



New records of polychaetes (Annelida: Polychaeta) associated to *Thalassia testudinum* at Boca del Río bay, Nueva Esparta, Venezuela

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Abstract. Studies about polychaetes associated with *Thalassia testudinum* meadows in Venezuela are scarce, only four studies have been done. In order to increase knowledge about the polychaetes associated to this phanerogam, sampling was carried out in a seagrass bed located in Boca del Río bay (Nueva Esparta state, Venezuela), using a PVC core (10.3 cm diameter) from October to December 2013. Two hundred fifty-six polychaete worms were collected and examined. The specimens belonging to nine families, 18 genera and 22 species, seven of which are new records for Venezuela (*Euclymene coronata*, *Nicomache antillensis*, *Eunice goodei*, *E. unifrons*, *Marphysa minima*, *M. longula*, and *Parasabella jamaicensi*). *Neoleprea* genus is a first record for the country.

Key words: taxonomy, biodiversity, infauna, seagrass, benthos.

Resumen. Nuevos reportes de poliquetos (Polychaeta, Annelida) asociados a *Thalassia testudinum* en la bahía de Boca del Río, Nueva Esparta, Venezuela. Los estudios sobre los poliquetos asociados a praderas de *Thalassia testudinum* en Venezuela son escasos, sólo cuatro investigaciones se han hecho hasta el presente. Con el fin de aumentar el conocimiento sobre los poliquetos asociados a esta fanerógama se realizaron muestreos en una pradera situada en la bahía de Boca del Río (estado Nueva Esparta, Venezuela), empleando un nucleador de PVC (10,3 cm de diámetro), de octubre a diciembre de 2013. Doscientos cincuenta y seis poliquetos fueron recolectados y examinados. Los ejemplares pertenecen a nueve familias, 18 géneros y 22 especies, siete de éstas especies constituyen nuevo registro para Venezuela (*Euclymene coronata*, *Nicomache antillensis*, *Eunice goodei*, *E. unifrons*, *Marphysa minima*, *M. longula*, y *Parasabella jamaicensi*). El género *Neoleprea* se registra por primera vez para el país.

Palabras clave: taxonomía, biodiversidad, infauna, praderas, bentos.

Introduction

Polychaete worms has colonized all substrates like rocks, sand, mud, seagrass beds and others; where they are important because of their physiology, energy intake, and response to disturbance agents such as pollution indicators (Fauchald 1977a, Solis-Weiss 1997, Liñero & Díaz

2011). They have colonized all substrates preferring from sandy bottoms with little to moderate amount of organic matter, to muddy bottoms with abundance of detritus. Even flowery seagrass bottoms are inhabited by numerous species, both wandering and sedentary (Liñero & Díaz 2011).

There are more than 9000 species spread over

more than 80 recognized families (Rouse & Pleijel 2001), but this number is constantly growing. For the Caribbean Sea region have been recorded over 1240 species, 447 genera, 69 families and an estimated of 500-600 species remain to be described, Salazar-Vallejo (1996). In Venezuela, the taxonomic knowledge about this group is very low and only about 43 families, 192 genera and 382 species of polychaetes have been identified until now (Liñero & Díaz 2009).

For the Nueva Esparta state, are known the researches of Hartman (1944), Díaz *et al.* (2009), Díaz & Ríos (2014) and Ríos *et al.* (2014), who recorded 60 species approximately. Only four studies about polychaetes associated with *Thalassia testudinum* has been made in Venezuela (San Martín & Bone 2001, Bone & Viéitez 2002, Bone & San Martín 2003 and Liñero & Díaz 2006). Liñero & Díaz (2011) report that in the tropics, given the stable environmental conditions and the formation of many biotopes, is expected a considerable number of polychaetes species is considerable. To increase the biodiversity knowledge in Venezuela a taxonomic study about polychaete species associated to *T. testudinum* was made in the Boca del Río bay, Nueva Esparta state.

Materials and Methods

Study area: Boca del Río bay (10° 55' N; 64°11' O) is located at southeast of Margarita island, Venezuela (Fig. 1). It's an area of shallow water influenced by the nutrient inputs and the high salinity water from the La Restinga lagoon. It's also affected by coastal upwelling processes, especially in the first months of the year (Valerio *et al.* 2014). The study area is characterized for having a seagrass bed covered bottom of *Thalassia testudinum* a sandy-muddy sediment and *Rhizophora mangle* at the northeast coast.

Methodology

The samples were collected from during October to December 2013, to a depth of 0.5-1.5 m using a core of 10.3 cm diameter. The samples were sieved with a 0.5 mm mesh opening sieve. Polychaetes were separated from the rest of the organic material and placed in plastic containers with seawater to be carried to the laboratory. Polychaetes were relaxed, fixed and preserved following the methodology described by Liñero-Arana & Díaz-Díaz (2011). They were examined using compound and stereoscopic microscopes and structures with taxonomic value

were dissected. The images were captured with a camera Casio Exilim and vectorized with Adobe Illustrator Cs6 software®. All specimens were deposited in the reference collection of the Laboratorio de Biología de Poliquetos (LBP) at the Instituto Oceanográfico de Venezuela. The polychaete specimens were identified using the regional keys (Uebelacker 1984, Fauchald 1992, Salazar-Vallejo & Carrera-Parra 1997, Santos & Mackie 2008, Tovar-Hernández 2008, Carrera-Parra 2009, Salazar-Vallejo & Díaz-Díaz 2009, Tovar-Hernández 2009, Liñero-Arana & Díaz 2010); while the taxonomic arrangement was made according to the Fauchald proposal (1977b), based on phylogenetic ideas in Fauchald (1974). In this paper only new records for Venezuela were characterized.

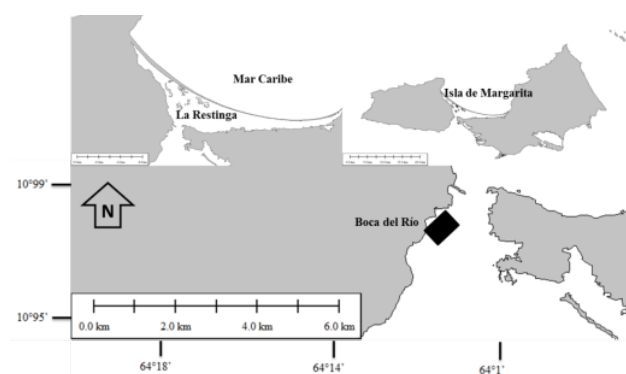


Figure 1. Sampling area in Boca del Río bay, Margarita Island Venezuela (red arrow).

Results

A total of 256 polychaetes specimens were found and examined, 22 species, in nine families, were identified (Table I): *Euclymene coronata*, *Nicomache antillensis*, *Eunice goodei*, *E. unifrons*, *Marphysa minima*, *M. longula*, and *Parasabella jamaicensis* are new records for Venezuela; and *Neoleprea* genus is recorded for the first time for the country. These results increase the knowledge about marine polychaete biodiversity at the continental shelf of Venezuela.

Family: Maldanidae Malmgren, 1867

Genus: *Euclymene* Verril, 1900

Euclymene coronata Verril, 1900

Figure 2a-i

Euclymene coronata Jiménez-Cueto & Salazar-Vallejo 1997: 1469, 1472: Figs. 7a-c; Salazar-Vallejo & Díaz-Díaz 2009: 298, 305, Fig. 3a.

Material examined. Nineteen fragmented specimens.

Description. All specimens fragmented. The best

preserved specimen with 70 mm in length and 5 mm in width. Fourteen chaetigers. Prostomium with prominent cephalic margin with two lateral notches and eight nuchal crenulations (Fig. 2a-c). The first three chaetigers with a large acicular spine (Fig. 2d) and next parapodia with 18-20 orstrate barbulated hooks (Fig. 2e-f). Bilimbate notochoetae (Fig. 2g). With two achaetous pre-anal segments (Fig. 2h). Anal plate with 28-30 large and small cirrus, the mid-ventral cirrus are a slightly longer than the others (Fig. 2i).

Remarks. *Euclymene coronata* is similar to *E. rubrocincta* and *E. tropica*. The main difference is that *E. rubrocincta* has four lobes on the posterior margin of the cephalic plate notches, while *E. coronata* has eight. *Euclymene tropica* differs in that it has a keel mid-ventral (Salazar-Vallejo & Díaz-Díaz 2009).

Distribution. Mexico. From Bermuda to northwest Caribbean Sea (Jiménez-Cueto & Salazar-Vallejo 1997). First record for Venezuela.

Genus: *Nicomache* Malmgren, 1865

Nicomache antillensis Augener, 1922

Figure 2j-ñ

Nicomache antillensis Jiménez-Cueto & Salazar-Vallejo 1997: 1462-1463, 1466, Fig. 3a-e; Salazar-Vallejo & Díaz-Díaz 2009: 302, 306, Fig. 5y-z.

Material examined. Nine fragmented specimens.

Description. The best preserved specimen reached 27 mm in length and 3mm wide. Ten chaetigers. Prostomium with inverted "V"-shaped nuchal organs. Cephalic keel underdeveloped (Fig. 2j). Capillary, bilimbates and spinuloses notochoetae (Fig. 2k). Neuropodia with 3-5 acicular hooks on chaetigers 1-3, (Fig. 2l) and in the next has four; from chaetiger four has 13 orstrate hook barbulated (Fig. 2m) up to 20 hooks in the posterior segments. Two pre-anal segments achaetous (Fig. 2n) and pygidium presents 18-22 anal cirrus (Fig. 2ñ).

Remarks. This species has been recorded to Baja California (Jiménez-Cueto & Salazar-Vallejo 1997; De Assis *et al.* 2007); however, the presence of this species in the Pacific Ocean is questionable (Salazar-Vallejo & Díaz-Díaz 2009), because the type locality is Antigua (Caribbean Sea) and the Baja California record was based on a single specimen, and has not been recorded again. *Nicomache antillensis* is similar to *N. carinata* but differs in that *N. carinata* has a acicular spine in the first segment. *Nicomache antillensis* also is similar to *N. lanai*, but differs by having annals cirrus of equal size while *N. lanai* has buds of different size and presents 4, 5 and 7 acicular spines on first, second and third parapodia respectively.

Table I. List of orders, families and species from Class Polychaeta collected in this study (* first record for Venezuela; ** first record for Nueva Esparta).

Order	Family	Species
Spionida	Poecilochaetidae	** <i>Poecilochaetus johnsoni</i>
Capitellida	Maldanidae	* <i>Euclymene coronata</i>
Opheliida	Opheliidae	* <i>Nicomache antillensis</i>
		<i>Armandia maculata</i>
		<i>Branchiosyllis lorenae</i>
		** <i>Exogone lourei</i>
Phyllodocida	Syllidae	** <i>Haplosyllis spongicola</i>
		** <i>Syllis corallicola</i>
		** <i>Syllis mexicana</i>
		** <i>Syllis variegata</i>
Amphinomida	Amphinomidae	<i>Eurythoe complanata</i>
		* <i>Eunice goodei</i>
Eunicida	Eunicidae	* <i>Eunice unifrons</i>
		* <i>Marphysa longula</i>
		* <i>Marphysa minima</i>
Flabelligerida	Flabelligeridae	<i>Piromis cf. amoureuxi</i>
Terebellida	Terebellidae	** <i>Loimia salazari</i>
		* <i>Neoleprea sp. 1</i>
		<i>Amphicorina aneae</i>
Sabellida	Sabellidae	** <i>Branchiomma nigromaculatum</i>
		** <i>Paradialychone diazi</i>
		* <i>Parasabella jamaicensis</i>

Finally, *N. antillensis* differs to *N. brasiliensis* by having a prostomium with a rounded, low dorsal keel, nuchal grooves nearly perpendicular to the keel, and by having 3–5 acicular spines, instead 2–6,

in chaetigers 1–3.

Distribution. Caribbean Sea. First record for Venezuela.

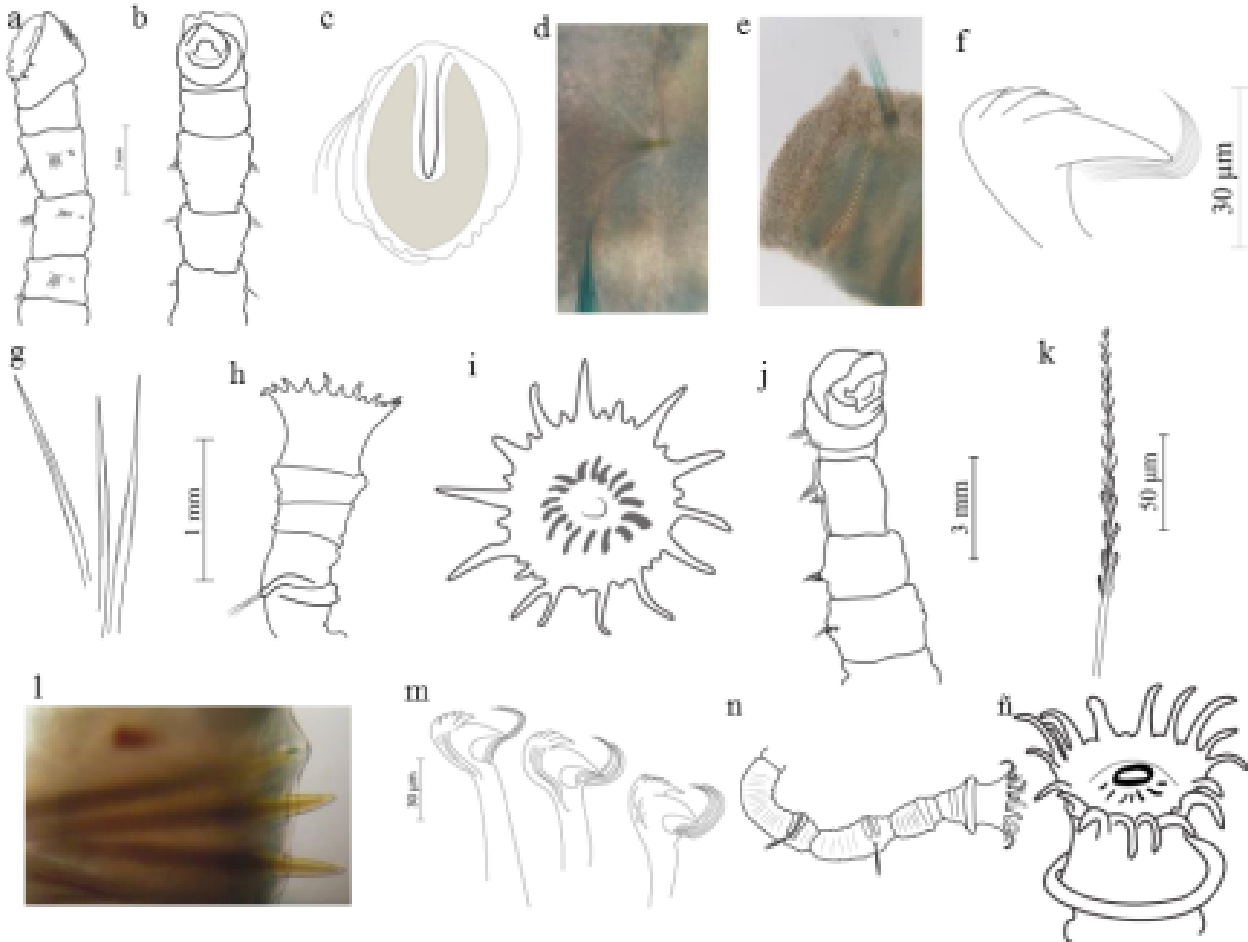


Figure 2. *Euclymene coronata*: a) front end (lateral view); b) prostomium (front view); c) front end (ventral view); d) acicular spine; e) row of hooks; f) rostrate hooks barbulate; g) bilimbates notochaetae; h) achaetous pre-anal segments; i) pygidium with anal plate, cirrus and terminal anus. *Nicomache antillensis*: j) anterior end; k) spinulose cheta or Type A; l) acicular hooks (chaetigers 2); m) rostrate hooks barbulates; n) posterior end; ñ) pygidium with cirrus anal and terminal anus. Photos: Verónica Gómez.

Family: Eunicidae Berthold, 1827

Genus: *Eunice* Cuvier, 1817

Eunice goodei Fauchald, 1992

Figure 3a-f

Eunice goodei Fauchald 1992: 154, 156, Fig. 50i-m; Carrera-Parra 2009: 175.

Material examined. Six specimens.

Description. All organisms were found fragmented: the best specimen with 56 chaetigers, 14 mm of total length and 1.2 mm wide. Prostomium bilobulate. Antennae in horseshoe shaped; antennae (AI) reaches the middle of the anterior peristomial ring; antennae II (AII) reaches the anterior margin of

chaetiger 1; antennae III (AIII) beyond of the anterior margin of chaetiger 2 (Fig. 3a). Flat jaw. Maxillary formula: 1+1, 5+5, 6+0, 5+6 (Fig. 3b). Notopodial cirrus digitiform with inflate base, large in the anterior segments (Fig. 3c) but decreasing in size and thickness to the posterior segments. Ventral cirrus digitiform with inflate base from the 8 to 34 chaetigers. Notopodial cirrus digitiform longer than the ventral one. Anterior aciculae lobule truncate, while the posterior is conical (Fig. 3c-3d). Heterodonts pectines short, dark aciculate, robust, sharply pointed (Fig. 3c-3d). Limbate setae and compound falcigers bidentate (Fig. 3e). Subacicular

hooks from chaetiger 28, bidentate and dark. Proximal tooth, triangular, directed laterally and slightly longer than the distal (Fig. 3f).

Remarks. *Eunice goodei* is very close to *E. imogena* but in this specie the first subacicular hooks are present from chaetiger 50. Also share characteristics with *E. wasinensis* and *E. cariboea*, although differs from the former because the limbate setae are absent, and from the second due to have mucronate aciculae in the anterior chaetigers, additionally very small eyes.

Distribution. Caribbean sea, eastern Tropical Pacific, Mexico (Carrera-Parra 2009). First record for Venezuela.

Eunice unifrons (Verrill, 1900)

Figure 3g-ñ

Eunice unifrons Fauchald 1992: 330-331, Fig. 113a-j; Carrera-Parra 2009: 172, Fig. 3a.

Material examined. Five specimens, four fragmented.

Description. The larger complete specimen (31 mm long and 3 mm wide) had 111 chaetigers. Antennae in

a horseshoe shaped; AI touches the anterior limit of the chaetiger 1; AII extends the anterior margin of the chaetiger 4; AIII reaches the chaetiger 8 (Fig. 3g). Peristomial cirrus digitiform with the inflated base, located on the anterior margin of the second peristomial ring; reaches half the prostomium. Branchiae pectinate, from chaetiger 3 with a branchial filament, gradually increasing to 8 filaments in chaetiger 36, and from this decreases to chaetiger 61, the latter being a single filament (Fig. 3h). Branchiae in at least 55% of the body. Dorsal cirri articulate (3-4 articulations), digitiform, erect; ventral cirri smooth, digitiform (Fig. 3h). Slender limbate setae with end serrated (Fig. 3i). Compound falcigers bidentate, both teeth with similar size; the hood tip slightly sharp and marginally serrate (Fig. 3j). Pectines heterodontes (Fig. 3k). Subacicular hook tridentate from chaetiger 27, always single (Figs. 3l-3n). Pygidium with 4 annals cirrus digitiforms (Fig. 3ñ).

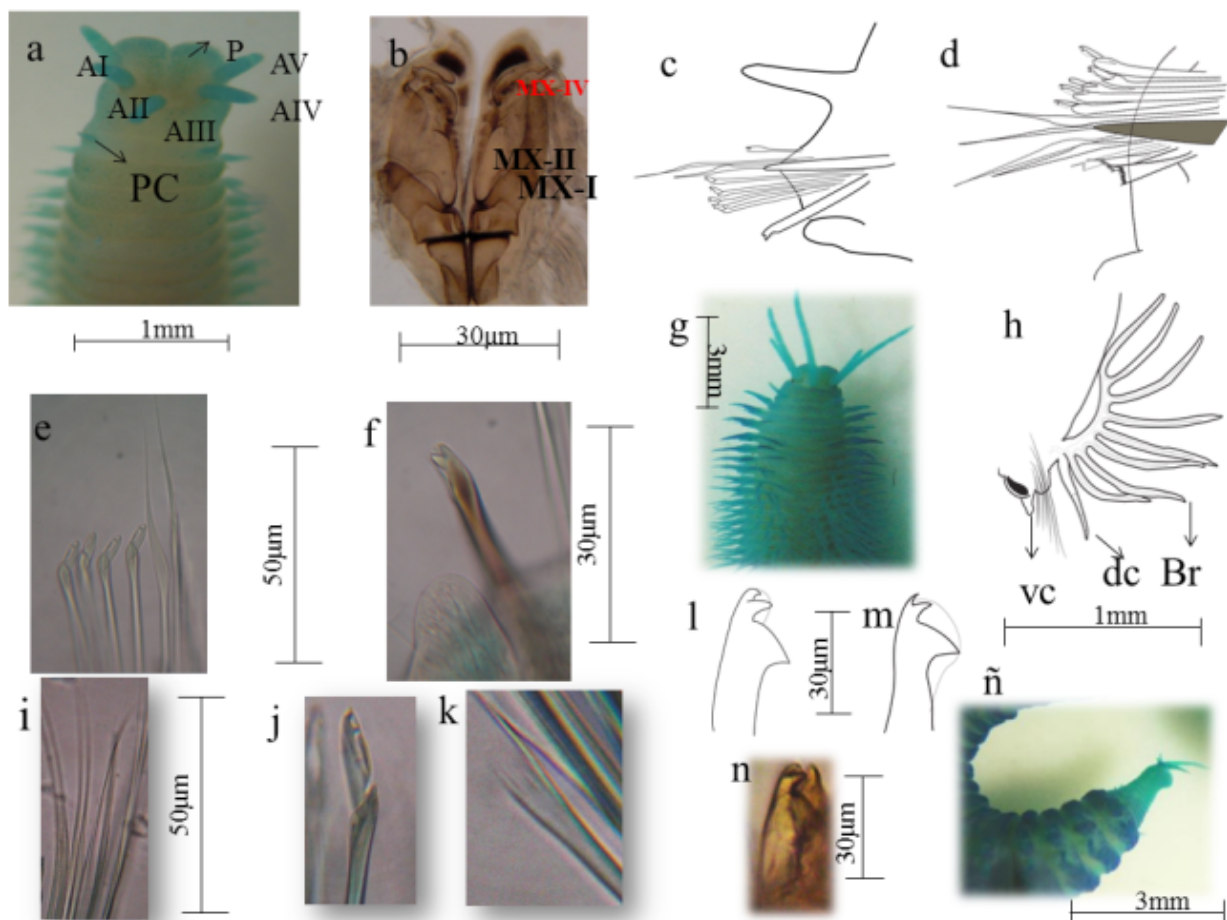


Figure 3. *Eunice goodei*: a) anterior end (dorsal view) with antennae (AI, AII, AIII, AIV, AV); palps (P) and peristomial cirrus (PC); b) maxilar complex; c) anterior parapodia; d) posterior parapodia; e) bidentate falcigers and limbate setae; f) subacicular hook. *Eunice unifrons*: g) anterior end (dorsal view); h) parapodium 35 (Br: branchiae, dc: dorsal cirri, vc: ventral cirri); i) limbate setae; j) bidentate falciger, mucros absent; k) pectinate setae heterodontes; l) subacicular hook from parapodium 38; m) subacicular hook tridentate from parapodium 50; n) subacicular hook tridentate from parapodium 38; ñ) pygidium with annals cirrus. Photos: Verónica Gómez.

Remarks. *Eunice unifrons* presents some similarity with *E. multicylindri*, but the peristomial cirri in this specie is articulated, with 2-4 articulations, while in *E. unifrons* lack articulations; *E. aucklandica*, *E. tentaculata*, *E. vittata* are similar to *E. unifrons* although this presents a pair of subacicular hooks by parapodia (Fauchald 1992).

Distribution. United States, Gulf of Mexico, Brazil. First record for Venezuela.

Genus: *Marphysa* de Quatrefages, 1865

Marphysa longula Ehlers, 1887

Figure 4a-g

Marphysa longula Salazar-Vallejo & Carrera-Parra 1997: 1489-1490, Fig. 5f-j; Carrera-Parra 2009: 179
Material examined. Three specimens fragmented.

Description. The larger specimen with 67 chaetigers (11 mm long and 1.3 mm wide). Ceratophore without articulations. Ceratostile digitiforms (Fig. 4a). The gills are absent. Antennae in horseshoe shaped, smooth, digitiforms; AI reaches the middle

of the anterior ring peristomial; AII reaches the anterior margin of chaetiger 1; AIII reaches the anterior limit of chaetiger 2; eyes at the base of AI and AII (Fig. 4b-c). Notopodial cirrus digitiform, longer than ventral; ventral cirrus conic, with bulging basis from parapodium 9 to 30 (Fig. 4d-e); dark acicula, simple and thick with acuminate end; compound falcigers bidentate; pectinate setae isodont and limbate setae (Fig. 4f); subacicular hook bidentate (Fig. 4g); first subacicular hook appears from chaetiger 25. Pygidium not observed.

Remarks. *Marphysa longula* is the only specie without gills of this genus in the Caribbean region.

Distribution. Caribbean Sea. First record for Venezuela.

Marphysa minima Hansen, 1882

Figure 4h-ñ

Marphysa minima Salazar-Vallejo & Carrera-Parra 1997: 1490, Fig. 6a-f; Carrera-Parra 2009: 170

Material examined. An incomplete specimen.

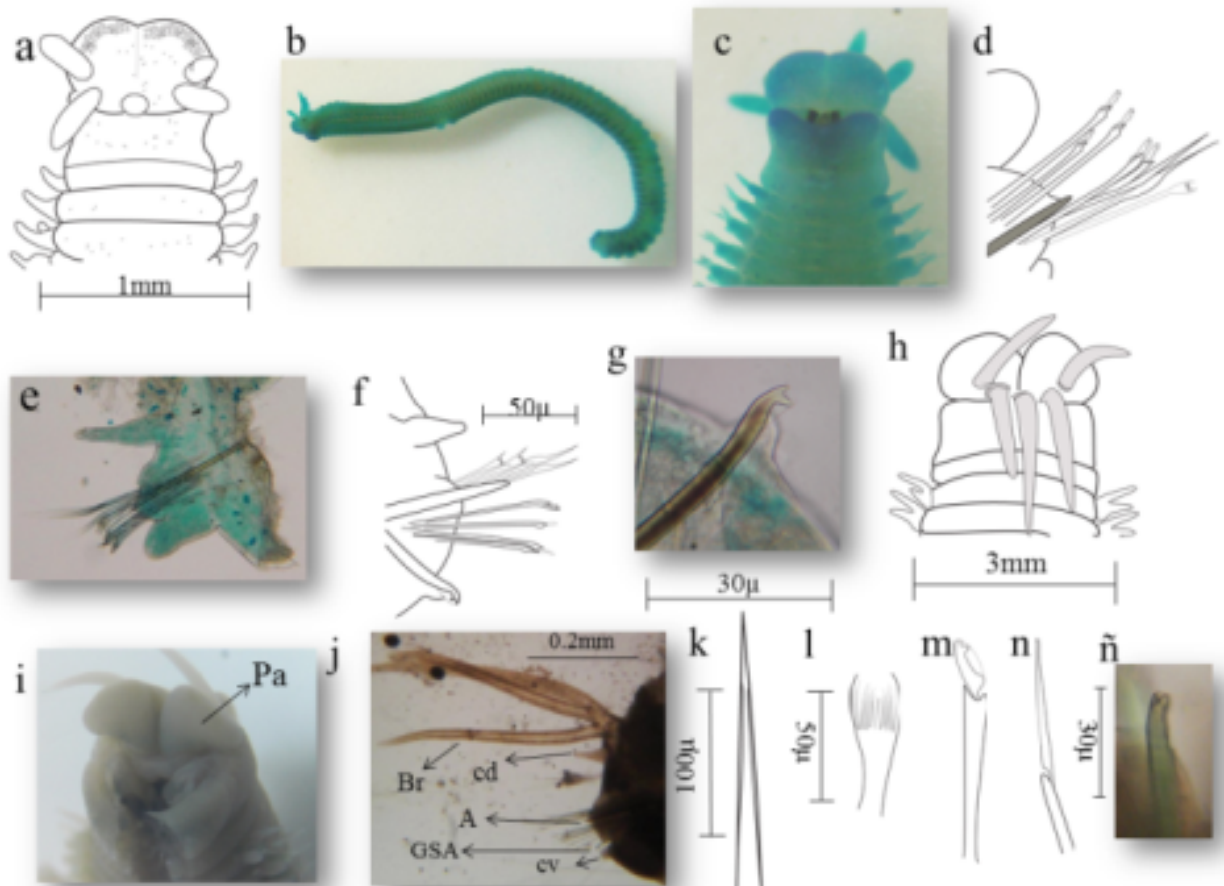


Figure 4. *Marphysa longula*: a) anterior end (dorsal view); b) specimen complete (lateral view); c) anterior end (ventral view); d) anterior parapodium; e) parapodium 56; f) parapodium 56; g) subacicular hook. *Marphysa minima*: h) anterior end; i) palps (ventral view); j) parapodium 72 (A: acicula, Br: branchiae, cd: dorsal cirri, cv: cirri ventral); k) limbate setae; l) pectinate setae isodont; m) bidentate falciger; n) compound espiniger; ñ) subacicular hook. Photos: Verónica Gómez.

Description. Organism with 135 chaetigers (60 mm long and 3 mm wide). Smooth antennae in semicircle-shape (Figs. 4h-4i). Pectiniform branchiae, appearing from chaetiger 47; with maximum 3 filaments from chaetiger 71 to the distal end of the fragment; ventral cirri with inflate bases except 1, 2, 3 parapodia; the cirris at posterior segments are smaller than anterior one (4j). Acicula dark and gross, with rounded tips, 2-3 aciculae in anterior parapodia and 1 in posterior. Notosetae: limbate (Fig. 4k) and isodont pectinates (Fig. 4l) in anterior segments. Neurosetae: compound falcigers bidentate (Fig. 4m); compound spinigers only in anterior chaetigers (Fig. 4n). Subacicular hooks from chaetiger 41 to final of fragment (Fig. 4ñ).

Remarks. *Marphysa minima* is very similar to *M. posterobranchia*, *M. mixta* and *M. escobarae*. Differs from the first because the branchiae begin in the chaetiger 84 and the pectinate setae are heterodonts. In *Marphysa mixta* the branchiae begin from the chaetigers 28-35. Finally, differs to *M. escobarae* due to the subacicular hook are unidenttatets.

Distribution. Caribbean Sea. First record for

Venezuela.

Family: Terebellidae Johnston, 1844

Genus: *Neoleprea* Hessle, 1917

Neoleprea sp. 1

Figure 5a-g

Neoleprea sp. 1 Londoño-Mesa 2009: 45, Fig. 12a-i.

Material examined. Two specimens fragmented.

Description. The best specimen had 39 chaetigers (27 mm long and 4.8 mm wide). Thorax with 10.8 mm long. Tentacular membrane well developed with two lateral lobes. Small tentacles without pigment; upper lip short and rounded, inferior lip long and swollen (Fig. 5a). Two pair of dichotomus branchiae on chaetigers 2 and 3 (Fig. 5b). Ventral shields deteriorated, ventral groove continues to posterior end (Fig. 5c). Nephridial papillae placed previous to notopodia. 26 pair of notopodia; two size of notosetae, bilimbate sub-distally with distal end dentate and slightly oblique (Fig. 5d). Notosetae shorts with end almost perpendicular (Fig. 5e). Uncini in double rows, from chaetiger 3 to posterior end (Fig. 5f-g). Pygidium not observed.

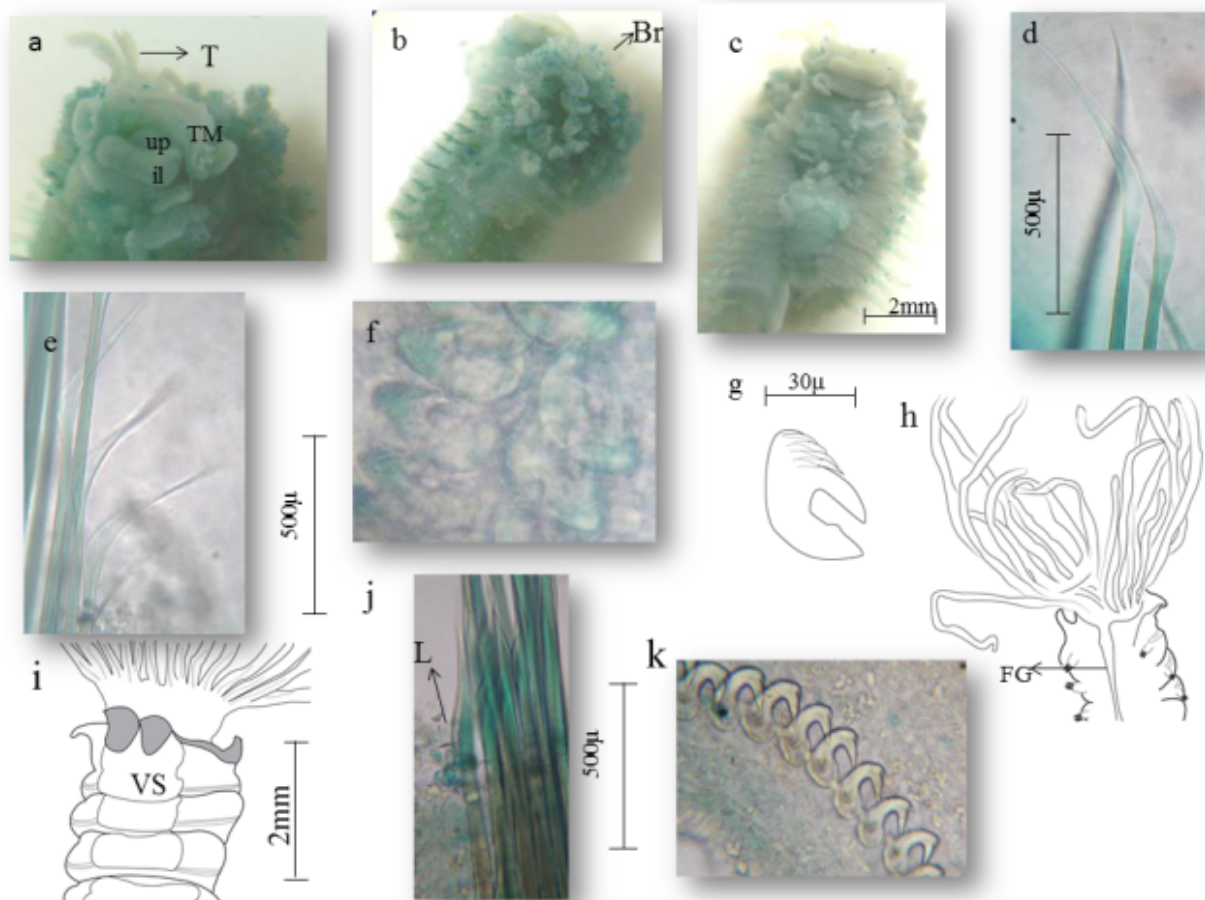


Figure 5. *Neoleprea* sp. 1: a) anterior end (ventral view, il: inferior lips, up: upper lips, TM: Tentacular membrane, T: Tentacle); b) Br, branqchiae; c) anterior end (ventral view); d) setae bilimbate sub-distally with distal end dentate and slightly oblique;

Figure 5 continued: e) notosetae shorts with end almost perpendicular; f) uncini in double row; g) uncini. *Parasabella jamaicensis*: h) anterior end (dorsal view); i) anterior end in ventral view (VS: Ventral shield); j) limbate notosetae (L: limbo); k) uncini. Photos: Verónica Gómez.

Remarks. *Neoleprea* sp. 1 differs from *Neoleprea* sp. A Kritzler 1984 (Uebelacker 1984) due to *Neoleprea* sp. 1 does not have eyespot and presents 26 pairs of chaetigers. Nevertheless, the characteristics observed mostly agree with the Londoño-Mesa (2009) description for *Neoleprea* sp. 1, specie reported for Bonaire by this author. Moreover, both species in addition to *Neoleprea* sp. B Kritzler, 1984 are not formally named as the materials are in poor conditions and the *Neoleprea* sp. B could be another genus, possibly *Lanicola*. However, Londoño-Mesa (2009) mentioned that the observed features are not allowed to fully identify the specie *Neoleprea* sp. 1, since it requires a greater number of specimens in good conditions; then possibly it is a new species for science.

Distribution. Bonaire. First record for Venezuela.

Family: Sabellidae Latreille 1825

Genus: *Parasabella* Bush, 1905

Parasabella jamaicensis Augener, 1942

Figure 5h-k

Demonax jamaicensis Tovar-Hernández & Salazar-Vallejo 2006: 27, 38, Fig. 8a-f; Tovar-Hernández 2009: 509.

Parasabella jamaicensis Tovar-Hernandez & Harris 2010: 15.

Material examined. Twelve specimens completes.

Description. The longer specimen with 50 chaetigers (20 mm long and 2.1 mm wide). Thorax 3.1 mm in long; abdomen 10.1 mm long; branchial crown 2.6 mm long with 10-11 pairs of radiole, without stylodes and eyes; radioles in semicircle. Collar well developed, widely separated dorsally by fecal groove (Fig. 5h). Ventral lappets rounded; ventral shield of segment 1 rectangular, twice as wide than high, expand the following segments; tori reaches the lower margin of ventral shields (Fig. 5i). Thorax with 8 chaetigers, limbate notosetae in two rows (Fig. 5j). Thoracic avicular uncini with manubrium medium; abdomen with 42 chaetigers with notosetae in two transversal rows and avicular uncini with manubrium short (Fig. 5k). Pygidium bilobulate.

Remarks. *Parasabella jamaicensis* is very close to *P. microphthalmus*, *P. lacunosus* and *P. flecatus*, but differs from first species as it presents numerous tiny ocelli in the radioles; from the second species due that ventral shield is wider than long; and from the third species differs because the anterior margin of ventral shield is complete (Tovar-Hernández 2009).

Distribution. Jamaica, Caribbean Sea (Tovar-Hernández 2009; Tovar-Hernández & Harris 2010). First record for Venezuela.

Acknowledgment

The authors wish to express their thanks to C. Lira, E. Mata, F. López, G. “Chipi” Gómez, G. Mizrachi, L. Troccoli and R. Hurtado for their help with the thesis’s realization.

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Caracterización física de tres playas de interés turístico-pesquero del municipio Península de Macanao, Isla de Margarita, Venezuela. **Multiciencias**, 14(4): 357-363.

Received: February 2016

Accepted: May 2016

Published: August 2016