

## The Discovery of a New Species, *Lamispina ammophila* sp. nov. from Shimoda, Japan

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### Abstract

A new species of Flabelligerid polychaete, *Lamispina ammophila* sp. is described near the Shimoda coast in Japan in November. This species can be distinguished from other animals by the following characteristics: i) the dorsal region of the cadaver is attached by sediment particles; ii) lamispines without teeth, the fourth generation and later generations, and iii) The cage is 1.5–2.0 times the width of the body. A partial mitochondrial cytochrome c oxidase subunit I (COI) gene sequence from this subtype is provided as a DNA barcode for the new species.

### Keywords

Polychaeta; Taxonomy; Marine invertebrates; Polychaetes.

### Introduction

*Lamispina* Salazar-Vallejo, 2014 is one of the 25 genera in the polychaete family Flabelligeridae, consisting of nine species reported from intertidal to deep sea sediment in subtropical to cold-temperature waters (Choi et al., 2017; Magalhaes et al., 2017). The genus was proposed so that it accommodates species

formerly placed in *Pherusa* Oken, 1807 having special neurochaetae. Members in *Lamispina* possess special neurochaetae, called “lamispines”, in which their distal area is thin and broad. This is one of the main features that distinguishes them from other flabelligerids (Cepeda et al., 2017; Jimi et al., 2017; Shcherbakova et al., 2017).

Around Japan, a sole species of the genus, *L. schmidtii*, has been known from the Japan Sea and

Okhotsk Sea. During the 8th Japanese Association for Marine Biology (JAMBIO) Coastal Organism Joint Survey held at Shimoda, the first author found some specimens of *Lamispina*. We describe the specimens as a new species and provide COI sequences as a DNA barcode of the species (Nilsai et al., 2017).

### Materials and Methods

Fresh specimens were collected by dredging from off the coast of Shimoda, Japan (34°39.217'N, 138°57.106'E to 34°39.071'N, 138°56.977'E). The specimens were fixed in 70% ethanol. After preservation, these specimens were observed with a Nikon SMZ1500 dissecting microscope and an OLYMPUS BX51 compound light microscope, and then photographed with a Nikon D5200 digital camera. All the material has been deposited in the National Museum of Nature and Science, Tsukuba (NSMT).

DNA extraction and sequencing of part of the COI were carried out following the method of Jimi and Fujiwara. The newly obtained sequence has been deposited in the DNA Data Bank of Japan (Amiri et al., 2017).

### Systematics

Genus *Lamispina* Salazar-Vallejo, 2014 [New Japanese name: sasanoha-habouki-zoku]

*Lamispina ammophila* sp. nov.

[New Japanese name: suna-sasanoha-habouki] (Figures 1, 2)

### Material Examined

Holotype: NSMT-Pol H-663, anterior fragment, 4 mm long, 1 mm wide (widest chaetiger), 17 chaetigers, sex unknown, off Shimoda, 45–46 m depth, 13 November 2015, collected by NJ; although the last two chaetigers were removed for observation and DNA extraction, any gene sequences could not be determined from those chaetigers. Paratypes: NSMT-Pol P-664, 10 specimens, anterior fragments, 2–6 mm long, 1 mm wide (widest chaetiger), 8–20 chaetigers, sex unknown, off Shimoda, 45–46 m depth, 13 November 2015, collected by NJ; the last two chaetigers and palps of one specimen were removed for DNA extraction.

### Sequence

LC363891, COI gene, 651 bp, determined from the paratype (NSMT-Pol P-664).

### Description

Holotype 4 mm long, 1 mm wide (widest chaetiger), 17 chaetigers (not complete). Body cylindrical, tapered in posterior region, greenish in life, yellowish after fixation (Figure 1A). Dorsal body surface with sparse sand particles (Figure 1B), ventral side without sand particles (Figure 1A). Body papillae long, thin, digitate, sediment particles attached on base, 1/2 times as long as parapodial papillae. Gonopodial lobes not seen. Gonopores not seen.

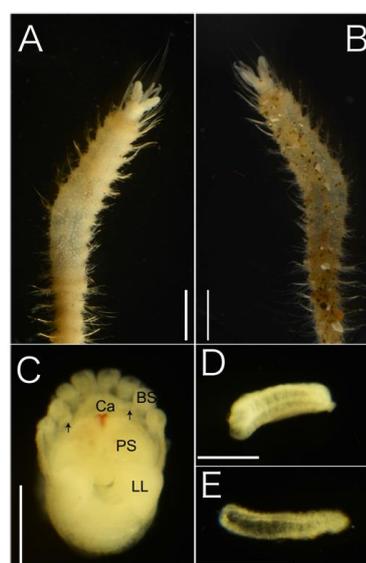


Figure 1: Photographs of *Lamispina ammophila* sp. nov. in preserved state. A, B, D, E, Holotype, NSMT-Pol H-663; C, paratype, NSMT-Pol P-664. A, Anterior end, ventral view; B, anterior end, dorsal view; C, prostomium (BS, branchial scar; Ca, caruncle; LL, lateral lip; PS, palp scar; black arrows, nephridial lobe); D, palp; E, branchia. Scale bars: A–B, 1 mm; C–E, 250  $\mu$ m.

Prostomium low cone, red eyes present, caruncle developed, lateral lip expanded, dorsal and ventral lips not well developed (Figure 1C). Palps short, thick, digitate, as long as branchiae (Figure 1D). Branchiae arranged in a continuous dorsal series, eight in number, digitate, microcilia present on surface (Figure 1E). Nephridial lobes present.

Cephalic cage well developed, 1.5–2.0 times as long as body width (widest chaetiger). Chaetigers 1–3 comprise cephalic cage, cephalic cage consisting of about 4 notochaetae and 8 neurochaetae (some chaetae broken). Chaetal transition from cephalic cage to body chaetae abrupt (Figure 1A).

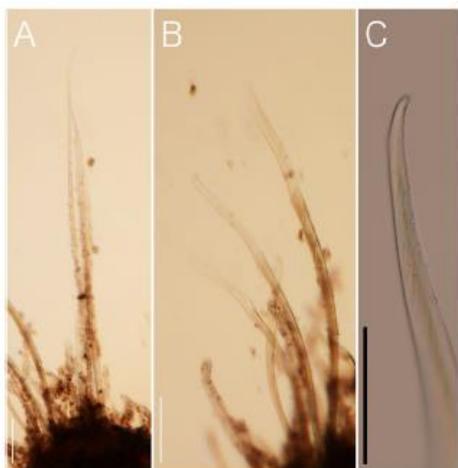


Figure 2: Photomicrographs of chaetae (chaetiger 17) in *Lamispina ammophila* sp. nov., holotype, NSMT-Pol H-663. A, Notochaetae; B, neurochaetae; C, tip of neurochaeta. Scale bars: A, B, 100  $\mu$ m; C, 50  $\mu$ m.

Parapodia poorly developed. Noto and neuropodial low lobes, 1/3–3/4 times as long as neurochaetae, 2–4 times as long as body papillae, 5–7 internal papillae, 4–6 postchaetal papillae; 4–5 chaetae per notopodia, 3–4 chaetae per neuropodia. Notochaetae multiarticulated capillaries, brownish, with articles medium-sized basally, long medially and distally (Figure 2A). Neurochaetae multiarticulated capillaries in chaetigers 1–3, brownish; anchylosed lamispines present in chaetiger 4 and succeeding posterior chaetigers, brownish, without accessory tooth, with articles medium-sized basally, slightly long medially (Figure 2B, C).

Posterior end unknown.

### Etymology

The specific name "*ammophila*" derives from ancient Greek  $\alpha\mu\mu\omicron\varsigma$  ammos (sand)+ $\phi\acute{\iota}\lambda\omicron\varsigma$  philos (loving, friendly), referring to the new species having sand particles on its body.

### Distribution

Only known from the type locality, Shimoda, Japan. 45–46 m in depth.

### Remarks

*Lamispina ammophila* sp. nov. is different from the other known species by the following features: *i*) sediment particles are adhered only to the dorsal region of the body, *ii*) lamispines are present in chaetiger 4 and backward, lacking accessory tooth, and *iii*) the cephalic cage is 1.5–2.0 times as long as the body width. The species resembles *L. amoureuxi* Salazar-Vallejo, 2014 in having sediment particles and lamispines without accessory tooth. While lamispines in *L. ammophila* sp. nov. emerge from chaetiger 4 and backward, they occur from chaetiger 2 in *L. amoureuxi*. The cephalic cage is 1.5–2.0 times as long as body width in *L. ammophila* sp. nov., it is as long as body in *L. amoureuxi*. The species also resembles *L. gymnopapillata* (Hartmann-Schroder, 1965) in that lamispines occur from chaetiger 4, but it differs from the latter in that sand particles adhere dorsally in *L. ammophila* sp. nov., whereas *L. gymnopapillata* does not carry sand particles.

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