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Spionidae (Annelida: Polychaeta) from the Parque Nacional Morrocoy, Falcón, Venezuela

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Abstract: Five species of polychaetes (Spionidae) were found associated to *Thalassia testudinum* meadows in Parque Nacional Morrocoy, Venezuela. We included a guide for their identification and present range extensions for the Venezuelan coasts and Southern Caribbean Sea. The species are: *Dipolydora socialis, Prionospio (Minuspio) cirrifera, P. (Prionospio) fallax, P. (P.) steenstrupi,* and *Spio pettiboneae*.

Key words: Polychaeta, Spionidae, *Thalassia testudinum*, Caribbean Sea, Venezuela.

The knowledge on the diversity of polychaetes from Venezuela is limited to the reports of such families as Nereidae and Acoetidae (Liñero 1983, 1984) and Onuphidae (Liñero and Andrade 1993) from the East coast of the country, plus several studies related with the characterizations of macroinfaunal assemblages of soft-bottom environments (Andrade and Liñero 1993, Jimenez and Liñero 1993). In contrast, very little is known on the diversity of polychaetes for the northwestern coast, where less emphasis has been placed on taxonomical research. Parque Nacional Morrocoy, the most extensive marine sanctuary of this area, has been the subject of scientific work for many years. Several studies have dealt with the fauna associated to seagrass beds (Bitter 1988, Bone 1991, Isea 1994), and some research has been done on the sampling and ecology of polychaetes (Bitter 1988, Bone 1991), but no previuos reports on the systematics of spionids are available for this region of the Caribbean Sea.

MATERIALS AND METHODS

Study site: Parque Nacional Morrocoy is located on the Northwest coast of Venezuela (10º52' N, 69º16' W), between the villages of Tucacas and Chichiriviche (Fig. 1). The Park includes continental, insular, and marine areas, covering a total of 320 km^2. Trade winds provide a northeast-southwest direction of surface water currents for most part of the year. Daily water temperature range from 27 and 32ºC, salinity values span from 30 to 38 ‰, and precipitation shows a mean annual value of 1.213 mm. Six sediment samples were obtained at 1.5 m depth during four sampling campaigns conducted between June 1993 and March 1994 in four *Thalassia testudinum* meadows: Las Luisas, Caño Capuchino, Tumba Cuatro and Boca Seca (Fig. 1). Samples were sieved using a 0.5 mm mesh. All animals were hand-picked and preserved in 10% buffered formalin. Polychaetes were dissected under a compound microscope

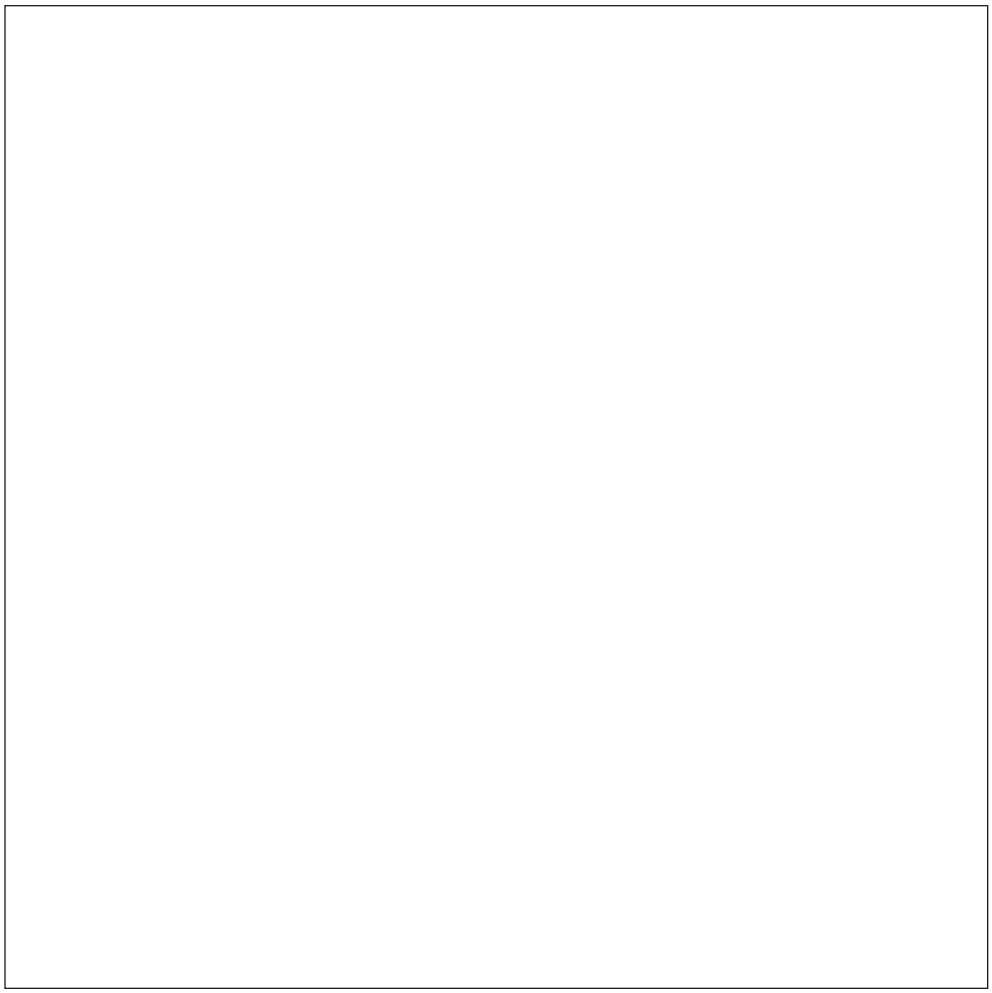

Fig. 1. Sampling stations. LL = Las Luisas, CC = Caño Capuchino, BS = Boca Seca, TB = Tumba Cuatro.

and identified down to species level. Specimens of all five species were deposited in the Museo Nacional de Ciencias Marinas de Madrid (MNCN), Madrid, Spain, and their collection numbers are given for each species. In addition, a complete collection of these specimens is available in the Laboratorio de Bentos Marino, Universidad Simón Bolívar, as a personal collection.

Dipolydora socialis (Schmarda, 1861)

Material examined: Las Luisas: 2 specimens, Boca Seca: 3 specimens MNCN 16.01/6087, MNCN 16.01/6088, MNCM 16.01/6089.

Diagnosis: Body length, 5.5 to 8.0 mm, width, 0.4 to 0.5 mm; prostomium bifid with prominent lateral lobes and small medial lobe; caruncle extending up to setiger 4; two pairs of eyes; palps missing; setiger 1 with capillary setae in both rami; anterior setae limbate; setiger 5 prominent, large, including modified setae: dorsal geniculate setae, heavy spines slightly falcate alternating with smaller pennoned companion; hooded hooks beginning on setiger 7, with main fang at oblique angle to shaft, diminishing in size on posterior setigers;

branchiae beginning on setiger 9, as reduced and digitiform lobes, continuing to near posterior end of body; pygidium as foliaceous lobes surrounding the anus, equivalent in size to the width of the last three setigers, with one ventral lobe fused to two lateral lobes separated by a narrow gap.

Remarks: The examined specimens agree with previous descriptions by Blake (1971, 1996), Light (1978) and Johnson (1984). The only difference of our specimens with respect to Blake's description is a pronounced tip of the pennoned setae.

Distribution: Both coasts of North America, Gulf of Mexico, Chile and Falkland Islands. This is the first report on this species for the Venezuelan coast.

Prionospio (Minuspio) cirrifera Wirén, 1883

Material examined: Las Luisas: 9 specimens, Boca Seca: 7 specimens, Caño Capuchino: 5 specimens. MNCN 16.01/6085, MNCN 16.01/6086.

Diagnosis: Body large, length 3.0 to 8.5 mm, width 0.2 to 0.4 mm; prostomium rounded, slightly enlarged anteriorly, with short caruncle; two pair of eyes, generally crescent-shaped, anterior pair smaller, more widely separated than posterior pair; parapodia well-developed in branchial region; branchiae cirriform, numbering 6 pairs, beginning on setiger 2; limbate setae present in noto- and neuropodia from first setigers; sabre setae beginning at setiger 11, granulated with distal spine; multidentate hooded hooks appearing in neuropodia between setigers 12-14, in notopodia by setiger 30, with 6 pairs of small denticles surmounting main fang.

Remarks: Specimens agree with previous descriptions available for this species, which shows high variability in the number of pairs and shape of branchiae (Foster 1971, Johnson 1984). According to Maciolek (1985), *P. cirrifera* is a cold-water species, so it is believed that previous reports for this species from warmer waters could be confused with the description of *P. (M.) aluta* Maciolek (1985), a close-related species. The later may be easily distinguished from *P. cirrifera* by the presence of ventrolateral interparapodial pouches. Despite Mackie's (1984) conclusions about the European Atlantic coasts species, we believe that our specimens do not belong to *P. (M.) multibranchiata* Berkeley, 1927, due to the number of pairs of branchiae present, setiger of first appearance of the sabre setae, the ventral hooks, and the number of small denticles overmounting the main fang.

Distribution: Widely distributed, Arctic Ocean, Greenland to South America, Gulf of Mexico, North Sea, English Channel, from Bering Sea to Gulf of California, Solomon Islands, Queensland, and Gulf of Viscaya. This is the first report for this species for the Venezuelan coast.

Prionospio fallax Söderström, 1920

Material examined: Tumba Cuatro: 1 specimen, Boca Seca: one specimen, Caño Capuchino: 1 specimen. MNCN 16.01/6090, MNCN 16.01/6091.

Diagnosis: Only one complete specimen, with 55 segments, 9.0 mm in body lenght, 0.25 mm in width; prostomium anteriorly rounded, incised in both sides, near the peristomium, large dorsal caruncle extending to setiger 2; two pair of eyes, in trapezoidal arrangement, anterior pair smaller and farther apart than posterior pair, which are larger and clearly visible, and the only pair visible in incomplete specimens; lamellae small and rounded in setiger 1, well developed in next setigers; neuropodial lamellae narrow ventrally in setiger 2, but becoming rounded thereafter; dorsal notopodial lamella triangular, erected, in setiger 2 to 5, becoming smaller and rounded thereafter; notopodial lamellae of setiger 7 connected across dorsum by a conspicuous, unique, dorsal crest, visible as a faint membrane in setigers 8-10; branchiae numbering four pairs, first (in 2 setiger) and fourth (in setiger 5) pinnate, similar in size, with dorsolateral pinnules that do not reach distal ends of branchiae; larger than the two cirriform pairs

from setigers 3 and 4; anterior setae all capillary, limbate and granular; thin, larger and less granular in postbranchial segments; ventral sabre setae present from setiger 10, curved, distally granulated and hooded, numbering 1-2 per fascicle in middle setigers; multidentate hooded hooks appearing in neuropodia from setiger 14, and from setiger 37 in notopodia; pygidium with two short lateral lobes.

Remarks: Following Sigvaldadóttir and Mackie (1993), our specimens agree completely with *P. fallax*, particulary in the presence of the dorsal crest in setiger 7, and the equally sized pinnate branchiae in setigers 2 and 5. Our specimens cannot be confused with *P. steenstrupi* Malmgren, 1867 because this species has a dorsal crest form setiger 6 to 15-20. The other species that share the characteristic of having two pairs of pinnate branchiae of equal size, and bluntly ventral neuropodial lamellae in setiger 2 (*P. kulin* Wilson, 1990 and *P. multicristata* Hutchings and Rainer, 1979) do not agree with the pattern of the dorsal membrane described for our specimens. According to Sigvaldadóttir and Mackie (1993), only Atlantic and Mediterranean reports are reliable, the rest need revision, due to the existing confusion with species related to the *steenstrupi* group. We think that Johnson's (1984) report for *P. fallax* from the Gulf of Mexico is correct.

Distribution: Gulf of Mexico, Atlantic Ocean, from Sweden to Madeira, Mediterranean Sea, South Africa, Southern California, Western Canada. This is the first report for this species for the Venezuelan coast.

Prionospio steenstrupi Malmgren, 1867

Material examined: Tumba Cuatro: 1 specimen, Boca Seca: 1 specimen. MNCN 16.01/6092.

Diagnosis: Most specimens incomplete, largest complete specimen with 9.0 mm in body length, and 0.25 mm in width; prostomium rounded anteriorly, with dorsal caruncle extending up to setiger 2; one pair of eyes; notopodial lamellae small, rounded, becoming more triangular on posterior setigers; dorsal crests connecting notopodial lamellae from setigers 6-9 absent or not visible; branchiae numbering four pairs, first and fourth pair pinnate, and second and third cirriform, same size; anterior setae simple, limbate; ventral sabre setae long, slightly curved, with distal hood projecting beyond tip, first present on setiger 10, numbering 1-2 per parapodium on middle setigers; multidentate hooded hooks appearing in neuropodia from setiger 20, in notopodia from setiger 25.

Remarks: The presence of only one pair of eyes on our specimens lays within the range of variation reported by Maciolek (1985). The specimens from Morrocoy agree with the description given by Johnson (1984) for this species.

Distribution: North Atlantic, from Norway to Greenland and Florida, Gulf of Mexico, Alaska to Southern California, Japan, South Africa, Southeastern Australia. This is the first report for this species for the Venezuelan coast.

Spio pettiboneae Foster, 1971

Material examined: Caño Capuchino: 3 specimens. MNCN 16.01/6093, MNCN 16.01/6094.

Diagnosis: The only complete specimen measured 7.5 mm in body length and 0.45 mm in width, with 39 setigers; prostomium bifid with prominent lateral lobes and small medial lobe; caruncle extending up to setiger 4; two pairs of eyes; peristomium well-developed, and applied to prostomium; branchiae well-developed throughout, beginning on setiger 1; first pair with same lenght than following pair; anterior setae uni- or bilimbate; tridentate hooded hooks first appearing on setiger 11, numbering 4-5 per fascicle (occasionally 6), with main fang of hook at slight angle to shaft, distal tooth very small (but visible); hooks increasing size posteriorly; sabre setae present, numbering two per fascicle (occasionally 3), first appearing on setiger 17; pygidium with four anal cirri, equal size, bluntly rounded distally, bearing gland-type structures in its interior.

TABLE 1
Comparison of the most relevant features of the species more closely related to S. pettiboneae[1]

Characters / Species	Tridentate hooks	Number of hooks/ podia	Pygidium cirri	Prostomium	Branchiae 1st pair	Sabre setae
pettiboneae Foster	11-17	6-9 (1) 3-10 (2)	4, equal size, bluntly round -ed (1 bifid occasionally)	rounded, 4 eyes	well developed	from set. 10-15, 2-4/fasc.
decoratus Bobretzby	10-20	3-10	4, equal size, occasionally dorsals long and thin	rounded, 4 eyes	well developed	
pacifica Blake and Kudenov	9-11	6-8	4, unequal size, ventral ones long and thick	rounded, 4 eyes,middle -incision, bilobulated caruncle	well developed	one, from set. 11-13, notched, with hood
quadrisetosa Blake	11	10-12	unknown	rounded, 4 eyes	well developed	
cirrifera Banse and Hobson	16-17	< 10	4, same size? limbate	rounded, 4 eyes	very small	one, from set. 32-35
armata Thulin	13-17	3-6	4, rounded, glandular	rounded, 6 eyes	very small	from set. 16, 2-3/fasc.
limicola Verrill	12-17	5-6	4, clearly glandular	rounded, 4-6 eyes	very small	notched, 2/fasc.
mesnili Augener	11	7-8	2-4	with anterior incision, 4 eyes	small	
tridentata Hutchings and Turvey	28-29	6-11	lost	anteriorly truncate	increasing in size up to set. 6-8 (3)	

1 Based on reviews of the works of Banse and Hobson (1968), Giordanella (1969), Foster (1971), Blake and Kudenov (1978), Maciolek (1983), Hutchings and Turvey (1984) and Dauvin (1989). (1) Foster, (2) Macioleck, (3) Several pairs of branchiae were totally fused to dorsal cirrus.

Remarks: Foster (1971) and Johnson (1984) discussed the differences existing between this species and such other closely related species, including *S. limicola* y *S. cirrifera*. Nonetheless, the differences between *S. decoratus*, a typical european species (Mediterranean and North Atlantic), and *S. pettiboneae* are not very clear. Many morphological features are very similar between both species, appearently differing only in the number of tridentate hooded hooks per neuropodia and geographic distribution. A comparison of the most relevant features of the species more closely related to *S. pettiboneae* is given in Table 1. The first four species have the first pair of branchiae well developed, distinguishing them from the rest. From these four, the first two (*S. pettiboneae* and *S. decoratus*) are different from the other two in bearing a

pygidium with four equal cirri, and sabre setae with no distal partial hood, which is the case for *S. pacifica*. This leaves *S. pettiboneae* and *S. decoratus* as species with very similar characteristics, difficult to differentiate between them, except for the characters mentioned above.

Distribution: From North Carolina (USA) to Gulf of Mexico. This is the first report for this species for the Venezuelan coast.

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RESUMEN

Se hallaron cinco especies de poliquetos (Spionidae) asociadas a las praderas de *Thalassia testudinum* del Parque Nacional Morrocoy, Venezuela. Se presenta una descripción y discusión de cada una de las especies, indicando cuales de éstas están informadas por primera vez para la costa venezolana y la región sur del Mar Caribe. Estas especies son: *Dipolydora socialis, Prionospio (Minuspio) cirrifera, P. (Prionospio) fallax, P. (P.) steenstrupi,* and *Spio pettiboneae*.

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