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Epibiotic relationships on *Zygochlamys patagonica* (Mollusca, Bivalvia, Pectinidae) increase biodiversity in a submarine canyon in Argentina

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ABSTRACT

The continental slope of the southern SW Atlantic Ocean has many distinguishable deep submarine canyons, varying in depth and extension. The benthic fauna within one of them, detected in April 2005 by means of a multibeam SIMRAD EM1002 sonar, and located at 43°35′S to 59°33′W, 325 m depth, was studied to discuss faunal affinities with the neighbouring Patagonian scallop fishing grounds located at upper slope depths. In order to add faunal information to the previous general study, we studied the epibiotic species settled on Patagonian scallops (the dominant species in the area) collected in the reference sampling site using a 2.5-m mouth-opening dredge, 10 mm mesh size. We sampled 103 scallops with shell heights between 22 and 69 mm; epibionts were recorded on both valves. We found 53 epibiotic taxa, which were most conspicuous on the upper valve. Bryozoa was the most diverse group (34 species) while Polychaeta was the most abundant group, recorded on 94% of the scallops. Stylasteridae (2 species) and Clavulariidae (Cnidaria) conform newly recorded epibionts on *Z. patagonica* and the sponge *Tedania* (*Tedaniopsis*) *infundibuliformis* also represents a new record for the SW Atlantic Ocean.

1. Introduction

The Argentine continental shelf is one of the largest and flattest in the world; its width varies between a few kilometers at 55°S and 850 km along 51°S (Lonardi and Ewing, 1971). It is dominated by soft sediments, mainly composed of sand with minor quantities of shells and mud; its external edge, where the continental slope starts, varies between 110 and 165 m depth approximately (Parker et al., 1997). The continental slope is cut by multiple deep submarine canyons and channels, crossing the upper continental slope in a W–E direction, and organised in two submarine canyon systems, the Ameghino and the Patagonia (or Almirante Brown) systems (Ewing et al., 1964; Lastras et al., 2011; Muñoz et al., 2013). The greatest canyon density was found on the continental slope between 42°S and 46°S, namely the Ameghino canyon system (Lonardi and Ewing, 1971). The Argentine continental margin is the result of the interaction of synchronous contourite and turbidity currents, the former modelling the general margin morphology in terraces and escarpments, and the latter creating the Argentine submarine canyons (Lastras et al., 2011; Muñoz et al., 2013).

A worldwide inventory indicates that there are more than 5800 submarine canyons (Harris and Whiteway, 2011), however patterns of benthic community structure and productivity have been studied in relatively few of them (e.g. Vetter and Dayton, 1998; Schlacher et al., 2007; Bianchelli et al., 2010; De Leo et al., 2010). Some findings suggest that canyons, where accelerated currents and dense water cascades can increase the transport of organic matter from shelf areas to the deep ocean, are likely to provide keystone structures resulting in hotspots of biodiversity (Gage and Tyler, 1991; Gili et al., 1999; Hargrave et al., 2004; Canals et al., 2006; Company et al., 2008; Vetter et al., 2010).

Recently, studies developed for the assessment and protection of Vulnerable Marine Ecosystems (VMEs) and dealing with the geomorphology, sedimentology and megafauna inhabiting areas with submarine canyons in the SW Atlantic Ocean were published by Portela et al. (2012). In this study, general results from the area located between 41°30′ and 48°S on the Argentine continental margin are shown, outside the Argentinean Economic Exclusive Zone. The main results divide the area in two regions (41°30′–45°S and 45–48°S), with the results on seafloor geomorphology, sedimentology and structure of the southernmost area (from 44°30′S to 48°S and from 59°W to nearly 61°W) extensively described and

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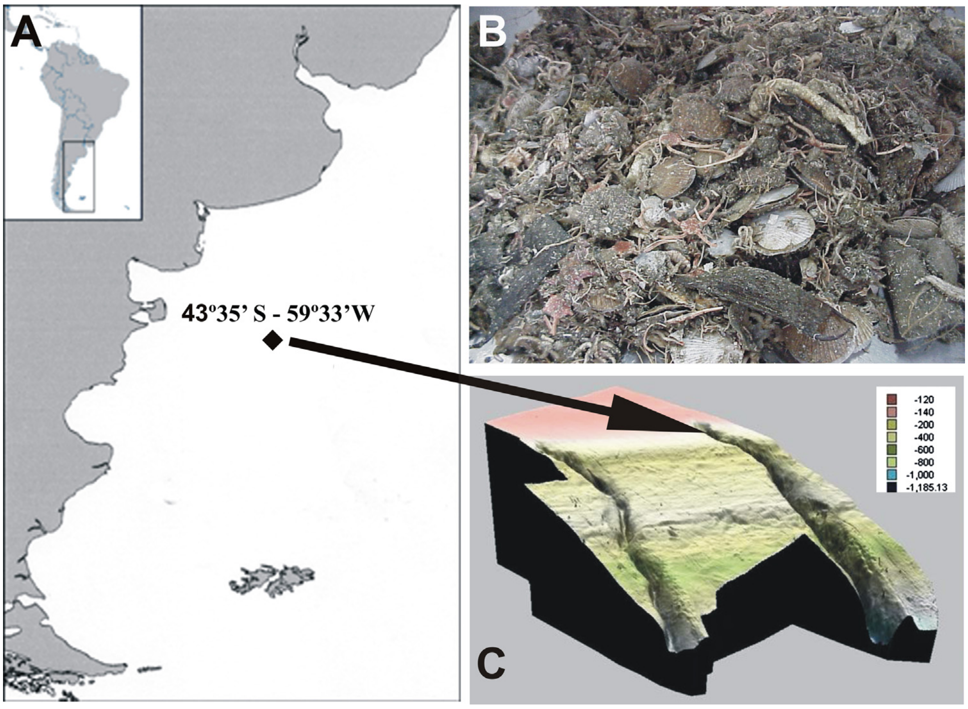

Fig. 1. (A) Location of the submarine canyon in South America. (B) photo showing total invertebrate catch inside the canyon (Cruise and haul Technical INIDEP Codes: OB 04 05, L88); (C) arrow shows the study site (this image was modified from: Madirolas A., F.I. Isla, M. Tripode, G. Alvarez Colombo and A. Cabreira. First results from the multibeam surveys carried out over the Argentine Continental shelf. FEMME, Dublin, Ireland, 26–29 April, 2005. Extended abstract, 2 pp.).

explained in Lastras et al. (2011) and Muñoz et al. (2012, 2013). The studies are based on a series of multidisciplinary Spanish research surveys that aimed for a qualitative and quantitative description of the biotopes, ecosystems and communities of the area. Information regarding the northern region (between 41°30′ and 45°S) mentioned in Portela et al. (2012) confirmed that the southernmost part exhibited numerous canyons and gullies. General characterisation of the benthic communities in the whole area studied mentioned the existence of cold-water coral reefs, coral gardens and sponge gardens, all categorised as Vulnerable Marine Ecosystems (FAO, 2008).

The canyon targeted by this study (43°35′S, 59°33′W) belongs to the Ameghino system, and is one of the canyons mentioned in Portela et al. (2012) for the northern region (Fig. 1), although the head of the canyon is located inside the Argentine Economic Exclusive Zone. Preliminary data dealing with acoustic results of this canyon were presented by Madirolas et al. (2005). Subsequently, Bremec and Schejter (2010) reported a faunal assemblage composed of 86 taxa of mega- and macroinvertebrates belonging to 10 Phyla (Foraminifera, Porifera, Cnidaria, Annelida, Mollusca, Bryozoa, Brachiopoda, Echinodermata, Arthropoda and Chordata). The scallop *Zygochlamys patagonica* (King, 1832) represented near 20% in biomass of the total catch (Bremec and Schejter, 2010 and Fig. 1). A higher species richness inside the canyon compared to the neighbouring scallop fishing ground at the shelf-break frontal area along the 100 m isobath was also noted. Sponge species found in the samples were previously studied by Bertolino et al. (2007) and it must be pointed out that from the nine sponges species recorded, two represented new distributional records (*Pseudosuberites* cf. *antarcticus* and *Guitarra dendyi*, only known from Antarctica until then), and two corresponded to new species for science and were described (*Stelodoryx argentinae* and *Tedania* (*Tedaniopsis*) *sarai*).

It is well documented that epibiotic relationships greatly enhance marine diversity, as they are omnipresent, variable and diverse; they have a profound ecological impact, as the presence of epibionts (organisms growing attached to a living surface) affects the fitness of basibionts (substrate organisms that are hosts to the epibionts) directly as well as indirectly, by modulating their interactions with the abiotic and biotic environment (see Wahl, 1989, 2008). Most basibiont species are found in larger hard shelled molluscs and crustaceans (Wahl, 2009) and, in different habitats or regions, they often feature different epibiotic species or different degrees of epibiotic coverage (Reiss et al., 2003; Dougherty and Russell, 2005; Wahl, 2009). Dayton (1984) stipulated that the structure of many benthic communities is affected by species which serve as a biogenic habitat or as a substratum for others. In sub-Antarctic waters, at the Patagonian scallop fishing grounds in Argentina, it was noted that epibiotic organisms are responsible for *approx*. 50% of the total richness recorded in the area (Schejter and Bremec, 2007, 2009; Schejter et al., 2011a,b).

The aim of this study is to add faunal information of the submarine canyon located at 43°35′S and 59°33′W at the Argentine continental margin by means of analysing the composition and frequency of epibiotic species settled on *Z. patagonica*. This was the only recorded species that – in terms of abundance – allowed this kind of study.

2. Material and methods

During a regular stock assessment cruise of the Patagonian scallop *Zygochlamys patagonica* in the Argentine Sea onboard the RV "Oca Balda" (INIDEP) (Cruise Code OB 04 05), two submarine canyons were located by means of a multibeam SIMRAD EM1002 sonar and one of them, due to the morphological characteristics, was wide enough to allow sampling. Benthic communities were sampled using a non-selective dredge (2.5 m mouth opening, 10 mm mesh size) in the head of one of the submarine canyons located at 43°35′S to 59°33′W, at 325 m depth (Fig. 1). A single haul (INIDEP Technical Code: L88) inside the canyon was performed and caught 39 kg of organisms from the benthic community which were frozen onboard and fully sorted at the laboratory. From this sample, a total of 103 Patagonian scallops (*Zygochlamys patagonica*) ranging from 22 to 69 mm total shell height were separated and carefully preserved (frozen) to be studied later under a binocular microscope for the identification of epibiotic organisms (for the other benthic fauna characterisation results, see Bremec and Schejter (2010) and Bertolino et al. (2007)). Epibiotic taxa richness (on *Z. patagonica*) was recorded for both valves and presence–absence data and frequencies on lower (right) and upper (left) valves of all epibionts were recorded. The Mann–Whitney–Wilcoxon test was used to test differences in taxa richness between upper and lower valves. The McNemar test for paired proportions with the continuity correction (Sokal and Rohlf, 1995) was used to establish preferences of the epibiont species for any of the scallop valves (except for Bryozoa species).

3. Results

Fifty three epibiotic taxa (34 Bryozoa, 5 Cnidaria, 4 Polychaeta, 1 Crustacea, 4 Porifera, 2 Ascidiacea, 1 Bivalvia, 1 Brachiopoda and unidentified Foraminifera) were recorded on living *Zygochlamys patagonica* valves (Table 1 and Fig. 2). Only 2 small scallops (22 and 34 mm total shell height) did not present epibiotic organisms.

The number of epibiotic taxa differed significantly between lower and upper valves (Mann–Whitney–Wilcoxon test, W: 10,385, $p=0.042$). Taxa richness varied between 0 and 11 for upper valves (average: 3.9) while for lower valves the range varied between 0 and 12 (average: 4.8). This difference was mainly attributed to some bryozoan species recorded on lower valves.

Polychaetes were the most frequent epibiotic group recorded on 94.1% of the studied scallops. Amongst them, Spirorbinae was the most frequent taxa, recorded on 90.3% of the scallops, recorded on both valves but with a preference for the lower valve (McNemar, χ^2: 10.61 and $p<0.05$). Other common polychaetes were *Serpula narconensis* (Baird, 1865) on 59.2% of the scallops, with a marked preference for the upper valve (McNemar, χ^2: 48.02 and $p<0.05$) and *Idanthyrsus macropalea* (Schmarda, 1861) in 33% of the scallops, only recorded on upper valves.

The second most important group in terms of presence, the Bryozoa, was recorded on 79.6% of the scallops. It was the most diverse group comprising a total of 34 species, with 29 species recorded on lower valves and 24 species on upper valves. The dominant and more frequent species on upper valves were *Plagioecia dichotoma* (d'Orbigny, 1847) and *Osthimosia eatonensis* (Busk, 1881), while *Hippothoa flagellum* (Manzoni, 1870) and *Neothoa* cf. *chiloensis* (Moyano, 1982) dominated on lower valves. Although not quantified, *Arachnopusia monoceros* (Busk, 1854) and *Osthimosia eatonensis* were the most important species regarding coverage due to the large size of their colonies. Eighteen species were found either on upper or lower valves, while 10 species were present only on lower valves and 5 only on upper valves (Table 1). Eighteen species (see Table 1) are recorded for the first time as epibiotic on *Zygochlamys patagonica*.

In general, polychaetes and bryozoans were frequent on small and large scallops, on both upper and lower valves. Only *Idanthyrsus macropalea* and hydrozoa were more frequently recorded on left valves of scallops larger than 55 mm shell height (commercial scallop size), reaching 49% and 20% of the total.

Cnidarians were recorded from 26.2% of the shells. Among them, hydroids were recorded on 15.5% of the scallops, with no preference for any valve (McNemar, χ^2: 0.64 and p: 0.42). The poor preservation of the hydroid colonies did not allow specific identification. Stylasteridae (2 species) were recorded for the first time epibiotic on *Zygochlamys patagonica*, and were registered on 9.7% of the scallops with a preference for the upper valves (McNemar, χ^2: 4.9 and $p<0.05$). A Clavulariidae colony and an *Alcyonium* sp. colony were registered on upper valves of scallops only once.

Ascidians were recorded on 6.8% of the scallops; among them, *Alloeocarpa incrustans* (Herdman, 1886) was recorded exclusively on upper valves.

Epibiotic sponges (Porifera) were uncommon; only 4.8% of the scallops presented a thin encrusting layer of sponge. Four

Table 1
Epibiotic taxa recorded on living *Zygochalmys patagonica* on upper and lower valves. NR: new records of epibionts on *Z. patagonica*.

Taxa	Upper	Lower	NR
Protozoa			
Foraminifera	x	x	
Porifera			
Iophon proximum (Ridley, 1881)		x	
Tedania infundibuliformis (Ridley and Dendy, 1886)	x		x
Tedania spinata (Ridley, 1881)	x	x	x
Tedania sp.	x		x
Cnidaria			
Hydrozoa	x	x	
Alcyonium sp.	x		
Clavulariidae	x		x
Stylasteriidae 1	x		x
Stylasteriidae 2	x	x	x
Annelida			
Idanthyrsus macropalea (Schmarda, 1861)	x		
Potamilla antarctica (Kinberg, 1867)	x		
Serpula narconensis (Baird, 1865)	x	x	
Spirorbinae	x	x	
Mollusca			
Hiatella meridionalis (d'Orbigny, 1846)	x		
Crustacea			
Ornatoscalpellum gibberum (Aurivillius, 1892)	x	x	
Brachiopoda			
Lyothyrella uva (Broderip, 1833)	x		x
Bryozoa			
Amastigia benemunita (Busk, 1884)		x	x
Andreella uncifera (Busk, 1884)	x	x	
Arachnopusia monoceros (Busk, 1854)	x	x	
Buffonellodes glabra (Hayward, 1991)	x	x	
Caberea darwinii (Busk, 1884)	x		
Calvetia dissimilis (Borg, 1944)	x	x	x
Cellaria malvinensis (Busk, 1852)		x	
Celleporella alia (Hayward, 1993)		x	x
Celleporina bicostata (Hayward, 1980)	x		x
Chaperiopsis galeata (Busk, 1854)		x	x
Disporella sp.		x	x
Ellisina incrustans (Waters, 1898)		x	x
Fenestrulina sp.	x	x	
Galeopsis pentagonus (d'Orbigny, 1847)	x		x
Gregarinidra variabilis (Moyano, 1974)	x	x	x
Hippothoa flagellum (Manzoni, 1870)	x	x	x
Lacerna hosteensis (Jullien, 1888)	x	x	
Micropora brevissima (Waters, 1904)		x	x
Microporella sp.	x	x	
Neothoa cf. *chiloensis* (Moyano, 1982)	x	x	
Odontoporella adpressa (Busk, 1854)		x	
Osthimosia bicornis (Busk, 1881)	x	x	
Osthimosia eatonensis (Busk, 1881)	x	x	
Parasmittina dubitata (Hayward, 1980)		x	x
Plagioecia dichotoma (d'Orbigny, 1847)	x	x	
Reptotubigera elegans (Borg, 1944)	x	x	x
Reteporella magellensis (Busk, 1884)		x	x
Smittina jullieni (Moyano, 1983)	x	x	
Smittina leptodentata (Hayward and Thorpe, 1990)	x	x	
Smittina oblita (López Gappa, 2002)	x	x	x
Smittoidea sigillata (Jullien, 1888)	x		x
Stomatopora eburnea (d'Orbigny, 1847)	x	x	x
Tricellaria aculeata (d'Orbigny, 1847)	x		x
Tubulipora sp.	x	x	
Chordata			
Alloeocarpa incrustans (Herdman, 1886)	x		
Colonial Ascidiacea	x		

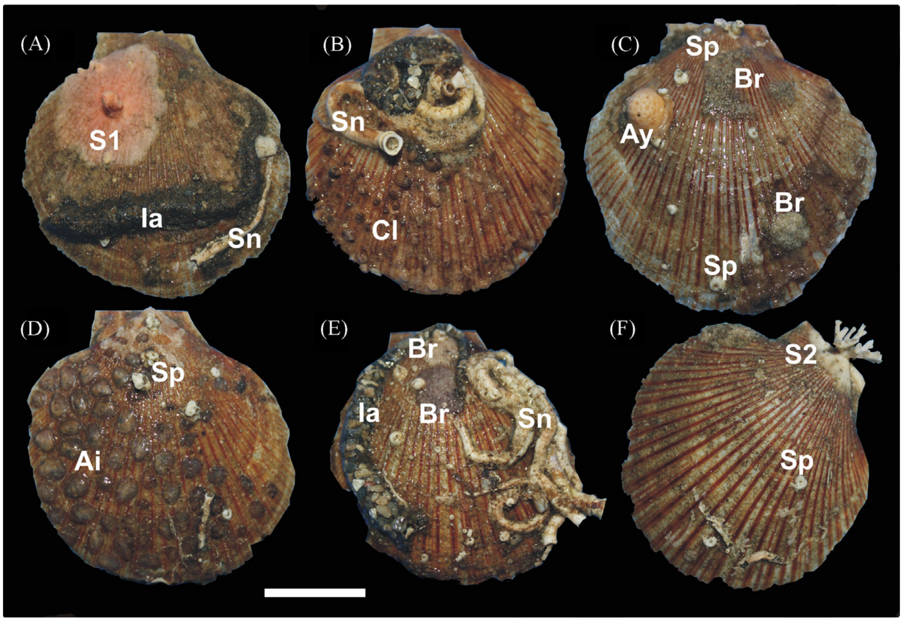

Fig. 2. Epibiotic organisms encrusting *Zygochlamys patagonica* specimens. S1: Stylasteridae 1; S2: Stylasteridae 2; Ia: *Idanthyrsus macropalea*; Sn: *Serpula narconensis*; Cl: Clavulariidae; Ay: *Alcyonium* sp.; Br: Bryozoa; Sp: Spirorbinae; Ai: *Alloeocarpa incrustans*.

Demospongiae species were recorded. The first one, *Iophon proximum* (Ridley, 1881) was already registered on *Zygochlamys patagonica*. A very thin layer (~1.5 mm) was found on an inner scallop valve. The spicules were large acanthostyles I, not fully spinated (187.5 237 μm × 10 μm); acanthostyles II fully spinated especially in the head (97.5–115 μm × 7.5 μm); acanthotylotes (182–200 μm × 5 μm); anisochelae (17.5–25 μm); bipocilli were not registered. The second species recorded, *Tedania* (*Tedaniopsis*) *infundibuliformis* (Ridley and Dendy, 1886), is a poorly known species only known from Pacific waters until now. A very thin encrusting layer was recorded in the left auricule of a 52 mm total shell height scallop. This sponge presented slightly curved styles (475–555 μm × 7.5–10 μm), tylotes (260–305 μm × 5 μm) and long onychaetes with different endings (270–410 μm) (Fig. 3A and B). Skeletic structure was not observed due to the small dimension of the sponge. *Tedania* (*Trachytedania*) *spinata* (Ridley, 1881), a very common sponge in SW Atlantic waters, was recorded on two scallops; spicules measurements of the two recorded specimens (Fig. 3D and E) are given in Table 2. Lastly, *Tedania* sp., was recorded on one scallop specimen and slightly differs from *T. spinata* in having larger tornotes than styles, with many anomalous spicules with thickenings (Fig. 3C and F, Table 2), a phenomenon mentioned by Sará (1978) for many species of *Tedania* from Argentina.

The crustacean *Ornatoscalpellum gibberum* (Aurivillius, 1892), the mollusc *Hiatella meridionalis* (d'Orbigny, 1846) and the brachiopod *Lyothyrella uva* (Broderip, 1833) were occasionally recorded on 1 or 2 scallops each.

4. Discussion

Current knowledge of the seabed deeper than 200 m on the Argentine continental margin, distributed along a wide latitudinal gradient between 39° and 53°S, was recently updated by Portela et al. (2012), who identified and described Vulnerable Marine Ecosystems of the Argentine continental margin, i.e. cold water coral reefs, coral gardens, sponge beds and rocky environments. Moreover, detailed topographic and environmental information regarding the sector of the continental margin comprised between 44°30′ and 48°S is given in Lastras et al. (2011) and Muñoz et al. (2012). Previous information is scarce (see Bremec, 1992; Bastida et al., 2007), as the faunal composition in soft bottoms came from a few locations from the Buenos Aires and Patagonian shelves (Roux et al., 1993, 2005). This contribution about epibiotic organisms on *Zygochlamys patagonica*, together with the faunistic records given in Bertolino et al. (2007) and Bremec and Schejter (2010), constitutes the only available knowledge of faunal composition in submarine canyons at a regional scale. Species richness in the study location is increased to 127 taxa. The present results include 34 bryozoan species, 3 sponges (*Iophon proximum*, *Tedania* (*Tedaniopsis*) *infundibuliformis*, *Tedania* (*Trachytedania*) *spinata*), 3 cnidarians (Clavulariidae, Stylasteriidae 2), one polychaete (*Potamilla antarctica*) and one crustacean (*Ornatoscalpellum gibberum*) different from the 86 taxa of mega and macroinvertebrates previously documented in the surveyed canyon. Due to the sessile life mode of the epibiotic organisms recorded here, they were not yet recorded elsewhere in the benthic community. Bremec and Schejter (2010) stressed out that taxonomic richness inside the canyon was higher than in the surrounding scallop fishing grounds, considering bryozoans and ascidiaceans (see Bremec et al., 2006 for the complete species list at the Patagonian scallop fishing ground).

Zygochlamys patagonica epibionts were previously studied in the SW Atlantic Ocean in different areas, e.g. the Magellan Strait (Rosso and Sanfilippo, 1991), the shelf-break system along the 100 m isobath and Beagle Channel (Schejter and Bremec, 2007). Taxonomical studies on epibiotic polychaetes in the Magellan Strait were developed by Sanfilippo (1994). In the shelf-break area, epibiotic bryozoans were previously studied by López Gappa and Landoni (2009) while some epibiotic sponges were registered by Schejter et al. (2006). More data on epibiotic organisms living on *Z. patagonica* are embedded in other ecological and biological studies (Walossek, 1991; Schejter and Bremec, 2009). Epibionts' richness in the surveyed canyon is similar to the value recorded in the Patagonian scallop fishing grounds (Schejter and Bremec, 2007; López Gappa and Landoni, 2009); however, main differences in faunal composition need to be highlighted.

Twenty eight epibiotic taxa are shared with samples collected on the Argentinean continental shelf, 16 of which are bryozoans. Bryozoan richness was much higher in the present study than in four Patagonian scallop fishing grounds located in the shelf-break

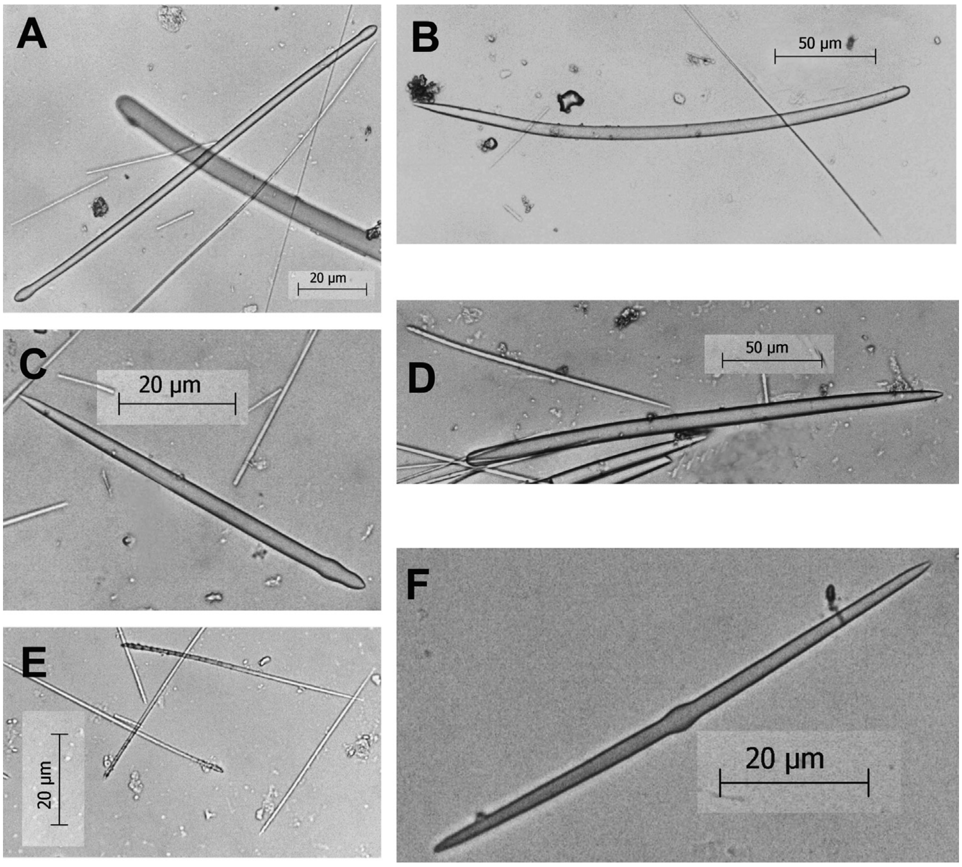

Fig. 3. (A and B) *Tedania* (*Tedaniopsis*) *infundibuliformis*. (A) Tornote and Onychaetes; (B) Style and Onychaetes. (C and F) *Tedania* sp. C. Style; F. Tornote. (D and E) *Tedania* (*Trachytedania*) *spinata*. D. Styles; E, Onychaetes.

Table 2
Tedania (*Trachytedania*) *spinata*. Spicules' measurements.

No	Styles (μm)	Tornotes (μm)	Onychaetes (μm)
Specimen 41	197.5–240/5–10	137.5–170/5–6.75	I. 107.5–137 II. 50–60
Specimen 8	205–240/5–10	135–187.5/2.5–5	I. 120–135 II. 50–60

area (34 vs. 22 species, see López Gappa and Landoni (2009)), although the dominant species in terms of coverage (*Osthimosia eatonensis* and *Arachnopusia monoceros*) were the same. *Hippothoa flagellum* and *Neothoa* cf. *chiloensis* were the most frequent species in lower valves, but their uniserial colonies are not as conspicuous as the other species mentioned. Additionally, 18 species were not previously registered as *Z. patagonica* epibionts. The finding of the species *Celleporella alia* constitutes the second mention for Argentina and extends its northern distribution limit by 10°. This species was described by Hayward (1993) from samples collected in South Georgia, South Orkney and the Bouvet Islands and on the continental slope off Tierra del Fuego and the Malvinas Islands during the "Discovery" expeditions, at depths ranging from 118 to 650 m.

Regarding cnidarians, Stylasteridae and Clavulariidae represent new records of epibionts on *Zygochlamys patagonica*. Stylasteridae is a poorly known group in the study area. Cairns (2012) reported 247 valid extant species of stylasterids distributed worldwide although, and among them, only 18 species were recorded in Atlantic waters of South America. Some of the species recorded in the SW Atlantic are also common in Antarctica. Descriptions, distributions and generalities of the Antarctic and SubAntarctic species are given in Cairns (1983). The species recorded here are presumably included among this literature. Stylasteridae colonies (non-epibiotic) were also reported in the faunal assemblage (Bremec and Schejter, 2010). On the other hand, the Family Clavulariidae (Alcyonacea: Octocorallia) comprises currently 24 valid genera. No species belonging to this family were previously mentioned in Octocorallia lists from Argentina (Perez and Zamponi, 2001; Zamponi, 2008), although some colonies were occasionally registered on *Z. patagonica* from the fishing grounds nearby (unpublished information). Recently, the cryptic species *Incrustatus niarchosi* was described for Tierra del Fuego, Argentina (McFadden and van Ofwegen, 2013). However, our specimen belongs to a different species that will be studied in detail with additional samples collected in the future.

In the case of Porifera, *Tedania* (*Tedaniopsis*) *infundibuliformis* constitutes the first mention of the species in SW Atlantic waters. The spicule measurements of the small specimen found agree with the original description made by Ridley and Dendy (1886, 1887). This is the only species of the genus *Tedania* in Argentina having tylote spicules instead of tornotes. This species was only scarcely known from Pacific waters. The other *Tedania* species registered, *T. spinata*, is a common species in the SW Atlantic Ocean (López Gappa and Landoni, 2005), also recorded in the Patagonian scallop fishing grounds and as epibiont on *Fusitriton magellanicus* (Schejter et al., 2011a). The common sponge species *Iophon proximum* has a relatively wide distribution comprising Antarctica, SW Atlantic waters and also Pacific waters (van Soest, 2012). This species was originally described encrusting a "*Pecten*" shell by Ridley (1881) (mentioned as *Alebion proximum*), although subsequently many other morphologies were described (see Desqueyroux-Faúndez and van Soest, 1996). It was already mentioned as epibiont on *Z. patagonica* by Schejter et al. (2006), where some information about previous records of the species in Atlantic waters is mentioned. On the shelf-break of Argentina, where the Patagonian scallop fishing grounds are located, this sponge often encrusts scallops; some patches present near 90% of scallops heavily coated by *Iophon proximum* while others show completely naked scallops (authors' personal observation). This represents the deepest record in SW Atlantic waters, where the species was previously recorded from 10 m in the Malvinas Islands (Goodwin et al., 2011) to 144 m off Uruguay (Burton, 1940).

In the case of epibiotic bryozoans, polychaetes and the brachiopod, all the species are commonly found in the Magellanic Biogeographic Province associated to the Malvinas Current (Roux and Bremec, 1996; López Gappa, 2000; Bremec and Schejter, 2010). The faunal assemblage in the canyon indicates its Magellanic origin, but some Antarctic components were also found as part of the megabenthos, like the ophiurid *Astrotoma agassizi* (Lyman, 1875) and the sponge *Guitarra dendyi* (Kirkpatrick, 1907; Roux et al., 2002; Bertolino et al., 2007; Bremec and Schejter, 2010).

Regarding other basibiont invertebrates in the Patagonian scallop assemblage, it is also interesting to point out that the hairy triton *Fusitriton magellanicus*, reported as conspicuous basibiont for the fishing grounds nearby (Schejter et al., 2011a,b), was not recorded in the studied canyon (Bremec and Schejter, 2010), as well as the gastropod *Adelomelon ancilla*, mostly found encrusted by two species of anemones (Schejter and Escolar, 2013).

Our results show that epibiotic relationships greatly increase benthic richness in the surveyed canyon; similar results have been already found in surrounding shelf areas where *Zygochlamys patagonica* dominates the benthic system (Schejter and Bremec, 2007, 2009; López Gappa and Landoni, 2009; Schejter et al., 2011a,b).

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