

## New records of two species of *Sabellaria* (Polychaeta: Sabellariidae) from the Argentinean Biogeographic Province

Nuevos registros de dos especies de *Sabellaria* (Polychaeta: Sabellariidae) en la Provincia Biogeográfica Argentina

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**Abstract.**- *Sabellaria bellis* Hansen, 1882 and *S. wilsoni* Lana & Gruet, 1989 were recorded in different habitats from coastal localities of Uruguay and Argentina, between 34°S and 37°S, Argentinean Biogeographic Province. Local distribution patterns in relation with the hydrography are discussed. Our findings show that both species are tolerant to salinity changes.

Key words: polychaetes, benthos, distribution, South Atlantic

**Resumen.**- *Sabellaria bellis* Hansen, 1882 y *S. wilsoni* Lana & Gruet, 1989 fueron registradas en diversos habitats costeros de Uruguay y Argentina, entre 34°S y 37°S, Provincia Biogeográfica Argentina. Se discuten los patrones de distribución local en relación con la hidrografía. Nuestros resultados indican que ambas especies son tolerantes a los cambios de salinidad.

Palabras clave: poliquetos, bentos, distribución, Atlántico Sur

### Introduction

The Sabellariidae Johnston, 1865, placed within the Sabellida (Rouse & Fauchald 1997), comprise non-colonial or colonial reef-builder worms, which occur from shallow to deep waters (Uebelacker 1984); colonies are formed by mass settlement (Eckelbarger 1977).

Four species of *Sabellaria* Savigny, 1818 have been found in the Southwestern Atlantic Ocean: *S. bella* Grube, 1870, *S. bellis* Hansen, 1882, *S. nanella* Chamberlin, 1919 and *S. wilsoni* Lana & Gruet, 1989 (Bremec & Lana 1994, Lana & Bremec 1994). All of them were recorded in southeastern Brazil (Espírito Santo, Rio de Janeiro, Santa Catarina and Paraná States, 20-32°S) and the last two species in Argentina (Monte Hermoso, 39°S). This paper reports the presence of *S. bellis* on different substrates in southern littoral latitudes of Uruguay (34-35°S), and *S. wilsoni* associated to reefs of *Ficopomatus enigmaticus* Fauvel, 1923, in a marine coastal lagoon of Argentina (37°S) and discusses local patterns of distribution.

### Taxonomy

*Sabellaria bellis* Hansen, 1882

*Sabellaria bellis* Hansen, 1882: 19, pl. 6, figs. 5-17; Augener, 1934: 149, fig. 30 a-e; Hartman, 1944: 339,

pl. 30, figs. 27-29; Rullier & Amoureux, 1979: 188; Gruet & Lana, 1988: 34, figs. 3-4; Kirtley, 1994: 55, figs.4.5.1-4.5.2; Lana & Bremec, 1994: 213, fig. 1-2.

### Material examined

Cruise EH-09-93 (INIDEP), 34°46'S – 53°50'W, 14 specimens, Piccard dredge, 23 m, sandy coarse bottom, 31.53 psu, August 1993, C.B. coll., Benthos Lab. INIDEP collection. Cruise EH-12-97 (INIDEP), 35°23'S – 55°36'W, 1 specimen, demersal trawl, 12 m, sandy bottom, 29.9 psu, November 1997, E. Spivak coll., Invertebrates Lab. National Univ. Mar del Plata collection.

### Remarks

The specimens fit well with the diagnosis and descriptions of Lana & Bremec (1994) and Gruet & Lana (1988). Diagnostic characters include external paleae with spiny median spike and two lateral teeth, middle paleae short, spoon-shaped and crenulated, and inner paleae long, concave and distally spiny. Length of individuals between 24,3 mm and 48,2 mm.

### Biological comments

The 14 specimens collected at 23 m depth were part of an assemblage of 34 species, with abundant specimens of the crabs *Pelia rotunda* Milne Edwards, 1875, *Libinia spinosa* Milne Edwards, 1934 and *Pachycheles*

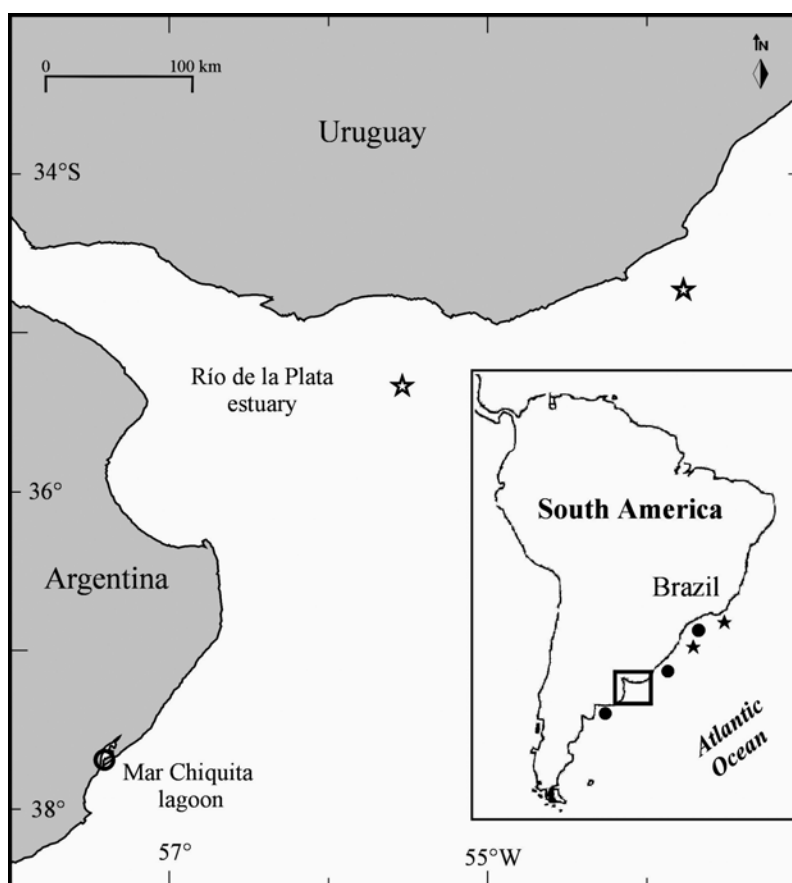
*chubutensis* Boschi, 1963; the echinoderms *Ophioplocus januarii* (Lütken, 1856) and *Patiria stellifer* (Möbius, 1859), the polychaetes *Nephtys* sp. and Serpulidae, as well as the bivalve *Ostrea puelchana* d'Orbigny, 1842 (Giberto 2001). Tubes of *Sabellaria bellis* were hard, made of sand grains, and found as epibionts of Ostreidae in sandy bottoms.

The specimen found in more coastal waters (35°23'S-55°36'W), was epibiont on aggregates of *Phyllochaetopterus socialis* Claparède, 1868 attached to a hard substrate (Obenat *et al.* 2001). In this case, the

tube was friable, made of small sand grains. A diverse fauna of eleven phyla was associated to the mats, and the most abundant were the polychaetes *Hydroides plateni* (Kinberg, 1867), different Syllidae, and the bryozoan *Aetea anguina* (Linné, 1758).

### Distribution

*Sabellaria bellis* is known from southeastern Brazil (Rio de Janeiro and Santa Catarina States). The new records extend the southern limit to marine coastal waters adjacent to the mouth of the Río de la Plata estuary (Fig. 1).



**Figure 1**

**Geographic distribution of *Sabellaria bellis* (star) and *Sabellaria wilsoni* (circle), indicating the location of new (empty) and previous (full) records in the southern Atlantic**

Distribución geográfica de *Sabellaria bellis* (estrella) y *Sabellaria wilsoni* (círculo), indicando la localidad de registros nuevos (vacío) y previos (lleno) en el Atlántico sur

*Sabellaria wilsoni* Lana & Gruet, 1989

*Sabellaria wilsoni* Lana & Gruet, 1989: 239, figs. 1-21; Bremec & Lana, 1994: 49, fig. 1d-f; Kirtley, 1994: 80, fig. 4.33; Lana & Bremec, 1994: 214, figs. 1m-2.

### Material examined

Mar Chiquita coastal lagoon, San Gabriel, 37°40'S–57°22'W, 1 specimen, 1 m, sandy bottom, March 2001, S. Obenat coll., Invertebrates Lab. National Univ. Mar del Plata collection.

### Remarks

The specimen fits well with the description and diagnosis of Lana & Gruet (1989) and Lana & Bremec (1994) respectively. Diagnostic characters include external paleae asymmetrical and distally spinous with a central spike, middle paleae basally concave with two lateral expansions, and inner paleae geniculated, basally excavated and distally pointed. Total length of the specimen 8,1 mm.

### Biological comments

Specimen collected as biota associated to reefs of *Ficopomatus enigmaticus* Fauvel, 1923, the most austral location registered for the species (Obenat, 2002). Conspicuous associated species were the amphipod *Melita* sp., the crab *Cyrtograpsus angulatus* Dana, 1851; the polychaetes *Neanthes succinea* (Frey & Leuckart, 1847) and *Laeonereis acuta* Treadwell, 1923, as well as the gastropods *Heleobia* spp. (Obenat, 2002). Tube of *Sabellaria wilsoni* friable, made of small sand grains.

### Distribution

The species is known from Paraná State (25°30'S, Brazil), Monte Hermoso (39°S, Argentina) and probably the French Guyana, between 6 and 16,5 m depth (Lana & Gruet, 1989). This new locality, Mar Chiquita coastal lagoon (Fig. 1), represents a highly variable environment, strongly influenced by tides, with a salinity annual range 0,5 to 34 (Reta *et al.* 2001).

### Discussion

Gaylord & Gaines (2000) explored the potential of ocean flows to generate distributional patterns, through their influence on recruitment processes of marine species with dispersing larvae. They suggested that biogeographic boundaries worldwide, often associated with flow fields, can function as one- or two-way barriers to range expansion of larvae and may be differentially permeable depending on their life-history

characteristics. The importance of transport mechanisms in nearshore systems, obviously including estuaries and coastal lagoon mouths, is stressed out by Pineda (2000), while hydrodynamic processes influencing the larval pool, physical transport, micro-hydrodynamics, substrate availability and behavior are considered the main phenomena influencing settlement (Pineda 1994).

The studied material was collected in the warm temperate waters of the Argentine Biogeographic Province (Boschi 2000a). It includes coastal waters from 43-44°S (Patagonia) to 23°S (southern Brazil). This part of the Southwestern Atlantic Ocean is interesting for many reasons, as the Argentine Province is influenced by subtropical and subantarctic waters, Brazilian and Magellanic, respectively, and also divided by the Río de la Plata (35°S) (Boltovskoy *et al.* 1999; Boschi 2000a), the major hydrographical feature within this province (Boschi 2000b).

This barrier was found to be intermittent for southbrazilian plankton and fish species, according to climatic variation and discharge patterns of the river (Mianzan *et al.* 2001a). Many taxa of decapods (Melo 1990, Boschi 2000a, Scelzo 2001, Schejter *et al.* 2002) and cnidarians (Zamponi 2000) also show affinity between southern Brazil and the littoral of northern Argentina (38°S). Oceanographic dynamic also favors physical transport from southern (Argentinean) to northern (Brazilian) shelf areas, and the translocation of species to estuarine waters is also possible (Guerrero & Piola 1997, Piola & Rivas 1997). Continental shelf water, originally subantarctic, intrudes upriver below the diluted upper layer and remains unaltered under most wind conditions (Mianzan *et al.* 2001b). However, it is considered that the dispersal of some invertebrates from south to north, and within estuarine waters, could be constrained due to thermal and salinity tolerance (Melo 1990, Giberto & Bremec 2003).

Sabellariids are characterized by long life span, very high fecundity and high dispersal capability; planktotrophic larvae remain in the plankton for long periods and are able to cross oceanic distances (Giangrande 1997). Larval settlement seems to be induced by the presence of con-specific reefs in gregarious species, while those of solitary species do not show this preference; larvae of a reef-forming sabellariid responded first to proper flow conditions and then to chemical cues that induced metamorphosis under experimental small spatial scales (Pawlik 1988, Pawlik *et al.* 1991).

Regarding sabellariids in South America, a disjunctive distribution was suggested as an actual zoogeographical pattern in a continental scale, with endemic or restricted geographical patterns (Lana & Bremec 1994). *S. bellis* was recorded on different settlement substrates, Ostreidae in Uruguayan marine waters and *Phyllochaetopterus socialis* mats in estuarine waters off Rio de la Plata; these records extend its southern distributional range from SE Brazil, where the known distribution was restricted (Lana & Bremec 1994, Obenat *et al.* 2001). *S. wilsoni* was collected in a shallow habitat with variable seasonal salinity, totaling four individuals in patches of 150 cm<sup>2</sup> in *Ficopomatus enigmaticus* reefs (Obenat 2002, pers. comm). These findings show that both species are tolerant to salinity changes; local nearshore patterns of circulation, and larval transport, permit *Sabellaria* species to colonize new coastal areas.

In conclusion, many authors consider the freshwater discharge of the Rio de la Plata and its adjacent area as a significant zoogeographic barrier for the distribution of several marine groups, particularly for the cold temperate species, while others emphasize it is a transitional zone with a high degree of mixing of faunal regimes (Bisbal 1995). Future research is needed to assess the local distribution of coastal polychaete fauna within the Argentine Province, together with the tolerance of every species to salinity and temperature variations and availability of primary settlement substrate.

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