta. Propodus about 2.5 times as long as wide, with one simple seta on dorso and ventrodistal margins. Dactylus and unguis as pereopod 1.

Pereopod 3 (Fig. 2C): as pereopod 2 except merus ventrodiscal margin with one spiniform and one simple seta. Carpus without simple setae, with scale and one pair of ventrodiscal spiniform setae.

Pereopod 4 (Fig. 2D): no visible coxa. Basis naked, robust, about 1.8 times as long as wide. Ischium with two ventral simple setae. Merus ventrodiscal margin with a row of fine setae and two spiniform setae. Carpus as long as merus, with one dorsodistal simple seta and two spiniform setae on each distal margin, at least two of which have medial ring of spinules. Propodus about 2.6 times as long as wide and 1.8 times as long as dactylus and unguis combined, with one dorsomedial setulated seta and one dorsodistal spiniform seta as long as dactylus and unguis combined, one shorter ventrodiscal spiniform seta. Dactylus and unguis combined shorter than previous pereopods. Unguis short and incompletely fused with dactylus.

Pereopod 5 (Fig. 2E): as pereopod 4 except carpus with one ventrodiscal spiniform seta with medial ring of spinules. Propodus dorsal margin with one medial setulated and one distal spiniform seta, ventrodiscal margin with two pinnate spiniform setae and one tiny spiniform seta.

Pereopod 6 (Fig. 2F): as pereopod 5 except propodus without dorsomedial setulated seta, with three dorsodistal pinnate spiniform setae, one ventrodiscal spiniform seta and one simple seta next to insertion of dactylus.

Pleopods (Fig. 1L): basal article naked. Endopod as long as exopod, with 11 outer plumose setae, one inner plumose seta and fine setae on outer margin. Exopod with 14 outer plumose setae.

Uropod (Fig. 1B): basal article naked. Endopod biarticulate; article 1 with one simple seta; article 2 with six distal simple setae. Exopod unarticulate, about 1.2 times as long as article 1 of endopod, with two distal simple setae.

Remarks: Silva-Brum (1973: 4) observed differences on the molar process and endite of maxilliped between *P. oculatus* (*sensu* Silva-Brum, 1973) and *P. oculatus* (*sensu* Vanhöffen, 1914). However, the author considered these features insufficient to erect a new species or synonymize *P. euelpis* Barnard, 1920 as suggested by Lang (1950: 360). It is somehow a bit confusing why the author considered the specimens from Brazil as *P. oculatus sensu stricto* (Vanhöffen, 1914) and not *P. euelpis* if we take into account their geographic distribution.

To separate *P. oculatus* (*sensu* Vanhöffen, 1914) and *P. euelpis*, Sieg (1986: 57) remarked that both species are distinct by the length merus of pereopod 1 and the shape of the distolateral margin of the maxillipedal endite; the author also considered *P. oculatus* (*sensu* Silva-Brum, 1973) a misidentification, based on the distribution of *P. oculatus*, since the species was only recorded from the Subantarctic (Kerguelen and Falkland Islands) and Indian Ocean while *P. euelpis* from Cape Town (South Africa) and Morocco (Monod, 1925: 65). Currently, Bird (2011) regards the records of *P. oculatus* in New Zealand waters by Sieg (unpubl. data) as unconfirmed.

Considering their distribution it seems unlikely that they are the same species, however, until a close examination of the material we will here consider the species remarked by Silva-Brum (1973) as *P. oculatus*.

Recently Bird (2011) regarded that most of the species assigned to the genus *Paratanais* do not conform to the pattern set by the type species *P. elongatus* (Dana, 1849) with respect to pereonite proportions, pleonal plumose setation (1–4), cheliped shape and pereopod setation. Our observations confirm this differences (see Tab. 1).

With concern to the lateral circumplumose epimeral setae on pleonites 1–4 while simple seta on 5th and the maxillipedal palp setation, *P. coelhoi* sp. nov. is similar to *P. gaspodei* Bamber, 2005, *P. wanga* Bamber, 2008, *P. martinsi* Bamber and Costa, 2009 and *P. vicentetis* Larsen, 2012. However it can be distinguished by these and other closely related species as *P. euelpis*, *P. oculatus*

Table 1. List of mainly diagnostic characters of all described *Paratanais* Dana, 1852 species, modified from Bird (2011). Abbreviations: prop.=proportion; chel.=cheliped; pereop.=pereopod; maxillip.=maxilliped; pereon.=pereonite; A1=antennule; art.=article; exp.=expod; end.=endopod; circumpl.=circumplumose.

| Taxa | Type locality | Size of adult female | Pereonites 1–6 prop. | Prop. pereon. 5–6 to pleon | Pleon setation | Prop. of A1 1st art. | Prop. of A2 art. 2 | Maxillip. palp setation | Maxillip. endite setation | Chel. prop. of basis and carpus | Cheliped propod setation | Prop. of P1 merus | Carpal spines of percop. | Uropod endopod | Uropod expod | Uropod end. |
|---|-------------------------------------|----------------------|--|----------------------------|-------------------------------------|----------------------|---------------------------------|--|---------------------------|---------------------------------|-------------------------------------|-------------------|--------------------------|------------------|---------------|-------------|
| <i>Paratanais clarkae</i> Bird and Bamber, 2000 | Indo-Pacific (South China Sea) | 3.8 mm | 5.2x (0.69; 0.9; 0.9; 0.9; 0.9; 0.7) | As wide as | 1–5 (all circumpl.) | 1.7x | 1.6x | Simple and bipinnate | 1 short simple seta | basis: 1.8x; carpus: 1.3x | 2 comb setae | 2.8x | 2–3 | Biarticulate | Uniarticulate | 0.9x |
| <i>P. coelhoi</i> sp. nov. | Ceará, Brazil | 1.9 mm | 4.3x (0.5; 0.82; 0.86; 0.83; 0.83; 0.74) | As wide as | 1–4 (1 simple seta on 5th pleonite) | 1.3x | 1.2x | Simple and bipinnate | 1 long simple seta | 1.2x; 1.8x | 1 stout simple seta and 1 bipinnate | 1.7x | 3–4 | Biarticulate | Uniarticulate | 1.2x |
| <i>P. dentatus</i> Gutu and Ramos, 1995 | E. Pacific (Colombia) | 4.2 mm | 2.7x (0.35; 0.34; 0.45; 0.51; 0.51; 0.6) | 0.9 times as wide as pleon | 1–4 (simple setae) | 1.7x | 1.7x | Bipinnate and stout serrated spiniform | 1 long simple seta | 1.1x; 1.3x | Naked | 2.5x | 4 | Biarticulate | Uniarticulate | 1.3x |
| <i>P. elongatus</i> (Dana, 1849 sensu Bamber, 1998) | Indo-Pacific Sulu Archipelago) | 2.3 mm | 5.4x (0.4; 1.1; 1.1; 1.0; 1.0; 0.8) | As wide as | 1–4 (circumpl. (Bird, 2011)) | 2x | 2x | Simple and bipinnate | 1 long simple seta | 1.9x; 1.6x | 2 bipinnate setae and 1 simple seta | 2.1x | 3–4 | Biarticulate | Uniarticulate | 0.6x ? |
| <i>P. eulipis</i> Barnard, 1920 sensu Lang, 1973 | Cape Town (South Africa) | 4–6 mm | 2nd slightly shorter than 3rd; 3rd and 4th subseq.; 5th and 6th subseq. (*Barnard, 1920) | As wide as | unknown | 2.3x | 1.6x | Apparent. 3 simple setae | 1 long simple seta | 1.2; 1.4x | 2 bi-bipinnate setae? | 3x | 4 | Biarticulate | Uniarticulate | 0.8x |
| <i>P. gaspodes</i> Bamber, 2005 | Western Australia | 2.8 mm | 4x (0.5; 0.6; 0.72; 0.8; 0.85; 0.8) | 0.9 times as wide as pleon | 1–4 (1 simple seta on 5th pleonite) | 1.7x | 1.2x (with lateral projections) | Simple and pinnate | 1 short simple seta | 1.3x; 1.3x | 1 short simple seta | 2.8x | 2 | Biarticulate | Uniarticulate | 0.8x |
| <i>P. hesleri</i> Kudinov-Pasternak, 1985 | N. Atlantic (Great Meteor Seamount) | 3.6 mm (♀) | 4.4x (0.55; 0.74; 0.85; 0.88; 0.87; 0.7) | As wide as | 1–5 (simple setae) | 2.1x | 1.5x | Simple and bipinnate | 1 short simple seta | 1.2x; 1.85x | Naked | 3x | 4 | Biarticulate | Biarticulate | 0.9x |
| <i>P. impressus</i> Kussakin and Tzareva, 1972 | N. Pacific (Kurile Islands) | 5.5 mm | 2.7x (0.3; 0.4; 0.36; 0.4; 0.5; 0.38; 0.34) | As wide as | Naked | 2x | 1.5x | Simple and bipinnate | 1 short simple seta | 1.3x; 1.4x | 1 simple seta | Unknown | 3 | Biarticulate | Uniarticulate | As long as |
| <i>P. intermedium</i> Dojiri and Sieg, 1997 | E. Pacific (California) | 2.1 mm | 3.4x (0.43; 0.56; 0.77; 0.88; 0.76; 0.42) | As wide as | Naked | 2.1x | 1.5x | Simple, bipinnate and serrated | 1 short simple seta | 1.3x; 1.4x | Naked | 1.8x | 2–3 | Biarticulate | Uniarticulate | As long as |
| <i>P. macleficus</i> Larsen, 2001 | Boonay Bay, Australia | 3.7 mm | 4.1x (0.5; 0.68; 0.7; 0.83; 0.9; 0.75) | As wide as | 1–5 (all circumpl.) | 2x | 1.1x | Serrated and bipinnate | 1 short simple seta | 1.4x; 1.7x | Naked | 2.3x | 3 | Biarticulate | Biarticulate | As long as |
| <i>P. nalgicus</i> Larsen, 2001 | Boonay Bay, Australia | 3.1 mm | 3x (0.3; 0.48; 0.57; 0.6; 0.65; 0.55) | As wide as | 1–5 (all circumpl.) | 1.8x | 2x | Serrated and bipinnate | Naked | 1.7x; 1.8x | 1 short serrate seta | 3x | 2 | Biarticulate | Uniarticulate | As long as |
| <i>P. maritimi</i> Bamber and Costa, 2009 | N. Atlantic, Azores, Portugal | 4.2 mm | 5.1x (0.62; 0.85; 1.0; 1.16; 1.08; 0.81) | As wide as | 1–4 (1 simple seta on 5th pleonite) | 2.2x | 1.2x (with lateral projections) | Simple and bipinnate | 1 short simple seta | 1.4x; 1.7x | 3 short simple? setae | 4.1x | 3–4 | Biarticulate | Uniarticulate | 0.7x |
| <i>P. monodi</i> Makhanova, 1971 | Red Sea | Unknown | Unknown | Unknown | Unknown | 2.1x | 0.8x | Unknown | Unknown | Unknown | Unknown | Unknown | Unknown | Biarticulate | Uniarticulate | 0.9x |
| <i>P. oculatus</i> (Vanhöffen, 1914 sensu Silva-Brum, 1973) | Kerguelen Islands | 6.4 mm | 3.4x (0.54; 0.64; 0.61; 0.7; 0.68; 0.54) | Slightly wider than pereon | 1–5 (simple setae) | 2.5x | 2.2x | Simple and bipinnate | Naked? | 1.2x; 1.8x | 2 simple setae | 3.4x | 2–3 | Biarticulate | Biarticulate | As long as |
| <i>P. parvosa</i> Bird, 2001 | Ilha Redonda, Bahia, Brazil | 3.7 mm | 3.8x (0.41; 0.54; 0.65; 0.73; 0.76; 0.59) | As wide as | Naked | 1.5x | 0.9x | Unknown | Unknown | 1.3x; 1.4x | Naked | 2x | Unknown | Uniarticulate | Uniarticulate | 0.6x |
| <i>P. parrisi</i> Bird, 2001 | Armer's Bay, New Zealand | 2.6–3.34 mm | 3.8x (0.41; 0.55; 0.57; 0.59; 0.77; 0.57) | 0.9 times as wide as pleon | 1–4 (circumpl.) | 2x | 1x (with lateral projections) | Simple and bipinnate | 1 short simple seta | 1.2x; 1.7x | 1 simple seta | 2.4x | 4 | Biarticulate | Biarticulate | As long as |
| <i>P. pterurbatus</i> Larsen, 2001 | Boonay Bay, Australia | 2.6 mm | 4.4x (0.5; 0.72; 0.81; 0.9; 0.81; 0.71) | As wide as | Naked | 1.1x | 1.4x | Serrated and bipinnate | 1 short simple seta | 1.4x; 1.6x | naked | 2.5x | 3 | Biarticulate | Uniarticulate | 0.8x |
| <i>P. spinanotoides</i> Sieg, 1981 | Seamount Verna, S. Africa | 3 mm | 2.6x (0.3; 0.37; 0.45; 0.45; 0.48; 0.38) | As wide as | Naked | 2x | 1.5x | Simple, bipinnate and spiniform serrated | 1 short simple seta | 1.7x; 1.6x | 2 simple seta | 3.9x | 3 to 4 | Biarticulate | Uniarticulate | 0.8x |
| <i>P. tara</i> Bird, 2011 | New Zealand | 1.4–3.6 mm | 4.2x (0.43; 0.78; 0.77; 0.79; 0.82; 0.68) | As wide as | 1–4 (circumpl.) | 1.9x | 1x (with lateral projections) | Simple and bipinnate | 1 short simple seta | 1.4x; 1.7x | 2 simple setae and 3 bipinnate | 1.9x | 4 | Biarticulate | Uniarticulate | 1.2x |
| <i>P. vetinari</i> Bamber, 2005 | Western Australia | 4.8 mm | 2.9x (0.34; 0.5; 0.55; 0.6; 0.58; 0.5) | As wide as | 1–5 (all circumpl.) | 1.6x | 1.3x | Simple and pinnate | 1 short simple seta | 1.3x; 1.7x | Naked | 2.7x | 3 | Biarticulate | Biarticulate | 1.3x |
| <i>P. vicentites</i> Larsen, 2012 | Cape Verde archipelago | 3.5 mm | 3x (0.5; 0.6; 0.5; 0.57; 0.6; 0.36) | As wide as | 1–4 (1 simple seta on 5th pleonite) | 1.4x | 1x (with lateral projections) | Bipinnate and serrated spiniform | 1 short simple seta | 1.3x; 1.7x | 1 stout simple seta | 1.9x | 3–4 | 2 pseudoarticles | Uniarticulate | As long as |
| <i>P. wangia</i> Bamber, 2008 | Moreton Bay, Australia | 3.4 mm | 3.2x (0.37; 0.52; 0.5; 0.61; 0.59; 0.57) | As wide as | 1–4 (1 simple seta on 5th pleonite) | 1.6x | 1.6x | Simple and pinnate | 1 short simple seta | 1.4x; 1.7x | 3 short simple? setae | 2.6x | 2 | Uniarticulate | Uniarticulate | 0.5x |



Figure 1. *Paratanaïs coelboi* sp. nov., adult female, holotype and paratype [MOUFPE 14.385 and 14.386, respectively]. Holotype: (A) Dorsal view. Paratype: (B) pleotelson and uropod; (C) left mandible; (D) right mandible; (E) labium; (F) maxilliped; (G) maxillule; (H) labrum; (I) antennule; (J) antenna; (K) cheliped; (L) pleopod. Scale bars: (A) = 0.5 mm; (B–J, L) = 0.1 mm; (K) = 0.2 mm.

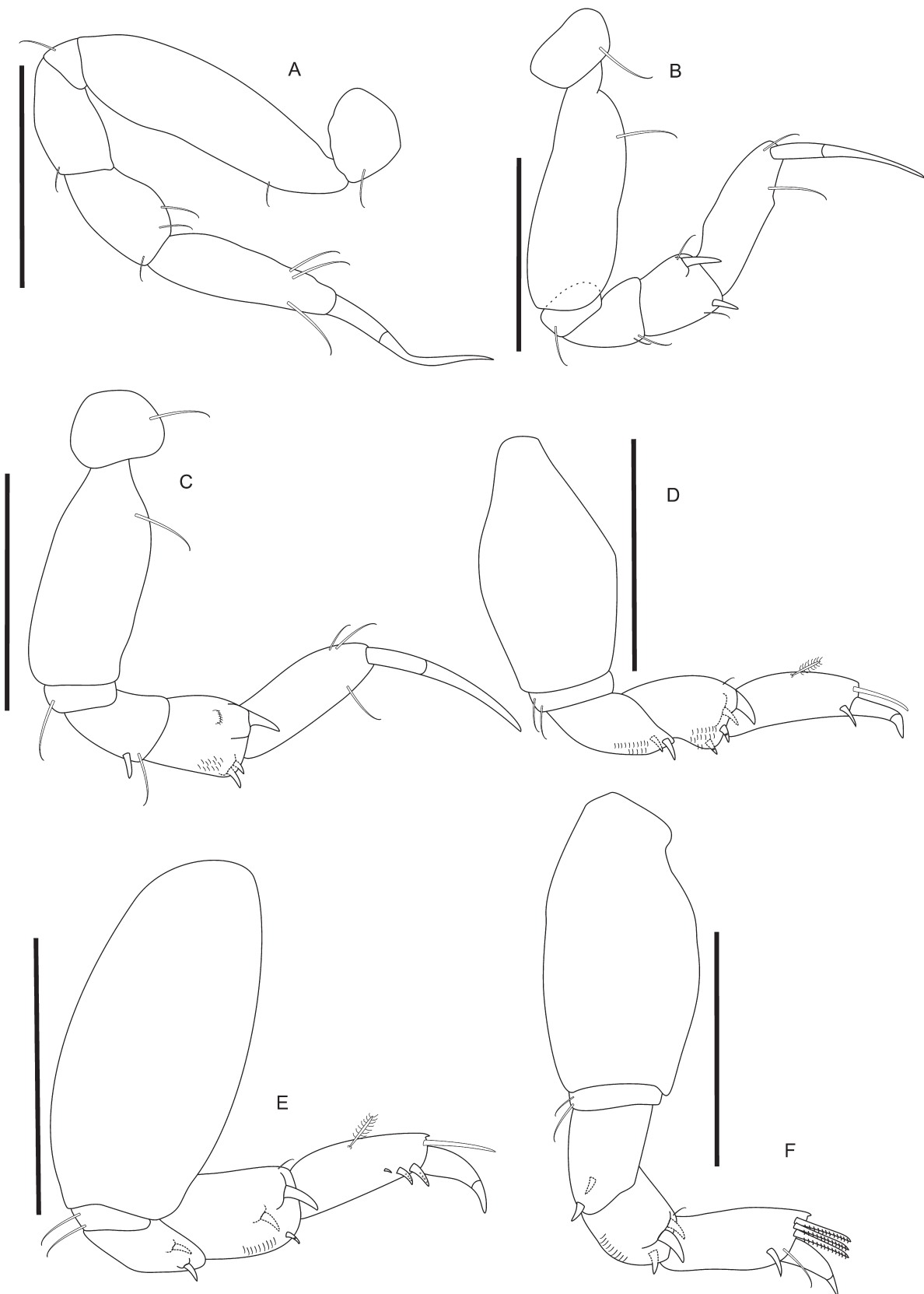


Figure 2. *Paratanais coelboi* sp. nov., adult female, paratype [MOUFPE 14.386]. (A) Pereopod 1; (B) pereopod 2; (C) pereopod 3; (D) pereopod 4; (E) pereopod 5; (F) pereopod 6. Scale bars: (A–F) = 0.1 mm.

(Vanhöffen, 1914 *sensu* Silva-Brum, 1973), *P. oculus* (*sensu* Shiino, 1978) and *P. tara* Bird, 2011 by the unique following combination of characters: 1) the pleonites 1–4 with lateral circumplumose setae while one simple on 5th [pleonites 1–4 circumplumose in *P. tara*, simple (appears simple in Shiino, 1978: 68, Fig. 38b) and naked in *P. oculus* (*sensu* Silva-Brum, 1973)]; 2) the antennule article 1 stout, about 1.3 times as long as wide [while 2.3, 2.5, 1.5 and 1.9 times in *P. euelpis*, *P. oculus* (*sensu* Shiino, 1978), *P. oculus* (*sensu* Silva-Brum, 1973) and *P. tara*, respectively]; 3) the maxilliped palp article 2 with three inner distal simple setae which distal one is stouter but without serrated spiniform seta; 4) the cheliped propodus with one outer ‘S’-shaped broad seta and one inner bipinnate seta; 5) the cheliped fixed finger with five denticles (in most *Paratanais* species the incisive margin is coarser with massive distal denticle/tooth); 6) the pereopod 1 merus 1.7 times as long as wide (at least two times as long as wide in related species); 7) the pereopod 2 merus without ventral spiniform seta (unusual in most *Paratanais* species which usually have one spiniform seta); 8) the uropod endopod biarticulate, exopod uniaarticulate, about 1.2 times as long as first article of endopod (for an extensive comparison with other species, see Tab. 1).

Paratanais spinanotandus Sieg, 1981 is recorded for South Africa (Seamount Vema), but is easily distinguished from *P. coelhoi* by the serrate spiniform seta [referred as ‘spine’ by Sieg (1981)] on the article 2 of the maxillipedal palp, by the proportion of the P1 merus (3.9 times as long as wide), and by the uropodal exopod length relative to that of endopod article 1.

It is possible that *P. oculus* (*sensu* Silva-Brum, 1973) is conspecific with *P. coelhoi*, but the specimens are kept on ‘Museu Nacional do Rio de Janeiro’ (MNRJ) and could not be obtained for this study.

There are a few anomalies regarding *P. impressus* Kussakin and Tzareva, 1972. The authors figured the pereon with seven

pereonites which is clearly a fusion of the cephalon with first pereonite.

New Records

Family Apseudidae Leach, 1814

Genus *Paradoxapseudes* Guçu, 1991

Paradoxapseudes intermedius (Hansen, 1895)

Apseudes intermedius Hansen, 1895: 49, 50; Băcescu, 1961: 152–156; Silva-Brum,

1969: 601, 602; Gardiner, 1975: 205.

Muramura intermedia: Guçu, 2006: 84.

Gollumudes intermedius: Guçu, 2007: 55, 56.

Paradoxapseudes intermedius: Guçu, 2008: 23, 24, 28, 29; Anderson, 2012: 3.

Muramura intermedia: Larsen *et al.*, 2009: 2.

Type locality: Cape Verde Islands.

Material examined: One adult female, ovigerous (damaged) [MOUFPE 14.291]. Collected on 11 December 2000, station NE IV #109A; 1°45’S 37°6’W, off Ceará state, North Chain Banks, Brazil. One adult female without oostegites (damaged) [MOUFPE 14.292]. Collected on 4th December 2000, station NE IV #181; 11°54’S 37°24’W, Bahia state, continental shelf.

Geographic distribution: Northwestern Atlantic: Mediterranean Sea (Larwood, 1940), Morocco (Monod, 1925) and Cape Verde Islands (Hansen, 1895). Southwestern Atlantic: continental shelf of Ceará and Bahia states (present study), Rio de Janeiro (Silva-Brum, 1969), Brazil.

Remarks: The specimens were dredged between 40.5 and 51 m depth, and were sorted from algae and sponges. The individuals correspond to the original description, except for the cephalothorax width being slightly wider than first pereonite and antennule with 16 articles in the outer flagellum (seven in *Paradoxapseudes intermedius sensu* Guçu, 2008). This is the first record of *P. intermedius*

from northeastern Brazil.

Family Leptocheliidae Lang, 1973
Genus *Intermedichelia* Guțu, 1996
Intermedichelia gracilis Guțu, 1996

Intermedichelia gracilis Guțu, 1996:
111–120; Larsen and Wilson, 2002: 208,
211, 214; Larsen *et al.*, 2009: 2; Anderson,
2012: 19.

Type locality: Cabo Frio, Rio de Janeiro,
Brazil.

Material examined: One adult female
(ovigerous) [MOUFPE 14.321]. Collected
on 14 November 2000, station NE IV
#130;03°20'24"S 38°10'48"W, Ceará State,
continental shelf. One adult female without
oostegites [MOUFPE 14.322]. Collected on
3rd December 2000, station NE IV #178;
11°16'12"S 37°01'12"W, Sergipe state,
continental shelf.

Geographic distribution: Southwestern
Atlantic: continental shelf of Ceará and
Sergipe states (present study), Cabo Frio, Rio
de Janeiro, Brazil (Guțu, 1996).

Remarks: The specimens examined in this
study were dredged between 70.8 to 71.6 m
depth, from sandy sediments, and were sorted
from algae and sponges. *Intermedichelia gracilis*
is endemic to Brazilian waters and this is the
first record of the species from northeastern
Brazil.

Family Leptognathiidae Sieg, 1976
Genus *Biarticulata* Larsen and Shimomura,
2007
Biarticulata sp.
(Figs. 3A, B)

Material examined: One adult female
without oostegites, 2.2 mm [MOUFPE
14.377]. Collected on 12 November
2000, station NE IV #113A;01°37'12"S
38°07'12"W, off Ceará state, North Chain

Banks, Brazil. One adult female (damaged)
[MOUFPE 14.378] same locality.

Geographic distribution: Southwestern
Atlantic: off Ceará state, North Chain Banks,
Brazil.

Remarks: The specimens were found on
gravel bottom, at 47.7 m depth, temperature of
26°C and salinity of 36. The genus *Biarticulata*
Larsen and Shimomura, 2007 is characterized
by the biarticulation on the uropod exopod;
however, the authors emphasized that this
character is probably homoplastic and
considered the genus clearly paraphyletic, thus
Biarticulata was erected to separate species
with this character (Larsen and Shimomura
2007: 19) from other leptognathids.

Biarticulata sp. has the uropod exopod
biarticulate, however differs from *Biarticulata*
elegans Kudinova-Pasternak, 1965, *B. greveae*
Kudinova-Pasternak, 1976, *B. parabranchiata*
Kudinova-Pasternak, 1977, *B. mironovi*
Kudinova-Pasternak, 1981, mainly with
respect on the uropod exopod length with 0.4
times as long as first endopod (*versus* 0.56, 0.6,
0.3, 0.7 times as long as first endopod in *B.*
elegans, *B. greveae*, *B. parabranchiata* and *B.*
mironovi, respectively); the uropod endopod
uniarticulate in *Biarticulata* sp. (Fig. 3B)
(*versus* biarticulate in all *Biarticulata* species
related). This is the first record of the family
Leptognathiidae in Brazilian waters.

Family Metapseudidae Lang, 1970
Genus *Vestigiramus* Guțu, 2009
Vestigiramus sp.
(Figs. 4A–C)

Material examined: One adult male,
2.1 mm [MOUFPE 14.307]. Collected on
3rd December 2000, station NE IV #178;
11°16'12"S 37°01'12"W, Sergipe state,
continental shelf.

Geographic distribution: Southwestern
Atlantic: Sergipe state, continental shelf, Brazil.

Remarks: The specimen was collected

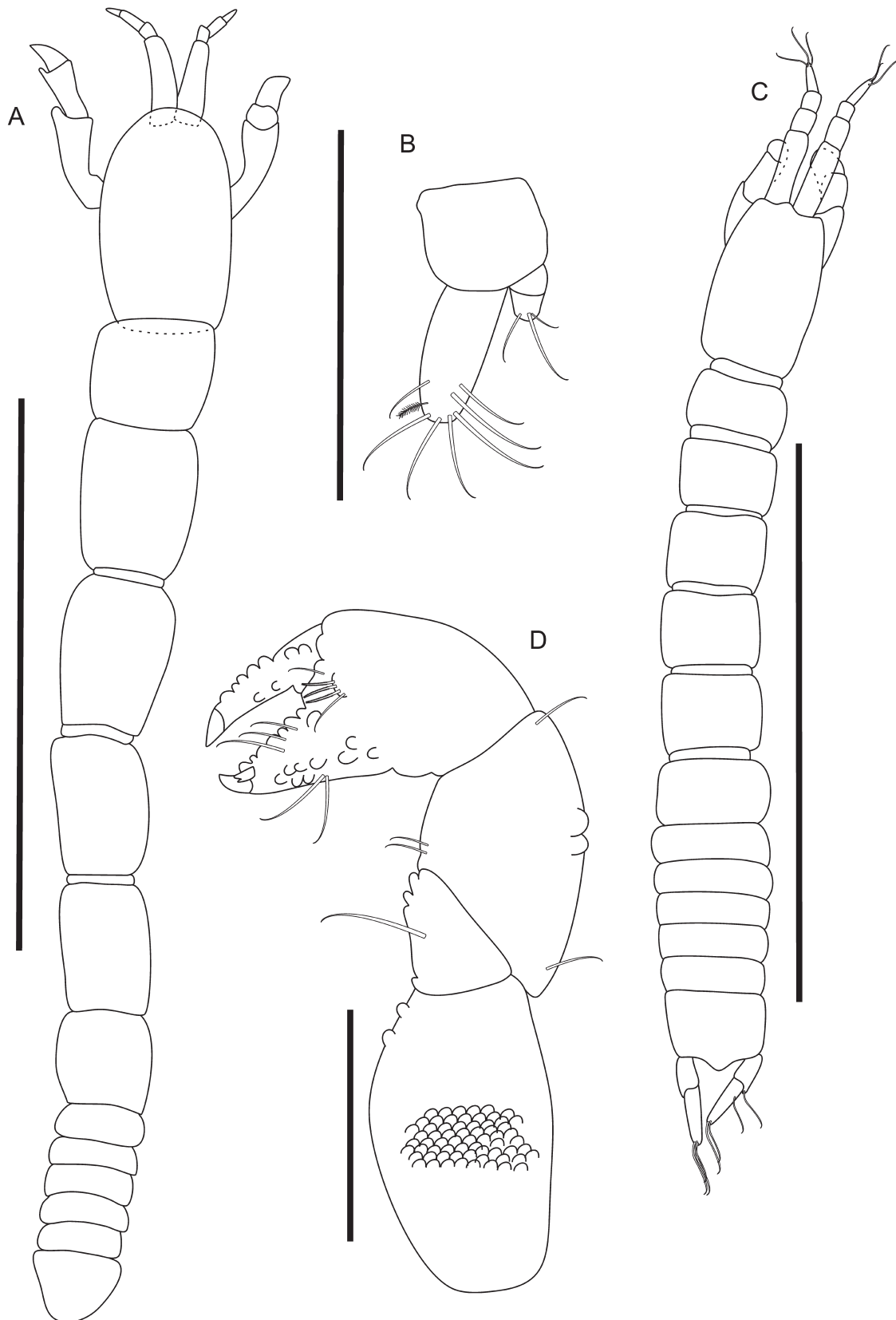


Figure 3. *Biarticulata* sp., adult female with no oostegites [MOUFPE 14.377]. (A) dorsal view; (B) uropod. *Arhaphuroides* sp. adult female with no oostegites [MOUFPE 14.390]. (C) dorsal view; (D) cheliped. Scale bars: (A, C) = 1 mm; (B, D) = 0.1 mm.

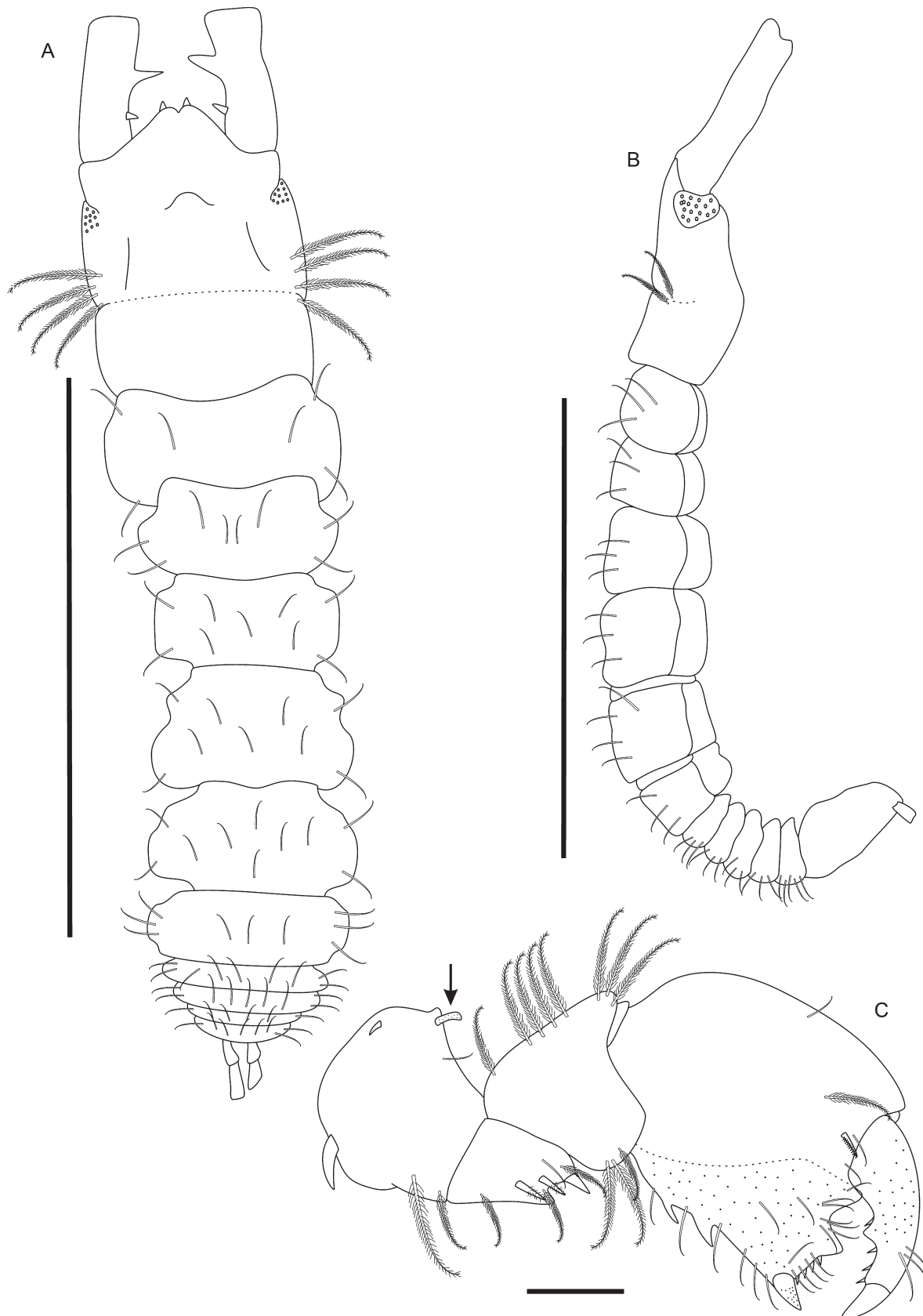


Figure 4. *Vestigiramus* sp., adult male [MOUFPE 14.307]. (A) Dorsal view; (B) lateral view; (C) cheliped. Scale bars: (A, B) = 1 mm; (C) = 0.5 mm.

at 71.6 m depth on sandy bottom associated with sponge and algae. Guțu (2009) erected the genus to include *Vestigiramus antillensis* Guțu, 2009 and *V. codreanui* (Guțu, 1996) which have reduced cheliped exopod. The single specimen examined in this study share this and other diagnostic character (Fig. 4C), and it is closely related with *V. codreanui* (type locality Santa Catarina, Brazil), however they can be distinguished mainly by *Vestigiramus* sp. having four plumose setae on medial lateral margin of cephalothorax (Figs. 4A, B), mandible article 1 with one inner distal spiniform seta, cheliped carpus with eight plumose setae on dorsal margin as well as other characters. This is the first record of the genus for northeastern Brazil.

Family Nototanaidae Sieg, 1976

Genus *Nototanooides* Sieg and Heard, 1985

Nototanooides cf. *trifurcatus* Sieg and Heard, 1985

(Figs. 5A, B)

Nototanooides trifurcatus Sieg and Heard, 1985: 51–62; Heard *et al.*, 2003: 123, 124, 126; Larsen, 2005: 268; Anderson, 2012: 23.

Type locality: The coast off Texas, East Flower Garden Bank, 72–190 m, Gollums Lake.

Material examined: Two adult males (damaged) MOUFPE 14.380]. Collected on 7th June 1998, station NE III #77A; 01°37'48"S 38°10'12"W, off Ceará state, North Chain Banks, Brazil.

Geographic distribution: Northwestern Atlantic: the coast off Texas. The species is widespread in the northern Gulf of Mexico but with apparently patchy distribution (Larsen, 2005: 268). Southwestern Atlantic: off Ceará state, North Chain Banks, Brazil (present study).

Remarks: The specimens were dredged in 56.7 m depth, gravel bottom, temperature 28°C and salinity 36. The two individuals examined are damaged, but when compared with the characters described by Sieg and Heard (1985) and Larsen (2005) shows that the specimens are at least closely related. The differences from the original species are the anterior spiniform projection on eyes lobes and the conformation of the pleotelson (Figs. 5A, B), which is more expanded than in *Nototanooides trifurcatus sensu* Sieg and Heard, 1985. This is the first record of *N. trifurcatus* from Brazil, indeed the first record for the entire South Atlantic.

Family Tanaellidae Larsen and Wilson, 2002

Genus *Arhaphurooides* Sieg, 1986

Arhaphurooides sp.

(Figs. 3C, D)

Material examined: One adult female without oostegites, 1.57 mm [MOUFPE 14.390]. Collected on 10th April 1997, station NE II #190; 09°49'S 35°39'W, Alagoas state, continental shelf, Brazil.

Geographic distribution: Southwestern Atlantic: continental shelf of Alagoas state, Brazil.

Remarks: The individual was collected at 35 m depth. This specimen is closely related to *Arhaphurooides io* (Bamber, 2005) and *A. septentrionalis* Sieg and Dojiri (1989) with type locality in Esperance Bay (Western Australia) and coast of New Jersey (NW Atlantic), respectively. Despite the overall similarity, *A. io* has a longer and 'sharper' exopod and a shorter endopod (*Arhaphurooides* sp. uropod endopod 3.2 times as long as wide); no tubercles on cheliped propodus while is evident in *Arhaphurooides* sp. as well as other characters.

Arhaphurooides septentrionalis is distinct from *Arhaphurooides* sp. by the following characters: 1) pleonites about three times as

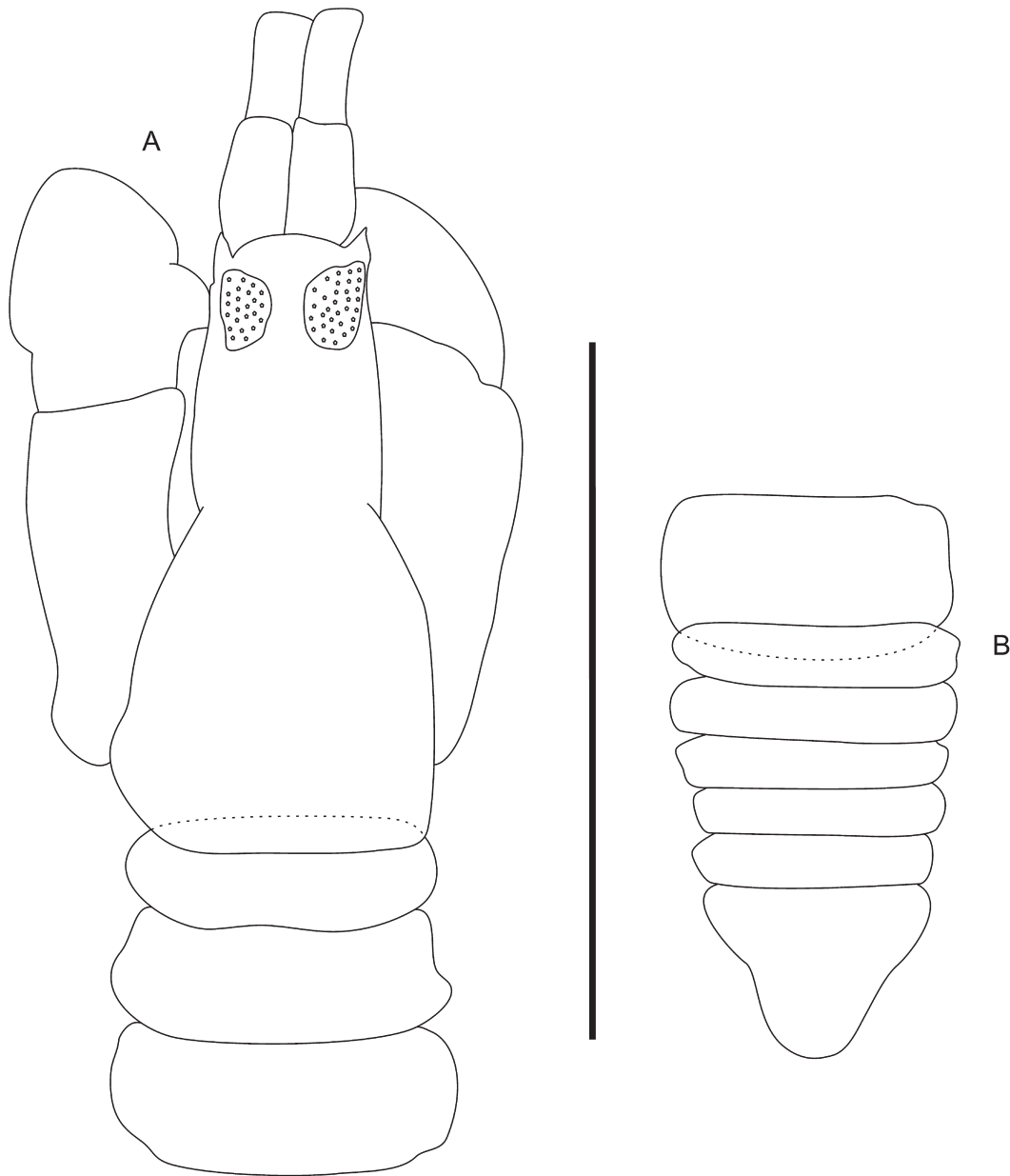


Figure 5. *Nototanoides* cf. *trifurcatus*, adult male [MOUFPE 14.380]. (A) detail of cephalothorax and pereonites; (B) pleon and pleotelson. Scale bar: (A, B) = 1 mm.

long as wide in *Arhaphuroides* sp. (about 4.6 times in *A. septentrionalis*); 2) antennule article 1 about twice as long as wide in *Arhaphuroides* sp. (about 2.5 times in *A. septentrionalis*); 3) cheliped propodus, fixed finger and dactylus with several tubercles (Fig. 3D) (absent in *A. septentrionalis*); 4) uropod endopod uniarticulate, about 6.7 times as long as exopod in *Arhaphuroides* sp. (about 2.2 times in *A. septentrionalis*). This is the first record of the genus *Arhaphuroides* from Brazilian waters.

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