

First record of the Levantine species *Scoloplos haasi* (Orbiniidae: Scolecida: Annelida) from the Mediterranean coast of Spain

EDUARDO LÓPEZ

Departamento de Biología (Zoología), Universidad Autónoma de Madrid, E-28049, Spain

During an investigation devoted to characterize all the Orbiniidae polychaete species present in the Iberian Peninsula, several individuals previously identified as Scoloplos armiger showed to actually belong to Scoloplos haasi, a species to date considered endemic from Israel. The comparison with the holotype deposited in the British Museum of Natural History confirmed the identification. This record of S. haasi is not only a new one for the western Mediterranean but also the first one out of its original locality, extending largely westwards the geographical range of the species.

Keywords: first record, Levantine species, *Scoloplos haasi*, Mediterranean coast of Spain

Submitted 18 June 2009; accepted 3 September 2009; first published online 9 December 2009

INTRODUCTION

The Orbiniidae (Scolecida: Annelida) are non-selective sub-surface deposit feeding polychaetes that are commonly found in sediments, usually at shallow depths. In most species, the very long body is divided in a short, muscular anterior thorax and much longer and weaker abdomen. In thoracic chaetigers neuropodial ramus usually is low and composed of several rows of chaetae, whereas in abdominal ones both rami are lobe shaped and dorsally shifted. Most species bear various kinds of chaetae, crenulated capillaries being the most characteristic. The presence/absence of neuropodial hooks (or uncini) in thoracic neuropodia is a distinguishing feature at genus level. Lastly, a number of species bear forked chaetae on abdominal notopodia. The most important review of the family systematics was by Hartman (1957), in which all the genera known so far were redefined; more recently Blake (2000) and Bleidorn (2005) made relevant updates of the systematics within the family.

During a project aiming to characterize the polychaete fauna pertaining to a number of families on the Iberian coasts on the basis of fresh material and museum collections, several specimens wrongly labelled as *Scoloplos armiger* (O.F. Müller, 1776) were found. After investigation, they were demonstrated to belong to *Scoloplos haasi* (Monro, 1937), a species described from shore environments in Israel and never again recorded; the comparison with the holotype of the species did not show relevant differences in their anatomical features. This conclusion was supported by the examination of specimens of *S. armiger*, both from the Iberian Peninsula and from the type locality area, and of *Scoloplos*

typicus (Eisig, 1914), the other species of the genus previously cited from the Iberian coasts.

MATERIALS AND METHODS

All the studied specimens were provided by the invertebrate collections of the British Museum of Natural History (BMNH), in London, from Zoologisk Museum of Københavns Universitet (ZMUC), and from Museo Nacional de Ciencias Naturales/CSIC (MNCN), in Madrid. After collection, the specimens had been preserved in 70% ethanol, in some cases for a very long time. However, all of them were in good condition and it was possible to properly observe the relevant taxonomic characters. Anatomical examination was made under a Nikon SMZ800 stereomicroscope, a Wild stereomicroscope provided with a camera lucida drawing device, and a Nikon Optiphot biological microscope with differential contrast optics (Nomarski) provided with a drawing tube.

SYSTEMATICS

Family ORBINIIDAE Hartman, 1942
Genus *Scoloplos* Blainville, 1828

DIAGNOSIS

Orbiniidae bearing prostomium conical or pointed, with a slightly rounded tip in a few species; with peristomium formed of a single achaetous ring; possessing thoracic neuropodia bearing hooks arranged in one or more rows and bearing or not crenulated capillaries and abdominal neuropodia bearing crenulated capillaries occasionally accompanied by flail-tipped chaetae; subpodal papillae absent or scarce, never forming complete ventral rings; interramal cirri absent, lateral ciliated organ more or less distinct.

Corresponding author:

E. López

Email: eduardo.lopez@uam.es

KEY TO THE IBERIAN SPECIES OF THE GENUS

1. Thoracic neuropodia bearing many more hooks than crenulated capillaries. 2
 - Thoracic neuropodia bearing as many or more crenulated capillaries than hooks *S. armiger*
2. Furcate and flail-tipped chaetae absent, abdominal notopodial postchaetal lobes axe-shaped and with a very distinct subdistal widening. *S. haasi*
 - Furcate and flail-tipped chaetae present, abdominal notopodial postchaetal lobes falcate and similarly wide all along. *S. typicus*

Scoloplos haasi (Monro, 1937)

Figure 1

Scolaricia haasi Monro, 1937.

Scoloplos haasi: Tebble, 1959.

Scoloplos armiger (non O.F. Müller): Redondo & San Martín, 1997.

MATERIAL EXAMINED

Scoloplos haasi (Monro, 1937). BMNH 1937.4.7.38, shore, between Acre and Jaffa (Israel), date unknown, holotype. MNCN 16.01/2541, infralittoral fine sand, between Cabo San Antonio and Port of Valencia (eastern Spain), 29 April 1996, one specimen. MNCN 16.01/2543, infralittoral fine sand, between Cabo San Antonio and Port of Valencia (eastern Spain), 29 April 1996, one specimen. MNCN 16.01/4330, Denia (eastern Spain), 5 April 1998. MNCN 16.01/5937, infralittoral fine sand between 2 and 15 m depth, Port of Sagunto (eastern Spain), 27 August 1999, two specimens.

COMPARATIVE MATERIAL EXAMINED

Scoloplos armiger (O.F. Müller, 1776): MNCN 16.01/403, intertidal sand, Santander (northern Spain), March 1917, one specimen. MNCN 16.01/3999, fine sand 34.5 m depth, Cabo Peñas, Asturias (northern Spain), 5 April 1998, one specimen. MNCN 16.01/4274, fine sand 27 m depth, Cabo Peñas, Asturias (northern Spain), 5 April 1998, one specimen. ZMUC-POL-1863, sand and gravel 5–17 m depth, Hasmark, northern Funen (Denmark), 10 September 1985. ZMUC-POL-1864, hard sandy bottom 9–10 m depth, Fredrikshaven, Kattegat (Denmark), 5 July 1971. ZMUC-POL-1865, sand mixed with clay and detritus 30–32 m depth, southern Knähaken, Ørensund (Denmark), 6 August 1968.

Scoloplos typicus (Eisig, 1914): MNCN 16.01/404, intertidal sand, Vigo (north-western Spain), October 1975, five specimens. MNCN 16.01/2543, infralittoral fine sand, between Cabo San Antonio and Port of Valencia (eastern Spain), 29 April 1996, one specimen. MNCN 16.01/4327, infralittoral, Almarda Beach, Sagunto (eastern Spain), 27 August 1999, one specimen.

DESCRIPTION

Holotype is the largest specimen examined; 60 mm long for 165 chaetigers; largest Iberian specimen 1.9 mm wide at middle thorax, 1.3 mm wide at the beginning of the abdomen, 16 mm long for 47 chaetigers. Body yellowish in alcohol. Prostomium pointed and dorsoventrally depressed (Figure 1A, B); bearing retractile anterior apical organ; lacking appreciable eyes but bearing lateral nuchal organs on a dorsal posterior position. Peristomium achetous (Figure 1A); very short and sharply

widening to thorax width, dorsally fused to first chaetiger; mouth ventral and extending to anterior end of first thoracic chaetiger. Thorax (Figure 1A, B) consisting of the peristomium and 23 chaetigers, slightly flattened in section in its anterior half, then becoming cylindrical on posterior thoracic chaetigers. Notopodia as short low ridges without postchaetal lobe on first five chaetigers; remaining thoracic chaetigers with a postchaetal lobe, first papilliform, increasing in length towards posterior thorax (Figure 1C); bearing 50–65 slightly curved, crenulated capillaries. Neuropodia bearing postchaetal lobes as low transverse ridges, very long from chaetiger 1 to 16 (Figure 1B, C); from this chaetiger to the end of thorax progressively shorter and shifting to dorsum. From chaetiger 3, neuropodia with a rounded postchaetal process dividing the posterior-most row of chaetae (Figure 1C); processes progressively longer, becoming piriform in posterior thoracic chaetigers; more dorsally placed on the lobe as more posterior to the thoracic chaetiger. Neuropodia bearing 50–75 thick, distinctly curved hooks arranged in rows; anterior and posterior thoracic chaetigers with three rows of hooks; central thoracic chaetigers bearing four rows, most posterior one incomplete, extending only through the ventral half of lobe; hooks usually bearing a translucent distal hood (Figure 1D), in larger specimens hooks lack appreciable transversal sculpture but in smaller ones those forming the posterior row show a distinct sculpture; each neuropodia bearing 27–30 slender crenulated capillaries, similar to corresponding notopodial ones, forming a row posterior to uncini and interrupted by postchaetal process. Chaetigers 21–23 transitional (Figure 1E); notopodial lobes similar to those of adjacent thoracic chaetigers, bearing up to 80 crenulated capillaries; neuropodial lobes also similar to those of adjacent thoracic chaetigers, bearing a piriform postchaetal process, with very few hooks (always less than 20) and up to 75 crenulated capillaries making two rows, one in front and the other behind the hooks. Abdomen cylindrical in section, incomplete in all the studied specimens; parapodial lobes dorsally shifted in a clear way. Notopodial lobes supported by two very fine, hardly protruding aciculae; bearing large postchaetal lobes, axe-shaped and with a very distinct subdistal widening (Figure 1F); possessing about 70 crenulated capillaries in anterior abdomen, similar to those in thorax but longer; forked chaetae absent. Interramal organ present (Figure 1F), large and with well developed ciliation, located nearer to notopodium than to neuropodium; interramal cirri absent. Neuropodia bilobed, with dorsal prechaetal lobe longer and supported by three slightly curved aciculae with clearly protruding tips (Figure 1F); bearing three or four crenulated capillaries similar to corresponding notochaetae and up to four slightly thicker ones, with tip abruptly tapering but not really being flail-tipped (Figure 1G); subpodial flange of median size (Figure 1F), increasingly larger to a maximum on chaetigers 30 to 35, then progressively smaller. Branchiae erected, from chaetigers 22–23 in Iberian specimens (from chaetiger 25 in holotype); first pairs shorter and papilliform (Figure 1A, B); the rest lanceolate, tapering to a rounded tip, one and a half times longer than notopodial postchaetal lobe, bearing well developed fimbriation that only reaches basal half of the branchia (Figure 1F). Pygidium not seen.

DISCUSSION

Apart from the smaller size, the specimens of *Scoloplos haasi* collected from the Mediterranean coast of Spain do not show observable differences with the holotype, so the identification

of the species is accurate. In a previous study (Redondo & San Martín, 1997) these specimens were misidentified as *S. armiger* and it is likely that many records of the latter species from the Mediterranean actually should be referred to *S. haasi*. In fact, *S. armiger* which was originally described from the north-eastern Atlantic (Denmark) has been widely recorded from all around the world, but in many cases superficial examination probably led to misidentifications and in

some others it might hide a species complex (Kruse & Reise, 2003; Kruse *et al.*, 2004).

Previous to this record, only two species of the genus *Scoloplos* were known on the Mediterranean coast of Spain (Ariño, 1987): the aforementioned *S. armiger* and *S. typicus* (Eisig, 1914). Due to their variability in *S. armiger*, the anatomical features usually employed in Orbiniid identification (namely, number of thoracic chaetigers and first segment

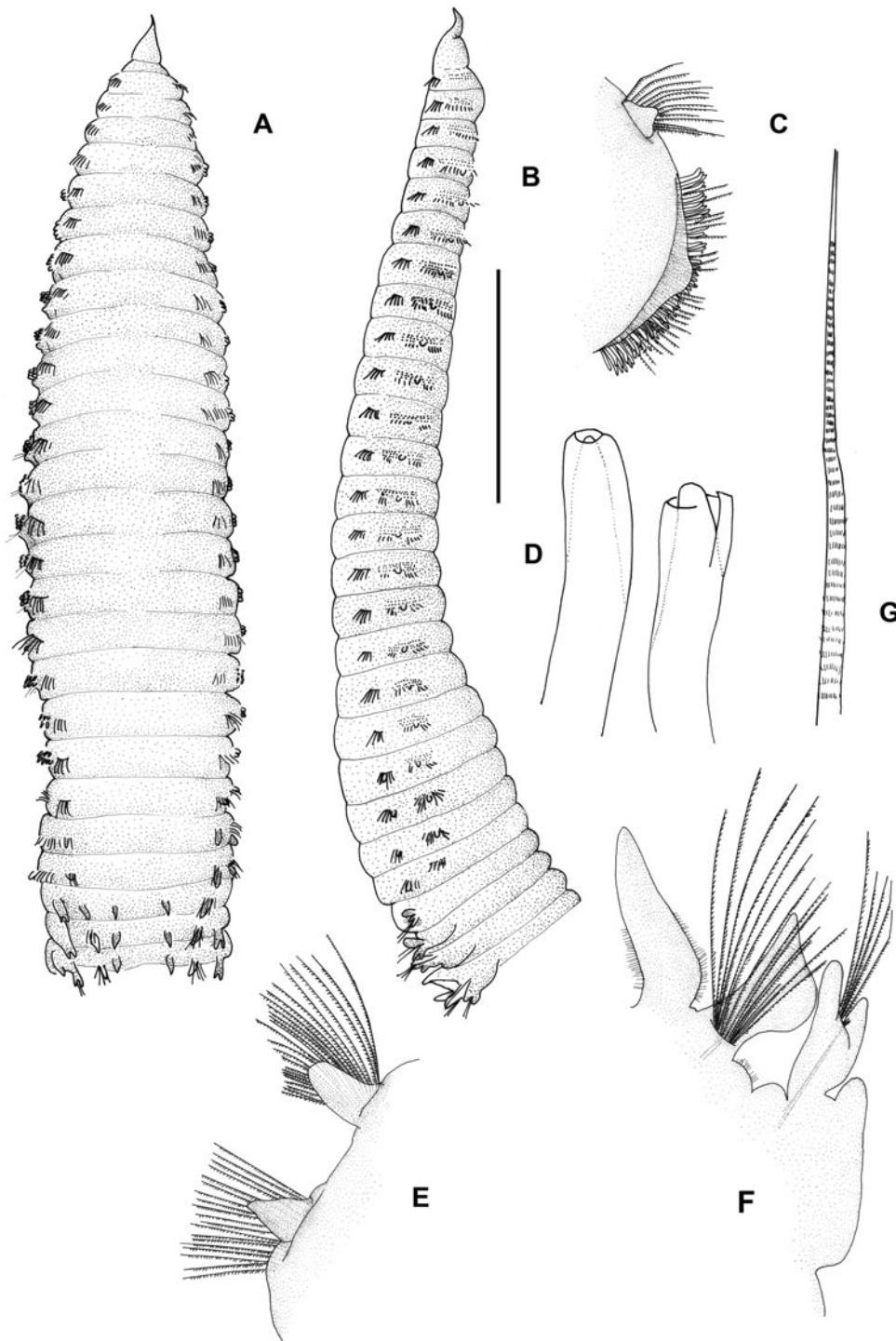


Fig. 1. *Scoloplos haasi* (Monro, 1937). (A) Anterior end in dorsal view; (B) same in lateral view; (C) parapodium from chaetiger 10, posterior view; (D) neuropodial hooks from the same chaetiger; (E) parapodium from chaetiger 23, posterior view; (F) parapodium from chaetiger 32, anterior view; (G) crenulated capillary neurochaeta from the same. Scale bars: (A, B) 2.6 mm; (C, E) 0.45 mm; (D) 75 μ m; (F) 0.45 mm; (G) 56 μ m.

bearing branchiae) are of no use for distinguishing it from *S. haasi*. In current literature (Hartmann-Schröder, 1996; Böggemann, 1997), European *S. armiger* are described as having 12–22 thoracic chaetigers and branchiae starting on chaetigers 9–12, whereas from the present study *S. haasi* was observed to possess 23 thoracic chaetigers and branchiae starting on chaetigers 22–25. These subtle differences possibly caused *S. haasi* to pass overlooked in the area (and probably from other Mediterranean localities where it might be present). However, when chaetal characters are taken into account clearer differences arise. In this respect, the most definitive trait is the arrangement in thoracic neuropodia, which are composed chiefly of crenulated capillaries accompanied by a few hooks in *S. armiger* and of several ranges of hooks and a single row of fine capillaries in *S. haasi*. The third Iberian species, *S. typicus*, also was observed to have thoracic neuropodia bearing several rows of hooks and very few capillaries, as in the original description (Eisig, 1914), being more similar to *S. haasi*. However, in the former species the abdominal notopodia bear conspicuous forked chaetae (absent from *S. haasi*; inconspicuous in *S. armiger*) and the neuropodia bear real flail-tipped capillaries (in *S. haasi* and *S. armiger* abdominal neurochaetae can show a subdistal narrowing, but this condition is anatomically different). In addition, *S. typicus* possesses a shorter thorax composed of 17 chaetigers, branchiae starting on a distinctly more anterior position (chaetigers 13–14 instead of chaetigers 22–25), and thin, falcate postchaetal lobes in abdominal segments instead of subdistally broad.

ACKNOWLEDGEMENTS

The author wishes to express his gratitude to the research staff of the Project, especially to Dr Julio Parapar, and to the curator staff of the various museums who lent the material examined for the study (Emma Sherlock from the British Museum of Natural History, Majken Them Jensen from Zoologisk Museum, Københavns Universitet and Javier Sánchez from Museo Nacional de Ciencias Naturales de Madrid). The comments and suggestion of two anonymous referees are to be gratefully acknowledged, for their contribution to the scientific quality of this communication. The present work was financially supported by the Spanish Ministerio de Ciencia y Tecnología through the research project 'Fauna Ibérica VIII. Anélidos Poliquetos III. Scolecida, Amphinomida y Phyllococida. CGL2004-04680-C10-02/BOS'.

REFERENCES

- Ariño A.** (1987) *Optimización de los estudios faunísticos: ensayos sobre poliquetos sedentarios ibéricos*. PhD thesis. Universidad de Navarra, Pamplona, Spain.
- Blake J.A.** (2000) A new genus and species of polychaete worm (family Orbiniidae) from methane seeps in the Gulf of Mexico, with a review of the systematics and phylogenetic interrelationships of the genera of Orbiniidae. *Cahiers de Biologie Marine* 41, 435–449.
- Bleidorn C.** (2005) Phylogenetic relationships and evolution of Orbiniidae (Annelida, Polychaeta) based on molecular data. *Zoological Journal of the Linnean Society* 144, 59–73.
- Böggemann M.** (1997) Polychaeten aus der Deutschen Bucht. *Courier Forschungsinstitut Senckenberg* 202, 1–315.
- Eisig H.** (1914) Zur Systematik, Anatomie und Morphologie der Ariciiden nebst Beiträgen zur generellen Systematik. *Mitteilungen aus der Zoologischen Station zu Neapel* 21, 153–593.
- Hartman O.** (1957) Orbiniidae, Apistobranchiidae, Paraonidae and Longosomidae. *Allan Hancock Pacific Expedition* 15, 211–393.
- Hartmann-Schröder G.** (1996) *Die Tierwelt Deutschland. 58. Teil. Annelida, Borstenwürmer, Polychaeta 2, Neubearbeitete Auflage*. Jena: Gustav Fischer.
- Kruse I. and Reise K.** (2003) Reproductive isolation between intertidal and subtidal *Scoloplos armiger* (Polychaeta, Orbiniidae) indicates sibling species in the North Sea. *Marine Biology* 143, 511–517.
- Kruse I., Reusch T.B.H. and Schneider M.V.** (2003) Sibling species or poecilogony in the polychaete *Scoloplos armiger*? *Marine Biology* 142, 937–947.
- Monro C.C.A.** (1937) A note on a collection of Polychaeta from the Eastern Mediterranean, with the description of a new species. *Annals and Magazine of Natural History, London, Series 10* 19, 82–89.
- Redondo M.S. and San Martín G.** (1997) Anélidos poliquetos de la costa comprendida entre el cabo de San Antonio y el Puerto de Valencia (Mediterráneo occidental). *Publicaciones especiales del Instituto Español de Oceanografía* 23, 225–233.
- and
- Tebble N.** (1959) On a collection of polychaetes from the Mediterranean coast of Israel. *Bulletin of the Research Council of Israel* B8, 9–30.
- Correspondence should be addressed to:**
E. López
Departamento de Biología (Zoología)
Universidad Autónoma de Madrid, E-28049, Spain
email: eduardo.lopez@uam.es