



Polychaetes (Annelida) from soft bottoms at Playa Dorada, Orinoco river, Venezuela

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Abstract. A total of 582 polychaete specimens were collected at the Playa Dorada station, Manamo creek, Orinoco River. Six species were identified from the material collected, three of which are new records for Venezuela: *Eteone heteropoda* (Phyllodocidae), *Nephtys bucera* (Nephtyidae) and *Streblospio benedicti* (Spionidae).

Key words: biodiversity, fresh water fauna, estuarine fauna, polychaetes

Resumen. Poliquetos (Annelida) de fondos blandos de Playa Dorada, río Orinoco, Venezuela. Se recolectaron 582 ejemplares de poliquetos en la estación Playa Dorada de caño Manamo en el río Orinoco. Se identificaron seis especies, tres de las cuales se citan por primera vez para Venezuela: *Eteone heteropoda* (Phyllodocidae), *Nephtys bucera* (Nephtyidae), *Streblospio benedicti* (Spionidae).

Palabras claves: biodiversidad, fauna dulceacuícola, fauna estuarina, poliquetos

Introduction

The Orinoco Delta is composed of numerous streams, creeks, distributary rivers, islands and marshes. This region, of significant ecological value, covers an extensive area (22,000 km²) but has been very poorly studied, especially with regard to aquatic invertebrates (Liñero-Arana *et al.* 2010). The few studies done on the benthic macrofauna include those by Lasso *et al.* (2004) who recorded 96 species of invertebrates, including polychaetes identified to family level: Capitellidae and Nereididae. Capelo *et al.* (2004), Martin & Díaz-Díaz (2007) Capelo *et al.* (2008a, b), Mora-Day *et al.* (2008) were mostly concerned with shellfish fauna, however, Díaz-Díaz *et al.* (2009), Delgado-Blas *et al.* (2010), Liñero-Arana *et al.* (2010) and Díaz-Díaz *et al.* (2013) focused exclusively on the systematics of polychaetes, and recorded 28 species. Nevertheless, our knowledge about polychaete species richness in the Orinoco River and its area of influence along the Venezuelan Atlantic shelf remains limited. In this study, six species were identified, three of which represent first records for Venezuela, thus increasing our knowledge of this important group of annelids both taxonomically and as regards their geographical distribution in this country.

Materials and methods

Specimens were collected between January 2011 and February 2012 from shallow waters (2-10 m deep) at Playa Dorada, Manamo creek (09°04'35.3"N-62°05'03.9"W), approximately 125 km from the sea, using a 0.09 m² drag-type Beam Trawl, with 1 mm mesh. Samples were sieved using a 0.5mm open mesh. Specimens were fixed in 10 % formaldehyde and preserved and stored in 70 % ethanol. They were examined using compound and stereoscopic microscopes and structures with taxonomic value were dissected. Drawings were made following Coleman (2006). Specimens are deposited in the reference collection of the Laboratorio de Biología de Poliquetos (LBP-FamilyN°cat./n°specimens) at the Instituto Oceanográfico de Venezuela.

Results and Discussion

A total of 582 polychaetes were collected and examined and six species, belonging to five families and six genera were identified. *Eteone heteropoda* (128 specimens), *Nephtys bucera* (157 specimens) and *Streblospio benedicti* (149 specimens) are cited for the first time for Venezuela. Family Capitellidae Grube, 1862

Genus *Heteromastus* Eisig, 1887

Heteromastus filiformis (Claparède, 1864)

Heteromastus filiformis Fauvel, 1927: 150, Fig.53 A-L; Hartman, 1947: 427, Pl. 52, Figs. 1-4; Day, 1967: 601, Fig. 28.3 A-D; Fauchald, 1977: 34; Hutchings & Rainer, 1982: 373–380; Liñero-Arana, 1996: 54-55, Pl. IV, Fig. 1-3; Blake, 2000: 69-70, Fig. 4.8; Dean, 2001: 75 figs. 10-12; Fauchald *et al.*, 2009: 780; García-Garza, 2009: 105-106, Fig. 2E.

Material examined. LBP-Ca0102/29 February-2011, LBP-Ca0117/32 June-2011; LBP-Ca0121/27 August-2011; LBP-Ca0125/13 November-2011; LBP-Ca0134/7 February -2012.

Remarks. Previous records indicate that *H. filiformis* shows a preference for fine sediment and that its abundance increases with the content of organic matter (Abele *et al.* 1998). However, some studies have indicated that in sediments with predominantly medium grained particles (0.1-0.2 mm) the relative abundance exceeds 20% of the total number of collected polychaetes (Høisæter & Johannessen 2001). Other authors (Cadeé 1979, Høisæter & Johannessen 2001, Węslawski *et al.* 2003) have suggested that these abundance patterns are erratic. In this study, specimens were collected from soft bottoms (medium grain particles) with plenty of decaying plant material.

Distribution. Bering Sea, Japan and Southeastern California, Mediterranean Sea, Persian Gulf, Morocco, South Africa, from Greenland to North Carolina, Gulf of Mexico, Venezuela.

Family Phyllodocidae Örsted, 1843

Genus *Eteone* Savigny, 1818

Eteone heteropoda Hartman, 1951

Figure 1 A-G

Eteone heteropoda Hartman, 1951:31, Pl. 9, Figs. 1-8; Pettibone, 1963:72, Fig. 16d; Day, 1973:19; Gathof, 1984: 19/6-8, Fig. 19.2 a-g.

Material examined. LBP-Ph0102/19 February-2011; LBP-Ph 0117/12 June-2011; LBP-Ph 0121/47 August-2011; LBP-Ph 0125/33 November-2011; LBP-Ph 0134/17 February -2012.

Characterization. Longest specimen complete; 31 mm in length, 2.5 mm in width, with 102 segments. Body cream color with tiny brown spots irregularly distributed on the dorsum. Prostomium trapezoidal with nuchal tubercle (Fig. 1A). Two pairs of frontal antennae biarticulate, one pair of eyes. Proboscis smooth with 19 distal globular papillae (Fig. 1B). Tentacular formula 0 1/1 + S 0/N. Tentacular cirriform, ventral cirri slightly larger than the dorsal ones. Two subdermal dorsal projections, distally pigmented, from the posterior margin of the tentacular segment to half way along the second chaetiger (Fig. 1A-B). Chaetae present from the

second segment, dorsal cirri absent. Parapodial lobe with distal notch. Triangular dorsal cirri present from third segment, symmetrical in anterior parapodia (Fig. 1C) but asymmetrical in parapodia from the mid-region (Fig. 1D); posterior dorsal cirri with upper margin asymmetric and longer than the inferior one (Fig. 1E). Heterogomph composite spinigerous chaetae, with two asymmetrical teeth at the distal end of the shaft (Fig. 1F), teeth with long blade finely serrated along the inner margin. Pygidium with two long, thick anal cirri (Fig. 1G).

Remarks. The morphology of the specimens agrees with the descriptions found in the literature. The main distinguishing characteristic of this species is the morphological variability of the dorsal lobes on the parapodia, which area symmetric in the middle and posterior segments. This is a common species in the intertidal zone.

Distribution. From Maine to North Carolina, Gulf of Mexico, Venezuela.

Family Nereididae Blainville, 1818

Genus *Alitta* Kinberg 1865

Alitta succinea (Frey and Leuckart, 1847)

Nereis (Neanthes) succinea. Pettibone, 1963:165, figs. 44a-e, 45a-d. Day 1973:41. Gardiner, 1976:149, figs. 14p, 15a-d. Liñero-Arana, 1979: 8, figs. 1-11.

Neanthes succinea. Hartman, 1945:17, figs. 1, 2; 1951:45. Rioja, 1946: 205, pl. 1, figs. 1, 2. Wilson, 1988: 5-7. Núñez, 2004: 359-361, fig. 132A-J.

Alitta succinea. Bakken & Wilson, 2005: 516–517. Glasby *et al.*, 2009: 6. Villalobos-Guerrero, 2012: 130-165. figs. 1-3. Villalobos-Guerrero *et al.*, 2012: 46-47.

Material examined. LBP-Ne0105/9 February-2011; LBP-Ne 0118/2 June-2011; LBP-Ne 0124/7 August-2011; LBP-Ne 0126/14 November-2011.

Remarks. *Alitta succinea* is euryhaline species and was relatively common in the samples collected. Villalobos-Guerrero (2012) affirmed that these organisms can tolerate up to a month in salinities of between 65 and 96 psu in the non-breeding or atokous stages, but during the reproductive stage (epitokous) they can only support salinities of up to 50 psu. Other uncorroborated records have indicated the presence of this species in waters with >16 psu salinity (Oglesby 1965, Wolff 1973, Oglesby 1978, Just 1930, Banse 1954), and Villalobos-Guerrero (2012) found individuals inhabiting waters with salinities of >30 psu in Mazatlan-Mexico. Wilson (1988) considers that the wide distribution of this species may be due to either accidental or intentional introduction.

Distribution. Cosmopolitan.

Genus *Nereis* Linnaeus, 1758

Nereis (*Neanthes*) cf. *micromma* Harper, 1979

Neanthes cf. *micromma* Liñero-Arana *et al.*, 2010: 29-31, fig. 3A-K.

Material examined. LBP-Ne0122/3 February-2011, LBP-Ne0137/2 June-2011; LBP-Ne0138/2 November-2011.

Remarks. Liñero-Arana *et al.* (2010) recorded the presence of *Neanthes* cf. *micromma* at various locations in the Orinoco Delta. The specimens examined were close to *N. micromma* Harper 1979, although they did show significant differences regarding the presence and distribution of the paragnaths (Maxilar ring without paragnaths, oral ring with small conical paragnaths: Area IV= 3-4 oblique row; Area VI=4-7 oval group; Areas VII-VIII = row of 7-8, small), the morphologies of the first, second and posterior chaetigers, the shape and size of the superior notopodial ligule and the presence of falcigerous chaetae on the first 8 to 10 chaetigers, rather than the first, second and posterior chaetigers as described by Harper (1979).

Distribution. Eastern Venezuela.

Family Nephtyidae Grube, 1850

Genus *Nephtys* Cuvier, 1817

Nephtys buccera Ehlers, 1868

Figure 1H-N

Nephtys buccera Ehlers, 1864-68: 617-619, pl. 23, fig. 8, Hartman, 1950: 105-106, Hartman, 1951: 49.

Material examined. LBP-Np0062/39 February-2011, LBP-Np0067/52 June-2011; LBP-Np0068/37 November-2011; LBP-Np0073/29 February -2012.

Characterization. Largest specimen complete; 22 mm in length, 1.5 mm in width, with 78 segments. Prostomium pentagonal, with a small notch on the frontal margin, one pair of frontal and one pair of ventro-lateral antennae; some reddish patches unevenly distributed along the mid-posterior margin of the prostomium (Fig. 1H). Eversible pharynx with 22 longitudinal rows of 8-10 papillae, each row with approximately 9 sub-distal papillae, decreasing in size posteriorly. Distal edge of the pharynx with 20 pairs of conical papillae. Tentacular segment with short dorsal digitiform cirri, presetal lobe wider than postchaetal lobe, neuropodial lobe wide and compressed. Elongated, conical ventral cirrus, approximately twice as long as the dorsal cirrus. Branchiae from chaetiger 4 as triangular projections (Fig. 1J), more developed from chaetiger 8. Parapodia biramous (Figs. 1I-L) from first segment, postchaetal dorsal lamella more developed than prechaetal lamella; rounded acicular lobe; branchiae thin, curved outwards, longer than the lobes of the chaetigers. Neuropodial postchaetal lamella with rounded margins, acicular lobe wide and rounded, prechaetal lamella short; subconical ventral cirrus.

Chaetae capillaries crenulate (Fig. 1M). Pygidium with one pair of long dorsal filiform cirri (Fig. 1N), anal opening ventral.

Remarks. Hartman (1944) and Liñero-Arana *et al.* (2010) recorded *Nephtys simoni*, Perkins, 1980, (registered by the latter authors as *N. magellanica*) from the Orinoco Delta and Coche Island, Eastern Venezuela. *N. buccera* differs from *N. simoni* in having a more developed inter-ramal cirrus, an anteriorly notched prostomium and a pygidium with an extremely long cirri.

Distribution. Bermuda, Gulf of Mexico, Venezuela.

Family Spionidae Grube, 1850

Genus *Streblospio* Webster, 1879

Streblospio benedicti Webster, 1879

Figure 2A-D

Streblospio benedicti Webster & Benedict, 1884:

728, Pl V; Figs. 60-61; Delgado-Blas, 2009: 595-596, Fig. 2D.

Material examined. LBP-Sp0042/25 February-2011; LBP-Sp 0057/17 June-2011; LBP-Sp 0061/49 August-2011; LBP-Sp 0065/39 November-2011; LBP-Sp 0069/19 February -2012.

Characterization. Largest complete specimen 17 mm in length, 1 mm in width, with 81 chaetigers. Prostomium elongated with rounded distal end. Peristomium long, distinct from chaetiger 1, with well-developed lateral wings. One pair of short palps, densely ciliated on the dorsal surface. One pair of branchiae, inserted just behind the palps, almost as long as the palps and ending in a digitiform process (Fig. 2A-B). Nuchal tentacle small, inserted between the branchiae, only visible once the branchiae are removed. Notopodia from first chaetiger with underdeveloped rounded postchaetal lobes and fine capillary chaetae; first neuropodia with rounded postchaetal lobe and few chaetae. Second notopodia with continuous postchaetal lobe and dorsal hood extending across the dorsum and connecting the left and right notopodia. Anterior margin of hood flares upwards forming an opening into a dorsal pouch that extends posteriorly to the end of the third chaetiger. Second neuropodia with more developed postchaetal lobe. Postchaetal notopodial lobes with rounded distal margins in the anterior and mid-regions, thinning to finger-like projections posteriorly. Similar neuropodial postchaetal lobes along the body, decreasing in size on posterior segments. Capillary chaetae on both branches, inferior neurochaetae slightly thicker. Sabre chaetae (Fig. 2C) and multidentate hooded hooks (Fig. 2D) present from chaetiger 7.

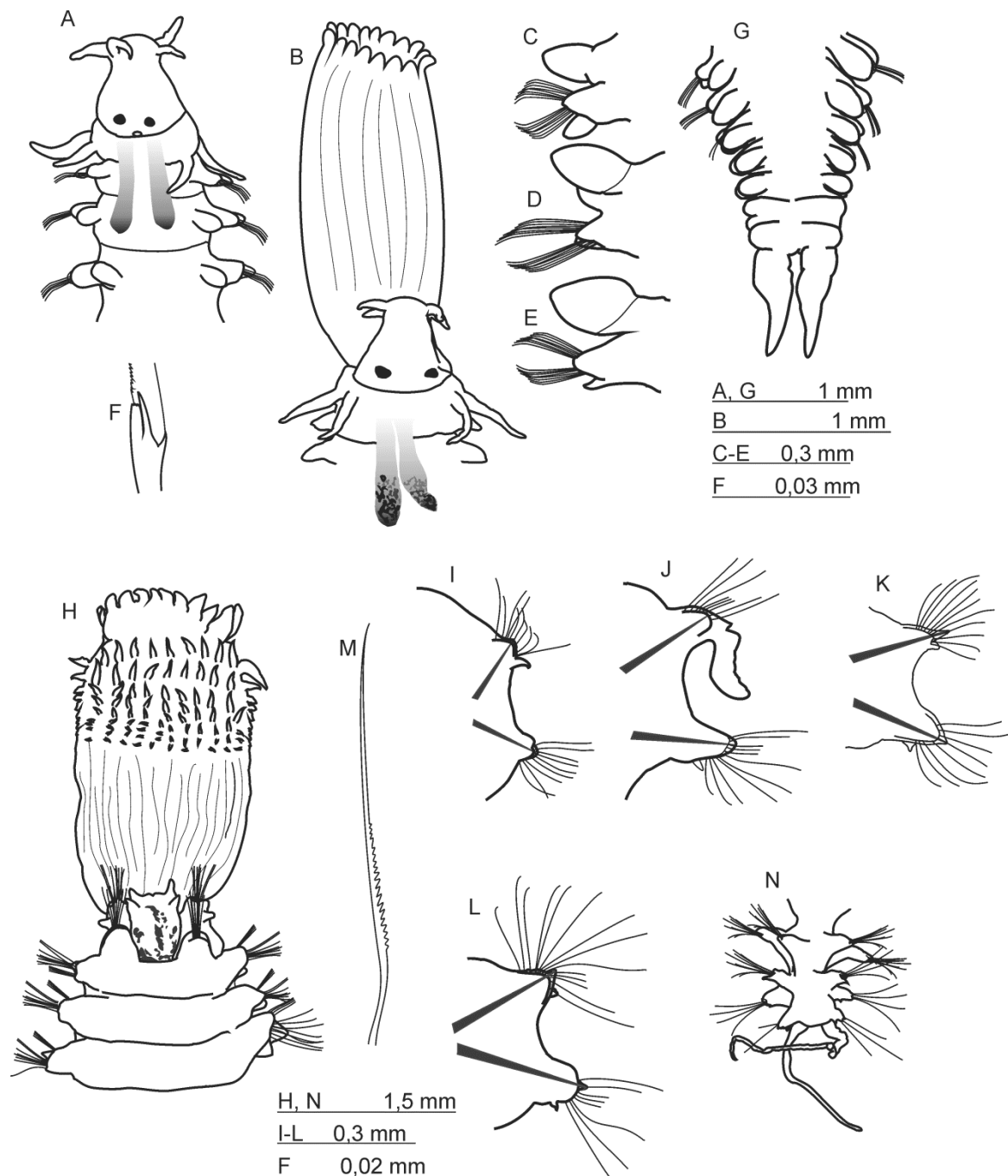


Figure 1. *Eteone heteropoda*: A) anterior end, dorsal view, B) anterior end showing the proboscis, C) dorsal cirri from anterior segments, D) dorsal cirri from middle segments, E) dorsal cirri from posterior segments, F) spinigerous chaetae, G) posterior end, dorsal view. *Nephtys bucera*: H) anterior end, dorsal view, I) parapodium 4, J) parapodium 8, K) parapodium 25, L) parapodium 50, M) capillary chaetae, N) posterior end, dorsal view.

Remarks. *Streblospio benedicti* is very close to *S. gymnobranchiata* Rice & Levin, 1998 reported by these authors from the Gulf of Mexico. The species differ, however, in that the latter has branchiae with incubation chambers, whereas in *S. benedicti*, the incubation chambers are not associated with the

branchiae. *Streblospio benedicti* is distributed from southern Maine to Florida, whereas *S. gymnobranchiata* is found from Florida to the Gulf of Mexico. *S. benedicti* was the dominant species of the macrofauna from the Terminos lagoon, Mexico, and (Hernández-Alcántara & Solís-Weiss 1994) and

was also abundant in the North Carolina marshes (Cammen 1976) and the Maine estuaries (Larsen & Doggett 1991). In addition, Sears & Mueller (1989) reported densities of over 5,000 polychaetes/m² in Galveston, Texas. *Streblospio benedicti* is considered moderately euryhaline; specimens have been found at salinities ranging from 10 to 17 psu (Webster & Benedict 1884) and 5 to 30 psu (Ristich *et al.* 1977). Some authors found that the density of this species decreases in abundance with increasing salinity (Ristich *et al.* 1977, Kocheshkova & Matviy

2009). This species also tolerates high concentrations of organic matter (Reish 1979), thus contributing to the colonization of substrates both as a pioneer and an opportunist. So much so, that it is considered, together with *Capitella capitata*, as one of the most successful opportunistic species and has been used as an indicator of organic pollution (Grassle & Grassle 1974). Finally, *S. benedicti* is an important food source for many estuarine species. Distribution. Maine to Florida, Trinidad, Venezuela.

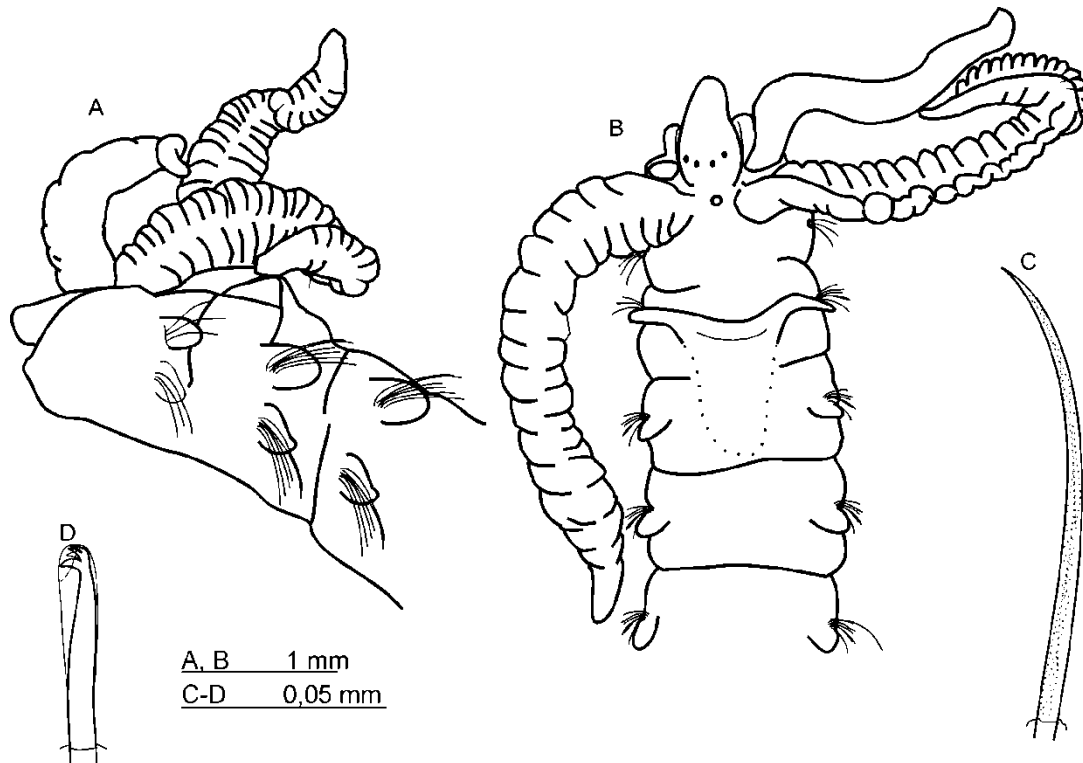


Figure 2. *Streblospio benedicti* A) anterior end, lateral view, B) same in dorsal view, C) sabre chaetae, D) multidentate hooded hooks.

Acknowledgements

The authors wish to thank TOTAL Oil & Gas in Venezuela for funding this study through the Project "Caracterización bioecológica del plancton y de la macrofauna dulceacuícola, estuarina y marina y calidad de agua y sedimentos superficiales de Caño Manamo, en el delta del Río Orinoco, Estado Delta Amacuro".

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Received December 2012

Accepted August 2013

Published online September 2013