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A new species of *Dasybranchethus* (Annelida: Capitellidae) from Mexican Pacific, with a redescription of *Dasybranchethus fauveli*

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Dasybranchetus pacifica, *collected in Concepcion Bay, Baja California Sur, Gulf of California, is described as a new species. In addition, the type species of the genus,* Dasybranchetus fauveli *Monro, 1931, is redescribed based on type material. The new species differs from* D. fauveli *in the absence of branchiae, the begining of the mid-dorsal lobe from chaetiger 2 instead of chaetiger 9, abdominal segments with well-developed neuropodial lobes, and hooded hooks with a main fang and three rows of subapical teeth in the following arrangement: 4 teeth in the basal line, 3 in the middle line, and 2 in the apical line.*

Keywords: *Dasybranchethus*, Polychaeta, Capitellidae, Mexican Pacific

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INTRODUCTION

Capitellidae is one of the most common families inside the polychaetes, the species of this family morphologically resemble earth worms, and they are mainly in sandy soft to muddy bottoms in practically all the seas of the world and in any depth. Their body is divided into two regions, a thoracic and an abdominal one, the transition among these two regions is detected by means of the chaetal change, the change in the morphology of the segments, and in some genera the position of the notopodia and neuropodia. In a cladistic analysis it has been considered that they are related with arenicolids and maldanids (Rouse & Fauchald, 1997). Some of their species are considered as a pollution indicator, because they quickly colonize organically enriched areas (Warren, 1991). It is considered that they have been described as approximately 150 species (Green, 2002), however, we believe that many of these species have been described with intermediate phases of their development; if this is correct, the number of valid species will be decreased considerably.

To date, *Dasybranchethus* has been considered monotypic. Monro (1931) carried out a very brief diagnosis of the genus and describes *D. fauveli* from a locality in the Great Barrier Reef of Australia, based on a single specimen. The genus is poorly known and subsequently to its original description was never reported. Fauchald (1977) mentioned *Dasybranchethus* in the list of Capitellidae genera, considering it as valid. Amaral (1980) in her research about the characterization of the genera, showed only a diagram of *Dasybranchethus*; both authors followed the characteristics of the original description.

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Dasybranchethus and *Capitobranchus* present 15 chaetigers with bilimbate capillary in both rami; the presence of the mid-dorsal lobe is a unique character in the family, not seen previously in other genera. Monro (1931) uses the number of thoracic chaetigers to differ *Dasybranchethus* from the rest of the previously known genera, until the moment, any genera are known with similar characteristics. In the case of *Capitobranchus*, although it presents its last four thoracic segments with a mixture of capillary and hooded hooks, the character is not found in *Dasybranchethus*. Another related genus *Pseudocapitella* Fauvel, 1913 presents 14 segments with bilimbate capillary, however, it possesses last three thoracic segments with a mixture of capillary and hodded hooks, and the first chaetiger segment incomplete, only with notopodium. The main objective of this study was the description of a new species under the genus *Dasybranchethus*. Furthermore, the holotype of *D. fauveli* was revised and characteristics that are not mentioned in the original description, such as the lateral organs, genital pores, branchiae and the mid-dorsal lobe, were observed.

MATERIALS AND METHODS

Type material of *Dasybranchethus fauveli* was borrowed from the collection of the British Museum of Natural History (BMNH), type and not type material of the new species here described was recollected in Concepcion Bay, Baja California Sur, Gulf of California. The specimens were recovered manually in the intertidial zone, mainly with mixed sediments of coarse sand and shell fragments, using two sieves of 0.5 and 1.0 mm. Specimens were fixed with a solution of formalin 10% in seawater, and preserved in ethanol 80%. Terminology used by Hartman (1947) and

Green (2002) was followed in describing features of the hooded hooks. Type material of the new species was deposited in the polychaetological collection of the Universidad Autonoma de Nuevo Leon (UANL). Methyl green stain was used to observe some morphological structures presenting particular patterns of coloration for each species.

SYSTEMATICS

Class POLYCHAETA Grube, 1850
Order CAPITELLIDA Dales, 1962
Family CAPITELLIDAE Grube, 1862
Genus *Dasybranchethus* Monro, 1931

DIAGNOSIS

Thorax with 16 segments including achaetous peristomium; 15 chaetigers with capillaries chaetae; first chaetiger birramous; lateral organs and genital pore presents; mid-dorsal lobe on some segments, abdominal hooded hooks multidentated; branchiae present or absent.

REMARKS

Monro (1931) describes *Dasybranchethus* for the only species known: *D. fauveli*. In the generic diagnosis, Monro mentions the following characteristics to differentiate the genus 'Capitellids with 16 thoracic segments, of which 15 are chaetigers. The thorax carries capillary bristles only, and the abdomen only hooks. No gills were seen'. With the analysis of the holotype of *D. fauveli* as well as that of *D. pacifica* a new species is here described. We have increased the features that we think distinguish this not very well-known genus, such as the lateral organs, genital pores and the presence of a mid-dorsal lobe in some segments. With respect to the mid-dorsal lobe, it is an unique structure in Capitellidae, never before seen in another genus. However, we ignore the function of that structure.

Dasybranchethus pacifica sp. nov.
(Figure 1A–D)

TYPE MATERIAL

Holotype: Concepcion Bay, Baja California Sur, Santispac mangrove channel, (coordinates: 26°45′43.2″N 111°53′31.0″W, water depth: 1 m) [UANL 6336]. Collected by M.E.G.-G. and J.A.L.-G., 26 June 2005.

Paratype: Concepcion Bay, Baja California Sur, El Quemadito beach, (26°45′33.1″N, 111°52′36.5″W; water depth:1 m) [UANL 6337]. Collected by M.E.G.-G. and J.A. L.-G., 26 June 2005.

DESCRIPTION

Holotype anterior fragment with 360 segments, measures 85 mm long by 2 mm wide in abdomen. Paratype incomplete posteriorly fragmented in two pieces, anterior one measures 80 mm long by 1 mm wide, posterior one 70 mm long by 1 mm wide. Colour in alcohol light brown. Prostomium triangular with an anterior palpode. Proboscis exposed with papillae on posterior end. Eyespots present, two posterior oblique lines. Peristomium and first chaetiger with epithelium smooth; epithelium tessellated from posterior part of chaetiger 2 and extending to chaetiger 9, subsequent segments smooth (Figure 1A).

Thorax with 16 segments including an achaetous peristomium and fifteen chaetigers with bilimbate capillary chaetae in both rami, first chaetiger birramous (Figure 1B). Thoracic and abdominal chaetigers biannulate. Mid-dorsal lobe from chaetiger 2, present only in thoracic region, independent of notopodia.

Lateral organs present along the body, located between notopodia and neuropodia; those on the thoracic region rounded, closer to notopodia; abdominal ones globular, exposed, and closer to neuropodia. Genital pores on last thoracic segments, appear between intersegments 8/9, 9/10, 10/11, 11/12, 12/13, 13/14 and 14/15.

Transition between thorax and abdomen marked by the chaetal change. Abdominal segments with hooded hooks on both rami. Notopodia simple, without evident elevation, chaetal fascicles armed by approximately 6 hooded hooks. Neuropodia with expanded lobes evident on lateral region, chaetal fascicles armed by approximately 20 hooded hooks. Notopodial and neuropodial abdominal hooded hooks of similar size and shape along body, with moderate anterior shaft, distinctly inflated node, evident constriction, wide shoulder and neck, and short hood, posterior shaft longer than anterior one (Figure 1C). Three rows of subapical teeth above main fang, basal one with 4, middle with 3 and apical one with 2 small teeth. Hood marginally striated (Figure 1D).

Branchiae not observed; a dissection was made and the absence of branchiae was evident. Pygidium not seen.

Methyl green stain pattern on prostomium with a triangular area stain light green. Thoracic region stain with continuous bands encircling the whole segment: peristomium to chaetiger 6 stains with light green, chaetigers 7 to 12 stain with moderate green, chaetigers 13 to 15 stain with dark green. Abdominal segments with a dark green dorsal band attenuated to ventral side bordering the neuropodial lobes. Lateral organs and intersegmental areas in whole body without stain.

REMARKS

The new species is considered under *Dasybranchethus* principally by the presence of 15 chaetigers with bilimbate capillary, and the presence of mid-dorsal lobe characteristic of this genus. *Dasybranchethus pacifica* differs from *D. fauveli* by the shape of the prostomium, triangular with two oblique lines of eyespots in the new species, rounded without eyespots in *D. fauveli*; by the presence of mid-dorsal lobe from chaetiger 2 instead of from chaetiger 9; simple abdominal notopodia clearly separate without evident elevation in *D. pacifica*, and notopodia fused dorsally protrude from body in *D. fauveli*; abdominal neuropodia similar along body expanded laterally to ventral side in *D. pacifica*, similar on anterior region but reduced to ventral region later on in *D. fauveli*; by the hooded hooks with proportionately shorter anterior shaft and a lesser number of teeth in the three apical rows of the hooks in *D. pacifica*, and hooded hooks with long anterior shaft and multidentate apical rows of the hooks in *D. fauveli*; branchiae absent in *D. pacifica*, branched in *D. fauveli*; methyl green stain pattern varies from light green to dark green along thorax and abdomen in *D. pacifica*, instead in *D. fauveli* it is uniformly light green in whole body.

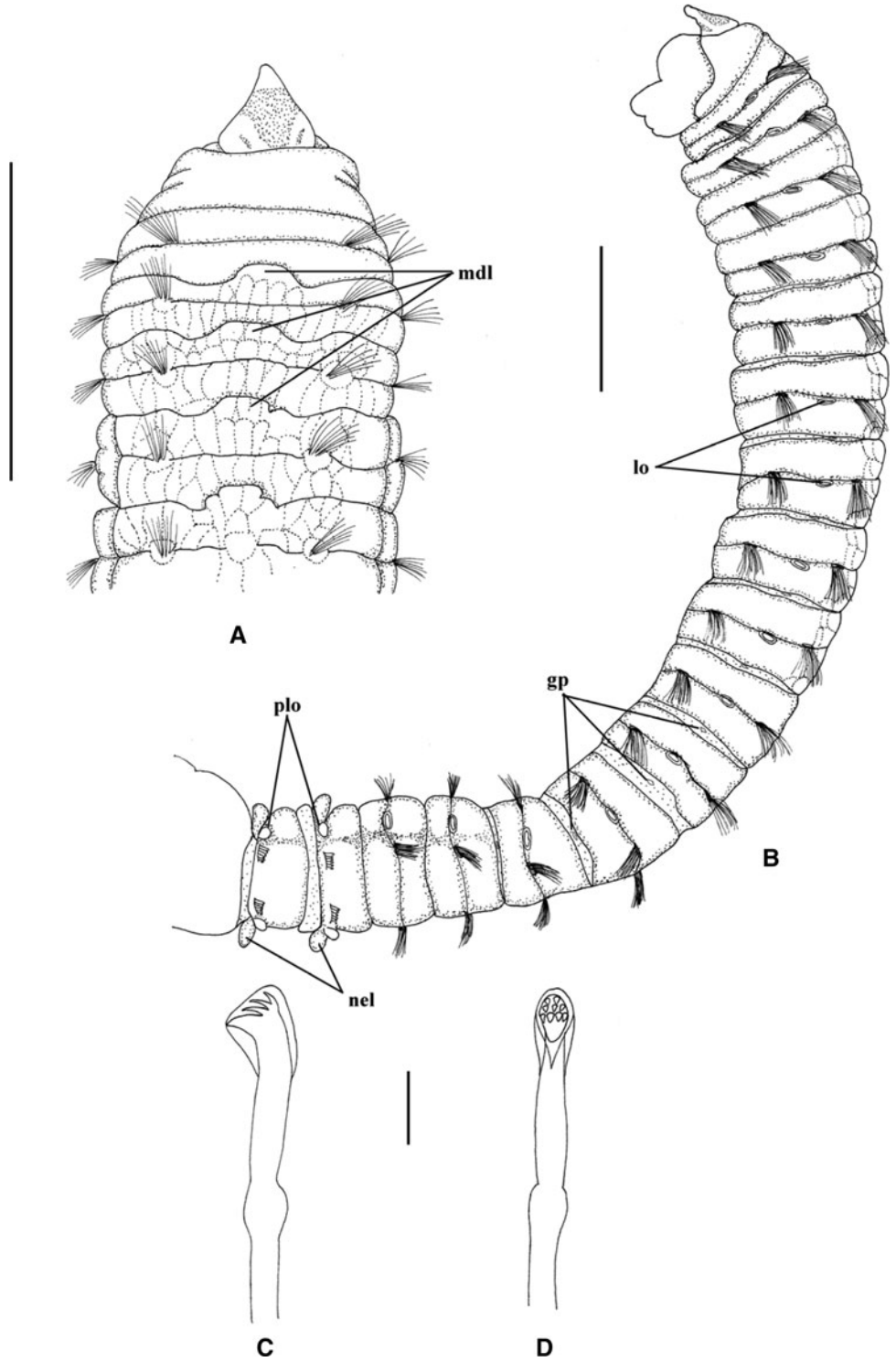

Fig. 1. *Dasybranchethus pacifica*. (A) Anterior end in dorsal view; (B) anterior end in lateral view; (C) notopodial hooded hook in lateral view; (D) notopodial hooded hook in frontal view. Abbreviations: gp, genital pore; lo, lateral organ; mdl, mid-dorsal lobe; nel, neuropodial lobe; plo, protruded lateral organ. Scale bars: A–B, 1 mm; C–D 15 μm.

ETYMOLOGY

Specific name refers to the Pacific Ocean.

TYPE LOCALITY

Baja California Sur, Concepcion Bay, Gulf of California, Santispac mangrove channel and El Quemadito beach.

HABITAT

Soft bottom of the intertidal zone, between sediments of coarse sand and sea shell fragments mixture.

Dasybranchethus fauveli Monro, 1931
(Figure 2A–E)

Dasybranchethus fauveli Monro, 1931:26, figure14 a–c.

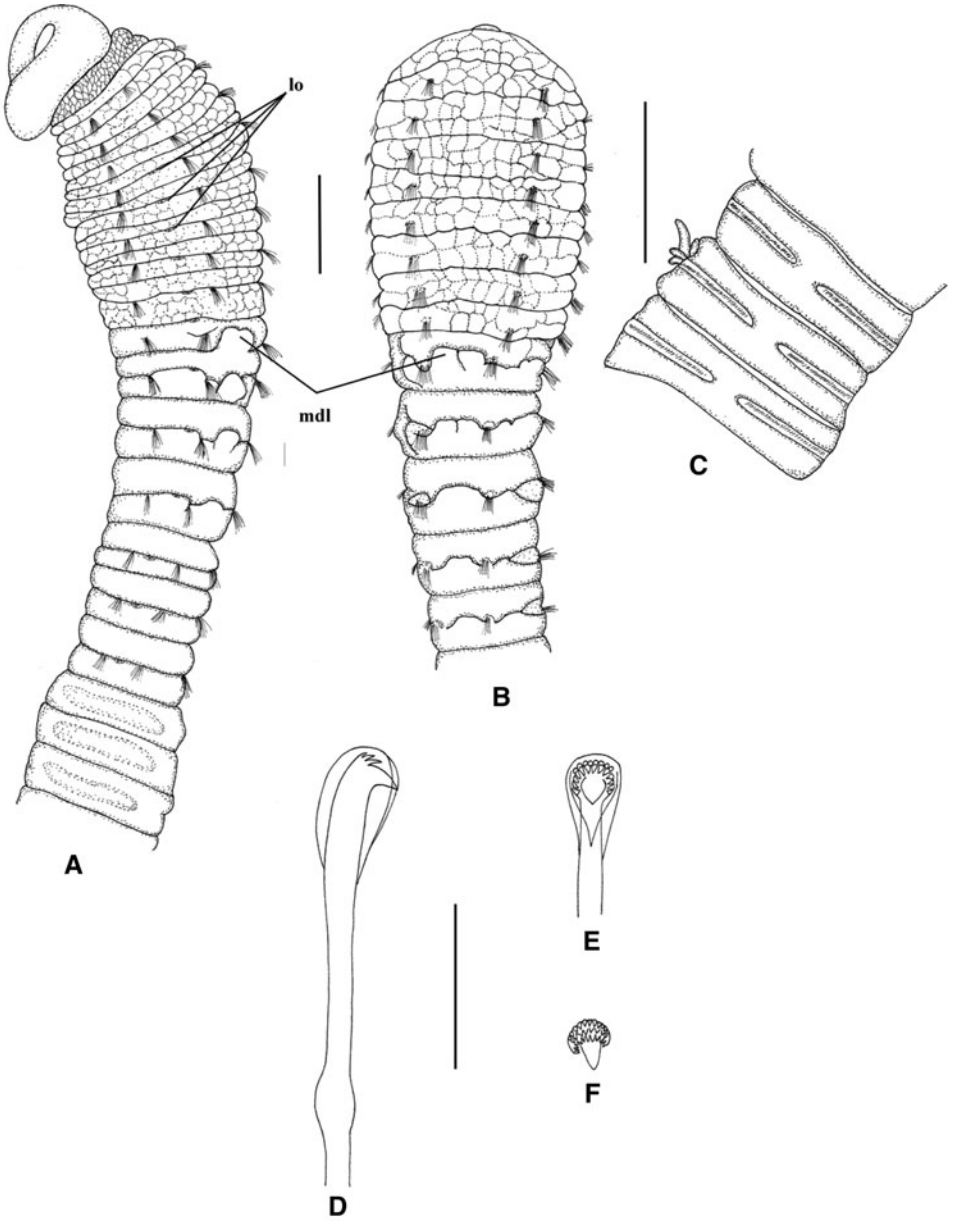

Fig. 2. *Dasybranchetus fauveli*. (A) Anterior end in dorso-lateral view; (B) anterior end in dorsal view; (C) abdominal region showing branchiae; (D) hooded hook in lateral view; (E) anterior end of the hooded hook in frontal view; (F) detail of the hooded hook anterior end in apical view. Abbreviations: lo, lateral organ; mdl, mid-dorsal lobe. Scale bars: A–B, 1 mm; C, 1 mm, D–F 15 μm.

TYPE MATERIAL

Holotype: Low Islands, Great Barrier Reef Queensland, Australia (BMNH-AN 02 1931.7.1.58). Collected by the Great Barrier Reef Expedition, 1928–1929.

REDESCRIPTION

Holotype anterior fragment with 236 segments, measures 90 mm long by 2 mm wide in abdomen. Colour in alcohol light brown. Prostomium rounded with palpode, covered by peristomium. Proboscis globular in shape, with papillae on proximal end, smooth on distal end. Eyespots absent. Tessellated epithelium from peristomium until segment 9, subsequent segments smooth. Damaged integument in posterior thoracic and anterior abdominal segments; in general, integument are soft and brittle. Thorax formed by 16 biannulate segments including an achaetous peristomium and 15 chaetigers (Figure 2A). First seven thoracic chaetigers dorsally with notopodia widely separated, chaetigers 8 to 15 with notopodia closest. Chaetigers 1 to 8 with uniform size, the following thoracic segments are almost of double size than the first ones. Mid-dorsal lobe on chaetigers 9 to 13, this structure is independent of notopodia (Figure 2B).

Lateral organs present on all chaetigers, located between the notopodia and neuropodia; those of thoracic region closer to the notopodia; abdominal ones globular, exposed, and closer to neuropodia. Genital pores starting on posterior thoracic chaetigers, between intersegments 8/9, 9/10, 10/11, 11/12, 12–13, 13–14 and 14/15.

Transition from thorax and abdomen is marked by chaetal change. Abdominal segments with hooded hooks on both rami. Notopodia and neuropodia protrude from body. Both

notopodial lobes fused dorsally, chaetal fascicles armed with 16 hooded hooks each. Anterior abdominal neuropodia expanded laterally through ventral side, posterior ones reduced to ventral region, all neuropodia separated ventrally (Figure 2C); neuropodial chaetal fascicles with 84 hooded hooks. Abdominal hooded hooks of similar size and shape in notopodia and neuropodia along body, with long anterior shaft, slightly inflated node, evident constriction, wide shoulder and neck, hood of moderate length, extending to middle shoulder, posterior shaft longer than anterior one (Figure 2D). With a main fang and three rows of subapical teeth, basal row with 12–13 teeth, middle with 8, and apical one with 10–11 small teeth (Figure 2E–F).

Retractile branched branchiae emerge from a pore immediately above the neuropodia on middle abdominal segments, up to 16 branchial filaments. Pygidium not seen.

Methyl green pattern stain light green throughout body, with no definite pattern.

REMARKS

The holotype is in poor condition with the epithelium of some thoracic and abdominal segments damaged. Monro (1931) did not describe some features such as lateral organs which are present from first chaetiger throughout body between notopodia and neuropodia; genital pores restricted to intersegments of chaetigers 8/9, 9/10, 10/11, 11/12, 12–13, 13–14, 14/15, which are visible only when they are separate from the pleats of each segment in that these structure are present, middorsal lobe on chaetiger 9 to 13, and presence of branched branchiae on posterior abdominal region. *Dasybranchethus fauveli* is known for only one locality in Australia, from their description in 1931 it has not been found again, which makes it a strange species. In the same way, *D. pacifica* only was collected in two very near localities, although on two occasions (2005 and 2006) was sampled the same places.

TYPE LOCALITY

Low Isles, Great Barrier Reef, Queensland, Australia, southwestern Pacific.

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