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First record of *Ammothea tetrapora* Gordon, 1932 for Uruguayan waters

(Ammotheidae, Pycnogonida)

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Pycnogonida are cosmopolitan marine animals, more frequent in temperate and polar latitudes. Their study in the Southwestern Atlantic has been discontinuous, with many areas insufficiently sampled. Several samples remain unstudied in Brazilian institutions. The study of this material may enhance local knowledge of the group, permitting new records and the description of new species. This paper aims to record *Ammothea tetrapoda* for the first time in Uruguayan waters, based on samples from Fundação Zoobotânica do Rio Grande do Sul, describing more fully a female specimen. This represents the third record for the species, previously known from the south of South America, near Falkland (Malvinas) Islands and South Georgia Island.

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Introduction

Class Pycnogonida contains exclusively marine arthropods (Du Bois-Reymond Marcus 1952, Munilla 1999), living from the intertidal zone to deep waters (Bamber 2007). The group is cosmopolitan, but predominates in temperate and polar regions, mainly in Antarctica (Corrêa 1987). Their study in South America, mainly in the Atlantic, began in the nineteenth century, but progressed in a punctual and sporadic way (Lucena & Christoffersen 2018). Pycnogonids from Uruguayan waters are unevenly reported. The shelf has seldom been sampled and species are poorly recorded in this area, while deep-sea species are much better known (Scarabino et al. 2019).

According to Lewinsohn & Prado (2006), many taxa are deposited in large numbers in Brazilian institutions, but have never been organized and studied systematically. A taxonomic survey of such groups may enhance knowledge of the marine diversity for a particular region or country, providing new records and the description of new species. Furthermore, many specimens deposited in museum collections may be impossible to collect again, due to the destruction of habitats, or to restraints for collecting

Figs 1–6. *Ammothea tetrapoda* Gordon, 1932. **1.** Dorsal view; **2.** lateral view; **3.** chelifore; **4.** proboscis; **5.** ocular tubercle in a lateral view; **6.** ventral view. **Ov**, oviger; **Pp**, palp.

in certain protected areas, limitations that did not exist when they were first sampled (Winston 2007).

The present paper records *Ammothea tetrapoda* Gordon, 1932 for the first time in Uruguayan waters, based on material deposited in the Museum of the Zoobotanical Foundation, Federal University of Rio Grande do Sul.

Material and methods

The specimen was offered for study by Professor Dr. Ricardo Ott, from Fundação Zoobotânica, of Universidade Federal do Rio Grande do Sul. The specimen examined is deposited in the Pycnogonida collection of the "Fundação Zoobotânica do Rio Grande do Sul" (FZB/RS).

Figs 7–8. *Ammothea tetrapoda* Gordon, 1932. **7.** Lateral view of second leg; **8.** Propodus.

Identification of the specimen was performed under a stereomicroscope and based on comparisons with the pycnogonids studied mainly by Gordon (1932), Fry & Hedgpeth (1969), Pushkin (1993) and Cano-Sánchez & López-González (2014). The measurements and pictures were made using the stereomicroscope Leica M205A, and edited in the softwares Leica Aplication Suite V4.8 and GIMP 2. The map was made in the software Quantum GIS 2.18.16. The measurements of the legs were made using the first leg, the only complete set of legs

Results

Family Ammotheidae Dohrn, 1881
Genus *Ammothea* Leach, 1814

***Ammothea tetrapoda* Gordon, 1932**
Figs 1–9

Ammothea tetrapoda Gordon, 1932: 99–101, figs 48–50; Helfer & Schlottke 1935: 285; Pushkin 1993: 314–315, figs 267–268.
Anammothea tetrapoda Fry & Hedgpeth, 1969: 97–98, figs 104, 105, 147, 150, 151.

Material examined. Uruguay: (FZB/RS-Pyc-006) 1♀, 35°31'S 52°52'W, 13 July 1964. Other information concerning the origin of this lot is lacking. However, the coordinates indicate a locality of a bit more than 100 m depth.

Description

Animal large (trunk more than 8 mm long). Trunk completely segmented. Segments 1 to 3 with a conical tubercle on distal margin, the second tubercle being largest; all with small apical setae on frontal and distal margins (Figs 1–2). Cephalon broadened anteriorly, almost as large as segments 1 + 2. Ocular tubercle located in center of cephalon, thickened, with pointed apical projection (Fig. 5). Frontal eyes twice as large as posterior eyes. Lateral processes separated by less than half diameter of proboscis, with a small dorsal projection and small setae on distal margin. Proboscis long and conical, slightly longer than half length of trunk, directed vertically downwards (Fig. 4). Terminal region of proboscis directed slightly forwards. Abdomen long, inclined backwards, forming an angle of 45 degrees with the trunk, with few small setae along its length.

Scape of chelifore uniarticulate, with very few small setae, concentrated mainly on distal margin (Fig. 3). Palm of chela small and rounded, with one seta above articulation with movable finger. Fingers small and conical. Palp with eight articles, all with small and spaced setae (Fig. 6). Article 4 is the largest article, article 2 measures $^4/_5$ of article 4. Articles 5 to 8 together are slightly longer than article 4, with setae concentrated along internal margin. Oviger with 10 articles, almost completely without setae (Fig. 6). Article 5 is the longest, followed by articles 4, 2, 3, 6, 7, 8, 9, 10, and 1.

Legs elongate and covered with small setae (Fig. 7). Coxa 1 almost as broad as long. Coxa 2 elongate, slightly longer than 3. Genital pores opening in ventro-terminal region of all second coxae. Coxa 3 elongate. The femur is the longest and most robust article. Tibia 1 more robust and shorter than tibia 2. Tibia 2 with many small setae. Tarsus oval, with a robust spine on the inner median region. Propodus long, with two large and robust spines in the region of the heel, which is not highlighted (Fig. 8). There are many small setae on sole and along external margin of propodus. Main claw half length of propodus. Auxiliary claws small, slightly more than $^1/_3$ of main claw.

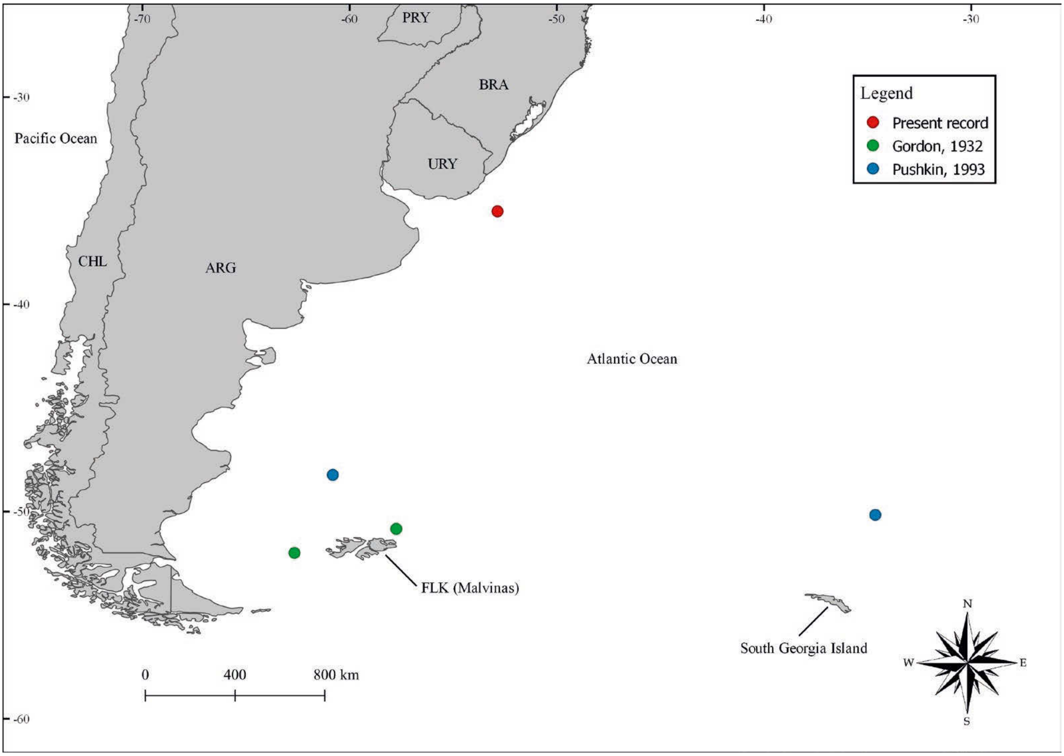

Fig. 9. Map of known distribution of *Ammothea tetrapoda* Gordon, 1932. ARG, Argentina; BRA, Brazil; CHL, Chile; FLK, Falkland (Malvinas) Islands; PRY, Paraguay; URY, Uruguay.

Measurements. Length of trunk (tip of the cephalic segment to the tip of fourth lateral processes): 8.03. Width of trunk across second lateral processes: 5.99. Length of proboscis: 4.64. Basal diameter of proboscis: 2.14. Length of abdomen: 2.27. Length of chelifore: 2.44. Length of scape: 1.67. Length of chelae and palm: 0.77. Length of palp: 0.52; length of palp articles (first to eighth): 0.47, 1.23, 0.52, 1.47, 0.33, 0.41, 0.40, 0.26. Length of first leg: 29.61. Length of articles of leg 1: coxa 1 1.64, coxa 2 2.60, coxa 3 1.76, femur 7.10, tibia 1 6.28, tibia 2 6.54, tarsus 0.29, propodus 2.37, claw 1.03, auxiliary claws 0.45. Length of oviger: 6.64; length of oviger articles (first to 10th): 0.28, 0.99, 0.71, 1.13, 0.82, 0.67, 0.53, 0.62, 0.45, 0.44.

Depth. Based on the records of Gordon (1932), Pushkin (1993) and our present record, the species is known to live from ca. 100 to 303 m depth.

Distribution. Recorded previously only for the Falkland (Malvinas) Islands, off south of Argentina (48°14'S 60°49'W), and South Georgia Island. This is the first record for Uruguayan waters (Fig. 9).

Comments. The specimen analysed herein conforms with the original description in most details, particularly regarding the anterior eyes, which are much larger than the posterior eyes; proboscis almost half length of trunk; dorsal tubercles conical; abdomen reaching distal margin of fourth lateral process, being erect, forming an angle of almost 45°; distal region of scape of chelifore thickened; proboscis straight; oviger with eight articles, the fourth and fifth segments of palp apparently fused.

We stress a few small differences with the original description (Gordon 1932: 99–101) pertaining to the proboscis, that is directed downwards almost vertically; the femur is longer than tibia 1 and, apparently, slightly longer than tibia 2. Regarding the description of Fry & Hedgpeth (1969), we did not observe setae on the palps as long as the segments. Our specimen does not appear to have the distal region of the proboscis so strongly curved upwards. The eyes do differ, and setae are also present on the posterior margins of the dorsal tubercles, as well as on the anterior margin.

Pushkin (1993) pointed out that the second tubercle of trunk is the large one, as we noted, and the presence of a "noticeable tubercle" (more like a small elevation) at the base of abdomen, not drawn by him, but illustrated by Fry & Hedgpeth (1969) and Gordon (1932). Like Fry & Hedgpeth (1969), Pushkin (1993) observed that the eyes are equals and the dorsal tubercles have setae just in the anterior margin. These observed differences noted by Fry & Hedgpeth (1969) and Pushkin (1993) differ not only from our specimen, but also from the original description. Yet, they represent small differences, of little taxonomical significance.

Discussion

Ammothea is one of the most speciose pycnogonid genera in Antarctic and Subantarctic waters, being represented by about 30 species (Munilla & Soler-Membrives 2009, Cano-Sánchez & López-González 2013, 2014). Our record represents the third for the species, well north (35° S) of the type locality for the Falkland (Malvinas) Islands, at 52° S (Fig. 9). The literature records a seasonal confluence of the Brazil and Malvinas Currents, formed by the distancing of the warm Brazilian Current (between 36–38° S) due the influence of the Subantarctic Malvinas Current. During winter there is a predominance of cold waters derived from the Malvinas Current, while warm waters derived from the Brazil Current are predominant during the summer (Scarabino et al. 2016). This confluence explains the findings of Subantarctic species along the coasts of Uruguay and southern Brazil (e. g. Silva Jr. et al. 1996, Carranza et al. 2007, Cataldi et al. 2010, Griffiths et al. 2011, Scarabino et al. 2016), as is the case of *Ammothea tetrapoda*. Other Subantarctic species of different genera have also been recorded for Uruguayan waters, such as *Ammothea longispina* Gordon, 1932, *Anoplodactylus vemae* Child, 1982, *Ascorhynchus cuculus* Fry & Hedgpeth, 1969, *Callipallene margarita* (Gordon, 1932), *Cilunculus acanthus* Fry & Hegdpeth, 1969, *Nymphon inferum* Child, 1995 and *Pallenopsis patagonica* (Hoek, 1881) (see Scarabino et al. 2019). Because Uruguay is strongly influenced by the Malvinas Current, mainly in winter, it is probable that other pycnogonid Subantarctic species will be discovered in the region (Child 1982, 1994, Miloslavich et al. 2011, Lucena & Christoffersen 2018).

According to Scarabino (2006), there are possibly three times more invertebrate species than presently known in Uruguayan waters (at least for inner shelf). Our result confirms the necessity of more studies for the region. We believe that the study of existing collections alone will represent a key factor for enhancing our knowledge of the local marine diversity.

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