

First record of *Phyllochaetopterus socialis* Claparède, 1870 (Annelida: Polychaeta) in Mar del Plata Harbor, Buenos Aires, Argentina

Primer registro de *Phyllochaetopterus socialis* Claparède, 1870 (Annelida: Polychaeta)
en el puerto de Mar del Plata, Buenos Aires, Argentina

Mariano Albano¹, Juan Pablo Seco Pon¹, Sandra Obenat¹ and Gabriel Genzano^{2,3}

¹Departamento de Biología, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata
Casilla de correo 1216, 7600 Mar del Plata, Argentina

²Departamento de Ciencias Marinas, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Mar del Plata
Casilla de correo 1216, 7600 Mar del Plata, Argentina

³CONICET

marianojalbano@yahoo.com.ar

Resumen.- Agregados del poliqueto tubícola *Phyllochaetopterus socialis* Claparède, 1870 fueron registrados por primera vez en el Puerto de Mar del Plata (38°02'S; 57°31'30"W), Buenos Aires, Argentina, en diciembre de 2003 mediante buceo autónomo a 6 m de profundidad. Los agregados fueron observados sobre sustrato duro, en el límite inferior del submareal. El presente trabajo amplía el rango de distribución de dicha especie para

Sudamérica, de la cual se tienen registros confirmados únicamente para el sur de Brasil y el Río de la Plata (Argentina).

Palabras clave: Macrobentos, fauna asociada, Chaetopteridae, gusanos tubícolas, buceo autónomo

Introduction

Chaetopteridae is a taxon found worldwide from intertidal sediments down to abyssal regions, comprising about 65 species of tubicolous worms placed in four genera: *Chaetopterus*, *Mesochaetopterus*, *Spiochaetopterus* and *Phyllochaetopterus*. This group posed species that bury their tubes, generally in sands or muds while others attach their tubes to hard substrates (Rouse & Pleijel 2001).

Depending on the species, body can be divided in two or three conspicuous regions, a peristomium that may have one or two pairs of tentacular cirri and palps of variable length. The anterior region holds uniramous parapodia while median and posterior regions present biramous parapodia; setae include capillary, limbic setae and modified spines in setiger 4 with uncini pectiniform in posterior setigers (Fauchald 1977).

Phyllochaetopterus is a genus comprised of 17 species (Fauchald 1977), which *P. socialis* Claparède, 1870 was found in New Zealand, South Africa, India

(including Pakistan, Ceylon, Burma and Malaya), Mediterranean Sea, Mexico and Costa Rica (Rioja 1941, Fauvel 1953, Day 1967, Probert & Wilson 1984, Ariño 1987, Abbiati *et al.* 1994, Dean 1996), but its assumed cosmopolitan distribution is under discussion (Bhaud pers. comm.)

Recently, it has been described for South America along the southern rocky shore of Brazil (Nalesso *et al.* 1995) and into estuarine areas of Río de La Plata (Obenat *et al.* 2001). This last study constitutes the first record for Argentinean continental shelf waters. Both studies agree that this species, among others marine benthic invertebrates, is associated with hard substrata such as rocks, empty mollusk shells and handmade hard objects.

An ecosystemic engineer status has been suggested for this tubicolous worm due to the intricate architecture of its tubes (aggregates, mats), which provide refuge and food supply for numerous marine species (Gottleson *et al.* 1985, Nalesso *et al.* 1995, Obenat *et al.* 2001).

Whilst a collecting trip to the Mar del Plata Harbor (38°02'S, 57°31'30"W), Buenos Aires, Argentina, during December 2003, aggregates of *Phyllochaetopterus socialis* were first registered during SCUBA dives performed at the north breakwater of this locality; this record extends the geographical distribution of this species in the south western Atlantic Ocean.

Materials and methods

Study area

The Mar del Plata Harbor is limited by two artificial breakwaters chiefly composed of ortoquartzitic blocks (Fig. 1). Mean water depth is about 5 m, ranging between 3 and 10 m. Water of low turbidity along with low salinity, dissolved oxygen and pH characterize the area (Rivero *et al.* 2005). This harbor has an appreciable pollution due to naval traffic, industrial discharged sewage and others contributions of surroundings waters (Bastida 1971).

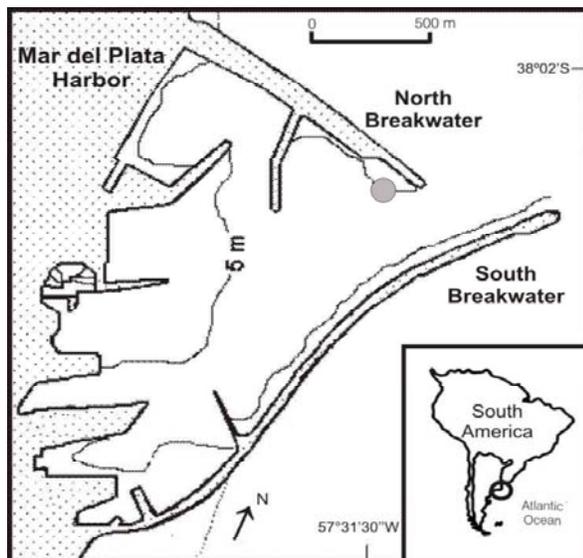


Figure 1

Location map of Mar del Plata Harbor, Buenos Aires, Argentina (● sampling site)

Mapa con la ubicación del puerto de Mar del Plata, Buenos Aires, Argentina (● sitio de muestreo)

Methods

Aggregates (mats) of *Phyllochaetopterus socialis* were first registered during SCUBA dives performed at 6 m at the north breakwater of Mar del Plata's Harbor (Fig. 1), on December 2003. Three dives were conducted on February 2004 when aggregates of *P. socialis* were randomly selected and sampled; whole mats were collected by hand, rubbed into plastic bags under water and then fixed with a formaldehyde solution (4%) on land. Water column displacement was performed in the laboratory in order to calculate the volume of the mats. Each sample was sieved and the macrozoobenthic organisms retained (> 0.5 mm) were preserved in 4%-formaldehyde solution.

Results

Mats of *P. socialis* (Fig. 2) were observed arising from hard substrate between the lower limits of the subtidal floor belonging to the north breakwater of the Mar del Plata's Harbor. Aggregates were stuck to different sides of the blocks, equally hanging or arising from them. Accumulation of organic material was observed at the basal structure of *P. socialis* mats. Mean volume of the mats was 291.6 cm³ (SD=190.4, n=3). An overall of 917 marine invertebrate organisms belonging to six taxa were counted associated to *P. socialis* mats, constituting a specific richness of 25 species. Most abundant taxa (expressed as a percentage of number of organisms/250 cm³) corresponded to Crustacea (90.5%), meanwhile Mollusca (7.83%) and Polychaeta (1.65%) were less represented. In addition, the colonial bryozoan *Bugula stolonifera*, the red alga *Pterosiphonia* sp. and the green alga *Bryopsis* sp. were also found attached to the tubes of this polychaete, remarking the importance of the mats as substrata and refuge for many associated organisms.

Discussion

The present study extends the geographical distribution of *Phyllochaetopterus socialis* for South America and constitutes the first record for Mar del Plata's Harbor.

Although *Phyllochaetopterus socialis* was not included in a regional scope of exotic marine species in the southwestern Atlantic Ocean (Orensanz *et al.* 2002), several specialists are discussing on its invasive exotic status.

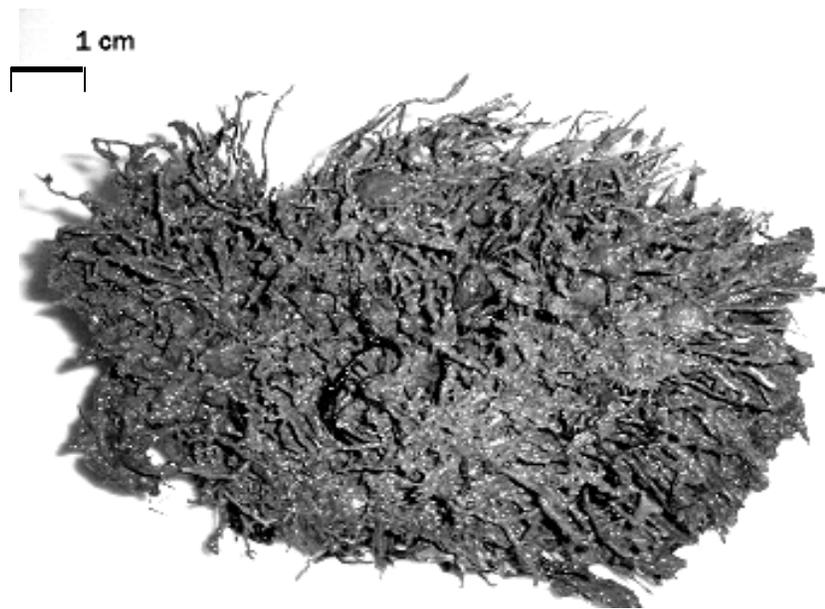


Figure 2

Agregado de *Phyllochaetopterus socialis*

Phyllochaetopterus socialis aggregates

Unfortunately, in the southwestern Atlantic Ocean baselines information from long - term monitoring are rare, turning very difficult to establish the starting point of a successful introduction. In the case of *P. socialis*, the first observations of this species into Mar del Plata harbor were during 1994 (Genzano pers. comm.), but just confirmed in this study.

It is remarkable that small tubes of *P. socialis* were occasionally observed in a quartzitic rocky outcrops front of Mar del Plata city (38°10'S, 57°26'W, 20 m depth) during December 2002. These scarce tubes attached directly on the rocks and never conformed mats. Further monitoring will be necessary in order to analyze if this species establishes successfully in this area, such as occurred in Mar del Plata harbor.

Observations conducted during this survey agree with Nalesso *et al.* (1995) and Obenat *et al.* (2001) results over hard substrata species association. The intricate structure of *P. socialis* tubes causes the accumulation of organic material, favoring the establishment of several detritivores species. These living shelters could have a special importance to

juvenile's forms of many marine organisms (Spivak pers. comm.).

Due to the ecosystemic engineer status suggested by several authors (Gettleson *et al.* 1985, Nalesso *et al.* 1995, Obenat *et al.* 2001), further monitories of *P. socialis* aggregates in Mar del Plata Harbor are needed to characterize the macrozoobenthic fauna associated and conduct further comparisons with Nalesso *et al.* (1995) and Obenat *et al.* (2001) results.

Acknowledgments

To Dr. Rodolfo Elías for the Mar del Plata Harbor map. To Lic. Laura Mauco for helping and criticizing the present study. We would also like to thank to the anonymous referees for many helpful comments and suggestions to improve the manuscript.

Literature cited

Abbiati M, A Airoidi, F Castelli, A Cinelli. & J Southward. 1994. Preliminary observations on a dense population of *P. socialis* Claparède at the sulphurous water boundary in a

- Mediterranean submarine cave. Actes de la 4^{ème} Conférence International. Angers, France, 1992. Mémoires du Muséum National d'Histoire Naturelle. Zoologie 6: 323-329.
- Ariño AH. 1987.** Bibliografía ibérica de poliquetos. Base de datos y catálogo de especies. Publicación de Biología de la Universidad de Navarra. Serie Zoológica 16. UNAS, 169 pp. Pamplona, España.
- Bastida RO. 1971.** Preliminary notes of the marine fouling at the port of Mar del Plata, Argentina. 2nd International Congress on Marine Corrosion and Fouling, 20th to 24th September 1968, Athens (Greece): 557-562.
- Day JH. 1967.** A monograph on the Polychaeta of southern Africa. Part I. Errantia; Part II. Sedentaria. Trustees of the British Museum of Natural History, 878 pp. London, United Kingdom.
- Dean HK. 1996.** Subtidal benthic polychaetes (Annelida) of the Gulf of Nicoya, Costa Rica. *Revista de Biología Tropical* 44 (3): 69-80.
- Fauchald K. 1977.** The Polychaete worms. Definitions and Keys to the Orders, Families and Genera. Science Series 28, 188 pp. Natural History Museum of Los Angeles County.
- Fauvel P. 1953.** The fauna of India including Pakistan, Ceylon, Burma and Malaya. Annelida Polychaeta, 507 pp. Indian Press, Allahabad.
- Gettleson DA, NW Phillips & RM Hammer. 1985.** Dense polychaete (*Phyllochaetopterus socialis*) mats on the South Carolina continental shelf. *Northeast Gulf Science* 7: 167-170.
- Nalesso RC, LFL Duarte, I Jr. Pierozzi & EF Enumo. 1995.** Tube epifauna of the Polychaete *Phyllochaetopterus socialis* Claparède. *Estuarine, Coastal and Shelf Science* 41: 91-100.
- Obenat S, L Ferrero & E Spivak. 2001.** Macrofauna associated with *Phyllochaetopterus socialis* aggregations in the Southwestern Atlantic. *Vie et Milieu* 51: 131-139.
- Orensanz JM, E Schwindt, G Pastorino, A Bortolus, G Casas, G Darrigan, R Elías, JJ Lopez Gappa, S Obenat, M Pascual, P Penchaszadeh, ML Piriz, F Scarabino, ED Spivak & EA Vallarino. 2002.** No longer the pristine confines of the World ocean: a survey of exotic marine species in the southwestern Atlantic. *Biological Invasions* 4: 115-143.
- Probert PK & JB Wilson. 1984.** Continental shelf benthos off Otago Peninsula, New Zealand. *Estuarine, Coastal and Shelf Science* 19: 373-391.
- Rioja E. 1941.** Estudios anelidológicos, 3. Datos para el conocimiento de la fauna de poliquetos de las costas mexicanas del Pacífico. *Anales del Instituto de Biología, Universidad Nacional Autónoma de México* 12: 669-746.
- Rivero AS, R Elías, & EA Vallarino. 2005.** First survey of macroinfauna in the Mar del Plata Harbor (Argentina), and the use of polychaetes as pollution indicators. *Revista de Biología Marina y Oceanografía* 40 (2): 101-108.
- Rouse GW & F Pleijel. 2001.** Polychaetes, 354 pp. Oxford University Press, Oxford.

Recibido el 20 de marzo de 2006 y aceptado el 28 de agosto de 2006