



Pycnogonida (Arthropoda) from Uruguayan waters (Southwest Atlantic): annotated checklist and biogeographic considerations

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Abstract

Records of pycnogonids from Uruguayan waters (south-western Atlantic) include 26 species cited from precise locations, and at least five other species based on unconfirmed records. Nearly half of the species in that fauna belong to the genus *Nymphon* (12 spp.). Most species (22) come from deep-water and were recorded and described by C. A. Child. Of these, at least twelve species have an extended Antarctic and Subantarctic distribution, showing the influence of these cold waters in the area; three others have a wide deep-sea distribution pattern. Five species are known only from the lower slope and abyssal basin off La plata river: *Mimipallene Atlantis* and four species of *Nymphon*. Records from coastal and shelf areas (four species) are poorly documented and should be the focus of future research. Of these, *Colossendeis geoffroyi* is considered endemic in the Southwest Atlantic between 34°S and 40°S, but presents clear Antarctic affinities. A small-sized species living in shallow waters, *Pycnogonum cessaci*, is here considered as cryptogenic.

Key words: deep-sea, Uruguay, southwest Atlantic, Pantopoda

Resumen

Los registros referidos a pycnogonidos de aguas uruguayas (Atlántico Sudoccidental) incluyen 26 especies citadas con localidad precisa y al menos otras cinco (5) basadas en registros no confirmados. Casi la mitad de esta fauna pertenece al género *Nymphon* (12 spp.). La mayoría (22 especies) provienen de aguas profundas y son principalmente conocidas debido al trabajo de C. A. Child. De estas, al menos 12 especies tienen además distribución antártica y subantártica, mostrando la influencia de estas aguas en el área y tres otras tienen amplia distribución en aguas profundas. Cinco especies son conocidas hasta ahora únicamente del talud inferior y planicie abisal frente al Río de la Plata: *Mimipallene atlantis* y cuatro especies de *Nymphon*. Las especies costeras y de plataforma han sido pobremente registradas (4 especies) y deberían ser el foco de futuras investigaciones. De estas, *Colossendeis geoffroyi* es considerada como endémica de un sector del Atlántico Sudoccidental (entre 34°S–40°S) aunque con afinidades antárticas. Una especie de talla pequeña de aguas someras, *Pycnogonum cessaci*, es considerada aquí como criptogénica.

Palabras clave: aguas profundas, Uruguay, Atlántico Sudoccidental, Pantopoda

Introduction

Pycnogonids (Class Pycnogonida), commonly known as “sea spiders”, are marine invertebrates that form part of most benthic communities. They feed mainly on slow or sedentary invertebrates, although debris and macroalgae are also known to be eaten by some species. A few records are from estuarine environments. Pycnogonids are found over a wide bathymetric range, from the littoral fringe to abyssal plains, and are distributed worldwide, from the tropics to Polar regions. Pycnogonids are recognized as being of minor significance in trophic chains, at least as prey, but their role as predators deserves further research (Arnaud & Bamber 1987; Child 1998; Bamber *et al.* 2018).

The pycnogonid fauna from the south-western Atlantic has received noteworthy attention over the last 70 years, particularly considering that most species are either small, cryptic, or deep-water inhabitants (Child 1998). Each country with coasts in the southwestern Atlantic (Brazil, Uruguay, and Argentina) is represented in publications by several authors (Marcus 1940a, 1940b; du Bois-Reymond Marcus 1952; du Bois-Reymond Marcus & Marcus 1962; Sawaya 1941, 1945, 1947, 1949, 1951; Mañé-Garzón 1944; Mello-Leitão 1945, 1946, 1949a, b, 1955; Corrêa 1948; Castellanos 1965; Larramendy 1974, 1975; Larramendy & Castellanos 1978; Bremec *et al.* 1986; see Lucena & Christoffersen 2018 for complete references from Brazil). The pycnogonid fauna from important oceanographic expeditions in that region was studied by Jan H. Stock (1966, 1992) and C. Alan Child (1982, 1997). Uruguayan research has been scarce and isolated (Mañé-Garzón 1944; López de Levy 1989; Carranza *et al.* 2007a). Scarabino (2006) updated faunistic data on the benthic invertebrates of the inner Uruguayan shelf, recording identified and unidentified material. Most of the knowledge of the pycnogonids from Uruguayan waters can be attributed to Child (1982, 1997), who analyzed the material collected by the Research Vessel (RV) *Vema* and the RV *Atlantis II*.

We assembled the present list and notes with the aim of making the existing information on pycnogonids from Uruguayan waters readily available. We also hope to stimulate further research. This is particularly relevant, given the current national interest in the exploration and exploitation of offshore deposits of fossil fuels. This contribution is part of a series documenting the benthic fauna from the Uruguayan shelf, slope and abyssal plain.

Methodology

The region of interest includes the coasts of Uruguay and its Exclusive Economic Zone (URY EEZ, Fig. 1), which extends over shallow coastal areas, the outer shelf, slope and abyssal plain. The latter belongs to the Argentine Basin. Bathymetric zonation is defined as follows: shelf (0–200 m), upper slope (200–1500 m), lower slope (1500–3000 m) and abyssal plain (3000–5500 m). A general oceanographic, geomorphological and sedimentological outline of the zone can be found in Scarabino *et al.* (2016) and Hanebuth *et al.* (2018). Documents screened for information include research papers, book chapters, meeting abstracts and thesis. The taxonomy used in this report follows Bamber (2007) and Bamber *et al.* (2018). Station data for Her Majesty's Ship (HMS) *Challenger*, RV *Vema* and RV *Atlantis II* are provided in Appendix 1 (see Figure 1), as are some of the RV *Calyпсо* involved in the mixing of material that includes Uruguayan stations (see remarks below under Ammonotheidae). Some stations of the RV *Atlantis II* are referred to by Child (1982, 1997) with a dual denomination, e. g. as “station 245A” or “station 245”. We have listed the station in both forms in order to avoid confusion. Station 242 of RV *Atlantis II*, cruise 60, that falls some miles off the region of interest, is included owing to the imminent enlargement of the UEEZ. Station 320 of the HMS *Challenger* Expedition (collecting locality for *Pallenopsis patagonica* (Hoek, 1881)) is located exactly at the boundary between Argentinean and Uruguayan EEZs. Species recorded from the Argentine coast and shelf zone are discussed under *Remarks* due to their geographic proximity and possibility of their presence in Uruguayan waters. The same applies to uncertain species records from Uruguayan waters. Some species are discussed under “remarks” because of their uncertain distribution. In fact, Stock (1966), in his paper collected by the RV *Calyпсо* expedition 1961–1962 reported a mix-up of stations in several cases. Hereupon it is impossible to determine the exact station of some species, so their presence in Uruguayan waters is uncertain (like *Tanystylum isthmiacum difficile* Stock, 1966).

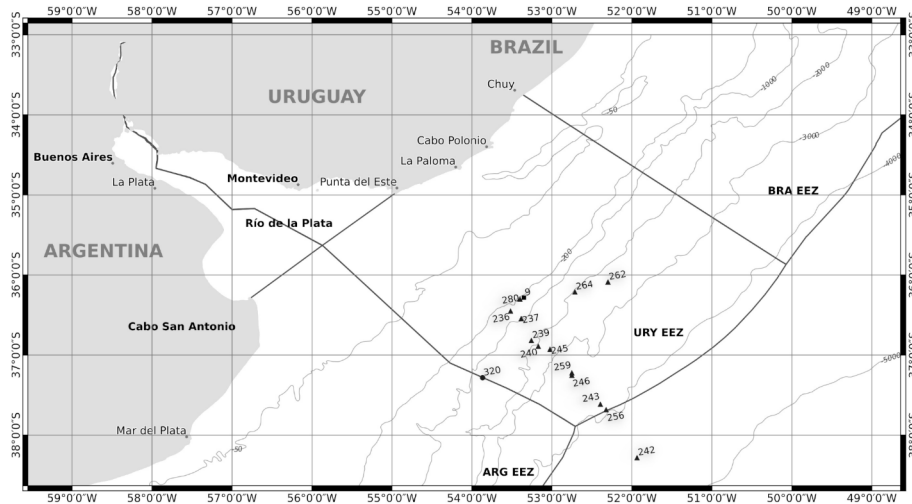


FIGURE 1. Uruguayan Economic Exclusive Zone (URY EEZ), indicating the position of the stations of HMS *Challenger* (circle), RV *Atlantis II* (triangle) and RV *Vema* (square).

Phylum Pycnogonida Latreille, 1810

Order Pantopoda Gerstacker, 1863

Suborder Eupantopodida Fry, 1978

Superfamily Ascorhynchoidea Hoek, 1881

Family Ammotheidae Dohrn, 1881

Remarks: The description of *Tanystylum isthmiacum difficile* Stock, 1966 was based on a single female collected at one of nine RV *Calypso* 1961–1962 cruise stations between north Brazil and Buenos Aires Province (Argentina). Owing to a mix-up in material (see Stock 1966), the exact station is not known, and thus its presence in Uruguayan waters is uncertain (Stock 1966). Fage & Stock (1966) and Stock (1975) recorded this subspecies from Cape Verde Islands (eastern Atlantic, 40 m depth) and northern Brazil (at depth between 51–93 m) respectively. It was also doubtfully recorded from shallow subtidal waters (6–9 m depth) on the Caribbean coast of Panama (Child 1979). Stock (1992) recorded this subspecies from southeast Brazil (19°S, 28 m depth). Muller & Krapp (2009) considered *T. isthmiacum* Stock, 1955 to be a morphologically variable species and did not follow the separation of that species into two subspecies. They also compiled the known distribution of this species in the Eastern Pacific, Western Atlantic and Eastern Atlantic.

Tanystylum orbiculare Wilson, 1878 has been recorded from the littoral zone of the Buenos Aires Province (Argentina) by several authors (Stock 1966; Bremec *et al.* 1986; Genzano 2002). *Achelia assimilis* (Haswell, 1885) has been recorded from the Buenos Aires Province (Argentina) (e. g. Stock 1966; Bremec *et al.* 1986; Genzano 2002; Albano *et al.* 2006) from near-shore locations; elsewhere it has been recorded for Subantarctic localities (e. g. Child 1994a). The taxonomy of species belonging to this genus remains problematic (see Child 1994a).

Genus *Ammothea* Leach, 1814

Remarks: Stock (1966) described the new species *Ammothea depolaris* from a location adjacent to Uruguayan waters (RV *Calypso* cruise 1961–1962, station 172, off Buenos Aires Province, Argentina).

***Ammothea longispina* Gordon, 1932**

Distribution: Antarctica (Scotia Sea; Ross Sea; South Georgia; South Orkney Islands; South Shetland Islands; Antarctic Peninsula); Magellanic region; Malvinas (Falkland) Islands; off La Plata River (Uruguay) (Child 1994a; Cano-Sánchez & López-González 2014).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, st. 237. Depth 993–1011 m.

***Ammothea spinosa* (Stimpson, 1853)**

Distribution: Antarctica (Weddell Sea; Scotia Sea near South Shetland Islands; Ross Sea; Antarctic Peninsula); Magellanic region; Malvinas (Falkland) Islands; coast and off Buenos Aires Province (Argentina); off La Plata River (Uruguay) (Child 1994a; Albano *et al.* 2006; Cano-Sánchez & López-González 2014).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, st. 239, referred as 239A. Depth 1661–1679 m.

Genus *Cilunculus* Loman, 1908

***Cilunculus acanthus* Fry & Hegdpath, 1969**

Distribution: Antarctica (Scotia Sea; Bouvet Islands; Bellingshausen Sea); off La Plata River (Uruguay) (Child 1994a, 1997; Munilla & Soler-Membrives 2009).

Uruguayan records: Child (1982, 1997): RV *Atlantis II*, cruise 60, sts. 245 and 262, referred as 245A and 262A. Depth 2440–2707 m.

Family Ascorhynchidae Hoek, 1881

Genus *Ascorhynchus* Sars, 1878

***Ascorhynchus cuculus* Fry & Hegdpath, 1969**

Distribution: Antarctica (Scotia Sea); off La Plata River (Uruguay) (Child 1982, 1994a).

Uruguayan records: Child (1982, as *A. cuculum*): RV *Atlantis II*, cruise 60, sts 237 and 240). Depth 993–2323 m.

Family *incertae sedis*

Genus *Mimipallene* Child, 1982

***Mimipallene atlantis* Child, 1982**

Distribution: Only known from off La Plata River (Uruguay).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, sts 237 and 240 (type locality). Depth 993–2323 m.

Superfamily Colossendeidoidea Hoek, 1881

Family Colossendeidae Hoek, 1881

Subfamily Colossendeinae Hoek, 1881

Genus *Colossendeis* Jarzinsky, 1870

Remarks: Child (1995a) commented: “The Antarctic species of this genus need a thorough revision but I leave this difficult task to a future student of the Pycnogonida.” He also reported *Colossendeis megalonyx* ssp. from the shelf and slope off Buenos Aires Province (Argentina) on the basis of material collected by the RV *Islas Orcadas* (37°24′S–54°39′W, 182–327 m). Child recorded great variation in size, and in morphometric relationships between proboscis, femur, and tibia. These considerations, as well as those made below for *C. geoffroyi*, highlight the need for a revision of Antarctic and Subantarctic species of *Colossendeis* (Cano & López-González 2007; Krabbe *et al.* 2010).

Colossendeis geoffroyi Mañé-Garzón, 1944

Distribution: Rio Grande do Sul (Brazil, 33°50′S–51°51′W, 65 m) to northern Argentine shelf (down to 40°S) (Mañé-Garzón 1944; Stock 1966, 1992; Larramendy 1974).

Uruguayan records: Mañé-Garzón (1944): 36°05′S–53°03′W, 130 m depth (type locality).

Remarks: Stock (1966) reported many specimens of *C. geoffroyi* collected by the RV *Calypso* 1961–1962 cruise station 172. Due to the mixing of materials, he reported specimens belonging to this species collected in one or more of six additional stations from that cruise (105, 149, 160, 161, 171 and 173) between Rio de Janeiro, Brazil and Buenos Aires Province, Argentina.

Larramendy (1974) identified 18 specimens from Argentinean waters (37°23′S–40°01′S) collected by the RV *Walther Herwig* (1966–1971) as *C. geoffroyi*. He indicated that these do not differ from the original description, but complemented the description with additional details.

Stock (1992) reported one fragmented specimen from the coast of Rio de Janeiro (23°25′S–43°00′W, 113 m depth), that he assigned with doubts to *C. geoffroyi*. He commented that “if...really this species, the range would be considerably extended in northward direction”.

Stock (1992) stated that the material reported by Minnard & Zamponi (1984) as *C. geoffroyi* seems to belong to a different species, given the differences illustrated by the Argentinean authors: “tarsus is [illustrated as being] almost twice as long as propodus; in *C. geoffroyi* both parts are almost equal in length”. Moreover, the data associated with that material is dubious. The RV *Walther Herwig* station 340 (cruise 1966) is not at 200 m depth, as reported by Minnard & Zamponi (1984), but 165 m depth; furthermore it is not located off Mar del Plata, as indicated by Stock (1992), but instead is off southern Argentina (53°57′S–58°46′W).

López de Levy (1989) gave a general description of females attributed to *C. geoffroyi* mañé-garzón, 1944, obtained as by-catch in the commercial fishery off the La Plata River (Uruguay-Argentina, 35°–39°S) (López de Levy, pers. comm. to FS 2005).

Colossendeis ?scoresbii Gordon, 1932

Distribution: Antarctica (Ross Sea); Patagonian shelf (Tierra del Fuego and Malvinas (Falkland) Islands); off La Plata River (Uruguay)? (Child 1995a).

Uruguayan records: Child (1997): RV *Atlantis II*, cruise 60, st. 242. Depth 4382–4402 m.

Remarks: This record may represent an undescribed species. Considering that only one specimen was collected, and that species in this genus appears to exhibit great variation, its taxonomic status is uncertain (Child 1997).

Superfamily Nymphonoidea Pocock, 1904

Family Callipallenidae Hilton, 1942

Genus *Callipallene* Flynn, 1929

***Callipallene margarita* (Gordon, 1932)**

Distribution: Burdwood Bank; Argentine shelf; South Georgia Islands; off La Plata River (Uruguay and Argentina); Southeast Brazil (23°40'S); southwestern Pacific up to ca. 42°S; Palmer Archipelago (Child 1982, 1995b; Stock 1992; Melzer *et al.* 2006).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, st. 240. Depth 2195–2323 m.

Family Nymphonidae Wilson, 1878

Genus *Nymphon* Fabricius, 1794

Remarks: Stock (1966) recorded one specimen of *Nymphon* from one of nine stations (4, 40, 69, 105, 149, 160, 161, 171 and 173) of the RV *Calypso* 1961–1962 cruise between north Brazil and Buenos Aires Province (Argentina) which included Uruguayan waters. He later described *Nymphon vulcanellum* based on a large series from the Brazilian coast between 21°40'S and 28°S (21–250 m depth) and assigning to this species the referred specimen (Stock 1992). The presence of this species in Uruguayan waters is uncertain.

Apart from the several species of *Nymphon* listed below, Child (1982) recorded a *Nymphon* specimen based on unidentifiable material (either juvenile or damaged) from RV *Atlantis II*, cruise 60, sts 237 and 262 (as 262A) (Argentine Basin off La Plata River) (Child 1982).

Loman (1923) recorded *Nymphon gracillimum* Calman, 1915 from station 2 of the Swedish Antarctic Expedition (1901–1903), off Buenos Aires Province, Argentina, 37°30'S–56°11'W, 100 m depth. Bremec *et al.* (1986) illustrated and discussed two specimens of *N. gracillimum* from the littoral zone of the Buenos Aires Province (38°45'S), pointing out differences between their material and the male holotype. This species is considered a junior synonym of *Nymphon hiemale* Hodgson, 1907, which has an Antarctic distribution (Child 1995c).

***Nymphon centrum* Child, 1997**

Distribution: Known only from off La Plata River (Uruguay).

Uruguayan records: Child (1997): RV *Atlantis II*, cruise 60, st. 245. Depth 2707 m.

***Nymphon dentiferum* Child, 1997**

Distribution: Argentine Basin (Uruguay and Argentina).

Uruguayan records: Child (1997): RV *Atlantis II*, cruise 60, st. 256). Depth 3906–3917 m.

***Nymphon hampsoni* Child, 1982**

Distribution: Known only from off La Plata River (Uruguay).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, sts 237 and 240. Depth 993–2323 m.

***Nymphon inerme* Fage, 1956**

Distribution: From isolated localities in the Pacific and Atlantic oceans; off La Plata River (Uruguay) (Child 1982; Raiskii & Turpaeva 2006).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, st. 243. Depth 3815–3822 m.

***Nymphon inferum* Child, 1995**

Distribution: Antarctic and Subantarctic waters on both sides of Scotia Sea; off La Plata River (Uruguay) (Child 1995b, 1997).

Uruguayan records: Child (1997): RV *Atlantis II*, cruise 60, st. 245, referred as 245A). Depth 2707 m.

***Nymphon laterospinum* Stock, 1963**

Distribution: Widely distributed in Atlantic basins; off La Plata River (Uruguay); southwestern of Indian Ocean (Child 1982, 1997; Raiskii & Turpaeva 2006).

Uruguayan records: Child (1982, 1997): RV *Atlantis II*, cruise 60, sts 246 and 259. Depth 3305–3343 m.

***Nymphon longicollum* Hoek, 1881**

Distribution: Circumantarctic and Subantarctic; off La Plata River (Uruguay) (Child 1995b, 1997, 1998; Weis *et al.* 2011).

Uruguayan records: Child (1997): RV *Atlantis II*, cruise 60, sts 242 and 256. Depth 3906–4402 m.

***Nymphon longicoxa* Hoek, 1881**

Distribution: Circumantarctic and Subantarctic; off La Plata River (Uruguay) (Child 1982, 1995b, 1997, 1998; Weis *et al.* 2011).

Uruguayan records: Child (1982, 1997): RV *Atlantis II*, cruise 60, sts 240, 245, 262 and 264, referred as 245A, 262A and 264A. Depth 2041–2707 m.

***Nymphon sandersi* Child, 1982**

Distribution: Known only from off La Plata River (Uruguay-Argentina).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, st. 243. Depth 3815 m.

***Nymphon scotiae* Stock, 1981**

Distribution: Antarctica (Scotia Sea); off La Plata River (Uruguay) (Child 1997).

Uruguayan records: Child (1997): RV *Atlantis II*, cruise 60, st. 245, referred as 245A. Depth 2707 m.

***Nymphon typhlops* (Hodgson, 1915)**

Distribution: Antarctica (Palmer Archipelago; South Orkney Islands); Pacific Ocean (Hikurangi Trench); off La Plata River (Uruguay) (Child 1982, 1995b, 1997).

Uruguayan records: Child (1982, as *N. spicatum*, 1997): RV *Atlantis II*, cruise 60, sts 243 and 245, referred as 245A. Depth 2707–3822 m.

Remarks: Described by Child (1982) as *Nymphon spicatum* n. sp. from the referred stations, but lately synonymized by him (1995c, 1997) with *N. typhlops*.

Nymphon vacans Child, 1997

Distribution: Known only from off La Plata River (Uruguay).

Uruguayan records: Child (1997): RV *Atlantis II*, cruise 60, st. 245, referred as 245A. Depth 2707 m.

Family Pallenopsidae Fry, 1978

Genus *Pallenopsis* Wilson, 1881

Remarks: This genus has a long and complex taxonomic history in the southwest Atlantic, summarized by Stock (1973, 1975). Weis *et al.* (2014) analysed the existence of a species-complex within the traditional concept of *Pallenopsis patagonica* (Hoek, 1881). In fact, they referred it as “one of the most taxonomically problematic and variable pycnogonid species known to date”.

Böhm (1879) recorded *Pallenopsis fluminensis* (Kroyer, 1844) (as *Phoxichilidium fluminensis*) from the Magellan Strait and Patagonia (54.9–76.8 m depth) based on material collected by the RV *Gazelle* in 1876, deposited in the Museum für Naturkunde der Humboldt-Universität zu Berlin. In the zoological report of the *Gazelle* expedition, Studer (1889) recorded that species (as *Pallene fluminensis*) from three stations, adding a third and deeper (80.5 m) record from the Uruguayan shelf. Schimkewitsch (1930) considered that Böhm’s specimens represent a new species: *Pallenopsis boehmi*. Stock (1973) redescribed this species, re-examining the material identified by Böhm as *P. fluminensis* (four specimens collected by the *Gazelle*), but considered that one specimen belongs to *P. patagonica*. Stock (1973) nominated a female specimen from the Magellan Strait as the Lectotype of *P. boehmi*. Due to insufficient labelling, it was not possible to establish which locality the specimen of *P. patagonica* belongs; either it was station LVII, 38°10.1’S–56°26.6’W, 54.9 m depth, off Buenos Aires Province, Argentina, or it belongs to station LX, 34°43.7’S–52°36.1’W, 80.5 m depth, Uruguayan shelf (Stock 1973; Dunlop *et al.* 2007). Therefore, the records of Studer (1889) for both localities remain uncertain. According to Stock (1973, 1992), *P. boehmi* has a geographical distribution extending from the Strait of Magellan to southeast Brazil (*ca.* 23°10’S). This distribution is biogeographically anomalous for a shelf species.

Pallenopsis tumidula Loman, 1923 was recorded from the RV *Calypso* 1961–1962 cruise station 172 off Buenos Aires Province, Argentina by Stock (1966). Another specimen, from an unknown location due to mixing of materials, was collected at one of the following stations of the same expedition: 160, 161 (both in Uruguayan waters), 171 or 173 (off Buenos Aires Province, Argentina) (Stock 1966). Stock (1992) also reported this species for southeast and south Brazil (23°15’S–30°20’S); therefore, the Uruguayan shelf is within its geographic range, although there are no reliable records. Station 2 of the 1901–1903 Swedish Antarctic Expedition (off Buenos Aires Province, Argentina, 37°30’S–56°11’W, 100 m) is the type locality of *P. tumidula* (Loman 1923).

Hedgpeth (1943) recorded, for the first time, *P. fluminensis* for Argentinean waters, off Buenos Aires Province (37°42’S–56°20’W, 80.4 m depth, station 26 of *Hassler* Expedition). Later, Bremec *et al.* (1986) briefly described and illustrated one specimen of *Pallenopsis* collected in the littoral zone of the Buenos Aires Province (38°45’S), identifying it as *P. fluminensis*. This species is otherwise known from the Brazilian coast (Lucena *et al.* 2017).

Pallenopsis meinerti Schimkewitsch, 1930

Distribution: Magellanic Strait?; off La plata river (Uruguay); Northeast Brazil (Bahia to Pernambuco) (Stock 1975; Child 1982).

Uruguayan records: Child (1982): RV *Atlantis II*, cruise 60, sts 236 and 237. Depth 497–1011 m.

Remarks: *Pallenopsis meinerti* is a somewhat enigmatic species. Based on additional material, Stock (1975) was the first to review this species and he detailed problems with the origin of the type material. This "species" deserves much additional research. As currently understood (Stock 1975; Child 1982), *P. meinerti* occurs in upper slope depths (specifically 370–1101 m) and has been reported only from northeast Brazil (*ca.* 8–9°S) and off the La Plata River (*ca.* 36°30’S), a somewhat anomalous geographic distribution for an upper slope species.

***Pallenopsis patagonica* (Hoek, 1881)**

Distribution: Southeast Pacific, from 33°S to the Magellanic Region; Southwest Atlantic to *ca.* 37°15'S, including the Malvinas (Falkland) Islands and South Georgia Islands; Burdwood Bank; Antarctica (Ross Sea, Weddell Sea) (Weis *et al.* 2014).

Uruguayan records: Hoek (1881, as *Phoxichilidium patagonicum* var. *elegans*): HMS *Challenger*, st. 320. Depth 1097 m.

Remarks: Hoek (1881) describes his specimen from st. 320 as probably representing a more elongated individual due to the influence of depth. Child (1995b), analyzing a large amount of material from the Antarctic and Sub-Antarctic regions, observed that some specimens had more elongated appendages, while others had shorter ones (although he did not determine if the variation occurs in specific localities or is diffused along of region). More recently, Weis *et al.* (2014), using molecular and morphological data, evaluated the variations found in individuals of *P. patagonica* from the Antarctic and Subantarctic regions. They observed that *P. patagonica* represents a large species complex, with at least two clades, a Chilean clade (which they called *P. yepayekae* Weis, 2014) and a "Falkland" clade, maintained under *P. patagonica*. It was in this last clade that the individual analysed by Hoek (1881) (*Pallenopsis patagonica sensu stricto*) was positioned.

Child (1995b) reported material he assigned to this species from the shelf and slope off Buenos Aires Province (Argentina) collected by the RV *Islas Orcadas* (37°24'S–54°39'7W, 182–327 m depth).

Superfamily Phoxichilidoidea Sars, 1891

Remarks: Specimens of *Endeis spinosa* (Montagu, 1808) have been recorded from the littoral zone of Buenos Aires Province (Argentina) by several authors (Castellanos 1965; Stock 1966; Bremec *et al.* 1986; Genzano 2002).

Family Phoxichilidiidae Sars, 1891

Genus *Anoplodactylus* Wilson, 1878

Remarks: *Anoplodactylus stictus* Marcus, 1940 and *Anoplodactylus pygmaeus* (Hodge, 1864) have been recorded from the littoral zone of Buenos Aires Province (Argentina) by several authors (*e. g.* Castellanos 1965; Stock 1966; Bremec *et al.* 1986; Genzano 2002).

***Anoplodactylus petiolatus* (Krøyer, 1844)**

Distribution: Widely distributed in tropical and temperate zones of the Atlantic Ocean (including Brazil, Uruguay and Argentina); Mediterranean and Black Seas (Stock 1966, 1975, 1992; Raiskii & Turpaeva 2006; Müller & Krapp 2009; Lehmann *et al.* 2014; Esquete *et al.* 2016).

Uruguayan records: Carranza *et al.* (2007a): littoral.

Remarks: Wide global distribution and a lengthy synonymy suggest that this name may apply to a species complex; more taxonomic studies are needed for determining its status, either native, exotic or cryptogenic.

***Anoplodactylus vema* Child, 1982**

Distribution: Magellan Strait; off La Plata River (Uruguay) (Child 1982, 1995b).

Uruguayan references: Child (1982): RV *Vema*, cruise 18, st. 9. Depth 676 m.

Superfamily Pycnogonoidea Pocock, 1904

Family Pycnogonidae Wilson, 1878

Genus *Pycnogonum* Bruennich, 1764

Remarks: *Pycnogonum elephas* Stock, 1966 was described from material of uncertain locality due to the mixing of samples collected at one or more RV *Calypso* 1961–1962 cruise stations (105, 149, 160, 161, 171 and 173) between Rio de Janeiro (Brazil) and Buenos Aires Province (Argentina), including Uruguayan waters. There have been no further records. The presence of this species in Uruguayan waters is uncertain.

Pycnogonum cessaci Bouvier, 1911

Distribution: East Pacific (Panama); West Atlantic (Uruguay; Brazil; Antilles; Venezuela; Colombia; Panama; SE coast of USA); East Atlantic (tropical coast of Africa, Cape Verde Is.) (Stock 1975, 1990, 1992; Child 1979; Carranza *et al.* 2007a; Müller & Krapp 2009).

Uruguayan records: Carranza *et al.* (2007a, as *P. pamphorum*): littoral.

Remarks: *Pycnogonum pamphorum* Marcus, 1940 and *P. leticiae* Mello-Leitão, 1945 are junior synonyms of *P. cessaci*, according to Stock (1975, 1992) and Child (1979). *P. cessaci* has an amphi-Atlantic distribution (east and west) in the tropics and subtropics (Stock 1990, Müller & Krapp 2009) and in the Pacific coast of Panama (Child 1979). It is also found in shallow waters among algae, hydroids, bryozoans and sponges, which are organisms commonly found in fouling communities in shallow-water marine systems. These communities are particularly composed by species that occur in different oceans which are commonly transported through different human commercial activities, such as shipping and aquaculture. There is no obvious natural dispersal mechanisms to explain the amphi-Atlantic distribution of *P. cessaci*. Its presence in fouling communities and its biogeographical history, which does not permit us to ascribed it as being native or exotic, lead us to suspect is that this represents a cryptogenic species (following definition by Carlton 1996, 2009).

Suborder Stiripasterida Fry, 1978

Family Austrodecidae Stock, 1954

Genus *Pantopipetta* Stock, 1963

Pantopipetta longituberculata (Turpaeva, 1955)

Distribution: Antarctica (Scotia Sea; King George Island; South Shetland Islands); Southeast Atlantic; Magellanic region; South Shetland Islands; Argentine Basin; off La Plata River (Uruguay); Brazil Basin; Guiana Basin; Northwest Atlantic; Southeast Pacific (Peru-Chile Trench); Northwest Pacific Ocean (Kurile-Kamchatka Trench); (Child 1982, 1994b, 1997; Raiskii & Turpaeva 2006).

Uruguayan records: Child (1982, 1997): RV *Atlantis II*, cruise 60, sts 240, 242, 243, 245, 256 and 262, referred as 245A and 262A. Depth 567–4402 m.

Remarks: Turpaeva (1990) recorded *Pantopipetta brevicauda* Stock, 1963 from a locality very close to Uruguayan waters (36°12.9' S–49°09.7' W, *i. e.*, international waters off Brazil) in a depth of 4630 m (RV *Akademik Kurchatov*, station 4893, cruise 43). We agree with Child (1982, 1994b) and Bamber & Thurston (1995) in considering *P. brevicauda* a junior synonym of *P. longituberculata*.

Biogeography and diversity

Twenty-six species of Pycnogonida have been recorded from Uruguayan waters based on precise records. Nearly a half of these species belong to the genus *Nymphon* (12 spp.). Most species (22) come from deep water and were described and cited by C. A. Child (Table 1). A further five species are based on unconfirmed records.

TABLE 1. Checklist of the species of Pycnogonida recorded in Uruguayan waters with bathymetric (S: shelf, US: Upper Slope (200–1500 m), LS: Lower Slope (1500–3000m) and AP: Abyssal Plain) and biogeographical distribution (SWS: Widely distributed shallow-water species, ASa: Antarctic and Subantarctic shelf and deep-sea species, O: off La plata River Deep-sea species, W: widely distributed deep-sea species. (*) indicates species described/cited for the area by C. A. Child.

Species	Bathymetric distribution				Biogeographical distribution			
	S	US	LS	AP	SWS	ASa	O	W
<i>Ammothea longispina</i> *		X				X		
<i>Ammothea spinosa</i> *			X			X		
<i>Cilunculus acanthus</i> *			X			X		
<i>Ascorhynchus cuculus</i> *		X	X			X		
<i>Mimipallene atlantis</i> *		X	X				X	
<i>Colossendeis geoffroyi</i>	X							
<i>Colossendeis ?scoresbii</i> *				X		X		
<i>Callipallene margarita</i> *			X			X		
<i>Nymphon centrum</i> *			X				X	
<i>Nymphon dentiferum</i> *				X			X	
<i>Nymphon inferum</i> *			X			X		
<i>Nymphon laterospinum</i> *				X				X
<i>Nymphon longicollum</i> *			X			X		
<i>Nymphon longicoxa</i> *			X			X		
<i>Nymphon scotiae</i> *			X			X		
<i>Nymphon typhlops</i> *			X	X		X		
<i>Nymphon vacans</i> *			X				X	X
<i>Nymphon inerme</i> *				X				
<i>Nymphon hamptoni</i> *		X	X					
<i>Nymphon sandersi</i> *		X	X				X	
<i>Pallenopsis patagonica</i>		X				X		
<i>Pallenopsis meinerti</i> *		X						
<i>Anoplodactylus vema</i> *		X				X		
<i>Anoplodactylus petiolatus</i>	X				X			
<i>Pycnogonum ccessaci</i>	X				X			
<i>Pantopipetta longituberculata</i> *		X	X	X				X

Coastline and shelf species have been poorly documented and should be the focus of future research in the area. Scarabino (2006) referred to several unidentified pycnogonids from that region. Among shelf species, *Colossendeis geoffroyi* is considered endemic to a sector of the south western Atlantic bounded by the latitudes of 34°S and 40°S, but has clear morphological affinities with Antarctic species (Mañé-Garzón 1944; Larramendy 1974).

The scarce and isolated records of Pycnogonida from Uruguayan waters preclude a detailed biogeographical analysis. However, these can be grouped as follows, also showing that they match some patterns better documented in other groups of benthic organisms:

- 1) **Deep-sea species with Antarctic and Subantarctic distribution** (12 spp.: *Ammothea longispina*, *A. spinosa*, *Cilunculus acanthus*, *Ascorhynchus cuculus*, *Callipallene margarita*, *Nymphon inferum*, *N. longicollum*, *N. longicoxa*, *N. scotiae*, *N. typhlops*, *Anoplodactylus vema* and *Pallenopsis patagonica*). The presence of these Antarctic and Subantarctic species in Uruguayan waters suggests a northernmost distribution to waters off the La Plata River. Work by Monniot & Monniot (1983), Carranza *et al.* (2007b) And scarabino *et al.* (2016) (and references therein) suggest that the distribution of several groups of benthic invertebrates, including pycnogonids (Child 1982; Munilla 2001; Griffiths *et al.* 2011), is dependent on the northwards flow of Antarctic and Subantarctic waters. Those studies showed the affinity of the pycnogonid fauna recorded off La Plata River with that of the Magellanic region and the South Shetland Islands, South Georgia and South Sandwich Islands. There are a few records of some species extending further north into the Brazilian basin.
- 2) **Deep-sea species only known from off La plata river** (six species: *Mimipallene atlantis*, *Nymphon centrum*, *N. dentiferum*, *N. vacans*, *N. hamptoni*, *N. sandersi*). This group includes species inhabiting the lower slope, but also ranging into the upper slope and the abyssal plain, as illustrated by the monotypic *M. atlantis* and members of the species-rich genus *Nymphon*. Allen & Sanders (1997), analyzing all the Atlantic deep sea basins, recorded a high percentage of endemic deep-sea protobranch bivalves from off La Plata River. An explanation for this pattern, which includes these six endemic pycnogonids, remains to be explored.
- 3) **Deep-sea species having a large distribution** (three species: *Nymphon inerme*, *N. laterospinum*, *Pantopipetta longituberculata*). In Uruguayan waters these species inhabit abyssal depths (two exclusively). They belong to a group of deep-sea pycnogonids with a wide distribution, either intra or inter-oceanic (see Arnaud & Bamber 1987; Müller 1993; Raiskii & Turpaeva 2006). The existence of pycnogonids with wide recorded distributions in the outer shelf and the deep-sea is challenged by the recent finding of species-complexes within the genera *Colossendeis* and *Pallenopsis* (Krabbe *et al.* 2010; Griffiths *et al.* 2011; Weis *et al.* 2014).
- 4) **Widely distributed shallow waters species** (two species). *Anoplodactylus petiolatus* and *Pycnogonum cessaci* have a tropical-temperate water distribution. The wide distribution of *A. petiolatus* and the number of synonymies observed for this species, together with the high level of phenotypic variability, suggests that this species might correspond to a species complex, requiring further taxonomic study. However, *P. cessaci* is here considered as cyptogenic.

The known distribution of *Pallenopsis meinerti* does not fit any of the referred groups of species above, being a somewhat enigmatic species as presently understood. It is reported from bathyal depths off north Brazil and off La plata river.

The Uruguayan Museo Nacional de Historia Natural holds an important collection of pycnogonids, assembled with the collaboration of the Dirección Nacional de Recursos Acuáticos (former Instituto Nacional de Pesca). Once studied, it will surely give a more accurate picture of the Uruguayan shelf and slope pycnogonid fauna.

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APPENDIX 1. Stations of the HMS *Challenger*, RV *Vema*, RV *Atlantis II*, and *Calypso* cruises mentioned in the text.

HMS Challenger (February 1876)

Station 320. 37°17'S–53°52'W, 1097 m

RV Vema, cruise 18 (February 1962)

Station 9. 36°17'S–53°21'W, 547–676 m

RV Atlantis II, cruise 60 (March 1971)

Station 236. 36°27'S–53°31'W, 36°28.1'S–53°32.3'W, 497–518 m

Station 237. 36°32.6'S–53°23.0'W, 993–1011 m

Station 239. 36°49'S–53°15.4'W, 1661–1679 m

Station 240. 36°53.4'S–53°10.2'W, 2195–2323 m

Station 242. 38°16.9'S–51°56.1'W, 4382 m

Station 243. 37°36.8'S–52°23.6'W, 3815–3822 m

Station 245. 36°55.7'S–53°01.4'W, 2707 m

Station 246. 37°15'1S–52°45'S, 3343 m

Station 256. 37°40.9'S–52°19.3'W, 3906–3917 m

Station 259. 37°13.3'S–52°45'W, 3305 m

Station 262. 36°05.2'S–52°17.9'W, 2440 m

Station 264. 36°12.7'S–52°42.7'W, 2041–2048 m

RV Calypso, cruise 1961–1962 to South America

Station 4. Atol das Rocas, Brazil, 14 m

Station 40. 10°54'S–36°45'W, 34 m (off Sergipe, Brazil)

Station 69. 15°37'S–38°44'W, 39 m (off Bahia, Brazil)

Station 105. 23°06'S–42°50'W, 65 m (off Rio de Janeiro, Brazil)

Station 149. 27°15'S–48°29'W, 18 m (Zimbros bay, Santa Catarina, Brazil)

Station 160. 35°05'S–52°33'W, 115 m (off Cabo Polonio, Uruguay)

Station 161. 34°43'S–54°03'W, 30 m (off La Paloma, Uruguay)

Station 171. 37°36'S–54°46'W, 740 m (off Buenos Aires Province, Argentina)

Station 172. 37°35'S–54°53.7'W, 270–220 m (off Buenos Aires Province, Argentina)

Station 173. 38°25'S–56°14'W, 81 m (off Buenos Aires Province, Argentina)