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A tubulariid hydroid associated with anthozoan corals in the Mediterranean Sea

M. BO^{1*}, C. G. DI CAMILLO¹, S. PUCE¹, S. CANESE², M. GIUSTI²,
M. ANGIOLILLO², & G. BAVESTRELLO¹

¹Dipartimento di Scienze del Mare, Università Politecnica delle Marche, Ancona, Italy, and ²ISPRA (ex-ICRAM), Roma, Italy

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Abstract

A solitary hydroid of the genus *Ectopleura* was described associated with several Mediterranean anthozoans: the black coral *Antipathella subpinnata* and three gorgonian species, *Eunicella cavolinii*, *Paramuricea clavata* and *Paramuricea macrospina*. This find represents the first record of a hydroid species epibiont of an antipatharian coral and also the first record of such association with Mediterranean gorgonians. Hydroids arise from the branches of the hosting corals and are enveloped by a thin sheet of their skeleton and by a layer of living coenenchyme up to the neck of the hydranths. The relationship causes no apparent damage to the host, while the epibiotic habitus allows the hydroid to avoid siltation and to gain in defence and support. It is hypothesised that actinulae of *Ectopleura* sp. are able to settle on the corals (both skeleton or tissue) and, during their growth, to be enveloped by the skeletons of their host.

Keywords: *Hydrozoa*, *Ectopleura*, *antipatharians*, *gorgonians*, *South Italy*

Introduction

Hydroids are able to establish epibiotic associations with the majority of marine phyla due to their fast growth rate and adaptability to a wide range of primary and secondary substrates (Riedl 1966; Boero 1984). In some cases, this epibiotic aptitude may shift to a mutualistic or parasitic relationship (Boero & Bouillon 2005; Puce et al. 2008b). Symbiotic associations involving hydroids and anthozoans were recently reviewed by Puce et al. (2008a) (Table I). Associations with living octocorals are well described, with 12 species belonging to six families (Asyncorynidae, Cladocorynidae, Corynidae, Ptilocodiidae, Tubulariidae, and Zancleidae) found associated with these corals. Particularly, the genus *Ralpharia* (Tubulariidae) is almost exclusively known to be associated with octocorals, with two species living on soft corals and four on gorgonians (Puce et al. 2008a). In contrast to associations with octocorals, the relationships between hydroids and hexacorals are almost unknown, with the exception of *Zanclaea*

margaritae Pantos and Bythell, 2010, which was recently described associated with *Acropora muricata* (Linnaeus, 1758) (Pantos & Bythell 2010). Some observations were also made for other scleractinian species, for example *Zanclaea* sp. and *Zanclaea gilii* Boero, Bouillon and Gravili, 2000 living in association with unidentified hard corals (Millard & Bouillon 1973, Millard 1975; Boero et al. 2000). Moreover, recently, a tubulariid hydroid, tentatively classified as *Hybocodon* cfr. *prolifer* (Agassiz, 1862), was photographed in association with living branches of *Madrepora oculata* (Linnaeus, 1758) in the white coral banks located at 500 m depth of Santa Maria di Leuca (Ionian Sea) (Mastrototaro et al. 2009; Vertino et al. 2009).

For benthic passive filter feeders, epibiosis on vertically branched anthozoans is particularly attractive (Bayer 1961) in fact, epibionts may increase their filtration efficiency (Linskens 1963; Oswald & Seed 1986; Zea 1993) and exploit the organic matter and bacteria entrapped in the coral mucus (Goh et al. 1999).

*Correspondence: M. Bo, Dipartimento di Scienze del Mare, Università Politecnica delle Marche, Ancona, Italy. Tel: +39 071 2204649. Fax: +39 071 2204650. Email: m.bo@univpm.it

Table I. Known associations between hydroids and anthozoans.

Species	Host	Locality	Reference
<i>Psilocodium repens</i>	<i>Psilosarcus sinuosus</i>	Timor Est	Coward 1909
<i>Hydrichthella epigorgia</i>	<i>Anthoplexaura dimorpha</i> , <i>Bellonella rigida</i> , <i>Dendronephthya</i> sp., <i>Siphonogorgia</i> sp.	Japan, Seychelles, Indonesia	Stechow 1909, Bouillon 1967, Hirohito 1988, Puce et al. 2008b
<i>Sarsia medelae</i>	<i>Thouarella</i> sp., <i>Primnoisis</i> sp., <i>Notisis</i> sp.	Antarctica	Gili et al. 2006
<i>Ralpharia magnifica</i>	<i>Parerythropodium membranaceum</i>	Australia	Watson 1980, 1984
<i>Ralpharia coccinea</i>	<i>Parerythropodium membranaceum</i>	Australia	Watson 1980, 1984
<i>Ralpharia neira</i>	<i>Melitodes ochracea</i>	Indonesia	Petersen 1990
<i>Ralpharia gorgoniae</i>	<i>Gorgonia ventalina</i>	Panama (Atlantic Ocean)	Petersen 1990
<i>Ralpharia sanctisebastiani</i>	<i>Lophogorgia punicea</i>	Brazil	da Silveira & Migotto 1984
<i>Ralpharia parasitica</i>	unidentified gorgonian	Philippines	Korotneff 1887, Petersen 1990
<i>Asyncoryne philippina</i>	unidentified gorgonians	La Réunion Islands	Boero et al. 1995
<i>Pteroclava kremplfi</i>	<i>Cladiella kremplfi</i> , unidentified gorgonian	Vietnam, Japan, Indonesia, Papua New Guinea, La Réunion Islands	Billard 1919, Hirohito 1988, Boero et al. 1995, Puce et al. 2008b
<i>Zanclaea timida</i>	<i>Paratelesto</i> sp.	Indonesia	Puce et al. 2008b
<i>Zanclaea gilii</i>	Unidentified scleractinian	Papua New Guinea	Boero et al. 2000
<i>Zanclaea</i> sp.	Unidentified scleractinian	Seychelles	Millard & Bouillon 1973, Millard 1975
<i>Zanclaea margaritae</i>	<i>Acropora muricata</i>	Australia	Pantos & Bythell 2010
<i>Hybocodon</i> cfr. <i>prolifer</i>	<i>Madrepora oculata</i>	Mediterranean Sea	Mastrototaro et al. 2009, Vertino et al. 2009
<i>Ectopleura</i> sp.	<i>Antipathella subpinnata</i> , <i>Paramuricea clavata</i> , <i>Paramuricea macrospina</i> , <i>Eumicella cavolinii</i>	Mediterranean Sea	Present study

For these reasons, octocorals host a highly diversified epibiotic community. Bayer (1961), for example, reported numerous species of commensal invertebrates such as hydroids, polychaetes, crustaceans and mollusks associated with gorgonians. Goh et al. (1999) recorded that half of the 31 gorgonian species known from Singapore are associated with sponges, hydroids, polychaetes, crustaceans, bryozoans or echinoderms. Also, antipatharian corals may host a rich associated fauna, whether or not commonly through species-specific relations, which generally occur on the living portions of the colonies (Tazioli et al. 2007). The majority of the sessile organisms, including hydroids, usually live on the dead portions of these corals, and can reach extremely high abundances (Love et al. 2007; Di Camillo et al. 2008; Bo et al. in press).

This study aims to describe the peculiar association of a tubulariid hydroid with colonies of the black coral *Antipathella subpinnata* (Ellis and

Solander, 1786) and some gorgonian species of the genera *Eumicella* and *Paramuricea* recorded in different mesophotic coral assemblages along the southern coasts of Italy (Mediterranean Sea).

Materials and methods

Hydroids epibiont of anthozoans were found on two samples of *Antipathella subpinnata* (family Myriopathidae) (Opresko 2001; Bo et al. 2008) and on one colony each of *Paramuricea clavata* (Risso, 1826) and *Paramuricea macrospina* (Koch, 1882) (family Plexauridae) (Carpine & Grasshoff 1975), collected in August 2009 on board of the R/V *Astrea* of ISPRA on a rocky shoal at 110–120 m depth in front of Vibo Marina (Calabria, South Tyrrhenian Sea, St. Eufemia Gulf; 38.8460°N–16.1430°E). The studied shoal is part of a system of rocky structures, about 50 m high, lying on the flat soft bottom of

the Gulf, exposed to moderate currents and characterised by peculiar mesophotic coral assemblages, which have already been described (Bo et al. in press). Hydroids were found also on two colonies of *Eunicella cavolinii* Koch, 1887 collected in July 2010 between 60 and 90 m depth along the rocky coast of the Gulf of Salerno (Secca dei Galli, 40.5900°N–14.4876°E) and Ischia Island (Punta S. Angelo, 40.6912°N–13.8939°E), respectively (Figure 1).

Samples were collected with a jaw grabber mounted on a Remotely Operated Vehicle survey (ROV 'Pollux').

The collected samples were fixed in 4% formaldehyde for morphological observations. Drawings were made from fixed material and the colours mentioned in the descriptions have been determined from the videos and photographs of living colonies. For the scanning electron microscopy (SEM) analysis, some portions of coral colonies, associated with the

hydroids, were rinsed and gradually dehydrated in an ethanol gradient. Then all samples were dried in a critical point dryer, coated with gold–palladium in a Balzer Union evaporator and examined with a Philips XL20 SEM.

The histological examinations were conducted after resin inclusion. The samples were dehydrated in a graded ethanol series (one-day steps) then included in a cold-curing resin (Technovit 8100), and finally mounted on plastic supports. The sections (9 µm thick) obtained by a microtome were coloured with Toluidine blue, then analysed on a compound microscope.

Results

Description of the hydroid

Specimens recorded on the studied anthozoans were very similar in morphology, size, cnidome and num-

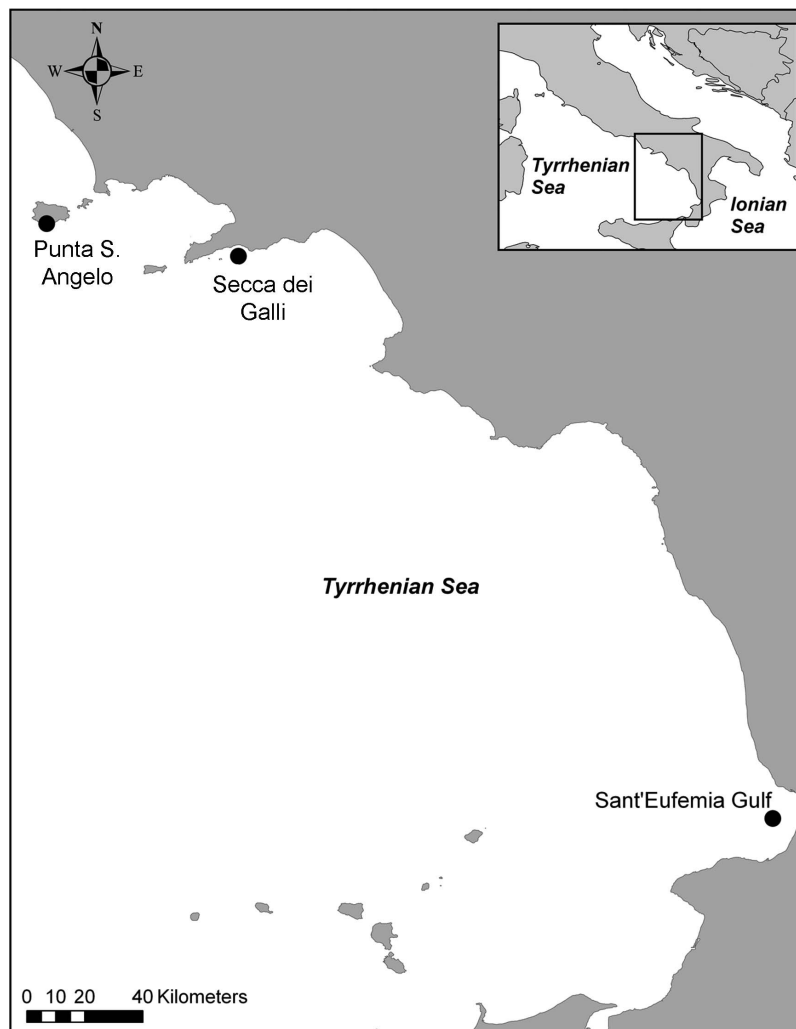


Figure 1. Map of the sampling regions. Locations of the explored areas along the western Tyrrhenian coast: Ischia Island, shoal Secca dei Galli and S. Eufemia Gulf (black dots).

ber of tentacles (Figures 2A,B, 3). The lumen of the stem of all specimens appeared open in transverse sections, without parenchymatic and longitudinal endodermal canals (Figures 2C,D). Hydranths were vasiform, about 1 mm high, without an evident collar on the neck region. This region was white–yellow coloured, while the portion including aboral and oral tentacles was milky white (Figures 2A, inset, 2B, inset). They bore about 25 pseudofiliform aboral tentacles and about 15 filiform oral tentacles, both types arranged in one whorl. The hypostome was cone-shaped. Hydranths arose from short, erect hydrocauli, 1–4 cm high, with a diameter of about 0.3 mm, the perisarc surrounding stem and stolons were beige coloured.

Only a few fertile polyps were observed. Fertile polyps found on the black coral showed immature gonophores just over the aboral tentacles characterised by a white, refringent distal extremity (Figure 2E). The fertile polyp found on *E. cavolinii* showed slightly larger gonophores, suggesting they were in an advanced stage of development (Figure 2F).

Three cnidocyst types were observed: (a) stenoteles of two sizes ($8.5\text{--}9 \times 7.5\text{--}8 \mu\text{m}$ and $7 \times 6.7\text{--}7 \mu\text{m}$), (b) desmonemes ($6 \times 5\text{--}5.5 \mu\text{m}$) and (c) basitrichous isorhizas ($8\text{--}11 \times 5.5 \mu\text{m}$). The cnidocysts were scattered in the polyp body and coenosarc, while they were concentrated in the tentacles.

Remarks

All the described tubulariids showed a stem with an open lumen, characteristic shared by both genera *Ectopleura* and *Hybocodon* (for recent descriptions see Bouillon et al. 2004; Schuchert 2010). However, in our specimens, unlike *Hybocodon*, the hydranths bore one whorl of oral filiform tentacles and lacked an evident collar on the neck region as described for *Ectopleura*. In the Mediterranean Sea, five species of *Ectopleura* and one of *Hybocodon* have been described: *E. crocea* (Agassiz, 1862), *E. dumortierii* (Van Beneden, 1844), *E. larynx* (Ellis and Solander, 1786), *E. wrighti* Petersen, 1979, *E. sacculifera* Kramp, 1957 (Bouillon et al. 2004), and *Hybocodon prolifer* L. Agassiz, 1862. Their distribution has been reported by Gravili et al. (2008).

Hybocodon prolifer was typically found associated with sponges and, with some doubts, with *Madrepora oculata* in Mediterranean deep waters (Mastrototaro et al. 2009; Vertino et al. 2009). This species strongly differs from our specimens for the presence of about 50 short oral filiform tentacles in arranged two closely set whorls and about 30 longer aboral filiform tentacles arranged in one whorl (Bouillon

et al. 2004). For these reasons we identify our hydroids as belonging to the genus *Ectopleura*. In the Mediterranean Sea, five species of *Ectopleura* are known: *E. larynx* and *E. crocea* are colonial hydroids, *E. dumortierii* is solitary, and *E. wrighti* is solitary or forms small colonies of a few polyps. The latter species differs from the other Mediterranean species by the presence of capitata or moniliform oral tentacles. The polyp stage of *E. sacculifera* is still unknown. The features of the hydroid described here agree with those of the solitary tubularid *E. dumortierii*, but a definitive specific attribution is impossible due to the lacking of mature reproductive structures.

Relationship with the hosts

The colonies of *Antipathella subpinnata* hosting *Ectopleura* sp. were bush-like, up to 30 cm high, with an almost planar arrangement of pseudopinnules (Figure 4A). They were collected from a mixed coral assemblage settled on a shoal of the St. Eufemia Gulf, including several gorgonian (*Callogorgia verticillata* (Pallas, 1766), *Eunicella cavolinii*, *Paramuricea macrospina*) and antipatharian (*A. subpinnata*, *Antipathes dichotoma* Pallas, 1766, and *Parantipathes larix* (Esper, 1790)) species. Sertulariid hydroids were occasionally observed living on the skeleton of dead branches, while the thinner branchlets and pinnules were spotted by numerous polyclad egg cocoons. *Ectopleura* sp. was settled on the living branches of the black corals (Figures 4B,C). The hydroid stems arose perpendicularly from the black coral branchlets (Figure 4B) or showed a short basal hydrorhiza running along them (Figures 2A, 4C) that, however, never ramified within the coral's tissues. Some hydrocauli were fused with one or more coral branchlets. The hydroids were camouflaged when the hydranths were contracted, and were distinguishable from the antipatharian branches only by their slightly contorted shape (Figure 4C). As many as 15 *Ectopleura* sp. polyps were recorded on a single 30 cm high colony of *A. subpinnata*, indicating relatively high density.

The colonies of *E. cavolinii* hosting *Ectopleura* sp. were collected on the top of two rocky cliffs (Secca dei Galli 88 m depth, Gulf of Salerno; Punta St. Angelo 48 m depth, Gulf of Naples) where the coral assemblages were mainly characterised by a mixed community of *P. clavata*. The density of *Ectopleura* sp. was lower than what was found on *A. subpinnata*, with four and one hydranths, respectively, for two colonies 30 cm tall. Moreover, two specimens, one of *P. clavata* and one of *P. macrospina*, hosting *Ectopleura* sp. were also recorded at 100–120 m depth in the Gulf of S. Eufemia

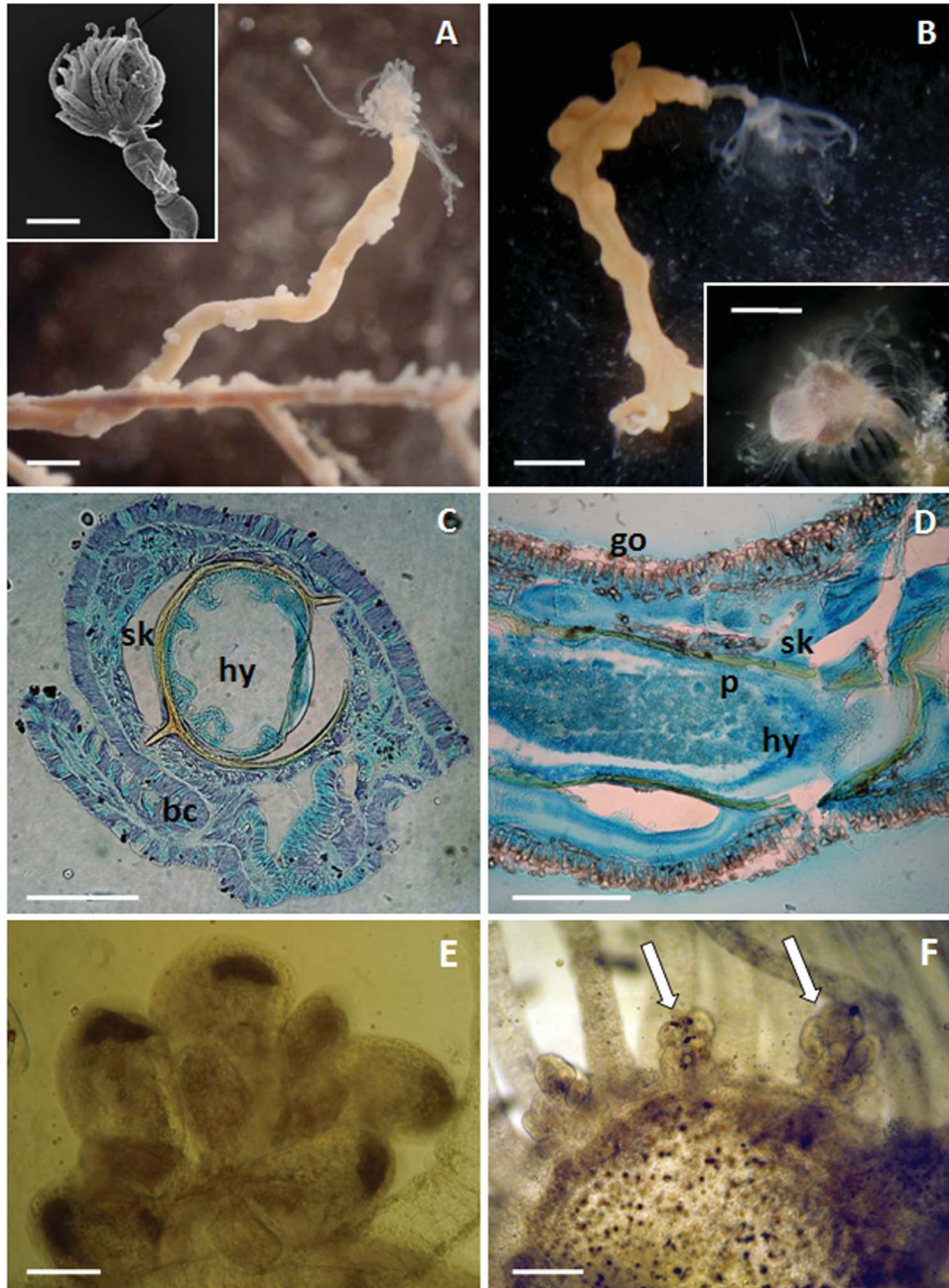


Figure 2. Description of *Ectopleura* sp. **A**, solitary polyp of *Ectopleura* sp. emerging from a branchlet of *Antipathella subpinnata*. Note the antipatharian polyps irregularly arranged on the hydroid stem. **Inset**: SEM close-up of the hydranth. **B**, solitary polyp of *Ectopleura* sp. emerging from a branchlet of *Eumicella cavolinii*. **Inset**: Close-up of the hydranth. **C**, transverse section of a hydrocaulus (hy) surrounded by the black coral (bc). Spines are visible on the golden skeleton of the coral (sk), while no divisions are found in the lumen of the hydroid. **D**, transverse section of a hydrocaulus (hy) surrounded by the gorgonian tissues (go). The gorgonian skeleton (sk), surrounded by the coenosarc bearing sclerites, covers the perisarc (p). Immature gonophores of *Ectopleura* sp. found in *A. subpinnata* (**E**) and *E. cavolinii* (white arrows) (**F**). Scale bars: B, 2 mm. A, B inset, 1 mm. A inset, 0.5 mm. C,D,F, 0.2 mm. E, 50 μ m.

(Figures 4D,E). In contrast to all other specimens, the hydrocaulus emerging from *P. clavata* was naked, with only the basal part surrounded by the gorgonian coenosarc (Figure 4D). In the case of both specimens of *P. macrospina*, as for *A. subpinnata* and *E. cavolinii*,

the host's tissue instead covered most of the hydroid stem (Figures 4E,F). In no case was the hydrorhiza ramified under the coenosarc of the host.

In all the examined specimens, with the exception of *P. clavata*, the anthozoan reacted to the

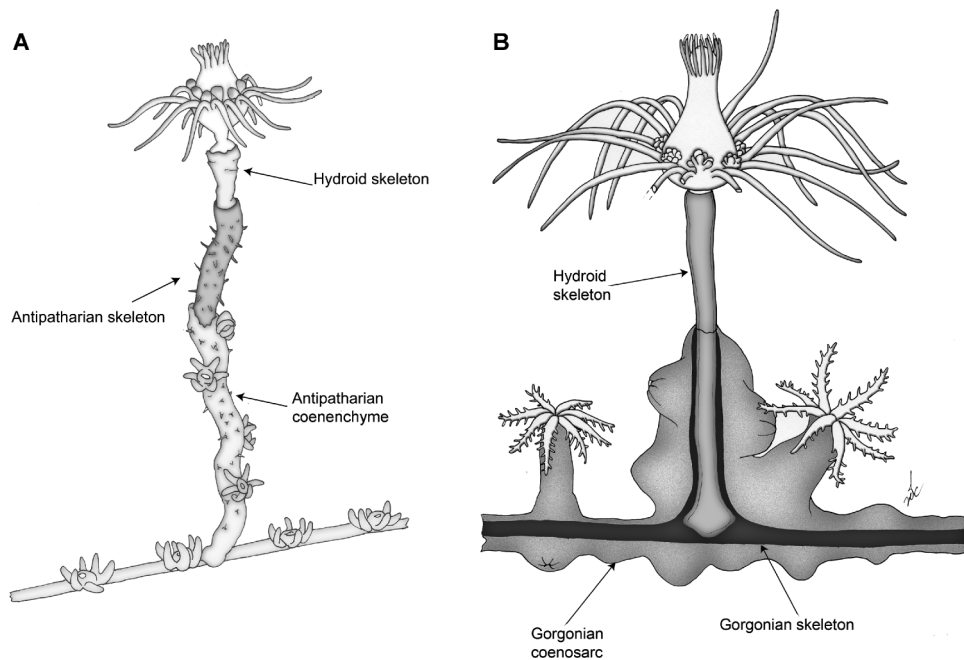


Figure 3. Scheme of the two associations. **A**, *Ectopleura* sp. on *Antipathella subpinnata*. **B**, *Ectopleura* sp. on *Euniceella cavolinii*. The distal portions of the hydrocauli have been represented as the coral tissue was removed to show the skeletons beneath.

hydroid settling by depositing a thin skeletal layer (about 5 μm) along the entire length of the hydroid's perisarc leaving exposed only a small region below the hydranth (Figure 3). The anthozoan skeleton was surrounded by the living coenenchyme bearing normal-sized polyps (Figures 2A,B, 4C,E,F). In the case of octocorals, the gorgonian skeleton almost completely surrounded the hydrocaulus (Figures 4G–J), which was reinforced by the overlying presence of sclerites. In the case of *A. subpinnata*, the coral skeleton was characterised by cylindrical, pointed spines (Figures 4K–M) covering the hydroid's perisarc, as happens for normal ramifications, and, occasionally, small coral branchlets. Spines were on average 0.11 mm high and 0.02 mm wide, as reported in the description of the species (Bo et al. 2008). This portion of the skeleton displayed a higher density of spines – on average 12 spines mm^{-1} – as well as several irregular aggregations of spines in the region near the attachment site of the hydroid (Figure 4M).

The transverse section of the black coral branchlet near the basal region of the hydrocaulus showed the tubular perisarc of the hydroid surrounded by concentric layers of the antipatharian skeleton due to successive skeletal deposits. The basal extremity of the hydroid is settled on the coral skeleton in the proximity of the central canal, which is surrounded by layers of the oldest skeletal material.

Discussion

The previously described cases of hydroids associated with living portions of anthozoans involved a number of species (Puce et al. 2008a) (Table I), of which six were tubulariids belonging to the genus *Ralpharia*. To these records must be added *Hybocodon* cfr. *prolifer* found on *Madrepora oculata* in Mediterranean deep waters (Mastrototaro et al. 2009; Vertino et al. 2009). The present study documents for the first time a species of *Ectopleura* establishing epibiotic associations with anthozoan corals. This increases the species of tubulariids involved in such relationships to eight. Within this family, there are several species reported in association with other organisms (Puce et al. 2005): *Hybocodon* includes species mainly associated with sponges and one associated with a scleractinian, *Zyzyzus* includes only species associated with sponges and a further species of *Ectopleura*, *E. exxona*, lives associated with an unidentified sponge (Watson 1978). All of these evidences strongly suggest that the tubulariid evolution may have had a role in the possibility to establish symbiotic relationships with different benthic groups (Puce et al. 2008a).

In the Mediterranean Sea, the species of *Ectopleura* are reported to live predominantly on artificial substrates (Morri & Boero 1986; Genzano 2001; Zintzen et al. 2008a), especially in areas exposed

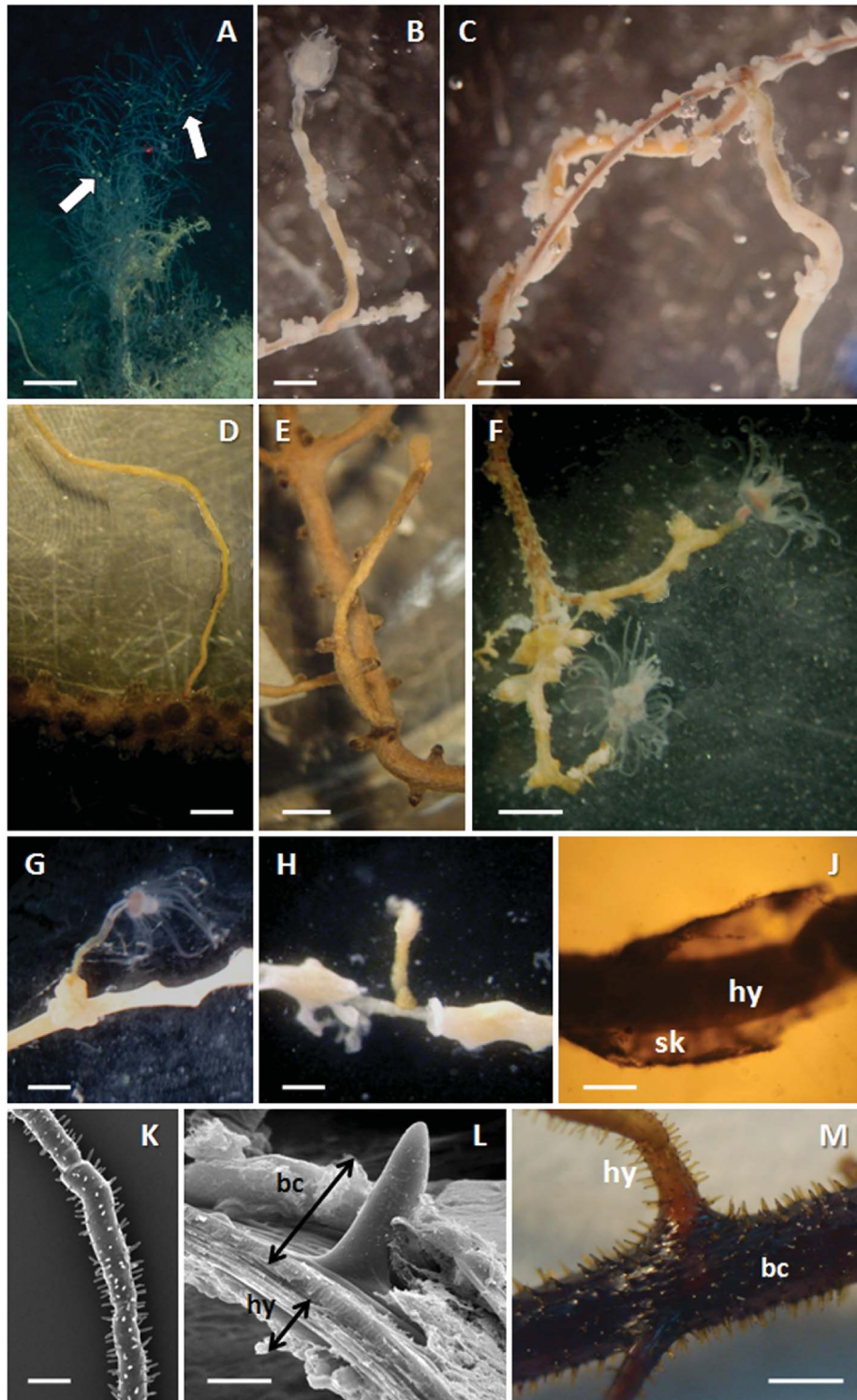


Figure 4. Relationship of *Ectopleura* sp. with the hosts. **A**, colony of *Antipathella subpinnata* characterised by a lax, non-arborescent ramification system. Several foreign elements (both sediment and epibionts) are visible dispersed on the branches (white arrows). **B**, hydroid polyp emerging perpendicularly from a black coral branchlet. **C**, hydrocaulus running along the black coral branchlet. **D**, naked hydrocaulus of *Ectopleura* sp. settled on *Paramuricea clavata*. **E,F**, *Ectopleura* sp. polyps settled on *Paramuricea macrospina*. **G**, hydroid polyp emerging perpendicularly from a branchlet of *Euniceella cavolinii*. **H**, peeled portion of *E. cavolinii* showing the place of settlement of the hydrocaulus. **J**, portion of hydrocaulus (hy) surrounded by the gorgonin layer (sk). **K**, perisarc of *Ectopleura* sp. covered by the spiny skeleton of *A. subpinnata*. Along the hydrocaulus diameter decreases are visible as skeleton constrictions, indicating different growing stages of the hydroid. **L**, SEM enlargement of the transversal section adjacent to the area of contact between *Ectopleura* sp. and *A. subpinnata*: on the outer side the black coral coenenchyme and spiny skeleton (bc), on the inner side the perisarc and the coenosarc of the hydroid (hy). **M**, black coral branchlet (bc) hosting *Ectopleura* sp. (hy). Cylindrical, pointed, irregularly arranged spines are visible near the attachment area of the hydrocaulus. Scale bars: **A**, 5 cm. **D**, 2 mm. **B,C,E-H,K,M**, 1 mm. **J**, 0.5 mm. **L**, 10 μ m.

to currents (Mullineaux & Garland 1993; Lemire & Bourget 1996). Since wrecks and other structures of anthropic origin, as well as deep coral assemblages, are sparse, the free-swimming stage of these organisms is hypothesised to have a high dispersal ability (Bacchiocchi & Airoidi 2003).

Hydroid dispersal may occur in different ways, including the release of jellyfish, planulae and actinulae or autotomy of floating portions (e.g. Wasserthal & Wasserthal 1973; Cornelius 1992; Pagliara et al. 2000). Tubulariids produce a particular post-embryonic stage known as actinula, exhibiting an ability for microhabitat selection (Nellis & Bourget 1996). We hypothesise that actinulae are able to colonise distant coral populations as a result of their notable dispersion ability (up to 10 km) (Zintzen et al. 2008b). The polyps of *Ectopleura* sp. were neither observed on other benthic organisms collected from the same study area nor on surrounding hard or soft substrates. Considering that the two studied localities, and in particular the S. Eufemia Gulf, are characterised by high sedimentation levels (Bo et al. in press), we suggest that the hydroid actinulae preferentially settle on large, erect anthozoans as a strategy to avoid siltation and enhance their survival chances. This also implies that actinulae should be immune to antifouling substances produced by the coral host. The result could be a long-lasting relationship, especially in the case of *Antipathella subpinnata*. Deep antipatharians, in fact, generally show slow growth rates (Roark et al. 2006); therefore, the fact that the hydroid was deeply settled within the black coral concentric skeletal layers suggests a long time of residence within the host.

It is likely that coral hosts do not suffer any particular damage from the presence of *Ectopleura* sp. polyps, while the hydroids gain the advantage of thickening and strengthening their perisarc. The thickening provided by the coral skeleton may also allow *Ectopleura* sp. polyps to extend the length of their stolons. Moreover, the coverage of skeleton and living tissue by the host may protect the hydroid from possible nudibranch attacks. In fact, these gastropods are known to perforate the perisarc in several species for feeding (Di Camillo et al. 2010). A similar situation was observed for *Ralpharia neira* (Petersen, 1990) found on the gorgonian *Ellisella* sp. and for *Pteroclava kremphi* (Billard, 1919) on *Astrogorgia* sp., both characterised by a hydrorhiza completely embedded in the coenosarc of their host (Puce et al. 2008a). In the case of *R. neira*, the juvenile settles on the gorgonian living tissue, which reacts by producing a kind of gall of coenosarc that envelops the base of the young polyp. Afterwards the coenenchyme grows along the hydrocaulus covering it up to the hydranth

neck region (Puce et al. 2008a). In all observations, this area of the hydroid stem is always naked, suggesting that the growth of the hydroid is faster than that of the host.

Some species belonging to the genus *Ectopleura* form colonies made of several polyps and forming large tufts arising from a common hydrorhiza. Species associated with anthozoans, however, have always been reported as solitary, and probably this is also the case of *Ectopleura* sp., as put in evidence by the absence of ramified hydrorhiza under the host's tissues. The latter, growing around the hydroid perisarc, unable further growth of the stolons and development of a colony.

We observed that the coral tissues did not always cover the epibiotic hydrocauli, as in the case of *Ectopleura* sp. growing on *P. clavata* (Figure 4D). A possible mechanical constraint to the coverage of the hydrocaulus could be the size of the polyps of the coral host, as pointed out, for example, for parasitic zoanthids (Di Camillo et al. 2009). Thin ramifications, in fact, are unable to withstand large heavy polyps, without breaking. In our case, *P. clavata*, the gorgonian species showing the thickest branches and tallest polyps, is the only one not able to cover the hydrocaulus. This may represent a limit in the spreading of the hydroid on different anthozoans species.

The observation of *Ectopleura* sp. epibiotic on *A. subpinnata* is the first record of a tubulariid hydroid living associated with an antipatharian coral. The arborescent colonies of black corals offer substrate and refuge to a high number of organisms, and can therefore, be considered as centres for symbiotic relationships, both in tropical coral reefs (Molodtsova & Budaeva 2007; Tazioli et al. 2007) and in deep environments. Despite the fact that the majority of the sessile epibionts live on the dead portions of these corals, in some cases they are also able to interact with the living tissue of black corals inducing morphological modifications and rearrangements of parts of the colonies (Molodtsova & Budaeva 2007). In the associations described here, no traces of modifications were observed for the black coral skeleton covering the hydroid, except for a higher density and a more irregular arrangement of the spines along the hydrocaulus. In the case of black corals, the coverage of the perisarc could be enhanced by the chitinous component, which is similar in both skeletons. The presence of a higher number of *Ectopleura* sp. polyps on *A. subpinnata* than on gorgonians could be due to the health status of the coral colonies. Antipatharians generally do not host stable epibionts within their tissues, which are often covered by a dense mucous. In the Gulf of S.

Eufemia the colonies, probably because of the heavy sedimentation, are not tall and arborescent as those observed in habitat of strong currents, such as near the Strait of Messina (Bo et al. 2009). The tissues are thin and damaged thus possibly favouring the settlement of actinulae on the underlying denuded skeleton.

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