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A new species of *Australonuphis* (Polychaeta: Onuphidae) from the eastern Pacific

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A new species of Australonuphis *Paxton, 1979 from the Ecuadorian coast, eastern Pacific, is described. The new species is characterized by seven modified parapodia, cirriform ventral cirri on the anterior 16 to 19 chaetigers, subacicular hooks beginning from chaetigers 43 to 57, and cirriform interramal processes on chaetigers 7–10 to 16–18 transformed back in a rounded lobe. This species belongs to the species group with unidentate pseudocompound hooks. Other species of this group are* A. beltrani *de León-González & Góngora-Garza, 1993,* A. hartmanae *(Friedrich, 1956),* A. parateres *Paxton, 1979 and* A. teres *(Ehlers, 1868).*

Keywords: Polychaeta, Onuphidae, eastern Pacific, new species

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INTRODUCTION

Onuphidae are tubicolous polychaetes, occurring in all oceans from the intertidal to the deepest depths (Paxton, 1986). The genus *Australonuphis* Paxton, 1979 comprises six species characterized by the presence of a limited number of parapodia directed anterolaterally, antennae and palps with moderately long ceratophores and short styles, mid-dorsal part of peristomium without distinct anterior fold, with the anterior pseudocompound hooks uni- to weakly bidentate, and subacicular hooks distally entire (Paxton, 1986). Four species of this genus are known from the American coast: *A. beltrani* de León-González & Góngora-Garza, 1993 from western México; *A. casamiquelorum* (Orensanz, 1974) from Brazil and Argentina; *A. hartmanae* (Friedrich, 1956) from El Salvador; and *A. violacea* Rozbaczylo & Castilla, 1981 from Chile. The other two are known from Australian waters: *A. parateres* Paxton, 1979; and *A. teres* (Ehlers, 1868) both from Australia. The American species differ from Australian ones by the presence of a cirriform interramal process between the dorsal cirri bases and prechaetal lobe.

Specimens here studied were collected from a sandy beach at Santa Elena Bay, San Pedro, Guayas province, Ecuador, at low tide. Once the opening of the tube was located, a small piece of fish was used as a bait to attract the worm to the anterior end of the tube. The specimens were pulled out of the sediment by hand, after grabbing the polychaete behind the head. Type materials were deposited in the Colección Poliquetológica, Universidad Autónoma de Nuevo León (UANL), Los Angeles County Museum of Natural History, Allan Hancock Foundation (LACM-AHF) and the National Museum of Natural History, Smithsonian Institution (USMN).

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SYSTEMATICS

Family ONUPHIDAE Kinberg, 1868
Australonuphis Paxton, 1979
Australonuphis paxtonae sp. nov.
(Figures 1 A–D, 2 A–F)

Material examined

Holotype (UANL 6488), paratype (UANL 6489), paratype (LACM-AHF 0000), paratype (USNM-000000), 15 November 2006; 5 specimens, January 2007; 6 specimens, February 2007; 2 specimens, March 2007, Santa Elena Bay, Ecuador 1°56′30″S and 80°43′30″W; intertidal, coll. Maria Herminia. Cornejo-Rodríguez *et al.*

Description

Holotype complete, body robust, cylindrical anteriorly until segment 10, later flattened dorsally, convex ventrally. Chaetigers 2 to 8 light brown, rest of body without colour pattern. With 720 chaetigers, 420 (365–420) mm long, 7 (7–8) mm wide including parapodia. Anterior end modified, first 7 parapodia directed anteriorly in all specimens.

Prostomium small, without eyes; with two oval frontal lips, three occipital antennae, and a pair of palps, last two structures with ringed ceratophores and tapering styles. Ventrally with a pair of triangular upper lips, basally fused and divided distally. Median antenna reaches anterior end of chaetiger 5 (5–6), ceratophore with 12 (8–12) rings; lateral antennae reach chaetiger 2, ceratophore with 9 (8–9) rings; palps shorter, not reaching the posterior end of peristomium, ceratophore 4 (4–5) rings. Peristomium 1.5x longer than first chaetiger, mid-dorsal part of peristomium lightly marked as an anterior fold, when median antenna is manipulated to the anterior end, then peristomium appears like a continuous extention to basis of median antenna. With a pair of peristomial cirri inserted distally, shorter than peristomium (Figure 1A).

Parapodia of seven anterior chaetigers similar in structure, greatly enlarged, stout and directed anteriorly. First parapodium biggest, formed by a basal truncate structure followed by a rounded prechaetal lobe expanded in the first chaetigers, present along the body, diminishing their size gradually until prepygidal segments. Postchaetal lobe cirriform, well developed in the first seven parapodia, diminishing in size towards the posterior chaetigers, always cirriform. Dorsal cirri slender, distally thin. Ventral cirri subulate to cirriform, shorter than dorsal cirri (Figure 1B–D). From chaetiger 8, dorsal cirri with a recurved basal digital process (Figures 1D & 2A). Ventral cirri digitiform in the first 17 (16–19) chaetigers, posteriorly transformed in a ventral pad. From chaetiger 8 (7–10) to 17 (16–18) with a cirriform interramal process between the dorsal cirri bases and prechaetal lobe (Figure 1D), from chaetiger 18 to 53 rounded anteriorly, diminishing in size until disappearing from chaetiger 54.

Branchiae from chaetiger 6 (6–8) with one filament, chaetiger 7 with 2, 8 with 3, 9 with 4, from chaetiger 10 to 157 with 5, from chaetiger 158 to 317 with 6, from chaetiger 318 to 337 with 7 filaments, from chaetiger 338 towards posteriors with 6 filaments, the last prepygidal chaetigers only with one filament appears. In paratypes and non-type material, branchial filaments show a similar distribution.

Anterior 7 parapodia with stout, unidentate pseudocompound hooks in all specimens, those of anterior parapodia with hooks slightly curved and short blade (Figure 2D), from chaetiger 5 to 7 these hooks are curved with long blade (Figure 2E). These types of hooks are accompanied with 1–2 limbate chaetae per parapodium. Following chaetigers with simple limbate chaetae. Pectinate chaetae from chaetiger 8, with 15–16 teeth (Figure 2F). Subacicular hooks from chaetiger 50 (43–57), distally entire (Figure 2G).

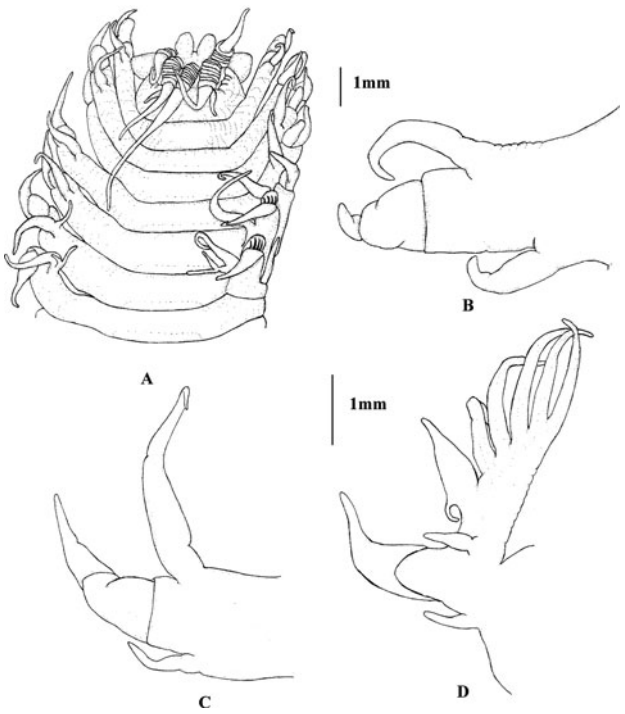

Fig. 1. *Australonuphis paxtonae* sp. nov. (A) Anterior end, dorsal view; (B) first parapodium, anterior view; (C) parapodium 5, anterior view; (D) parapodium 17, anterior view.

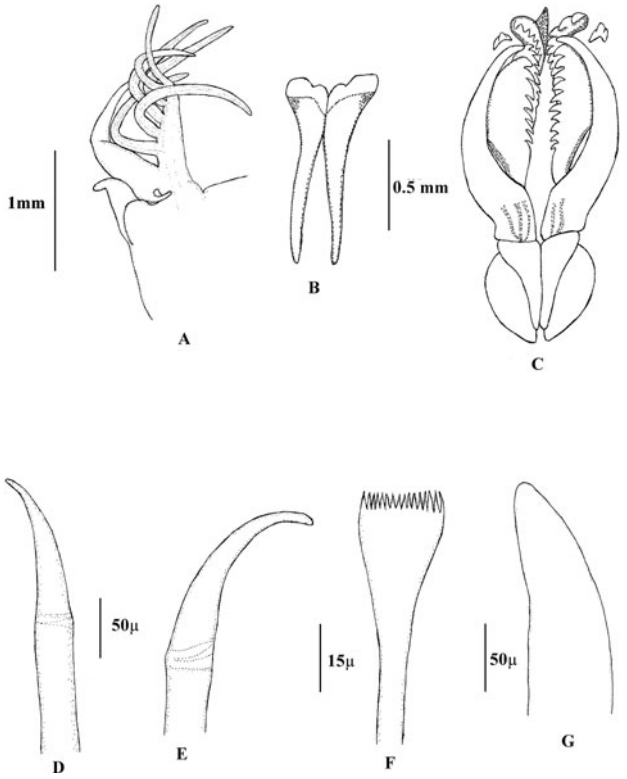

Fig. 2. *Australonuphis paxtonae* sp. nov. (A) Parapodium 626, anterior view; (B) mandible, anterior view; (C) maxillary apparatus; (D) pseudocompound hook from first parapodium; (E) pseudocompound hook from parapodium 5; (F) pectinate chaeta from parapodium 170; (G) subacicular hook from same parapodium.

Pygidium with terminal anus, a dorsal process enlarged with two slender cirri, and a shorter ventral process without cirri.

Jaws calcified, robust. Mandibles fused distally, with two bilobulate anterior calcified cutting plates (Figure 2B). Maxillary apparatus not seen in holotype, paratypes dissected, maxillary formula: MxI = 1 + 1; MxII = 7 + (8–10); MxIII = 8 + 0; MxIV = (6–7)+ (6–9); MxV = 1 + 1 (Figure 2C).

Etymology

The specific name is a modest homage to Hannelore Paxton for her work on onuphid polychaetes.

DISCUSSION

Australonuphis paxtonae sp. nov. differs from all *Australonuphis* species by the presence of 7 modified parapodia. *Australonuphis beltrani* and *A. hartmanae* have 6 modified parapodia, *A. casamiquelorum*, and *A. violaceus* have 5, *A. parateres* and *A. teres* have 5 or 6. In the case of *A. hartmanae* Friedrich (1956) comments in his paper that the parapodia 7 and 8 are transitional to normal parapodia.

Australonuphis paxtonae is close to *A. beltrani*, both these species differ in the following characteristics: relative size of median antennae, number of ceratophore rings on lateral

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Table 1. Comparison of main morphological features between *Australonuphis* species: (A) number of ceratophore rings on median antenna; (B) number of ceratophore rings on lateral antennae; (C) number of ceratophore rings on lateral palps; (D) relative length of median antenna style (reach chaetiger __); (E) digitiform ventral cirri to chaetiger __; (F) number of parapodia with pseudocompound hooks; (G) shape of pseudocompound hooks; (H) maximal number of branchial filaments; (I) start of subacicular hooks (parapodia); (J) maxillary formula.

	A	B	C	D	E	F	G	H	I	J
A. beltrani	9–10	9–10	7–10	2	18–22	6	unidentate	8	44	1 + 1; 8 + 8 (6 to 8 + 8-10); 6 + 0; 8 + 8 (6 to 8 + 8 to 10); 1 + 1
A. casamiquelorum	10	10	10	5	10–16	5	weakly bidentate	4	50–56	1 + 1; 5 + 5; 7 + 0; 6 + 4-5; 1 + 1
A. hartmanae	8	12–13	8	5	17	6	unidentate	5–6	?	?
A. teres	9–14	9–14	4–6	2–3	8–12	6	unidentate	7	65–75	1 + 1; 6 + 6; 8 + 0; 7 + 8; 1 + 1
A. parateres	9–14	9–14	4–6	2–3	8–13	6	unidentate	7	50–75	1 + 1; 6 + 7 (4 to 9 + 5 to 9); 7 + 0 (6 to 9 + 0); 6 + 8 (4 to 8 + 5 to 9); 1 + 1
A. paxtonae sp. nov.	8–12	8–9	4–5	5–6	16–19	7	unidentate	6–7	43–57	1 + 1; 7 + (8 to10); 8 + 0; (6 to 7) + (6 to 9); 1 + 1
A. violaceus	8–10	7–10	6–8	4	17–25	5	weakly bidentate	6–7	60	1 + 1; 7 + 7; 7 + 0; 7-8 + 8; 1 + 1

palps, number of anterior parapodia with pseudocompound hooks, shape of interramal process, number of teeth on Maxillae III, and shape of Maxillae V. In *A. beltrani* style of median antenna reaches chaetiger 2, ceratophore of lateral palps with 7 rings in holotype and 9–10 in both paratypes, unidentate pseudocompound hooks on first six parapodia, cirriform interramal process located between the dorsal cirri bases and prechaetal lobe from chaetiger 8, on chaetiger 9 this structure is transformed in a subconical lobe, diminished in size to the end of fragment in holotype (with 52 chaetigers) and paratypes, Maxillae III formed by 6 conical teeth and Maxillae V like a chitinous flat plate. While in *A. paxtonae* style of median antenna reaches chaetigers 5 to 6, ceratophore of lateral palps formed by 4 to 5 rings, unidentate pseudocompound hooks on first seven parapodia invariably, interramal process cirriform on first (7–10) to (16–18) parapodia, posteriorly transformed in a rounded lobe which diminishes its size posteriorly, Maxillae III formed by 8 conical teeth, and Maxillae V with a well formed tooth. The variations of characters of the other species can be seen in Table 1.

Interramal process between dorsal cirri bases and prechaetal lobe is described only in American *Australonuphis* species with the exception of *A. hartmanae* which is known only from its original description. Besides *A. beltrani* and *A. paxtonae* described previously, *A. casamiquelorum* presents this structure cirriform from chaetiger 7 to chaetiger 170 where that structure disappears. In *A. violacea* this structure appears from chaetiger 7 like a cirriform appendix, from parapodia 12 to 15 the structure becomes a rounded lobe, from parapodia 40 this lobe moves ventrally fusing with the prechaetal lobe resulting in a presetal lip which replaces the prechaetal lobe on chaetigers 65–70 (Rozbacylo & Castilla, 1981). In *A. paxtonae* the interramal process never replaces the prechaetal lobe.

Peristomium anterior end in *A. casamiquelorum* and *A. paxtonae* is slightly marked, but this character can be due to the fixation of specimens (Orensanz personal communication). In *A. paxtonae* when median antenna is manipulated and directed anteriorly, then there appears a continuous mark from anterior end of prostomium to median antenna basis, characteristic of *Australonuphis* species.

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