

A NEW SPECIES OF SHALLOW WATER SABELLARIIDAE (ANNELIDA: POLYCHAETA) FROM MADEIRA ISLAND, PORTUGAL, AND CANARY ISLANDS, SPAIN

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A new species of Sabellariidae (Annelida, Polychaeta), *Lygdamis wirtzi*, is described, based on material from Madeira and Canary Islands, northeastern Atlantic Ocean. The specimens were collected from sandy bottom at 7 to 14 m depth. The new species is characterised by the shape of the inner and outer paleae and of the nuchal hooks. The feeding position of living animals is described.

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A descrição de uma nova espécie de Sabellariidae (Annelida: Polychaeta), *Lygdamis wirtzi*, é feita, baseada em material da Madeira e Ilhas Canárias, Oceano Atlântico Nordeste. Os espécimes foram recolhidos em fundo arenoso numa profundidade entre os 7 e 14 metros. A nova espécie é caracterizada pela forma do *paleae* interior e exterior e pelos ganchos nucais. A posição de alimentação do organismo vivo é descrita.

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INTRODUCTION

Sand tube- and reef forming polychaetous annelids of the family Sabellariidae have attracted the attention of a number of scientists but their taxonomy had been poorly known before the revision of the family by KIRTLEY (1994). After this monograph had been published, a few additional species were described from the Pacific Ocean (e.g., LECHAPT & KIRTLEY 1996, 1998; NISHI & KIRTLEY 1999). Dr. Peter Wirtz sent some material of *Lygdamis*, which he collected at Madeira Island to David Kirtley, who replied (January 1997, pers. comm. to P. Wirtz) that the

material belonged to a new species, which he planned to describe as *L. wirtzi*. In July 1997, Dr. Kirtley unfortunately died. Dr. Wirtz kindly sent me fresh material of Madeiran *Lygdamis*, which we here describe. The second author provided additional materials during the survey of Canary Islands, Salvage Islands, and Western Sahara.

MATERIALS AND METHODS

Specimens were collected by Dr. Peter Wirtz and Mr. J. Escatler using SCUBA gear, gently digging the animals out from sandy bottom at Madeira Island, in 14 m depth, at the margin of rock and

sand, in front of Hotel Galomar, Caniço, in December, 1998, and 7 to 10 m depth at Canary Islands, 1995. Three specimens were anaesthetised in a MgCl solution and stored in 70% ethanol. The material was then sent to Coastal Museum and Natural History, Katsuura, Japan, it was examined and dissected under a light microscope. Paleae and setae were observed under scanning electron microscopy (SEM). For the SEM observation, paleae and parapodia were transferred to 80, 90, 95, 99, 100% ethanol, air-dried, coated with paradium and Pt, and finally

viewed on a Hitachi S-800 SEM. The specimens are now deposited in the Coastal Museum of Natural History (CMNH-ZW) and Museum of Sciences of Tenerife (MCT).

RESULTS

Family Sabellariidae Johnston, 1865

Subfamily Lygdaminae Kirtley, 1994

Genus *Lygdamis* Kinberg, 1867

Lygdamis wirtzi new species

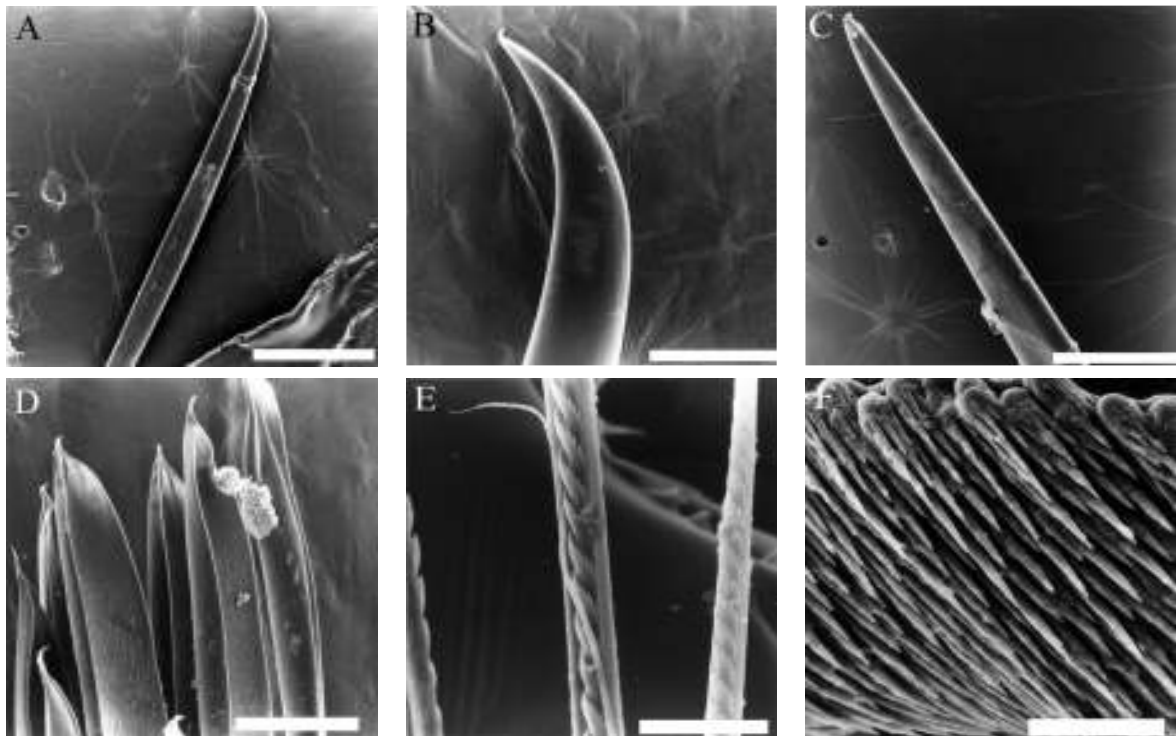


Fig. 2. *Lygdamis wirtzi* SEM photos of paleae and chaetae. A-B, inner palea. C, outer palea. D, paleae from parathoracic 2nd segment. E, abdominal chaetae. F, abdominal uncini. Scale shows 750 μm (A), 100 μm (B), 500 μm (C) 150 μm (D), 30 μm (E), 25 μm (F).

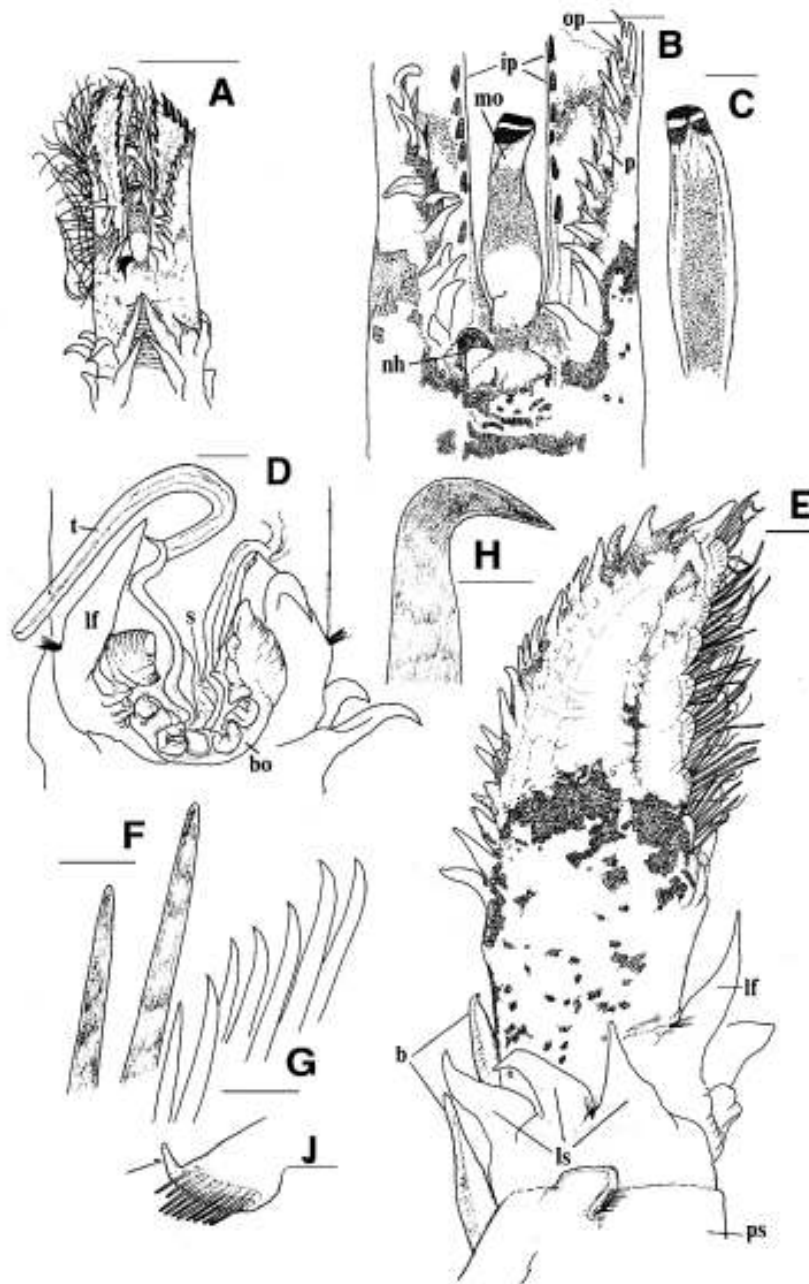


Fig. 1. *Lygdamis wirtzi*. A, dorsal view of crown and anterior thorax of holotype. B, dorsal view of middle part of crown showing median organ (mo), rows of paleae (ip, inner palea; op, outer palea), left nuchal hook (nh; lacking right hook) and papillae (p). C, ventral view of median organ. D, ventral view of mouth, tube-building organ (bo), prostomial tentacles (t), stoma (s) and anterior thoracic segments (lf, lobe of first setigerous segment). E, right view of crown and anterior thorax of holotype showing a conical lobe with a fascicle of chaetae on first setiger (lf), three conical lobes on second setiger (is), branchia (b), parathoracic segment (ps) and dotted pigmentation on opercular lobe. F, inner palea. G, row of outer palea. H, nuchal hook. J, notopodial sheave of first parathoracic segment showing a cirri (arrow) on dorsal side. Scale shows 5 mm (A), 1 mm (B, C, D, E), 0.5 mm (F, G, H).

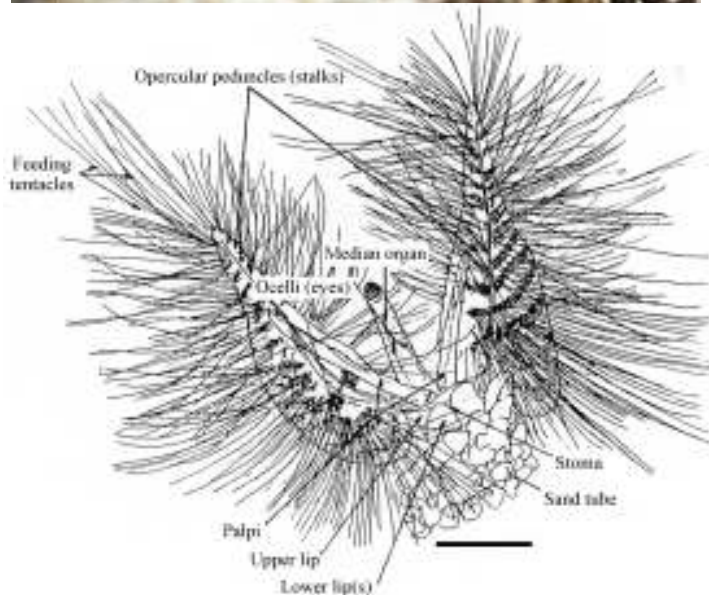


Fig. 3. *Lygdamis wirtzi*. The two opercular lobes in the feeding position: upper, colour photo of living animal taken by Peter Wirtz; lower, figure drawn by David W. Kirtley.

MATERIAL EXAMINED

Holotype, CMNH-ZW-30, Madeira Island, 14 m depth, at the margin of rock and sand, in front of Hotel Galomar, Caniço, December 1998, collected by Dr. Peter Wirtz. Two paratypes, -ZW-31 and 32, same data as holotype. Two paratypes, CMNH-ZW-51 and 52, and one paratype, MCT-XXX, same data as holotype. Three paratypes, MCT-XXX and -XXX, Canary Island, Tenerife, 7 m depth, sandy bottom with stones, part of the tube under stones, Teresitas Beach, San Andres, September 1994, collected by J. Escatller; one paratype, NCT-XXX, Canary Islands,

Tenerife, 10 m depth, stones with gravel, Palm-Mar, Adeje, December 1995, collected by J. Escatller.

DESCRIPTION

Holotype and paratypes complete; total length 95 mm excluding cauda, 100 mm including cauda (holotype), thoracic diameter 4 mm, abdominal diameter 4-5 mm. Anterior end of opercular stalk completely divided into bilaterally symmetrical lobes (Fig. 1A, 3 lower). Opercular paleae of two kinds, in curved, dorso-ventral rows (Fig. 1F, G). Outer paleae 28-43 in number, 2 mm long, protruding 0.5-1 mm from lobe, semi-transparent, slender, smooth-sided, flattened in cross section, with curved tips (Fig. 1G, 2B-C); inner paleae 18-28 in number, 3-4 mm long, protruding 0.5-2 mm from lobe, light brown, smooth, terminating in blunt point (Fig. 1F, 2A). A series of 30-35 conical palpi along anterior margin of each lobe (Fig. 1A, B). Falcate dorsal nuchal hooks, tips recurved inward toward dorsal midline (Fig. 1H). With well-developed median organ, about half-length of lobe, arising from dorsal sagittal suture between opercular lobes (Fig. 1B, C). Top of median organ with dark brown with white line, middle part with light brown, lower part pale white. Ventrally middle part light brown; with a black line on each side distally (Fig. 1C). A pair of ocelli on ventral lower part of median organ (Fig. 3 lower) not discernible in fixed materials (Fig. 1C).

Over 100 pairs of filiform feeding tentacles on ventral margins of inner sides of opercular peduncle, outer row tentacle whitish with a line of brown slit, inner row light brown. A pair of prehensile prostomial tentacles, nearly same length of operculum, arising from anterior margin of upper lip of stoma (Fig. 1D). Large U-shaped building organ with small papillae on lateral margins, and on each side a large conical lobe, each with a fascicle of short, finely serrate slender chaetae (Fig. 1D, E). Second setigerous segment with three conical lobes on each side and ventral one with a fascicle of slender finely serrate chaetae dorsal to the middle lobe (Fig. 1E). Four parathoracic segments with tiny cirri on distal margin of setigerous notopodial sheaves (Fig. 1J); 8-10 paired, stout setae with lanceolate distal tips (Fig. 2D) and spinous chaetae. Neuropodial chaetae similar but smaller in size and fewer in number. Dorsal branchiae well developed on parathoracic segments (Fig. 1A) and first to 10th abdominal segments, diminished in size on 11-14th segments, absent on posterior ones. Abdominal segments, 60 in holotype, with bundles of long, spiny neurosetae (Fig. 2E) and uncinigerous notopodial tori (Fig. 2F). Tube constructed with coarse sand particles (Fig. 3).

ETYMOLOGY

The new species is named after Dr. Peter Wirtz, who collected the material from Madeira.

ECOLOGY AND FEEDING POSITION

According to Dr. Wirtz, the species is common around Madeira Island, from about 5 m depth down to at least 35 m depth. It commonly occurs in sandy substrate close to rock or gravel, the final 5 cm of the tube (which may be more than 15 cm long) being firmly attached to hard substrate. Dr. Wirtz took numerous photos of the new species in the field and some of these photos (e.g. Fig. 3) show the posture of feeding and the position of some of the appendages of the living animal. The worm holds the crown towards the water current, with the longitudinal axis of the worm at a small angle. The median organ and the palps are directed anteriorly, upwards. The

feeding tentacles are directed to the water current or slightly anteriorly (Fig. 3). Not all the worms in the same area show the same direction of the feeding crown (see figures of WIRTZ 1995, 1998).

REMARKS

Species of *Lygdamis* that have similar outer paleae with smooth-sided curved distal tips differ in various ways. Those of *L. curvatus* and *L. ehlersi* are blunt-tipped and only slightly curved; those of *L. gibbsi* have a more gentle curved over a longer arc (and very different nuchal hooks); those of *L. laevispinia* and *L. nesiotas* have a sharper curve with a very small sigmoidal tip and those of *L. rayrobertsi* have less curvature and a very small sigmoidal tips. Furthermore all these species have nuchal hooks with sharper and more reflexed curve.

The only known species that might overlap geographically with *L. wirtzi* is *Lygdamis muratus*. It differs from *L. wirtzi* in that the outer paleae of *L. muratus* are almost straight, the nuchal hooks are more curved and the lateral lobes on the second setinger are very different in having irregular distal margins and in being fused basally to form a collar-like structure. Those of *L. wirtzi* are triangular in shape and well separated.

KIRTLEY (1994) suggested that the shape and coloration patterns of the median organ have significant diagnostic importance, particularly in live materials (p. 116). We therefore report here on the shape and coloration of the median organ of the new species. As this has not yet been done for other species, no comparisons can be made.

Dr. Wirtz has taken similar photographs of *Lygdamis* species at the Canary Islands and at the Cape Verde Islands, and the second author observed similar one at Salvage Islands, but without a study of the morphology of specimens the species-names of these species cannot be determined.

ACKNOWLEDGEMENTS

Firstly we would like to dedicate this work to the memory of David Kirtley, who studied Madeiran Sabellariidae and drew some figures but died

before the completion of this work. The first author (E. N.) has been working with him on Japanese Sabellariidae for several years and some results are already published in NISHI & KIRTLEY (1999). Secondly we are grateful to Dr. Peter Wirtz, who sent us fresh material and field colour photos of polychaetes and gave us a chance to publish this paper. We acknowledge anonymous referees for their useful suggestions on the manuscript. Finally we acknowledge the staff of the Coastal Museum of Natural History for their encouragement and careful advice on invertebrate biology.

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