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Cañete, Juan I.; Hilbig, Brigitte; Santana, Mario
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Nota Científica

Presence of *Prionospio* (*Prionospio*) *orensanzi* Blake, 1983 (Polychaeta: Spionidae) off Punta Arenas, Chile, with notes on their abundance and spatial distribution in shallow, subtidal sandy bottoms

Juan I. Cañete¹, Brigitte Hilbig² & Mario Santana¹

¹Departamento de Ciencias y Recursos Naturales, Facultad de Ciencias
Universidad de Magallanes, Casilla 113-D, Punta Arenas, Chile

²Universität Hamburg, Zoologisches Institut und Zoologisches Museum,
Martin Luther King Platz 3, 20146 Hamburg, Germany

ABSTRACT. This paper confirm the presence of the spionid polychaete *Prionospio* (*Prionospio*) *orensanzi* Blake 1983, from a shallow, sandy, subtidal benthic area, between 5 and 20 m of depth, near to domestic wastewater and the Las Minas river fresh water discharge, off Punta Arenas (53°08'00"S, 70°51'15"W to 53°10'30"S, 70°54'30"W), Chile. The external morphology of this specimens agree well with the original description of this species. *P. (P.) orensanzi* was collected together to 42 others polychaete species, where nine spionids species are listed. The family Spionidae was the most common of the polychaetes collected in the sampling area, with *P. (P.) orensanzi* being the most abundant species. This new record confirm the presence of this species in Chilean waters, increase to three the number of members of the genus *Prionospio* (*Prionospio*) on the Chilean coast, and nearly to 41 the total number of species of Spionidae from Chile. A key to the Chilean species of *Prionospio* is presented.

Key words: Polychaeta, subantarctic benthos, *Prionospio* (*Prionospio*) *orensanzi*, Magellan Strait.

Presencia de *Prionospio* (*Prionospio*) *orensanzi* Blake, 1983 (Polychaeta: Spionidae) frente a Punta Arenas, Chile, con notas sobre su abundancia y distribución espacial en fondos arenosos submareales someros

RESUMEN. Se confirma la presencia del poliqueto perteneciente a la familia Spionidae *Prionospio* (*Prionospio*) *orensanzi* Blake, 1983 en sedimentos arenosos submareales entre 5 y 20 m de profundidad, afectados por aguas servidas y descarga de agua dulce del río Las Minas, Punta Arenas (53°08'00"S, 70°51'15"W a 53°10'30"S, 70°54'30"W), Chile. Los especímenes recolectados coinciden en gran medida con la descripción original de Blake (1983). *P. (P.) orensanzi* fue recolectada junto a otras 42 especies de poliquetos, identificándose nueve especies pertenecientes a la familia Spionidae. Esta familia fue la más representativa en el área de muestreo por la riqueza de especies, donde *P. (P.) orensanzi* fue más abundante. Este nuevo hallazgo confirma la presencia de esta especie en aguas marinas chilenas, produciendo un incremento cercano a 41 especies en la familia Spionidae y a tres el número de miembros pertenecientes al género *Prionospio* (*Prionospio*). Se presenta una clave para identificar las especies del género *Prionospio* descritas para Chile.

Palabras clave: poliquetos, bentos subantártico, *Prionospio* (*Prionospio*) *orensanzi*, estrecho de Magallanes.

The genus *Prionospio* (*Prionospio*) Malmgren 1867 includes species with smooth, non-pinnate and pinnate branchiae arranged in various combinations (Blake, 1983). Until now was represented in Chilean waters by two species (Rozbaczylo, 1985): *Prionospio* (*Prionospio*) cf. *elheri* Fauvel, 1928, a predominantly deep-sea species (Blake, 1983; Maciolek, 1985; Gage & Tyler, 1991; Cañete *et al.*, 1999a) and *P. (P.) steenstrupi* Malmgren, 1867, this last collected around off Juan Fernandez Island near to 46 m depth (Blake, 1983; Rozbaczylo, 1985).

An analysis of benthic polychaete fauna collected as part of an oceanographic cruises in 1991 in the Magellan Strait produced specimens with incomplete branchiae suggesting the presence of *P. (P.) orensanzi* in this region (Gambi & Mariani, 1999). This species was previously reported from the coast of Argentina (37°S, Blake, 1983) and its presence is now confirmed among the benthic macrofauna inhabiting a shallow, sandy bottom area between 2.5 to 20 m depth off Punta Arenas (53°S, 71°W) (Cañete, 2000).

This ecological evaluation was developed to know the shallow, marine benthic biodiversity in relation to potential effects produced by domestic wastewater and the influence of the Las Minas River discharge at the spatial dynamic. The present study documents the record of *P. (P.) orensanzi* along the coast off Punta Arenas, Chile, given preliminary data on the abundance and spatial distribution in the shallow sandy bottom studied. We had included, for reference, list with other spionid polychaetes obtained in the samples.

Sediments samples were collected in november, 1999 by a diver using a 0.0225 m² Ekman-Birge grab sampler along twelve transects perpendicular to the coastal line (Fig. 1), with stations selected according to depth. One sample was taken at depths of 2, 5, 10 and 15 or 20 m depending on bottom morphology. The sediment samples were washed on a 0.5 mm mesh geological screen to collect the infauna, and animals were fixed in 4% seawater-formalin and preserved in 70% ethanol. The position of each sampling station were recorded using a Garmin Co.

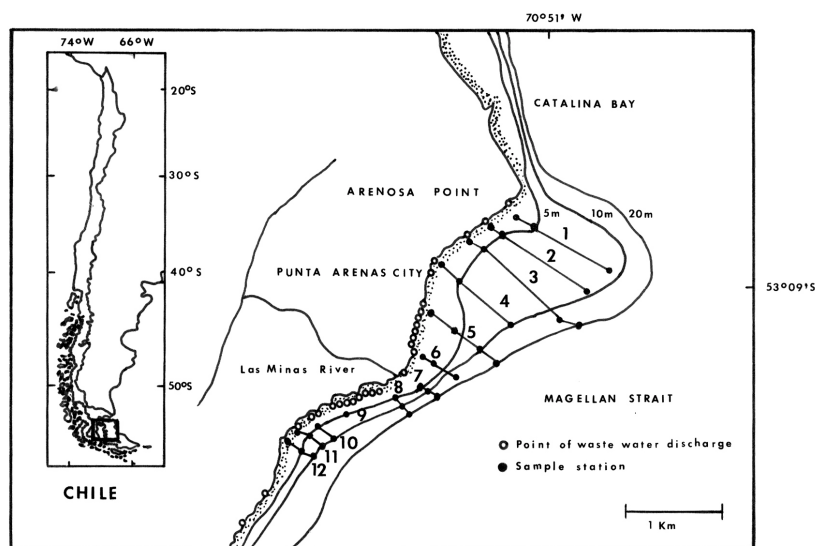


Figure 1. Spatial distribution of transects and sampling stations. White circles show the location of wastewater discharge and black circles the position of benthic sampling stations; numbers indicate transects. Samples of transect eight were lost. The mouth of Las Minas River is located near to the transect seven.

Figura 1. Distribución espacial de transectas y estaciones de muestreo (círculos negros). Círculos blancos muestran la localización de los emisarios que descargan aguas servidas; los números identifican las transectas. Las muestras de la transecta ocho fueron perdidas. La boca del río Las Minas está localizada frente a la transecta siete.

MK II global positioning system. Additional samples were obtained during August 1999, January and May, 2000 (Fig. 1; transects 10, 11 and 12).

Specimens were stained with methyl blue in 70° ethanol to observe the branchial arrangement and the morphology of parapodial lobes and dorsal crest. Figures were provided through a system of image collections (Proseries Capture Kit MV™ version 1.0 for Windows produced by Media Cybernetics) connected to stereoscopic microscope and a camera, or mounting the camera on microscope. Scanning electronic microscope (SEM) photographs were obtained with a JEOL JSM-T300, on specimens which were critical-point dried using CO₂ and a Samdri 780A Tousimis equipment. Specimens were gold coated for SEM observations using a JEOL JFC-1100 fine coat ion sputter (Rouse & Pleijel, 2001).

Three identified specimens of *P. (P.) orensanzi* were deposited in the Systematic Room of Flora and Fauna Profesor Patricio Sánchez Reyes (code SSUC-6914), Faculty of Biological Sciences, Pontificia Universidad Católica de Chile (SSUC). Additional samples were deposited at the collection of benthic polychaetes of the subantarctic Chilean coast in the Departamento de Ciencias y Recursos Naturales, Facultad de Ciencias, Universidad de Magallanes, Punta Arenas, Chile.

***Prionospio* (*Prionospio*) *orensanzi* Blake, 1983**
(Figs. 2a-d)

Prionospio (*Prionospio*) *orensanzi* Blake, 1983, p. 225, Figs. 10-11.

Prionospio (*P.*) cf *orensanzi* Gambi & Mariani, 1999, p. 236.

Material examined: Punta Arenas, Chile (53°08'00"S, 70°51'15"W to 53°10'30"S, 70°54'30"W), 5 to 20 m depth, J.I. Cañete & B. Hilbig collectors, from shallow, sandy bottoms, November 22, 1999. 36 specimens: SSUC-Chile (3 specimens), and Collection of Chilean Polychaetes, Facultad de Ciencias, Universidad de Magallanes, Chile (rest of specimens).

Description: one specimen was selected for taxonomic description, measuring 17 mm long and 0.8 mm wide, with 64 setigers. Other specimens were 15 to 20 mm length, with 58 to 63 setigerous segments. Nearly all specimens were incomplete,

being collected mainly the anterior ends. Color in alcohol: light tan to white. Segments increase in length from anterior to posterior. Posterior end acute. Prostomium triangular in shape twice as longer as wide; anterior margin varied in shape: broadly rounded in some specimens, with weak central incision; in others incision not observed, occasionally the anterior end of prostomium recorded as undulated flap (Fig. 2a). Caruncle extends posteriorly as a low ridge to middle of setiger 2; long ciliated nuchal grooves occurring lateral to caruncle; two pairs of black eyes, posterior pair larger, irregular in shape, composed of numerous ocelli; anterior pair smaller. Peristomium reduced, lacking lateral wings.

Setiger 1 well developed, separated from peristomium, with broad notopodial lamellae and smaller, leaflike neuropodial lamellae (Fig. 2a); notopodial lamellae of setigers 2-5 large, triangular in shape (Fig. 2a); lamellae of setigers 6-19 continued across dorsum forming an evident dorsal crest (Fig. 2a); neuropodial lamellae of anterior and middle setigers rounded, slightly wider than long, becoming leaflike in posterior setigers. After setiger 19, crest not detected and the segments longer than those located in the anterior end (Fig. 2b). Setigers 13-21 with incomplete ventral crests separated only in the central zone, being lowest than the dorsal crests; ridges located at posterior margin of each segment and fused to globular papillae located behind neuropodial lobes.

Branchiae present on setigers 2-5 (Fig. 2a), all of similar length; first and fourth pairs pinnate, second and third pairs cirriform. Branchial pinnules longer than detailed in original description.

Capillary notosetae of anterior and middle setigers unilimbate, arranged in 2 rows, those of anterior row being shorter, with wider sheaths than those of posterior row (Fig. 2a). Both types of setae with granulations on distal half of shaft. Capillary neurosetae bilimbate, arranged in two rows, also with granulations on shaft; neuropodia with thin inferior sabre setae from setiger 10 (Fig. 2b); multidentate hooded hooks in neuropodia from setiger 18 and in notopodia from setiger 36 with right shaft; hooks with 10-12 apical teeth arranged in 2 rows above main fang; internal hood inconspicuous; neuropodial hooks accompanied by 4-7 thin, bilimbate setae in each torus (Fig. 2c). Pygidium with a long central cirrus and two shorter anal cirri located to each side in the proximal end (Fig. 2d).

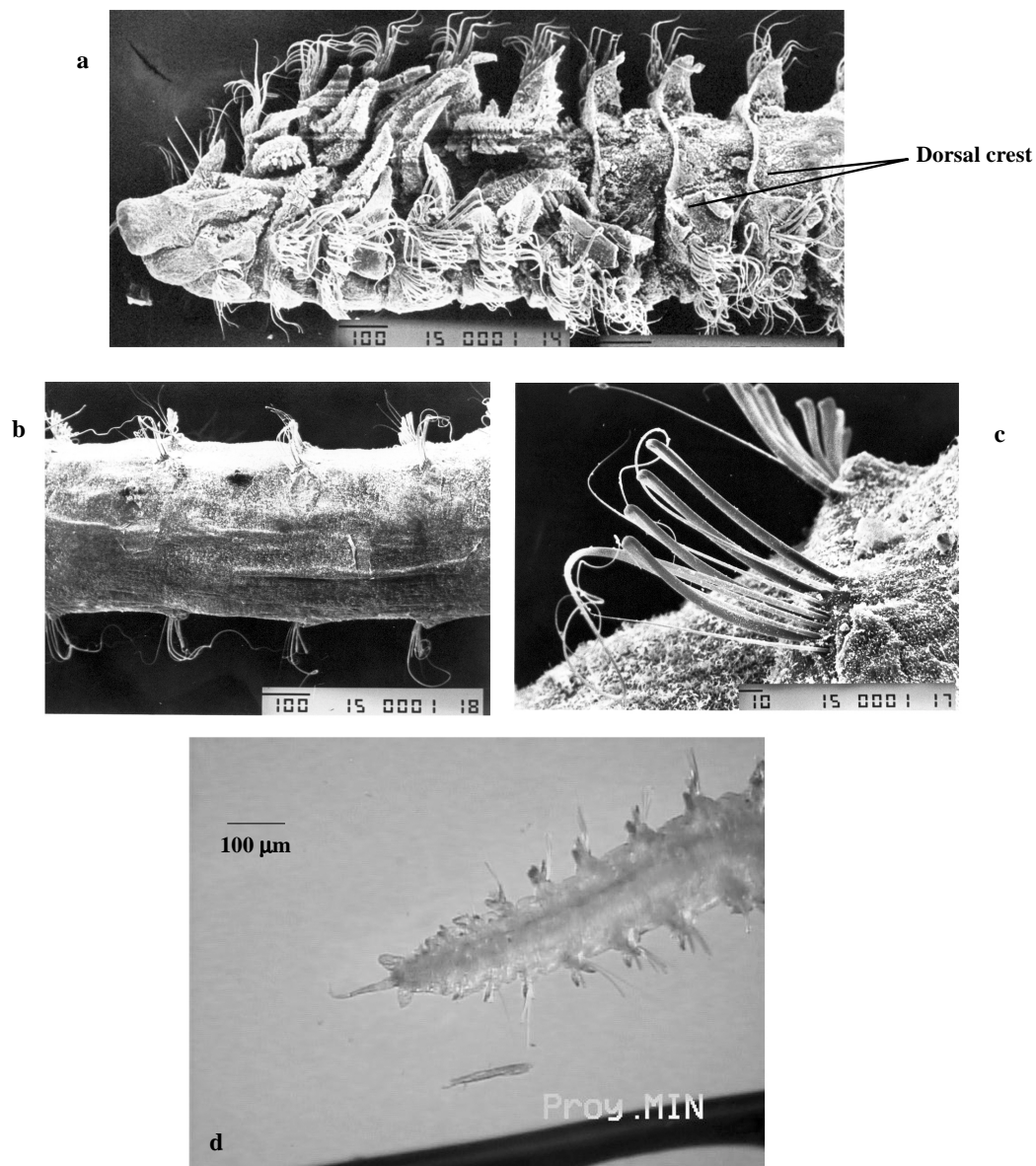


Figure 2. *Prionospio (Prionospio) orensanzi* Blake 1983. a) dorsal view of the anterior end, showing the branchial pattern and elevated dorsal crests, b) dorsal view of mid setigerous segments without dorsal crests, c) noto and neurosetae of mid setiger, d) ventral view of the pygidium and posterior end.

Figura 2. *Prionospio (Prionospio) orensanzi* Blake 1983. a) vista dorsal del extremo anterior, mostrando la organización de branquias y crestas dorsales, b) vista dorsal de segmentos setígeros medios del cuerpo, carentes de crestas dorsales, c) distribución y morfología de noto y neurocerdas de setígeros de la zona media del cuerpo, d) vista ventral del pigidio y extremo posterior del cuerpo.

Geographic distribution: the present study extends the distributional range of *Prionospio* (*Prionospio*) *orensanzi* from its original locality (37°S to San Matías Gulf, south of Argentina; Blake, 1983) to Punta Arenas, Chile (this study), allowing to certify their presence in southern Chilean waters. Thus, it should be considered a typical representative of the Magellan Biogeographic Province or cold temperate regions (Moyano, 1982; Brattström & Johanssen, 1983; Briggs, 1995; Cañete *et al.*, 1999b; Lancellotti & Vásquez, 2000). It is notoriously that in a specific study on the subtidal polychaetes from the San José Gulf, a small embayment within the San Matías Gulf, *P. (P.) orensanzi* neither others members of the family Spionidae were reported by Pastor de Ward (2000); the difference could be related to the presence of poorly sorted rock and coarse sand in San José Gulf, while fine sandy bottom dominates in the subtidal area off Punta Arenas.

Taxonomic notes: this species is representative the morphology of Punta Arenas specimens clearly coincide with Blake's (1983) original description. Diagnostic characters include the morphology and distribution of the branchiae and the elevated dorsal crests fused to the notopodial lamellae of the anterior notopodia (Fig. 2a). A weak medial incision in the anterior end of the prostomium was not observed in all Punta Arenas specimens. Furthermore, the latter posses branchial pinnules longer than figured in the original description, and the ventral crest were not reported by Blake (1983).

This finding increases to three the members of the genus *Prionospio* (*sensu stricto*) (Blake, 1983) reported from Chilean coast, and nearly to 41 the number of spionid polychaetes reported within politic limits of Chile (Rozbaczylo, 1985). A key to identify the three species reported for Chilean waters is given below.

Dicotomous key to identify three species of the genus *Prionospio* (*Prionospio*) (Polychaeta: Spionidae) from the Chilean coast

- 1a. First pair of branchiae pinnate, others cirriferous *P. (P.) elhersi*
- 1b. Two pairs of branchiae cirriferous and two pairs pinnate 2
- 2a(1b). Neuropodial hooks from setigerous 13 to 17 *P. (P.) steenstrupi*
- 2b(1b). Neuropodial hooks from setigerous 20 *P. (P.) orensanzi*

Ecological notes

This species is representative of shallow, sandy sediments off Punta Arenas, Chile, where nine species of spionid polychaetes have been collected in the present study (Table 1). The maximum abundance of *P. (P.) orensanzi* off Punta Arenas reach to 400 ind.·m⁻² (average = 3 ind.·0.0225 m⁻²) and the average abundance is higher in intermediate depths than in shallow and most deep stations. Some specimens were collected in all depths, except to 2 m stations (Fig. 3a). If the Gambi & Mariani (1999) specimens are the same species reported by us, then the bathymetric distribution could be extended to 80 m depth.

P. (P.) orensanzi has a bimodal spatial distribution along the coastal line off Punta Arenas, where the discharge of Las Minas River and the presence of a shallow sand bar disrupt the population distribution (Fig. 3b). This situation could explain the absence of diverse species collected in this study between transects 7 and 9 along the coastline. The effects of freshwater discharge on coastal benthos is a topic we plan to address in future research. Spionidae represent the family with highest number of species within all families of polychaetes

Table 1. List of species of the family Spionidae (Polychaeta) collected at subtidal sandy bottoms off Punta Arenas, Chile (n.r. = new record). Include only data on spionid polychaetes collected during November 1999.

Tabla 1. Lista de representantes de la familia Spionidae (Polychaeta) recolectados en sedimentos arenosos submareales frente a Punta Arenas, Chile. Considera sólo datos de muestras recolectadas en noviembre 1999.

Species	Total abundance (%)
<i>Prionospio</i> (<i>P.</i>) <i>orensanzi</i> (n.r.)	33.3
<i>Spiophanes bombix</i>	14.2
<i>Caraziella</i> sp.	3.3
<i>Boccardia polybranchia</i> = <i>B. wellingtonesis</i> *	10.0
<i>Polydora</i> spp. (2 species)	3.3
<i>Spio</i> sp.	1.8
<i>Rhynchospio glutaea</i>	28.3
<i>Laonice</i> sp.	0.8
Spionidae indeterminate	5.0

* According to Sato-Okoshi & Takatsuka (2001).

collected in the study area (Table 2), where 42 species were identified.

Finally, as in other embayments along the Chilean coast (Iquique, Valparaíso, Quintero and Concepción bay) studied by Quiroga *et al.* (1999), Rozbaczylo & Salgado (1993), Cañete *et al.* (2000) and Carrasco (1974), respectively, spionid

polychaetes attain high densities and ecological dominance in coastal bottoms off Punta Arenas. Furthermore, this family contributes nearly to 10% of the total richness of macroinvertebrates species (Cañete, 2000), being a very important taxon in to sustain the subantarctic biodiversity at shallow, sandy bottoms of this location.

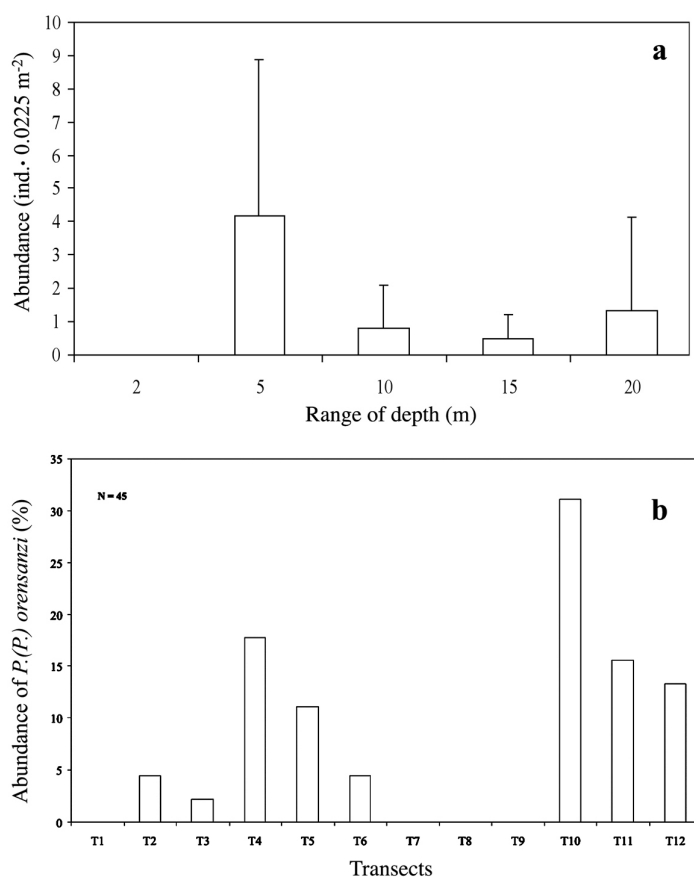


Figure 3. a) Mean abundance and bathymetric distribution of *Prionospio (P.) orensanzii* off Punta Arenas, Chile. Bars show the standard deviation. Data of August and November 1999 and January and May 2000 were grouped (Fig. 1, transects 10, 11 and 12) (N = 160 specimens collected), **b)** total abundance (as percentage) of *Prionospio (P.) orensanzii* by transect along the coastal line off Punta Arenas (November, 1999).

Figura 3. a) Variación batimétrica de la abundancia promedio de *Prionospio (P.) orensanzii* frente a Punta Arenas, Chile. Barras verticales indican la desviación estándar. Datos obtenidos en agosto y noviembre 1999, y enero y mayo 2000 se muestran agrupados (Fig. 1, transectas 10, 11 y 12) (N = 160 especímenes), **b)** abundancia total (en porcentaje) de *Prionospio (P.) orensanzii* por transecta en el borde costero localizado frente a Punta Arenas (noviembre, 1999).

Table 2. Species richness of benthic polychaetes families collected from sandy, subtidal bottom off Punta Arenas, Chile, in November 1999. Nomination to the order level based in Rouse & Pleijel (2001).

Tabla 2. Riqueza de especies de cada familia de poliquetos bentónicos recolectados en sedimentos arenosos submareales localizados frente a Punta Arenas, Chile, noviembre de 1999. Clasificación a nivel de orden basada en la proposición de Rouse & Pleijel (2001).

Family	Order	Richness of species
Capitellidae	Scolecida	3
Cossuridae	Scolecida	1
Maldanidae	Scolecida	2
Opheliidae	Scolecida	1
Orbiniidae	Scolecida	1
Paraonidae	Scolecida	3
Polynoidae	Aphroditiformia	1
Hesionidae	Nereidiformia	1
Nereididae	Nereidiformia	1
Pilargiidae	Nereidiformia	1
Syllidae	Nereidiformia	2
Glyceridae	Phyllodocida	2
Goniadidae	Phyllodocida	1
Nepthyidae	Phyllodocida	2
Phyllodocidae	Phyllodocida	2
Dorvilleidae	Eunicida	1
Lumbrineridae	Eunicida	1
Onuphidae	Eunicida	2
Cirratulidae	Cirratuliformia	3
Ampharetidae	Terebelliformia	1
Chaetopteridae	Spionida	1
Spionidae	Spionida	10
Total	number of species	42

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