A NEW SPECIES OF POLYDORA (POLYCHAETA, SPIONIDAE) ASSOCIATED WITH THE EXCAVATING SPONGE CLIONA VIRIDIS (PORIFERA, HADROMERIDAE) IN THE NORTHWESTERN MEDITERRANEAN SEA

Daniel Martin

Centre d'Estudis Avançats de Blanes (C.S.I.C.) Camí de Santa Bàrbara, s/n. E-17300 Blanes (Girona). Spain.

ABSTRACT

A new species of Polydora is described from the Catalan coast of the northwestern Mediterranean Sea. The species has exclusively been found in association with specimens at the three growth stages of the excavating sponge Cliona viridis, and is closely related to Polydora armata. It mainly differs from its closest relatives by: (1) the rounded entire anterior margin of the prostomium; (2) the unusual hook-shaped row arrangement of the modified spines on its posterior notopodia; and (3) the stout flattened modified spines, which have tips hooked in different degrees depending on their position on the notopodia.

Keywords: Spionidae, Polydora rogeri, new species, Cliona viridis, excavating sponge, association, northwestern Mediterranean.

INTRODUCTION

Many species of Polydora settle on and bore in different calcareous substrates (viz., shells of molluscs, corals, calcareous algae). Shell-boring species inhabit both dead and living molluscs (Blake 1969, 1980; Blake & Evans 1973). Some are well known as parasites or pests of cultured molluscs (Haswell 1885; Dolphus 1932; Lunz 1940, 1941; Landers 1967; Blake & Evans 1973; Kent 1979, 1981; Imajima & Sato 1984; Mori et al. 1985) and two, P. commensalis and P. glycymeris, behave as commensals with molluscs (Andrews 1891; Hatfield 1965; Blake 1969; Radashkevich 1993; Dauer 1991). Polydora species have been found inhabiting old coral heads (Woodwick 1964) and some species, such as P. alioporis (Light 1970), P. armata (Okuda 1937) and P. pacifica (Takahashi 1937), occur as commensals living in deep burrows within healthy living corals. There are no special relationships between Polydora and coralline algae, although the spionids have been often found inhabiting the latter (Mesnil 1896; Southern 1914; Okuda 1937; Hannerz 1956; Woodwick 1963a,b; Blake & Evans 1973; Day & Blake 1979; Blake 1981; Sarda 1984; Martin 1987; Radashkevich 1993).

As a part of a wider study on excavating sponges (Rosell & Uriz 1991; Rosell 1996), several collections of different species burrowing in calcareous algae were examined from the Catalan coasts of the northwestern Mediterranean Sea. Among the sponges studied, only samples of Cliona viridis Schimdt contained individuals of Polydora which, on examination, proved to be new to science. A description of this new species, along with a discussion of its taxonomic affinities and the characteristics of its association with the sponge, is presented herein.

I am indebted to Dolors Rosell who examined the collections of excavating sponges, first found the specimens of the new species, and provided interesting comments from a “sponge point of view”. I would also like to thank the operator of the S.E.M. at the Universite de Perpignan for his help with the micrographs. Michel Bhaud facilitated the S.E.M. session at Perpignan and also contributed valuable comments to this work. Temir A. Britayev kindly provided data on Russian papers. Tim Granata kindly corrected the English of the manuscript. I wish to thank the two anonymous referees for their helpful comments. The author had the benefit of a postdoctoral fellowship from the Ministerio de Educacion y Cientia de Spain (MEC/ MRS, ref. num. f93 46037786) during 1994 and of a research contract from the Consejo Superior de Investigaciones Cientificas of Spain since 1995. This paper is a contribution to the research projectAMB94-0746 from the C.I.C.Y.T. of Spain.
MATERIAL AND METHODS

Samples of coralline algae excavated by C. viridis were collected in June 1987 (papillate sponges) and in April 1988 (massive encrusting sponges) by SCUBA diving at 5 to 20 m depths off San Francesc Beach in Pinya de Rosa, a small cove near Blanes, on the north Catalan coast of the Iberian Peninsula (north western Mediterranean Sea). Samples were fixed either with Bouin's Fluid or 5% formalin-sea water mixture and preserved in 70% alcohol.

For SEM observations, individuals were washed three times in distilled water (30 min each), run through a series of ethanol concentrations, and stored in 70% ethanol until observation. Immediately prior to viewing in a Hitachi S.520 SEM (University of Perpignan, Centre of Electron Microscopy), they were transferred to 100% alcohol, critical-point dried, attached to a stub, and coated with gold palladium.

For light microscope observations, samples of calcareous algae excavated by C. viridis were fixed in a 10% formalin-sea water mixture, decalcified in 6% HNO₃, and desilicified in 5% HF. After washing three times in distilled water (30 min each), they were run through a series of ethanol concentrations ending with 100% alcohol, embedded in paraffin, and sectioned with an ultramicrotome. Sections were stained with Masson trichrome. Whole worm observations were made with a Wild M8 stereomicroscope. Sections and external morphology observations were made with a Leitz Diaplan stereomicroscope equipped with interference contrast optics (Nomarsky).

The holotype and paratypes of the new species are deposited in the Museo Nacional de Ciencias Naturales de Madrid (MNCNM), in the S.E.M. collection of the Instituto de Ciencias del Mar of Barcelona (SEMICMB) and with the collection of the Centre d'Estudis Avançats de Blanes (CEAB).

Family Spionidae Grube, 1850, Polydora Bosc, 1802

Polydora rogeri sp. nov.

Figs. 1-5

Type Material. Holotype and 14 paratypes (MNCNM, 16.01/819); 3 paratypes (SEMICMB, Polydora-1); from calcareous algae excavated by papillate C. viridis. 30 paratypes (CEAB, SPI-l to 3) from encrusting and massive C. viridis. Specimens collected by D. Rosell.

Type locality. Known only from Sant Francesc beach and Pinya de Rosa cove (Bay of Blanes), 41° 40.6'N, 2° 48.2'E, 5 to 20m, inhabiting calcareous algae in association with papillate to massive growth stages of the sponge C. viridis.

Description

Small species, complete holotype 0.2 mm wide and 3.5 mm long for 36 setigers; largest complete paratype reaching 4.9 mm for 39 setigers. Color in alcohol: pale yellowish (possibly stained by Bouin's Fluid when first preserved).

Prostomium entire and rounded on anterior margin; rectangular portion of prostomium extending to anterior margin of setiger 1 (Figs. la, b and 3a), with narrow depressed constriction followed by triangular caruncle, extending laterally to encompass bases of notopodial postsetal lamellae of setiger 1 (Figs. 1 c and 3a); caruncle narrowing posteriorly, terminating dorsally at posterior margin of setiger 2 (Figs. lc and 3a). Ciliated nuchal grooves extend from bases of notopodia to apex of triangle section (Figs. 1b, c and 3a). Occipital tentacle and eyes absent. Peristomium depressed and lower, in lateral view, than first setiger and succeeding segments. Palps stout, long, reaching to setiger 11 or 12 (Fig. la, b); each with heavily ciliated median longitudinal groove, bordered by two narrow lateral bands of more or less densely aggregated tufts of cilia (Fig. 1d); proximal ninth of palps smooth (Fig. 1a-c). Pharynx not everted.

Setiger 1 with small oval notopodial lamellae and 3-4 short fine capillary setae. Setigers 2-4 and 6-25 with small oval notopodial lamellae and 6-7 irregularly arranged, unilimbate, slightly fringed capillaries; dorsal setae much longer than ventral (Fig. 2a, b). Se tgiers 26-27 and last 2 or 3 setigers with notopodial rosette of 4-7 short smooth, sharply pointed, emergent spines (Fig. 2g, h). The two more posteroventral spines accompanied by 2 long alimbat capillaries emerging posteriorly to, and between, their bases (Fig. 2g, h). Setigers 28-32 with 15-17 stout, flattened, emergent spines (Fig. 4b-e), arranged in hook shaped row; curved part anterior-most (Fig. 2g-h), cone-shaped when closed, fan-like when opened; spines of the straight part of the row more flattened with more hooked tips (Figs. 2g-h and 4b-c). The two more postero-ventral spines, at the straight part of the row, accompanied by 2 long alimbat capillaries emerging posteriorly to, and between, their bases (Fig. 2g, h). Neurosetae of setigers 1-4 and 6 with 5-6 short, bilimbate, slightly fringed capillaries (Fig. 2a). Bidentate hooded hooks from setiger 7, numbering up to 3 per fascicle (Fig. 2b); hooks accompanied ventrally throughout by 1 very thin, slightly fringed, pointed seta (Fig. 2b). Hooks with very
wide angle between main fang and secondary teeth, main fang twice as long as secondary
teeth (Fig. 3a); hood fringed, with distinctly serrated opening (Fig. 2c). No constriction or
manubrium on shafts. Round ciliated area between notopodia and neuropodia of each segment
(Figs. 1 c and 2a-b).

Setiger 5 modified, larger than either 4 or 6; setae include superior dorsal fascicle of 2
broad limbate geniculate setae, 2-3 major spines and ventral fascicle of bilimbate, slightly
fringed capillaries (Fig. 2d, 2e). Major spines falcate, more or less clearly bidentate, with
large flattened accessory flange; flange postero-lateral to main fang. Distal end of spines
covered by dense hairs, obscuring accessory flange; fang tips smooth (Figs. 2d-f and 4f, g).
No companion setae of any sort.

Short, smooth, broad, heart-shaped branchiae from se tiger 7 (Figs. le and 3a), absent
from posterior half of body. Branchiae partly fused to the small oval notopodial postsetal
lamellae (Figs. le and 3a) . Last few segments much smaller than those preceding (Fig. 2g).
Pygidium highly glandular, cupshaped, with slight ventral notch and dorsal medial gap. (Figs.
2g, 3b).

Distribution. Known only from the type locality.

Etymology. This species is dedicated to my son Roger who was born at the time the new
species was discovered.

Ecology

All specimens of Polydora rogeri sp. novo inhabited coralline algae infested by the
excavating sponge C. viridis. The environmental conditions (irradiance level, usually linked
to depth) of the ecological niches occupied by C. viridis, enabled the sponge to develop into
different growth stages, progressively overgrowing the calcareous excavated substrate (Rosell
& Uriz 1991). The three stages are known as alpha (papillate), beta (encrusting), and gamma
(massive).

At the alpha stage of growth, only the papillae of the sponge protrude from the
calcareous substrate. The partnership between P. rogeri sp. novo and C. viridis was present
from the alpha stage, with both sponge and polychaete excavating the calcareous substrate.
The tops of the polychaete tubes were observed protruding from the surface of the algae, next
to the inhalant papillae of the sponge. The external part of the polydorid tube was formed by fine sediment grains embedded
in an organic matrix, whereas the linear internal parts were only formed by the organic
matrix. Internal tubes passed through the calcareous algae and the sponge body
(choanosome) till an appropriate portion of an aquiferous canal of the sponge was reached.
Then, the tubes disappeared, being replaced by the sponge canals (Fig. 5a, b).

In massive and encrusting sponge specimens with almost no trace of visible calcareous
substrate within the sponge surface, the anterior ends of the polychaete tubes were observed
directly protruding from the sponge surface, mostly near the inhalant papillae. The disposition
of tubes and polychaetes in the sponge was the same both in papillate and encrusting/massive
specimens of the sponge.

Infestation rates were highly variable and probably depended on the available
substrate (both calcareous algae and sponge). They could be as high as 18 polychaete
individuals per cm3 of host sponge (massive stage) or 10 poly-chaete individuals per cm3
(papillate stage).

DISCUSSION

Systematics

Polydora rogeri belongs to a group of species having modified spines on the posterior
neuropodia (Fig. 7), with hooded hooks lacking a constriction on the shaft, and some
similarity in structure of the major spines of setiger 5 (Fig. 6). This group includes: P.
aciculata Blake and Kudenov, 1978, P. armata Langerhans, 1880 (Fauvel1927; Woodwick
1964; Blake & Kudenov 1978; Sardi 1984), P. blakei Maciolek, 1984, P. caulleryi Mes~il,
1897 (Blake 1971) and P. quadrilobata Jacobi, 1883 (Blake 1971) together with the new
species here described (Table 1).

Polydora rogeri sp. nov. and P. aciculata have entire prostomia, whereas the remaining
species have bilobed/ bifid prostomia (Table 1). In all species, the major spines of setiger 5
are bushy-topped or have bristles in different quantities (Fig. 6). The spines are hirsute on
their upper curved ends, except for P. quadrilobata, which has spines with a fine bushy tuft
between two nearly equal sized teeth (Fig. 6c). Polydora rogeri sp. nov., P. armata, and P.
blakei differ from the remaining species in lacking, instead of having, companion setae (Table
1). Polydora rogeri sp. nov. and P. blakei also coincide in the unusual shape of the caruncle
This feature was considered unique among the Spionidae when *P. blakei* was first described (Maciolek 1984). *P. rogeri* clearly differs from *P. blakei* and *P. armata* in having entire prostomium and stout flattened emergent spines which are arranged in hook-shaped rows on posterior notopodia.

The shape of the major spines of setiger 5 is consistently considered as relevant when dealing with taxonomic classification of *Polydora* species. Although the major spines of each species should be unique, their appearance can differ according to angle of view, stage of wear, and use of scanning or light microscope, as well as the individual interpretation of each author. *Polydora rogeri* sp. nov. (Fig. 4f, g), *P. armata* (Fig. 6e-l), and *P. blakei* (Fig. 6b) are a good example of the latter, showing a marked variability in the presence and shape of the secondary tooth, development of the accessory flange, and presence of hairs. Probably, different authors from widely different geographical areas may have been examining a variety of species, but also they might have been using different techniques of observation. Consequently, it is difficult to define which morphotype of major spines belongs to each of these three species. From Maciolek (1984), it appears that the clearest differences between *P. armata* and *P. blakei* are: (1) the presence of well-developed hairs in the major spines of setiger 5 of *P. blakei*, and (2) the unusual shape of the caruncle in *P. blakei*. The remaining descriptive points are coincident. Blake & Kudenov (1978), however, pointed out that minute bristles could be seen on the hood or cowling of major spines of *P. armata*. These were figured earlier by Woodwick (1964) (see Fig. 6h).

From my observations of *P. rogeri* sp. nov., the shape, size and distribution of hairs on major spines and the shape of caruncles may vary depending on the type of microscopy employed. The unusual shape of the caruncle and the presence of hairs in *P. rogeri* becomes clearly evident only using S.E.M. This was also the technique used to describe *P. blakei* but it has not been used in descriptions of *P. armata*. Therefore, although it is not the main subject of this paper, I feel that type specimens of *P. blakei* and *P. armata* should be re-examined to assess the possible synonymy between both species. Although these problems directly apply to *P. rogeri* sp. nov., this species can be separated from the other two by its prostomium shape and its particular arrangement and shape of posterior notopodial spines.

**Ecology**

The behavior of *P. rogeri* sp. novo inhabiting calcareous algae excavated by papillate specimens of *C. viridis* appears not to differ greatly from that of other coraline-boring species of *Polydora*. The main difference, and indeed that characterizing the new species, is the symbiotic association which is still maintained when the sponge progresses to the encrusting and the massive stages. Thus, I can take into account this habitat specificity (i.e., the symbiotic quality of the association) to reinforce the status of *P. rogeri* as a new species.

Three other polydorid species, *Polydorella smurovi* Tzeltin & Britayev, *Polydora colonia* Moore, and *P. spongicola* Berkeley & Berkeley (Table 2), have been described as specific sponge associates. *P. smurovi* inhabits mucous tubes on the surface of its host sponge. *P. colonia* inhabits tubes within sponges, forming compact soft masses. *P. spongicola* lives inside the sponge itself. None of the involved hosts, however, were excavating sponges. Other species of *Polydora* have been mentioned as sponge endobions among other habitat types. These species, like many other polychaetes, probably occupy the interstitial spaces of the sponges (merely inquilinism) without causing any noticeable damage to their structure (Pansini & Daglio 1981; Alas et al., 1982; Kokouras et al. 1992). For instance, Alós et al. (1982) mentioned that more than a half of the endo fauna inhabiting the sponge *Aplysina aerophoba* were specimens of *Polydora hoplura*. Finally, general mention of sponges as a habitat for *Polydora* species can be found in the literature (i.e., Woodwick 1964: 148 mentioned that "*P. armata* has been described in the past from coralline algae, sponge, shells ... "), but neither the sponge species nor the type of association can be verified. Woodwick (op. cit.), however, indicates that the corresponding species (in that case *P. armata*) is "a form adapted to a fairly wide range of ecological conditions especially within the limestone habitat". This statement is probably valid for *P. blakei* (in light of the type material listed by Maciolek 1984). This lack of habitat specificity is in contrast with the specific ecological niche occupied by *P. rogeri* sp. nov. Moreover, as a part of a wider study on the polychaete fauna associated to coraline algae (Martin 1987), samples of these algae non-excavated by *C. viridis* from the Bay of Blanes were examined, revealing the absence of *P. rogeri* sp. nov. but the presence of *P. armata*.

The nature of the relationship between *P. rogeri* sp. nov. and *C. viridis*, however, remains unclear. The association involving another tube building organism, the scyphozoan *Nausithoe punctata*, and different horny sponges was originally considered as parasitism on the basis of changes in the surface morphology of inhabited sponges, and because the scyphozoan disturbs the sponge's functional orifices. Nevertheless, after a typological study of the association (Uriz et al. 1992b), benefits both for *N. punctata* (e.g., physical protection,
trophic advantages due to the carrying capacity of the sponge inhalant flow, chemical defense) and the host sponges (e.g., the use of the horny scyphozoan theca as skeletal fibers, the cleaning of the surrounding water by the scyphozoan) were noted. Polydora glycymerica Radashevsky, another commensal polydorid that inhabits shells of the bivalve Glycymeris yessoensis, locates the openings of its tubes on the posterior end of the shell, in the region of the mollusk’s siphons. From this position, the worms have been observed projecting the palps out of their tubes to catch suspended particles from the water current produced by the mollusk (Radashevsky 1993).

Cliona viridis has neither a well-developed spongiokeleton (Rosell 1996) nor significant chemical defenses (Uriz et al. 1991, 1992a). However, some of the above cited benefits could also be advantageous to the two new associates here described. As the polychaetes tend to place the openings of their tubes near the inhalant papillae of the sponge, their feeding activity can be favored by the inhalant flow originated by the filtering activity of the host. Physical protection offered to the worm by the sponge body may also be advantageous, especially when the calcareous algae have completely disappeared (i.e., massive stage). The ability of the polychaetes to manipulate relatively large particles (either to feed or to build its tubes) may favor the filtering activity of the sponge by cleaning the water around the inhalant papillae, thus preventing the collapse of their orifices. Moreover, costs derived from the association seem neither evident for the polychaete, nor for the sponge. Although the polychaetes partly build their tubes throughout the sponge tissue and then occupy some aquiferous canals, this does not disturb the normal progress of the host towards the successive growth stages. The aquiferous canals occupied by the polychaete do not become collapsed, probably because the worms do not entirely fill the canals (Fig. Sa, b). Although probably reduced, water flow through the sponge canals is not stopped by the worms. Then, if the canal belongs to the exhalant system, water flow would contribute to the discharge of worm faeces, while faeces could be used as food by the sponge if the canal belongs to the inhalant system.

In light of the above, the association between P. rogeri and C. viridis could be tentatively considered mutualistic, although further morphological and experimental studies are necessary to assess its exact nature. Morphological studies should be focused both on the cellular organization and the aquiferous system structure of the sponge around the worm tubes. Experiments should be addressed to substratum preferences (excavated calcareous algae versus others) during settlement of polychaetes, and differential growth rates (from alpha to gamma stages) of infested or non-infested sponges.

**Biogeography**

Cliona viridis is a widely distributed species (Rosell & Uriz 1991; Rosell 1996). The presence of the associated species of Polydora, however, has not previously been reported. Sponge specimens in different stages of growth from areas closer to the type locality (e.g., Tossa de Mar, about 10 km from Blanes, or the Balearic Islands) have been examined and no specimens of the new species, or of other Polydora species, have been observed (Rosell, personal communication). Although we consider the new species endemic and, thus, the association, the possibility that it might be widespread, at least in the Mediterranean, cannot be ruled out.

Polydora armata, the species most closely resembling P. rogeri sp. nov., is a cosmopolitan species which has been found in Australia, New Zealand, Japan, South America, the north easten Pacific, and the Mediterranean and the Atlantic European waters. This species has also been found in the Bay of Blanes boring in calcareous algae non-excavated by Cliona viridis (Martin 1987). Polydorella smarroi coincides with Polydora rogeri sp. nov. in being known only from the type localities situated in tropical (Red Sea) and temperate (Mediterranean Sea) zones, respectively (Table 2). The other two polydorid species associated with sponges, Polydora colonia and P. spongicola have a wider distribution. The former, however, is known to be limited to the shorelines bordering the Atlantic Ocean from eastern North America to South America, whereas the latter occurs along the north American coasts of the Pacific ocean, and in the Sea of Japan (Table 2).

**REFERENCES**


Mesnil, F., 1896, Etudes de morphologie externe chez les annelides. Les spionidiens des cotes de la Manche. -


Martin, D., 1987. La comunidad de Anelidos Poliquetos de las concreciones de algas caldreas del litoral catalan. -


Fig. 1 Polydora rogeri sp. nov. SEM micrographs. (Paratype Polydora -1). a. - General view of the anterior end, dorsal. b. - General view of the anterior end, dorso-lateral. c. - Detail of the anterior end. d. - Distribution of cilia on palp. e. - First and second pair of branchiae. Scale bars in µm.

Fig. 2. Polydora rogeri sp. nov. SEM micrographs. (Paratype Polydora-1). a. - Setigers 1-2. b. - Setigers 13-14. c. - Detail of hooded hooks of setiger 13. d. - Anterior view of setiger 5. e. - Posterior view of setiger 5. f. - Upper view of setiger 5 modified setae. g. - Posterior end. h. - Detail of modified setae of posterior end. Scale bars in µm.
Fig. 3. *Polydora rogeri* sp. nov. a. - Anterior end in dorsal view, right palp removed (Paratype *Polydora-1*); b. - Pygidium in dorsal view (Holotype). Scale bars in µm.

Fig. 4. *Polydora rogeri* sp. nov. (Holotype). a. - Hooded hook of setiger 13. b-e. - Posterior modified notosetae, from posterior-most (b) to anterior-most (e) parts of hook-shaped row of setiger 29. f-g. - Modified setae of setiger 5 in lateral (f) and anterior (g) views. Scale bars in µm.
Fig. 5. *Polydora rogeri* sp. nov. Light micrographs of sections of an anterior part of the body inside the calcareous algae excavated by *Cliona viridis*: a. - Section through a segment from the postbranchial posterior region; b. - Section through branchial segment (scale bars indicate 50 µm).


| Table 1. Some taxonomic characteristics of the Polydora species most closely resembling Polydora rogeri, sp. nov. References: (1) Fauvel (1927); (2) Woodwick (1964); (3) Blake (1971); (4) Blake & Kudenov (1978); (5) Maciolek (1984); (6) Sardi (1984); (7) Radashevsky (1993); (8) present work. Size (length in mm x width in mm x number of segments); caruncle (reaching the posterior margin of indicated segment); hooded hooks (starting segment); branchiae (starting segment - full-size segment - reaching body proportion). +: present; -: absent. |
|---|---|---|---|---|---|
| **Size** | **P. aciculata** | **P. armata** | **P. blakei** | **P. caulleryi** | **P. quadrilobata** | **P. rogeri** |
| **Prostomium** | 16×0.3×85 | 4×0.3×30 | 7×0.3×40 | 15×0.2×150 | 15-50×1×70-140 | 3.5-6×0.2×90-30 |
| **Occipital notosetae** | - | - | - | - | - | - |
| **Eyes** | - | - | - | - | - | - |
| **Caruncle - Location** | 3 | 2 | 2 | 5-4 | 5-4 | 2 |
| **- Form** | low ridge | low ridge | triangular, laterally expanded | thin ridge | indistinct ridge | triangular, laterally expanded |
| **Notochord at 1st** | + | + | + | + | + | + |
| **Hooded hooks** | 7 | 7 | 7 | 7 | 7 | 7 |
| **Branchiae** | 9-12 1/3 | 7-9 1/3 | 7-9 1/3 | 7-11 1/3 | 7-11 1/3 | 7-13 1/3 |
| **Pygidium** | 4 lobes | cup-shaped | cup-shaped | 4 lobes | 4 lobes | cup-shaped |
| **Main references** | 4 | 1, 2, 4, 6 | 5 | 3 | 3, 7 | 8 |

| Table 2. Polydorid species described as being specifically associated to sponges. |
|---|---|---|---|
| **Species** | **Host sponge** | **Locality** | **Authority** |
| Polydora caulleryi | Unidentified red sponge | Dachlak Arch. | Tazett & Britsaeve 1985 |
| Polydora caulleryi | Unidentified sponges | eastern North America, Jamaica | Blake 1971, 1983 |
| Polydora caulleryi | Unidentified sponges | South Africa, Argentina | Blake 1971, 1983 |
| Polydora caulleryi | Lysometra excavata | off California | Berkeley & Berkeley 1950 |
| Polydora caulleryi | Unidentified sponge | Peter the Great Bay | Radashevsky 1988, 1993 |
| Polydora caulleryi | Nupharidium species | Peter the Great Bay | Radashevsky 1988, 1993 |
| Polydora caulleryi | Ophiothorax species | Peter the Great Bay | Radashevsky 1988, 1993 |
| Polydora caulleryi | Mytilus species | Peter the Great Bay | Radashevsky 1988, 1993 |
| Polydora caulleryi | Ctena viridis | Bay of Biscay | Present work |
| Polydora caulleryi | Ctena viridis | Bay of Biscay | Present work |