

Taxonomy and systematics

## *Ilyphagus gebruki* n. sp., an abyssal flabelligerid from the Eastern Pacific (Annelida: Sedentaria: Flabelligeridae)

### *Ilyphagus gebruki* n. sp., un flabeligérido abisal del Pacífico oriental (Annelida: Sedentaria: Flabelligeridae)

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#### Abstract

The taxonomy of abyssal polychaetes is problematic because they are fragile and easily damaged during collection. *Ilyphagus* Chamberlin, 1919 is an abyssal flabelligerid annelid genus that includes 4 species; a new species from the Eastern Pacific is herein described: *I. gebruki* n. sp. This new species is diagnosed as having a cigar-shaped body, more than 5 times longer than wide, with long body papillae, branchial plate with 8 branchial filaments, notochaetae with articles progressively longer, and neurochaetae smooth. The species ranges from off the Aleutian Islands to the Peru-Chile Trench and was sampled in sediments distributed between 5,047 and 7,000 m depth.

*Keywords:* *Ilyphagus*; Abyssal; Eastern Pacific; Gonopodial papillae

#### Resumen

La taxonomía de los poliquetos abisales es problemática porque son frágiles y se dañan fácilmente durante la recolecta. *Ilyphagus* Chamberlin, 1919 es un género de anélidos flabeligéridos abisales que incluye 4 especies; se presenta la descripción de una nueva especie del Pacífico oriental: *I. gebruki* n. sp. La diagnosis de esta especie nueva es que tiene el cuerpo en forma de puro, más de 5 veces más largo que ancho, con papilas corporales largas, placa branquial con 8 filamentos, notosetas con artículos progresivamente más largos, y neurosetas lisas. La distribución de la especie incluye desde la región de las Aleutianas hasta la fosa Perú-Chile y fue recolectada en sedimentos entre 5,047 y 7,000 m de profundidad.

*Palabras clave:* *Ilyphagus*; Abisal; Pacífico oriental; Papilas gonopodiales

## Introduction

The study of abyssal polychaetes is always problematic, because, besides the need for a high level of sophisticated equipment such as vessels and collecting machines, abyssal annelids are often delicate, and easily damaged during sampling, sorting or identification.

*Ilyphagus* Chamberlin, 1919 and *Bradabyssa* Hartman, 1967 include most abyssal flabelligerid species (Salazar-Vallejo, 2012, 2017, 2019). *Ilyphagus* comprises only 4 known species, all with fragile, thin body walls, and all recorded from abyssal depths. During the study of all specimens available for a revision of *Ilyphagus*, I came across an undescribed species from the Eastern Pacific; a similar specimen from the Northern Pacific was also detected, but the specimen was in suboptimal conditions. Consequently, I decided to postpone the description of the species, in order to have the chance to study some additional specimens in Russian collections. Unfortunately, none were available, despite the fact that Russian scientists have undertaken an impressive series of collecting expeditions all over the world (Mikhailov et al., 2002), especially the vessels belonging to the Shirshov Institute of Oceanology, including the Akademik Kurchatov (Neiman et al., 2017). More recently, German-Russian expeditions in the German R/V Sonne in the Northwestern Pacific have focused on the Kurile Kamchatka Trench (Brandt & Malyutina, 2012), and in the Okhotsk Sea (Malyutina et al., 2018). This delayed description is herein provided, aiming to encourage the study of abyssal flabelligerids, along with an updated key to species.

## Material and methods

Twenty specimens were carefully cleaned of excessive sediment particles by gently brushing the body, and they were often immersed during a few seconds in a 1:1 white vinegar-70% ethanol solution to facilitate the removal of adsorbed materials. Chaetae were carefully removed, cleaned, and mounted in temporal glass slides for observing patterns of articulation. In one specimen, the anterior end was dissected to observe the anterior end and count the branchial filaments. Digital photos were compressed by using HeliconFocus. The material is deposited in the collections of El Colegio de la Frontera Sur, Chetumal, México (ECOSUR), the Museum of Natural History of Los Angeles County, Allan Hancock Foundation Polychaete Collection, Los Angeles, California, U.S.A. (LACM-AHF), and the Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow (SIORAS). The description is based mostly on the holotype with some comments on variation of the other specimens.

## Results

Class Polychaeta Grube, 1850

Family Flabelligeridae de Saint-Joseph, 1894

*Ilyphagus* Chamberlin, 1919

*Ilyphagus gebruki* n. sp.

Figure 1

<http://zoobank.org/urn:lsid:zoobank.org:act:B766A586-663C-4FFE-B460-65F040996501>

**Diagnosis.** *Ilyphagus* with body arenicoliform, more than 5 times longer than wide. Body papillae long. Branchial plate with 8 branchial filaments. Notochaetae with articles progressively longer; neurochaetae smooth.

**Description.** Holotype (SIORAS AK 294) without posterior end, whitish, some chaetae broken (Fig. 1A). Body arenicoliform, elongate, anteriorly rounded, tapered posteriorly (Fig. 1C); 52 mm long, 5 mm wide, cephalic cage broken (remaining chaetae 4 mm long), 30 chaetigers. Body papillae very dense; papillae filiform, cylindrical, slightly capitate, with abundant fine sediment particles adherent on its basal and medial regions.

Anterior end not exposed in holotype; observed in a non-type specimen (LACM Sta. 69) (Fig. 1D). Cephalic hood short, margin smooth, longer dorsally. Prostomium distorted, without eyes. Caruncle not seen. Palps massive, contracted, longitudinally cleft, longer than branchiae; palp lobes reduced.

Branchiae cirriform, sessile on branchial plate, slightly projected, with 4 thick filaments per side, arranged in an irregular marginal row. Nephridial lobes not seen.

Cephalic cage chaetae mostly broken; complete size relationships with body length or width unknown. Chaetiger 1 involved in the cephalic cage; notochaetae of chaetiger 2 as long as body width. Chaetiger 1 with an unknown number of chaetae in dorsal bundle series; neurochaetae in short curved series, only 1-3 chaetae remaining.

Anterior dorsal margin of first chaetiger papillated, depressed in relation to nearby enlarged, projected notopodia; anterior chaetigers without especially long papillae. Chaetigers 1-3 of about the same length. Chaetal transition from cephalic cage to body chaetae abrupt; neurospines from chaetiger 4; chaetigers 1-3 with some transitional neurochaetae with long articles distally, articulated region progressively reduced from first to third chaetiger. Gonopodial lobes in chaetigers 5-6, as long as 1/3 segment length, short rounded, covered by thin integument, once removed dark brown (Fig. 1B). Parapodia lateral, low, long transverse lobes; median neuropodia ventrolateral. Noto- and neuropodia close to each other.

Median notochaetae arranged in short transverse rows; all multiarticulated capillaries, articles short basally,

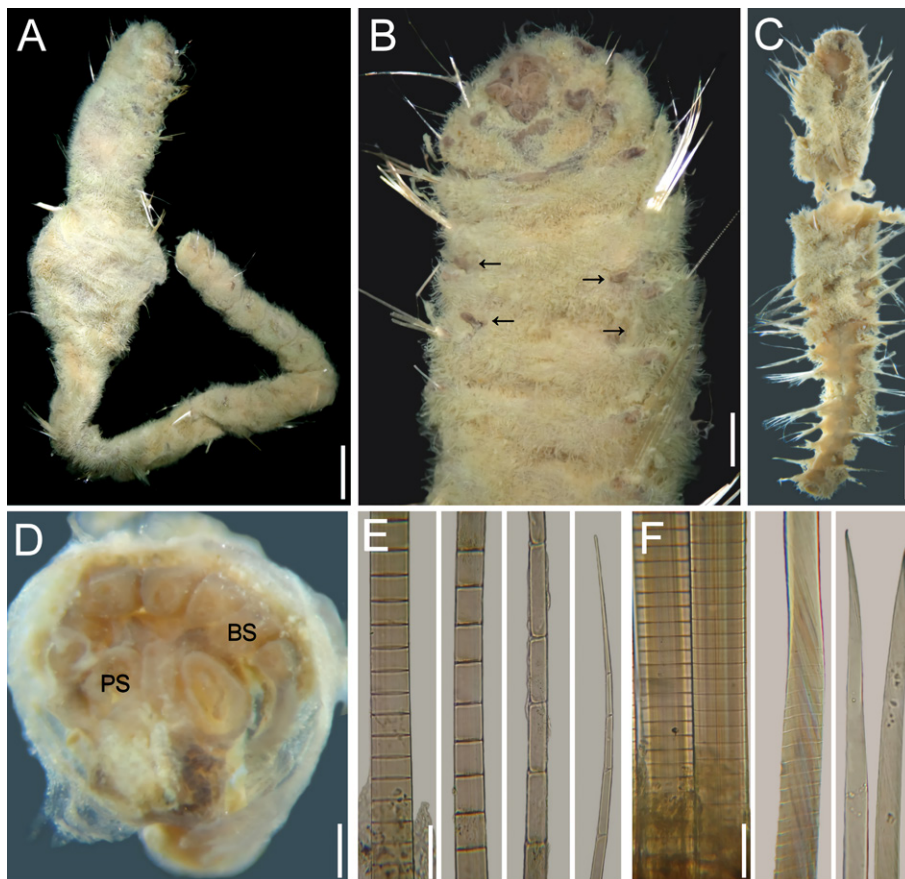


Figure 1. *Ilyphagus gebruki* n. sp. A, Holotype (SIORAS AK 294), dorsal view; B, same, anterior end, ventral view (arrows point to gonopodial lobes); C, non-type specimen (LACM Sta. 69), breaking into 2 parts, integument removed in some parts; D, same, head, frontal view (branchiae and palps removed; BS: branchial scar, PS: palp scar); E, holotype, chaetiger 11, right parapodium, notochaetal basal, medial and distal regions; F, same, neurochaetal basal, medial and distal regions (right tip broken, left entire). Scale bars, A: 2 mm, B: 0.6 mm, C: 1.8 mm, D: 0.2 mm, E, F: 45  $\mu$ m.

progressively longer in medial and distal regions (Fig. 1E); 1-2 per ramus, as long as 2/3 body width. Neurochaetal spines from chaetiger 4, arranged in transverse series, 7-8 per ramus; each with very short anchylosed articles basally and medially, distally hyaline, tapered, smooth (Fig. 1F).

Posterior end missing in holotype; another complete specimen (SIORAS Vitjaz 6085) tapered posteriorly, pygidium with anus terminal, without anal cirri.

*Variation.* Complete specimens have 22-37 chaetigers; gonopodial papillae in chaetiger 5, or in chaetigers 5 and 6.

#### *Taxonomic summary*

*Type locality.* Off Trujillo, Peru, in 6,200-6,240 m.

*Type material:* Eastern Pacific Ocean. Holotype (SIORAS AK 294) and paratypes (SIORAS AK 294b and ECOSUR 000), R/V Akademik Kurchatov, Sta. 294 (08°23' S, 81°00' W), off Trujillo, Peru, 6,200-6,240 m,

Sigsbee trawl, 31 Oct.-1 Nov. 1968 (paratypes 2 anterior fragments, damaged, 25/32 mm long, 4/4 mm wide, cephalic cage broken, remaining chaetae 3/3 mm long, 14/18 chaetigers; gonopodial lobes in chaetigers 5-6).

*Additional material:* Eastern Pacific Ocean. One specimen (LACM-AHF unnumb.), complete, Peru Chile Trench Expedition, R/V Anton Bruun, Cruise II, Sta. 36 (05°43' S, 82°01' W), 5,047 m, Menzies trawl, 5 Oct. 1965 (47 mm long, 14 mm wide, cephalic cage broken, 23 chaetigers). Eight specimens (LACM-AHF unnumb.), one without pygidium, another one regenerating the posterior end, others without posterior end, Peru Chile Trench Expedition, R/V Anton Bruun, Cruise II, Sta. 69 (06°19' S, 81°49' W), 5,750 m, Beam trawl, 9 Oct. 1965 (w/o pygidium 44 mm long, 3 mm wide, cephalic cage broken, 37 chaetigers, gonopodial papillae in chaetigers 5 and 6, black, digitate, visible after brushing sediment; regen.

posterior end 27 mm long, 3.5 mm wide, cephalic cage broken, 28 chaetigers, gonopodial papillae in chaetiger 5). Three specimens (LACM-AHF unnumb.), one complete, others broken off, Peru Chile Trench Expedition, R/V Anton Bruun, Cruise II, Sta. 72 (08°25' S, 81°05' W), 6,220-6,052 m, Menzies trawl and beam trawl in tandem, 12 Oct. 1965 [(34 mm long, 4 mm wide, cephalic cage broken, 23 chaetigers). One specimen (LACM-AHF unnumb.), complete, Peru Chile Trench Expedition, R/V Anton Bruun, Cruise II, Sta. 113 (08°44' S, 80°45' W), 5,986-6,134 m, Menzies trawl and Beam trawl in tandem, 19 Oct. 1965 (23 mm long, 5 mm wide, cephalic cage broken, 23 chaetigers). Three specimens (LACM-AHF unnumb.), one complete, others broken off, Peru Chile Trench Expedition, R/V Anton Bruun, Cruise II, Sta. 38 (05°46' S, 82°00' W), 5,379 m, Beam trawl, 6 Oct. 1965 (complete 62 mm long, 8 mm wide, cephalic cage broken, 22 chaetigers). North Pacific Ocean. One complete specimen and an anterior fragment (SIORAS V-6085), heavily eroded, R/V Vitjaz, Sta. 6085 (50°48.6' N, 173°29.0' W), south of Andreanof Islands, Aleutian Islands, 6,965-7,000 m, Sigsbee trawl, 1 May 1969 (complete/anterior fragment 33/36 mm long, 8/7 mm wide, cephalic cage chaetae 3.5/1.0 mm long [most broken], 29/20 chaetigers; both with gonopodial lobes in chaetigers 5-6).

**Etymology.** This species is named after Dr. Andrey Gebruk, head of the Benthic Ecology group of the Shirshov Institute of Oceanology, Russian Academy of Sciences, Moscow, in recognition of his publications on deep-sea ecology, especially dealing with holothurians, and to thank his generous support to study the rich SIORAS collections. The epithet is a noun in the genitive case.

#### Remarks

*Ilyphagus gebruki* n. sp. is a member *Ilyphagus* Chamberlin, 1919 because of its body shape, abundant

papillae and chaetae. It resembles *I. coronatus* Monro, 1939 from the Indian Ocean and redescribed elsewhere (Salazar-Vallejo, 2012), because both have an elongate body with abundant thin papillae; they differ, however, in branchial and chaetal features. In *I. gebruki* there are 8 branchial filaments in a single series, notochaetae have articles progressively longer medially and distally, and neurochaetae have well-defined anchylosed articles with smooth tips. On the contrary, in *I. coronatus* there are 14 branchial filaments in 3 successive series, notochaetae have small to medium-sized articles medially and distally, and neurochaetae have poorly defined anchylosed articles with hirsute tips.

On the other hand, *I. gebruki* differs from *I. bythincola* Chamberlin, 1919, the other Eastern Pacific species in body shape, and in fine details of chaetae. In *I. gebruki* the body is elongate, arenicoliform, markedly longer than wide, notochaetal distal articles are 10 times or more longer than wide, and neurochaetal anchylosed articles are 1/5 as long as wide. On the contrary, in *I. bythincola*, the body is short, ovoid, longer than wide, notochaetal distal articles are 3 times longer than wide, and neurochaetal anchylosed articles are 1/10 as long as wide.

One specimen from the North Pacific (SIORAS V-6085) is almost without body papillae, but chaetal articles resemble those present in *I. gebruki*. However, because the collecting sites are far away, and there are some differences in the relative body shape (northern specimen having a wider posterior region and with some lobate regions along body) and body wall pigmentation (darker in the type series, paler the northern one), this northern specimen is herein included with some hesitation, pending the study of better-preserved specimens.

**Distribution.** In sediments in 5,047-6,400 m depth off Peru, along the Peru-Chile Trench, and off the Aleutian Islands (6,965-7,000 m).

Key to species of *Ilyphagus* Chamberlin, 1919 (modified from Salazar-Vallejo 2012).

- 1 Body short, about 3 times longer than wide..... 2
- Body cigar-shaped or arenicoliform, more than 5 times longer than wide ..... 3
- 2(1) Neurochaetae markedly hirsute subdistally (oblique fibers exposed); chaetiger 1 with 3-4 neurochaetae per side...  
..... *I. hirsutus* Monro, 1937 Indian Ocean
- Neurochaetae barely hirsute or smooth subdistally; chaetiger 1 with about 8 neurochaetae per side.....  
..... *I. bythincola* Chamberlin, 1919 *partim* Eastern Pacific
- 3(1) Body velvety (papillae short); most neurochaetae smooth or barely hirsute ..... 4
- Body pilose (papillae long); neurochaetae smooth and hirsute (by fracture), or smooth ..... 5
- 4(3) Chaetiger 1 with about 8 neurochaetae per side; about 40 branchial filaments.....  
..... *I. bythincola* Chamberlin, 1919 *partim* Eastern Pacific
- Chaetiger 1 with 10-12 neurochaetae per side; about 16 branchial filaments.....  
..... *I. wyvillei* (M'Intosh, 1885) Antarctic

- 5(3) Notochaetae with articles progressively smaller; neurochaetae smooth and hirsute; up to 14 branchial filaments ...  
.....*I. coronatus* Monro, 1939 Indian sector, Antarctic (1200-3500 m water depth)  
- Notochaetae with articles progressively longer; neurochaetae smooth; 8 branchial filaments.....  
.....*Ilyphagus gebruki* n. sp. Eastern Pacific (5,000-7,000 m water depth)

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