

A New Species, *Lamispina ammophila* sp. nov. (Annelida: Flabelligeridae), from Shimoda, Japan

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A new species of flabelligerid polychaete, *Lamispina ammophila* sp. nov., is described from off the coast of Shimoda, Japan. The species can be discriminated from the other congeners by the following features: *i*) dorsal region of body being adhered to by sediment particles, *ii*) lamispines without accessory tooth, present from chaetiger 4 and succeeding chaetigers, and *iii*) cephalic cage 1.5–2.0 times as long as body width. A partial mitochondrial cytochrome *c* oxidase subunit I (COI) gene sequence from the paratype is provided as a DNA barcode for the new species.

Key Words: Marine invertebrates, new species, Polychaeta, polychaetes, taxonomy.

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 (Salazar-Vallejo 2014). The genus was proposed so that it accommodates species formerly placed in *Pherusa* Oken, 1807 having special neurochaetae (Grube 1877; Haswell 1892; Annenkova-Chlopina 1924; Støp-Bowitz 1948; Hartmann-Schröder 1965; Salazar-Vallejo 2014). 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 distinguish them from other flabelligerids.

Around Japan, a sole species of the genus, *L. schmidtii* (Annenkova-Chlopina, 1924), has been known from the Japan Sea and Okhotsk Sea (Annenkova-Chlopina 1924; Salazar-Vallejo 2014). 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.

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 (2016). The newly obtained sequence has been deposited in the DNA Data Bank of Japan.

Systematics

Genus *Lamispina* Salazar-Vallejo, 2014

[New Japanese name: sasanoha-habouki-zoku]

Lamispina ammophila sp. nov.

[New Japanese name: suna-sasanoha-habouki]

(Figs 1, 2)

Material examined. Holotype: NMST-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

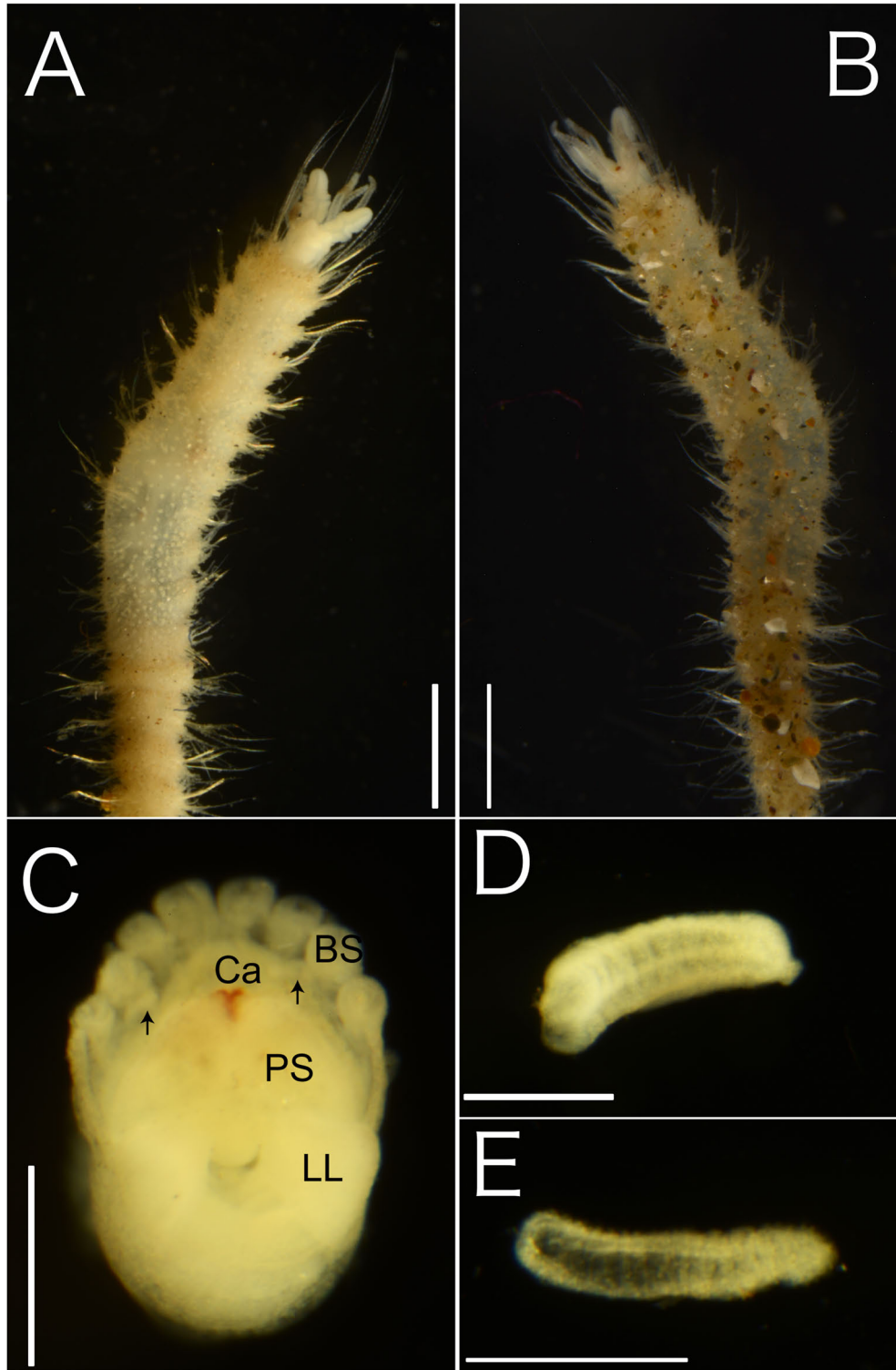


Fig. 1. Photographs of *Lamispina ammophila* sp. nov. in preserved state. A, B, D, E, Holotype, NSMT-Pol H-663; C, paratype, NSMT-Pol P-664. A, Anterior end, ventral view; B, anterior end, dorsal view; C, prostomium (BS, branchial scar; Ca, caruncle; LL, lateral lip; PS, palp scar; black arrows, nephridial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

fixation (Fig. 1A). Dorsal body surface with sparse sand particles (Fig. 1B), ventral side without sand particles (Fig. 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.

Prostomium low cone, red eyes present, caruncle devel-

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

Cephalic cage well developed, 1.5–2.0 times as long as

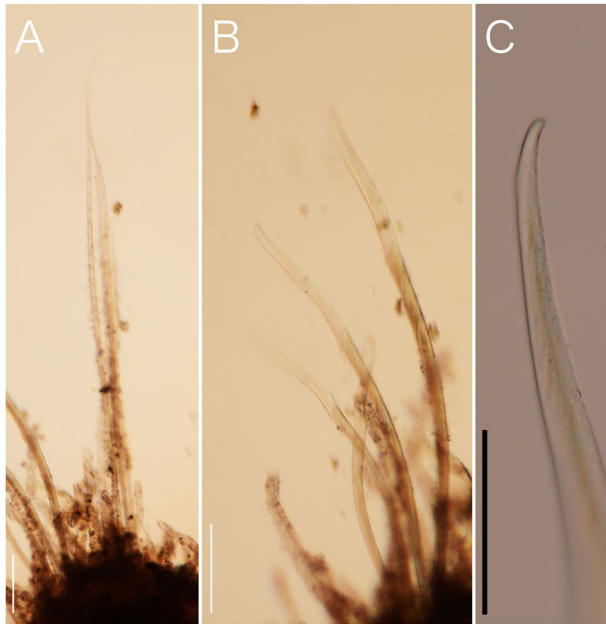


Fig. 2. Photomicrographs of chaetae (chaetiger 17) in *Lamispina ammophila* sp. nov., holotype, NSMT-Pol H-663. A, Notochaetae; B, neurochaetae; C, tip of neurochaeta. Scale bars: A, B, 100 μ m; C, 50 μ m.

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 (Fig. 1A).

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 (Fig. 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 (Fig. 2B, C).

Posterior end unknown.

Etymology. The specific name “ammophila” derives from ancient Greek $\alpha\mu\mu\omicron\varsigma$ *ámmos* (sand)+ $\phi\acute{\iota}\lambda\omicron\varsigma$ *phílos* (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-Schröder, 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.

Key to Species of the Genus *Lamispina* [Modified from Salazar-Vallejo (2014)]

1. Body papillae without sand or large sediment particles 2
- Body with sand or larger particles, at least dorsally; lamispines falcate 9
2. Body papillae stiff, tapered or conical 3
- Body papillae delicate, filiform, often eroded leaving bare surfaces 7
3. Lamispines tapered, tips acuminate 4
- Lamispines subdistally widened, tips falcate 5
4. Lamispines from chaetiger 3; notochaetae abundant (9–12 per bundle); four transverse series of papillae on medial segments *L. kerguelarum* (Grube, 1877):
Southern Indian Ocean
- Lamispines from chaetiger 4; notochaetae sparse (5 per bundle); two transverse series of papillae on medial segments *L. chilensis* Salazar-Vallejo, 2014: SE Pacific (Chile)
5. Cephalic cage 6 \times longer than body width; medial parapodia with 8 notochaetae per bundle *L. carrerai* Salazar-Vallejo, 2014: NE Pacific (Mexico)
- Cephalic cage 2–3 \times longer than body width 6
6. Medial parapodia with 5–6 notochaetae per bundle; body with 3–5 transverse series of papillae per segment *L. horsti* (Haswell, 1892): Southern Australia
- Medial parapodia with 10 notochaetae; body with 4–6 transverse series of papillae per segment *L. gymnopapillata* (Hartmann-Schröder, 1965):
SE Pacific (Chile)
7. Notochaetae longer than body width 8
- Notochaetae 1/3 as long as body width; 7–8 lamispines per bundle, tips with fibers exposed; body with 2 transverse series of papillae per segment *L. milligani* Salazar-Vallejo, 2014:
NE Atlantic (Florida)
8. Medial segments with 5–7 lamispines per bundle, tips hooded, appearing bidentate; body with 5–6 transverse series of papillae per segment *L. schmidtii* (Annenkova-Chlopina, 1924):
Japan Sea
- Medial segments with 4–5 lamispines per bundle, tips entire, smooth; body with 8–10 transverse series of papillae per segment *L. falcata* (Støp-Bowitz, 1948): Norwegian Sea
9. accessory tooth in neurochaetae absent 10
- accessory tooth in neurochaetae present

- *L. keeli* Salazar-Vallejo, 2014:
Gulf of Mexico (Florida)
10. Lamispines from chaetiger 2; cephalic cage as long as
body width..... *L. amoureuxi* Salazar-Vallejo, 2014:
NE Atlantic (off SW Ireland)
- Lamispines from chaetiger 4; cephalic cage 1.5–2.0
times as long as body width
- *L. ammophila* sp. nov.: Japan

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