



## A new species of *Eunice* Cuvier, 1817 (Polychaeta: Eunicidae) from the slope of the Desventuradas Islands and seamounts of the Nazca Ridge, southeastern Pacific Ocean

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### Abstract

A new species of Eunicidae, *Eunice decolorhami* **sp. n.**, from the southeastern Pacific Ocean, is described. The species was collected at the slope of the Desventuradas Islands (San Félix and San Ambrosio) and in three nearby seamounts of the Nazca Ridge, in dead coral rubble bottoms from 180 to 340 m depth and inhabiting inside parchment-like branched tubes. *Eunice decolorhami* **sp. n.** can be distinguished from other species of the genus, mainly by the coloration pattern of the subacicular hooded hooks along the body segments, the beginning of the subacicular hooded hooks, the beginning of the branchiae, the maximum number of branchial filaments, and the maxillary formula. A key for the seven *Eunice* species recorded off the coast of Chile and Peru, including the new species described herein, is provided.

**Key words:** Polychaeta, Eunicidae

### Introduction

Desventuradas is an archipelago formed by the San Félix (25°15'S, 80°07'W) and San Ambrosio islands (26°20'S, 70°58'W), and the González and Roca Catedral islets. Located about 850 km off the coast of Chile, off Chañaral in the Atacama region, they are an extension of the seamount ranges of Nazca—Salas and Gómez, and the only emerging part of a volcanic massif that rises on the ocean floor at a depth of 4000 m at the eastern end of the Salas y Gómez ridge. Its remote geographical position and the fact that it is a restricted military zone makes it one of the least explored places in the Pacific Ocean.

In general, the scientific studies carried out so far on the Desventuradas Islands are scarce and are mainly qualitative descriptions. Quantitative information on the underwater fauna of the Desventuradas Islands can be found in the expedition report “*Pristine Seas*” of the National Geographic Society and Oceana (2013).

The polychaete fauna along the coast of Chile and its oceanic islands (Rapa Nui and the Juan Fernández archipelago), is relatively well-known, with 593 species recorded (Rozbaczylo *et al.* 2017), but the information on the fauna of polychaetes near the Desventuradas Islands and seamounts of the Nazca Ridge is practically unknown. In the Eunicidae family seven species have been recorded along the coast of Chile, five of them are of the genus *Eunice*, four species in Rapa Nui with one species of *Eunice*, and four species in the Juan Fernández Archipelago but none of them from the genus *Eunice* (Rozbaczylo 1985).

The genus *Eunice* is the most diverse within the family Eunicidae, with more than 250 recognized species

worldwide. They can be found in cracks and crevices, in rocky and sandy bottoms, some can drill in dead coral rubble, and some species build complex arrays of branched tubes (Hutchings 1981; Paxton 2000; Pleijel 2001; Carrera-Parra 2009). They can live in symbiosis with other invertebrates such as sponges and corals (Kise & Reimer 2016). Some species have been referred as dominant species in biogenic calcareous bottoms of living and dead algae, coral reefs and other biodetritic fragments (Lana 1996).

Parin *et al.* (1997) carried out a study in 22 seamounts of the Salas y Gómez and Nazca ridges and reported the presence of 192 species of benthic invertebrates, including 10 species of polychaetes, among which *Eunice* sp. was mentioned, but also indicated the presence of unidentified calcareous encrusting tubes. Parin *et al.* (1997) also point out that the fauna of benthic and benthopelagic invertebrates in the area is much more related to the western Indo-Pacific than to the fauna of the southeastern Pacific Ocean. They also highlight the high degree of endemism at the species level (51 % among the identified invertebrates); which has also been pointed out for other authors for the rest of the oceanic islands of Chile such as Rapa Nui, Salas y Gómez, and the Juan Fernández Archipelago (Rehder 1980; Friedlander *et al.* 2013, 2016; Pérez-Matus *et al.* 2014; Carrasco *et al.* 2019).

In this paper we describe a new species of *Eunice*, from the slope of the Desventuradas Islands (San Félix and San Ambrosio) and from three nearby seamounts of the Nazca Ridge within the Chilean economic zone. A key for the identification of the species of *Eunice* registered in jurisdictional waters of Chile and Perú is included. Images showing the habitat of the new species, taken with a remotely operated vehicle, are also presented.

## Materials and methods

A multidisciplinary oceanographic cruise (CIMAR 22 Oceanic Islands) was carried out onboard the research vessel AGS-61 *Cabo de Hornos* of the Chilean Navy, between October 22th and November 1st, 2016. Samples were obtained from the slope at the west of San Félix and San Ambrosio islands (Desventuradas Islands; 26°17'S–26°21'S, 79°51'W–80°06'W) and from three seamounts (25°25'S–26°19'S, 81°53'W–83°18'W) of the Nazca Ridge, covering a depth range of 180 to 340 m (Fig. 1). Sampling was performed using a modified Agassiz trawl (AGT), consisting of a metal frame with a 1.5 m × 0.5 m (width x height) mouth, fitted with a 12 mm mesh at the cod end, which was operated in 10-minutes (bottom contact) hauls at ~ 3 knots. Sample collection was done under permission Res. Ext N°41/2016 from SERNAPESCA (Chile) to Universidad Católica del Norte.

Prior to sampling with the AGT a visual observation of the study site was performed using a remotely operated underwater vehicle (ROV; Commander MK2; Mariscope Meerestechnik, Kiel, Germany), equipped with a HD Camcorder (Panasonic SD 909) and laser pointers (10 cm apart).

Collected specimens were preserved in 100% ethanol and the type material and voucher specimens are deposited in the following Chilean institutions: Museo Nacional de Historia Natural, Santiago (MNHNCL), Museo de Zoología de la Universidad de Concepción, Concepción (MZUC-UCCC) and Sala de Colecciones Biológicas de la Universidad Católica del Norte, Coquimbo (SCBUCN).

Specimens were examined with light microscopy using a AMPLE Scientific SMZT10 00018 stereomicroscope and a Swift Optical Instruments M10 Series research compound microscope. Photomicrographs were taken with a Digital Camera Laborgeräte GmbH mounted on both the stereo- and compound microscopes. Measurements of specimen structures were made using a micrometer attached to the microscope eyepiece; the measurements were standardized for width at chaetiger 25 excluding parapodia. Photographies of tubes were taken with a Sony Cyber-shot DSC-HX60V camera. Some specimens were initially stained with a saturated solution of Methyl Green (MG) in 70% ethyl alcohol (ETOH) in order to elucidate some staining patterns and thus to more clearly visualize the articulations of appendages of the prostomium, peristomium, parapodia and pygidium. This stain dissipates completely in ETOH. Line drawings were made after photographs taken with the digital camera through the stereoscopic and compound microscopes, using the methodology described by Coleman (2003, 2006).

**Nomenclature:** the electronic edition of this article conforms to the requirements of the amended International Code of Zoological Nomenclature, and hence the new name contained herein is available under that Code from the electronic edition of this article (ICZN, 1999; ICZN, 2008). This published work and the nomenclatural acts it contains were registered in ZooBank (LSID urn:lsid:zoobank.org:act:A8C80D3F-A411-4238-9E59-D8661473EDB6)

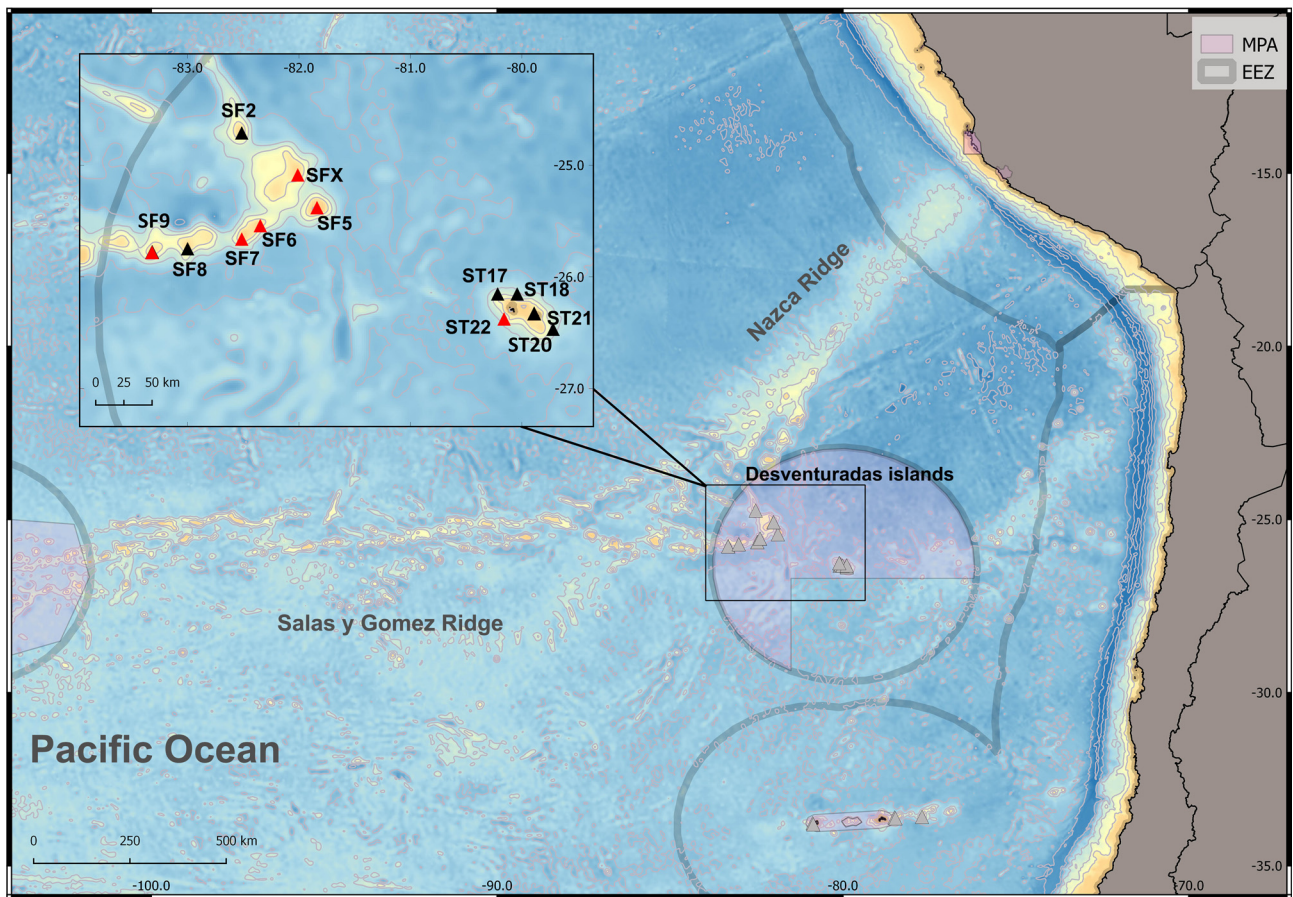


FIGURE 1. Location of the stations sampled between 22 October and 1 November 2016 in the CIMAR 22 cruise. Red triangles represent the collection points of the material examined. (Credits: Ariadna Mecho (ESMOI)).

## Results

### Systematic section

#### Order Eunicida Dales, 1962

#### Family Eunicidae Berthold, 1827

#### *Eunice* Cuvier, 1817

#### *Eunice decolorhami* sp. n. Díaz-Díaz & Rozbaczylo

Figs. 2–4

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**Diagnosis.** Prostomium with five cephalic appendages with articulations inconspicuous. Peristomium biannulated, with peristomial cirri with up to six articulations, exceeding anterior end of peristomium. Maxillary apparatus with MF =: 1+1; 6+7; 9+0; 9+12; 3+1; 1+1. (Figs 3b; 4o). Postchaetal lobe oval on chaetigers 1 and 2; subtriangular on subsequent parapodia. Dorsal cirri cirriform, weakly articulated. Branchiae pectinate from chaetigers 7–8 to posterior end of body, with up to 16 filaments. Pectinate chaetae in anterior chaetigers with 12–14 teeth with filiform tips; in middle and posterior chaetigers with up to 16 teeth. Neuropodia with 2–3 blunt-tipped black aciculae. Subacicular bidentate hooks from chaetiger 25, with black color concentrated on most length of hook; in mid-posterior chaetigers, black color concentrated toward subdistal end, and in last chaetigers, color fades. Tube white bone colored, parchment-like, branched with alternating openings.

**Material examined.** Holotype MNHNCL ANN-15035, station C22.S22, 015 (26°19'40"S, 79°59'52"W), slope of San Ambrosio and San Félix islands (Desventuradas islands), trawled at 340 m depth, October 23, 2016. Paratype 1 SCBUCN 6854, 1 specimen, same as holotype. Paratype 2 MNHNCL ANN-15036, 1 specimen, Seamount SF5, northwest of San Ambrosio and San Félix islands, station C22. SF5 047.045 (25°25'40"S, 81°53'6"W), November 01, 2016, trawled at 180 m depth. Paratype 3 SCBUCN 8674, Seamount SF9, northwest of San Ambrosio and San Félix islands, station C22.SF9.077.011 (25°46'37"S, 83°18'57"W), October 27, 2016, trawled at 200 m depth. Paratype 4 SCBUCN 6856, Seamount SFX, northwest of San Ambrosio and San Félix islands, station C22.SFX.027 (25°5'6"S, 82°0'54"W), October 31, 2016, trawled at 230 m depth.

Additional material: SCBUCN 6937, 1 specimen, same as paratype 2; SCBUCN 7248, 3 specimens, same as paratype 2; SCBUCN 7150, 2 specimens, same as paratype 2; SCBUCN 8068, 2 specimens, same as paratype 2; SCBUCN 6966, 1 specimen, same as paratype 3; SCBUCN 7271, 1 specimen, same as paratype 3; SCBUCN 8040, 1 specimen, same as paratype 4.

**Description.** Holotype (Fig. 2c) complete, in two fragments, with 105 chaetigers, total length 55.5 mm; first 10 chaetigers measure 10 mm in length, widest part measures 4.5 mm without parapodia (6.5 mm with parapodia). Preserved color pale with dorsal light brown color stripes on all chaetigers and pygidium. Distal end of prostomium clearly notched (i.e., a very deep sulcus present). Prostomium shorter and narrower than peristomium, almost 2/3 length of peristomium (Figs 2a-c; 4a). A pair of large rounded black eyes situated outside lateral antennae behind the palps (Figs 2a-c; 4a; 5a, b). Palps and antennae evenly spaced. Palps slightly thinner than antennae. Antennae and palps articulated distally, medial antennae with ten subequal cylindrical articulations, first three basal articulations inconspicuous, reaching chaetiger 12 (Fig. 4a); lateral antennae with six subequal drop-shaped articulations, reaching posterior margin of chaetiger 3. Palps with three subdistal subequal drop-shaped articulations, slightly exceeding anterior peristomial margin (Figs 2c; 4a). Peristomium biannulated, anterior ring about 3/4 of total length (Figs. 2a-c, 4a), separation between rings clear dorsally and ventrally (Fig. 2a, c). Peristomial cirri with up to six articulations, exceeding anterior end of peristomium. Mandibles dark, calcareous cutting plates subsquare-shape (Fig. 3a), with eight growth rings. Maxillary apparatus with MF = 1+1; 6+7; 9+0; 9+12; 3+1; 1+1 (Figs 3b; 4o). MxI and MxII with distinct thickened outer ridge; MxIII short; part of distal arc with left MxIV and V; MxVI ridge-shaped.

Prechaetal lobe low, lightly oval on anterior parapodia, median and median to posterior parapodia subtriangular with apex shifted slightly upwards (Figs. 2e-g; 4c-e) and becoming straight and as long as postchaetal lobe on most posterior parapodia (Fig. 4f). Postchaetal lobe oval on chaetigers 1 and 2; subtriangular on subsequent parapodia (Fig. 3b-e), longer than prechaetal lobe. Dorsal cirri cirriform, weakly articulated, two times longer than ventral cirri on four anterior chaetigers (Fig. 1b); 2.5 times longer than ventral cirri on chaetigers 8-30 (Figs. 2e; 4c); two times longer than ventral cirri on middle (Figs 2f; 4d, e) and posterior (Fig. 2g) chaetigers; on most posterior chaetigers both with almost same length (Fig. 4f). First four ventral cirri slender, digitiform (Figs. 4b; 5a, b); subsequent ones, with suboval inflated base from chaetiger 5 through chaetiger 33 with a short tapering tip (Fig. 2d,e, 4c). Subsequent ventral cirri digitiform, three times shorter than dorsal cirri on posterior chaetigers (Fig. 2f, g, 4d, e).

Branchiae pectinate, appearing from chaetiger 8 in holotype (chaetigers 7-8 in paratypes) to posterior end of body (Fig. 2c). Last two chaetigers not branchiated. Branchiae best developed around chaetiger 40 with up to 16 filaments (Fig. 4e); some specimens with dichotomous filaments (Figs 2f; 4d, e); first pair of branchiae with four filaments (Fig. 4c), last pair with 1-3 short filaments (Fig. 4f). On posterior segments, branchial filaments similar in length to notopodial cirri (Fig. 4f).

Limbate chaetae (Fig. 4g) marginally striated, giving appearance of being serrated. Pectinate chaetae in all chaetigers, inserted between dorsal bundle of limbates and neuroaciculae, with similar position all along body; pectinate chaetae in anterior chaetigers 8-10 thin, all pectinate chaetae scoop-shaped, serrated, isodont with external teeth differing in length, asymmetrical, with 12-14 teeth with filiform tips (Figs 2i; 4i); in middle and posterior chaetigers with 4-6 thick, flat to slightly curved, isodont, asymmetrical, with up to 16 teeth, with blade slightly wider than that of anterior chaetigers, both with the outer tooth almost two times longer than median teeth. Compound falcigers bidentate (Figs. 2h; 4h); distal tooth strongly curved and pointing in same direction as proximal tooth. Proximal tooth larger and thicker than distal one. Guards distally asymmetrical, bluntly pointed and basally serrated. Shafts of compound falcigers marginally serrated with a distinct core (Fig. 2h). Neuropodia with two black aciculae usually, sometimes up to three; blunt-tipped (Figs 2f; 4j) from about chaetiger 30 to posterior ones, becoming pointed and distally falcate in last few chaetigers. Subacicular hooded hooks (Figs 2j, j'; 4k-n) present from chaetiger 25



**FIGURE 2.** *Eunice decolohami* n. sp.: a) anterior end, dorsal view (paratype MNHNCL ANN-15036); b) same, ventral view; c) anterior end, lateral view (holotype); d) chaetigers 7–8 (holotype); e) chaetiger 15, posterior view (paratype MNHNCL ANN-15036); f) chaetiger 36, anterior view (paratype MNHNCL ANN-15036); g) chaetiger 80, anterior view (paratype MNHNCL ANN-15036); h) falciger chaeta; i) pectinate chaeta; j) subacicular hooded hook, lateral view; j') same, frontal view; k) pygidium, dorsal view (paratype MNHNCL ANN-15036).

(paratypes: 28–30); usually a single bidentate hook with a distinct hood, with black color concentrated on most of its length (Figs 2j, j'; 4k, l), but in mid-posterior chaetigers (from chaetigers 85 to 98), black color concentrated toward subdistal end (Fig. 4m) and color fades in last chaetigers (Fig. 4n). Few parapodia with two subacicular hooded hooks (Fig. 2g). Pygidium with two ventral pairs of anal cirri; ventral-most pair shortest, finger-shaped, dorsal one longest, with 4–5 subequal cylindrical articulations; cirri as long as last nine chaetigers (Fig. 2k).



**FIGURE 3.** *Eunice decolorhami* n. sp.: a) mandibles; b) maxillar complex (paratype SCBUCN 8674).

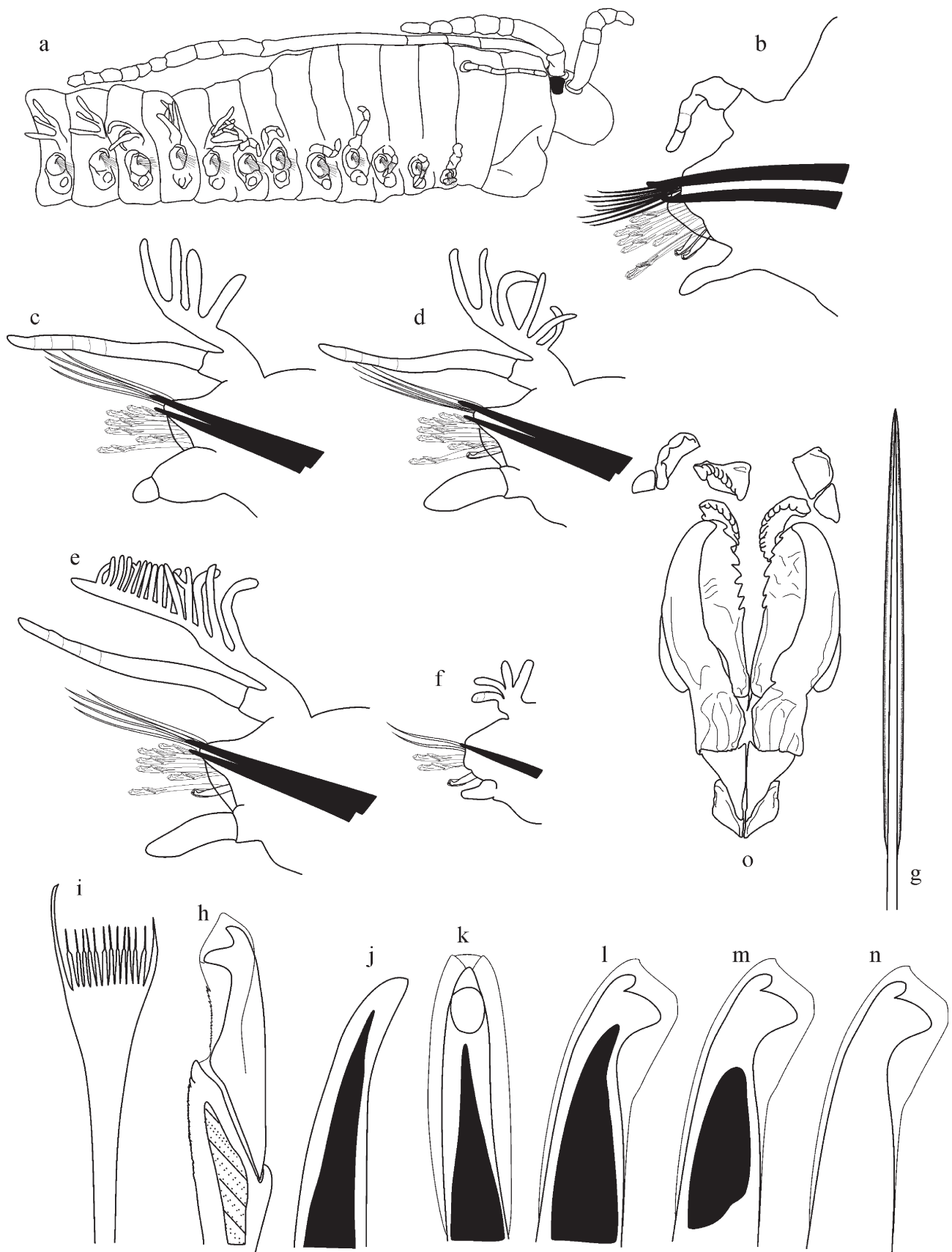
Tube white bone colored, parchment-like, branched with alternating openings (Fig. 5c). Tubes forming complexes on the sandy bottom at depths between 180 to 340 m. Usually a single specimen found per tube.

**Variation.** Paratypes and non-type material with 73–104 chaetigers, total length 32.0–54.5mm; widest part measuring 2.2–4.5 mm without parapodia (up to 6.5 mm with parapodia). In some specimens, separation between peristomial rings is not clear. Peristomial cirrus in some paratypes reaching anterior end of peristomium (Figs 4a; 5b). Maxillary apparatus with MF = 1+1; 6–7+6–7; 8–9+0; 7–8+11; 1–2+1; 1+1.

In all specimens examined, branchiae begin on chaetigers 7–8, ending on two or three chaetigers before pygidium. Branchiae with up to 18 filaments and in some specimens, most dorsal filaments are dichotomous; shortest specimens with 2–3 filaments in posterior branchiferous segments. Subacicular hooded hooks (Figs 2j, j'; 4k–n) usually present from chaetiger 25 (paratypes: 28–30), at widest segment including parapodia.

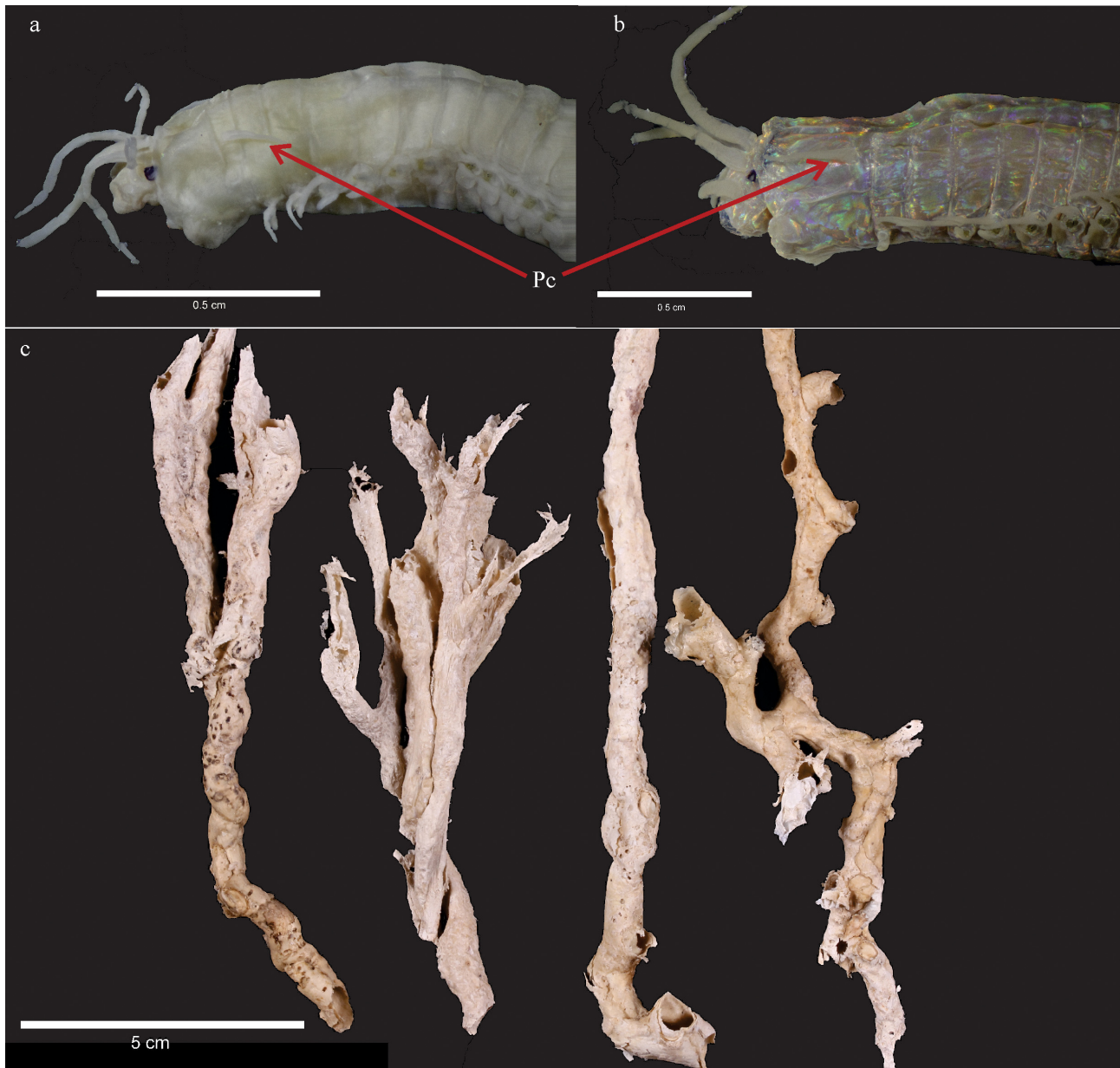
**Etymology.** The name of the species derives from Latin: *decolorata* = decolorated and *hami* = hooks and refers to the gradual discoloration of the subacicular hooks from black-brown to clear sheaths-translucent that occur from the mid-posterior region of the body until the last chaetigers.

**Type locality.** Upper slope northwest of San Ambrosio and San Félix islands (Desventuradas Islands), 26°19'40"S, 79°59'52"W, 340 m depth.



**FIGURE 4.** *Eunice decolorhami* n. sp.: a) anterior end, lateral view (paratype SCBUCN 6856); b) chaetiger 3, anterior view (AV); c) chaetiger 8, AV; d) chaetiger 36, AV (paratype); e) chaetiger 48, AV; f) posterior chaetiger, near posterior end, PV; g) limbate chaeta; h) pectinate chaeta; i) falciger chaeta; j) aciculum; k, l) anterior hooded hooks; m) middle hooded hook; n) posterior hooded hook; o) maxillary complex.

**Distribution and habitat.** Specimens come from samples obtained from the slope of Desventuradas Islands, station S22 (26°19'40"S, 79°59'52"W, 340 m depth) and the summit of three nearby seamounts: SF5 (25°25'40"S, 81°53'6"W, 180 m depth), SF9 (25°46'37"S, 83°18'57"W, 200 m depth) and SFX (25°5'6"S, 82°0'54"W, 230 m depth). The habitat of three stations (S22, SF9 and SFX), of the four in which the specimens of the new species were collected, was explored using a ROV. The bottom at SF9 and SFX was dominated by coarse calcareous sediments produced by foraminiferous tests, debris of deep-sea corals, holopelagic gastropod shells (*Cavolinia* sp. and *Cuvierina* sp.) and rhodoliths, with scattered rocky outcrops (Fig. 6b–c). Habitat at S22 differed by the predominance of fine sand (Fig. 6a).

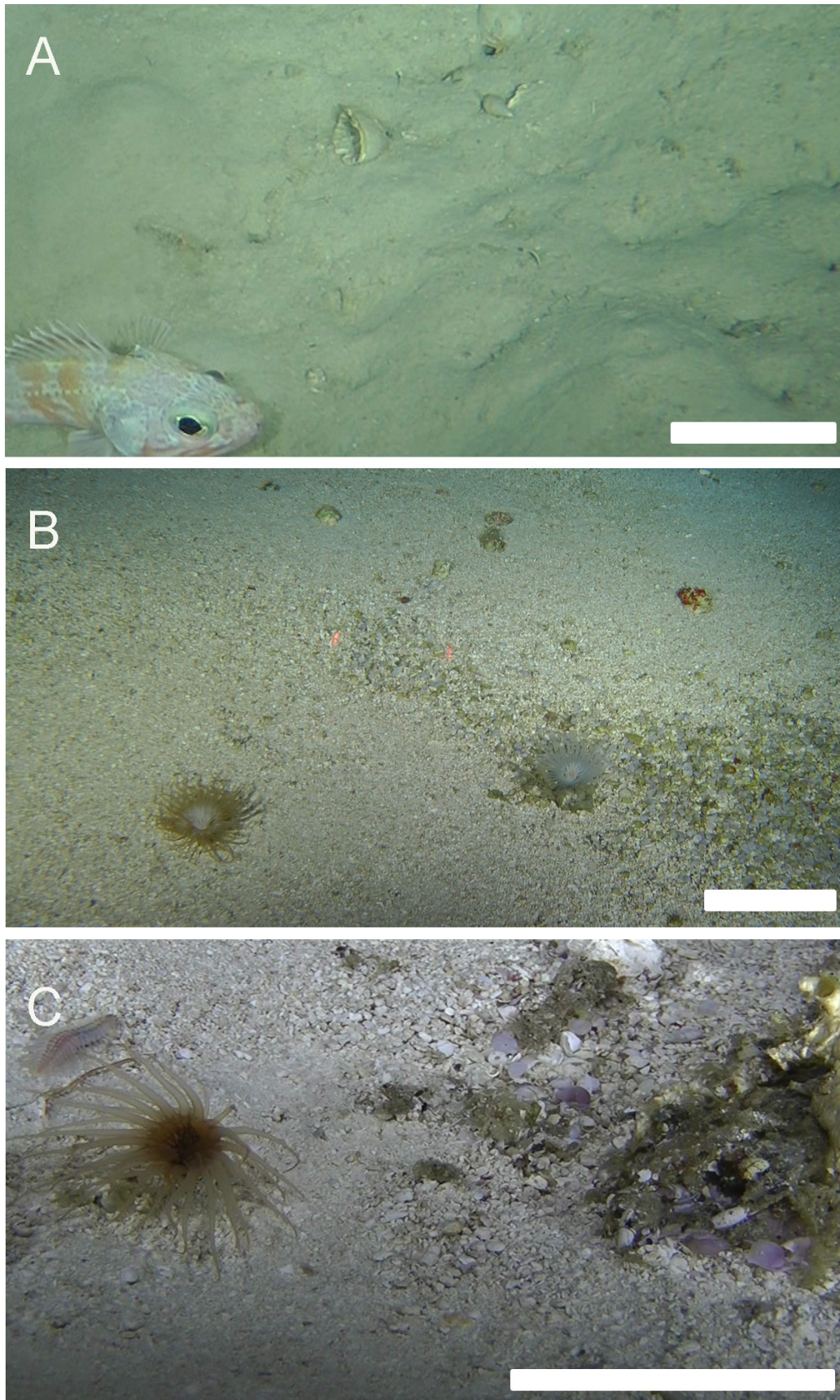


**FIGURE 5.** Paratypes (SF5 (a) and SF7 (b)) red arrows indicate peristomial cirri; c) tubes

## Discussion

Zanol *et al.* (2000) mentioned that, despite their large body size and the high number of characters, the taxonomy of eunicids is quite problematic. Furthermore, several original descriptions were rather brief, leading to a high number of indeterminable species. Fauchald (1992a, b) reviewed the genera *Eunice* and *Palola* and redescribed them in a more realistic framework, allowing the identification of many rare species previously reported as synonyms of 'well-known' species.





**FIGURE 6.** Different habitats (S22, SF9 and SFX) for *Eunice decolorhami* n. sp. a) habitat at S22 with predominance of fine sand; b, c) bottom at SF9 and SFX, dominated by coarse calcareous sediments produced by foraminiferous tests, debris of deep-sea corals, holopelagic gastropod shells and rhodoliths, with scattered rocky outcrops.

Eight species of *Eunice* have been recorded in the south eastern Pacific Ocean from Perú to Chile, five of them are found along the Chilean coast: *E. atlantica* Kinberg, 1865 (in Iquique, ~20°S), *E. frauenfeldi* Grube, 1866, (in the Magallanes region, ~48° to 56°S), *E. parasegregata* Hartmann-Schröder, 1965 (in Punta Lavapié, ~37°S), *E. pennata* (O.F. Müller, 1776) (from Aysen to Magallanes, ~46°S to ~56°S), and *E. splendida* Grube, 1856 (in Valparaíso, ~33°S). *Eunice decolorhami* **sp. n.** differs from *E. splendida*, because the latter has moniliform antennae, the peristomial cirri have cylindrical articulations and reaches the anterior margin of the prostomium, and the subacicular hooks are tridentate; it differs from *E. parasegregata*, because the branchiae terminate well before the posterior end (present on less than 55% of total number of chaetigers), and the subacicular hooks are yellow in color. Furthermore, the new species differs from *E. frauenfeldi* Grube, 1868 (= *E. magellanica* McIntosh, 1885) because in the latter all subacicular hooks are black. Records of other two species in Chile are questionable (*E. atlantica* and *E. pennata*). The new species differs from *E. atlantica* Kinberg, 1865 (recorded off Rio de Janeiro, Brazil) in that the latter has yellow and tridentate subacicular hooded hooks. *Eunice pennata* (Müller, 1776) has been widely reported and was considered with bipolar distribution; Fauchald (1992a) wrote “Records of this species from the southern hemisphere (cf. Hartman, 1964: 118, 1967: 99) have yet to be confirmed” posterior records from Chile were made with incomplete specimens and these should be re-examined (Montiel *et al.* 2004; Rozbaczylo *et al.* 2006). However, *E. decolorhami* **sp. n.** differs from *E. pennata* (Norwegian coast), in that the latter has yellow subacicular hooks, branchiae terminating well before the posterior end (present on less than 55% of total number of chaetigers), and by the presence of ring-shaped bases in posterior notopodia, this feature being only reported in *E. nicidioformis* Treadwell, 1906, and *E. pennata*.

Other comparable species from nearby areas is *E. pelamidis* Quatrefages, 1866 (found off Paita, Perú, ~5°S), which shares the same geographical distribution and some morphological characters, but *E. decolorhami* **sp. n.** is different by the absence of pseudocomposite chaetae, the development of the basal portion of the ventral cirri, and by the color of aciculae and subacicular hooks (Table 1).

Within the *Eunice* species that build branched tubes, *E. decolorhami* **sp. n.** is close to *E. denticulata* Webster, 1884 (= *E. conglomerans* Ehlers, 1887) and *E. floridana* (Portuàles, 1857), both from the Great Caribbean region. The new species differs from both in the segmental origin of the branchiae, the maximum number of branchial filaments, the beginning of the subacicular hooded hooks, the coloration pattern throughout the body and in the maxillary formula (Table 2). Differences between *E. decolorhami* **sp. n.** and other related *Eunice* species with branched tubes are shown in Table 3.

## Concluding remarks

*Eunice decolorhami* **sp. n.** constitutes the sixth species within the genus reported for continental and insular Chilean waters. Although still poorly explored, the area where the new species lives is known by its high levels of endemism, both for vertebrates and invertebrates (Friedlander *et al.* 2016). Further future sampling is needed to corroborate that the new species is endemic to the area. The present work contributes to the knowledge of the fauna of the Desventuradas islands and nearby seamounts, located in the intersection of the Salas y Gómez and Nazca ridges. This important area, in terms of the conservation of the global biodiversity, is now protected by the large Nazca-Desventuradas Marine Park, created in 2016 by the Chilean government.

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**TABLE 1.** Comparison between *Eunice decolorhami* sp. n. and other *Eunice* related species (SHH: subacicular hooded hook)

Species	Distribution	Antennae ceratostyle	Peristomial cirri	Branchiae from/to
<i>E. cultrifera</i> Zanol, Hutchings & Fauchald, 2020	Jervis Bay, New South Wales, Australia	Irregularly articulated	Irregularly articulated	50 to end of body
<i>E. decolorhami</i> sp. n.	Southeastern Pacific Ocean	10 subequals weakly cylindrical articulations	3 weakly cylindrical articulations	8/103 near to posterior end
<i>E. atlantica</i> Kinberg, 1865,	Brazil (Rio de Janeiro) and Chile (Iquique)	5 cylindrical articulations	3 cylindrical articulations	3/?
<i>E. borneensis</i> Grube, 1878	Palawan (North Borneo, Pacific Ocean)	6 cylindrical articulations	3 cylindrical articulations	6/120 near to posterior end
<i>Eunice ehlersi</i> Gravier, 1900	Djibouti, Gulf of Aden, Indian Ocean	8 cylindrical articulations	not articulated	14/end the fragment
<i>E. frauenfeldi</i> Grube, 1868	Antarctic Ocean (St. Paul's Island), Pacific Ocean (Chile, Magellan Province), Atlantic Ocean (Mar del Plata, Argentina)	Cylindrical articulations and drop-shape articulations distally	4–5 cylindrical articulations	Chaetiger 6/?
<i>Eunice nigricans</i> Schmarda, 1861 (Sensu Fauchald, 1992a)	Caribbean Sea (Port Royal, Jamaica)	20 short articulations	7 articulations	6–7/180 near to posterior end
<i>E. parasegregata</i> Hartmann-Schröder, 1965	Punta Lavapie, Chile	Drop-shape articulations	Not articulate	Third chaetiger / terminating well before posterior end
<i>E. pennata</i> (O.F. Müller, 1776)	Atlantic Ocean (North Sea, Norway (Strokjær), Spain, France, Greece, Ireland, Mediterranean Sea, Canada, Gulf of Mexico, Brazil, Argentina) Indian Ocean (Red Sea) and Pacific Ocean (Chile), Antarctic Ocean	Irregularly spaced articulations	3–4 irregular long articulations	3/39–41
<i>E. purpurea</i> Grube, 1866	Adriatic Sea	Up to 13 cylindrical articulations	3 cylindrical articulations	5/100 near to posterior end
<i>E. roussaei</i> Quatrefages, 1866	Caribbean Sea (Martinique)	Vaguely articulate	Vaguely articulate	6–8/?
<i>E. violaceomaculata</i> Ehlers, 1887	Caribbean Sea (Florida)	10 articulations	6 articulations	6–7/215 near to posterior end

.....continued on the next page

TABLE 1. (Continued)

Species	Branchial filament maximum	Notopodial cirri	SHH: type/color (begin)	Aciculae type/color
<i>E. cultrifera</i> Zanol, Hutchings & Fauchald, 2020	2	irregularly articulated	dark brown to black core, clear sheaths-translucent. (90)	acicula tapering to blunt tips; tip distally bent in posterior chaetigers/ black core,
<i>E. decolorhami</i> sp. n.	8–14	weakly articulate	Bidentate/black-brown core, clear sheaths-translucent. (27)	up to 3; blunt-tipped/black core, clear sheaths
<i>E. atlantica</i> Kinberg, 1865,	5?		Tridentate/Yellow (?)	Distally tapering gently curved, yellow
<i>E. borneensis</i> Grube, 1878	9	Not articulate	Bidentate/Black (30–35)	(3) narrowly blunt tip/Black
<i>Eunice ehlersi</i> Gravier, 1900	6	Not articulated	Bidentate/ amber to dark brown (27)	Sharply and symmetrically pointed, straight/amber to dark brown
<i>E. frauenfeldi</i> Grube, 1868	3	Articulated anteriorly, posteriorly not articulated	Bidentate/light brown	Distally tapering gently curved/Light brown
<i>Eunice nigricans</i> Schmarda, 1861 (Sensu Fauchald, 1992a)	18	7–3 articulations	Bidentate /Brown core, clear sheaths (30)	Tapering to slender tips, curved/Brown core, clear sheaths
<i>E. parasegregata</i> Hartmann-Schröder, 1965	18	Not articulate	Bidentate/yellow (¿?)	Distally tapering gently curved/Yellow
<i>E. pennata</i> (O.F. Müller, 1776)	12	Weakly articulated	Bidentate/Yellow	Distally tapering straight or gently curved/Yellow
<i>E. purpurea</i> Grube, 1866	14	Articulate	Bidentate /Brown core, clear sheaths (19)	Tapering tips/Brown core, clear sheaths
<i>E. roussaei</i> Quatrefagues, 1866	30–47	Not articulate	Bidentate/ indeterminate (?)	Tapering to slender, straight tips/ Brown core, clear sheaths
<i>E. violaceomaculata</i> Ehlers, 1887	20	6 articulations	Bidentate/Dark brown (25–36, 39)	Tapering to slender tips, distally curved or straight/ dark brown

\* *Eunice splendida* Grube, 1856, from Valparaiso was considered undetermined by Fauchald (1992), absence of information on the chaetal structure does not allow an adequate characterization

\* *Eunice oerstedii* Stipson 1853, from Grand Manan Island Canada was considered undetermined by Fauchald (1992), no original material is available.

**TABLE 2.** Maxillary formula of *Eunice* species from Chile and related species.

Species	Maxillary formula
<i>E. decolorhami</i> sp. n.	1+1; 5–7+6–7; 8–9+0; 7–9+11–12; 1+1
<i>E. atlantica</i> Kinberg, 1865	unknown
<i>E. borneensis</i> Grube, 1878	1+1; 4+4; 7+0; 5+11; 1+1.
<i>E. ehlersi</i> Gravier, 1900	1+1; 5+6; 8+0; 3+9; 1+1.
<i>E. frauenfeldi</i> Grube, 1868	unknown
<i>E. nigricans</i> Schmarda, 1861 ( <i>Sensu</i> Fauchald, 1992a)	1+1; 4+5; 6+0; ?+6; 1+1.
<i>E. parasegregata</i> Hartmann-Schröder, 1965	1+1; 14+16; 13+0; 10+16; 1+1.
<i>E. pennata</i> (O.F. Müller, 1776)	1+1; 6+7; 9+0; 6+11; 1+1.
<i>E. purpurea</i> Grube, 1866	1+1; 4+5; 7+0; 2+7; 1+1.
<i>E. roussaei</i> Quatrefages, 1866	unknown
<i>E. violaceomaculata</i> Ehlers, 1887	1+1; 5+5; 6–7+0; 4–6+9; 1+1.

**Key to the *Eunice* species recorded in the southeastern Pacific Ocean off the coast of Chile and Perú**

(Q: questionable)

- 1a. Subacicular hooded hooks tridentate ..... 2  
 1b. Subacicular hooded hooks bidentate ..... 3  
 2a. Pseudocompound falciger chaetae present; subacicular hooded hooks amber colored ..... *E. pelamidis* Quatrefages, 1866  
 2b. Pseudocompound falciger chaetae absent; subacicular hooded hooks yellow colored ..... *E. atlantica* Kinberg, 1865 Q<sup>1</sup>  
 3a. Antennae and palps with ceratostyles moniliform ..... *E. splendida* Grube, 1856  
 3b. Antennae and palps with ceratostyles with cylindrical and/or drop-shaped articles ..... 4  
 4a. Aciculae and subacicular hooded hooks with same color, uniform throughout the body ..... 5  
 4b. Aciculae and subacicular hooded hooks with different color throughout the body: black in anterior chaetigers, and brown core, clear sheaths and translucent in posterior chaetigers ..... *E. decolorhami* sp. n.  
 5a. Branchiae present from chaetiger 6; branchiae with maximally three filaments; notopodial cirri articulated in anterior chaetigers and not articulated in the posterior ones; aciculae and subacicular hooded hooks light brown cores and clear sheaths. .... *E. frauenfeldi* Grube, 1868  
 5b. Branchiae present from chaetiger 3; branchiae with maximally 18 filaments; notopodial cirri not articulated or weakly articulated; aciculae and subacicular hooded hooks yellow ..... 6  
 6a. Antennae, palps, peristomial cirri and notopodial cirri not articulated; branchiae with up to 18 filaments ..... *E. parasegregata* Hartmann-Schröder, 1965  
 6b. Antennae, palps, peristomial cirri and notopodial cirri weakly articulated; branchiae with up to 12 filaments ..... *E. pennata* (O.F. Müller, 1776) Q<sup>2</sup>

<sup>1</sup>Species described for Rio de Janeiro, Brazil<sup>2</sup>Species described for Norway.**References**

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**TABLE 3.** Comparison among *E. decolorhami* sp. n. and other *Eumice* species with multibranching tubes.

Species	Branchiae terminating well before posterior end?	Maxillary formula MI: MII: MIII: MIV: MV	Branchiae start/N° max. Filament	Subacicular hook start	Type locality
<i>E. cultrifera</i> Zanol, Hutchings & Fauchald, 2020	No	1+1, 6+4, 7+0, 4+8, 1+1, 1+1	50/2	90	Jervis Bay, Australia
<i>E. decolorhami</i> sp. n.	No	1+1; 5-7+6-7; 8-9+0; 7-9+11-12; 1+1	7-8/14	27	San Ambrosio Is., Chile
<i>E. antipathum</i> (Pourtales, 1857)	Yes	1+1: 7-8+8: 7-8+0: 5-6+8: 1+1	6-12/1 (rarely 2)	18-22	Cuba
<i>Eumice denticulata</i> Webster, 1884 (= <i>E. conglomerans</i> Ehlers, 1887)*	No	1+1: 5+6: 6+0: 2+6: 1+1	23-29/4	22	Florida, Great Caribbean
<i>E. floridanus</i> (Pourtales, 1857)	No	1+1: 6+6: 7-9+0: 6+8: 1+1	9-10/8	29-40	Great Caribbean
<i>E. marianae</i> Hartmann-Schröder, 1998**	Yes	1+1: 10+10: 10+0: 9+10: 1+1	7-15/1	21	Reunion Is., Indian Ocean
<i>E. metatropos</i> Hanley, 1986	Yes	1+1: 7+7: 9+8: 7+6: 1+1	6/3	?***	Western Australia
<i>E. musorstomica</i> Hartmann-Schröder, 1998	Yes	1+1: 8+7: 7+0: 9+5: 1+1	7-14(8)/1	26	Loyalty Is., Pacific Ocean
<i>E. palauensis</i> Okuda, 1937	Yes	1+1: 6-7+7-8: 8+0: 5-8+6-8: 1+1	6-7/2-3 (rarely 4)	24-25	Australia
<i>E. philippinensis</i> Hartmann-Schröder, 1998	Yes	1+1: 6+7: 8+0: 6+7: 1+1	5-6/3	18-21	Philippines
<i>E. tibiana</i> (Pourtales, 1867)	Yes	1+1: 8+9: 10+0: 7+11: 1+1****	6-7/6	29	West Indies
<i>E. tubicola</i> (Treadwell, 1922)	No	?	12/1	21	Samoa, Pacific Ocean
<i>E. tubifex</i> (Crossland, 1904)	Yes	1+1: 4+3: 7+0: 2+7: 1+1	17/4	29-32	Zanzibar, Africa

\*Zanol (2011)

\*\* in Hartmann-Schröder & Zibrowius, 1998

\*\*\* Hanley do not specify (original description)

\*\*\*\*Ehlers, 1887