

Megastomia conspicua (Alder, 1850) (Gastropoda Pyramidellidae) parasitic on Sabella spallanzanii (Gmelin, 1791) (Polychaeta Sabellidae), with notes on the modality of interaction

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ABSTRACT

The finding of living specimens of the pyramidellid gastropod *Megastomia conspicua* (Alder, 1850) (Gastropoda Heterobranchia Pyramidellidae) attached to the tube of the fanworm *Sabella spallanzanii* (Gmelin, 1791) (Polychaeta Sabellidae) allowed observations on the parasitic activity of the mollusc on this latter. Moreover, the external soft parts of the mollusc were described and figured for the first time. Hypothesis on the peculiar color of both the shell and mollusc of this species and its mimetic role were finally furnished.

KEY WORDS

Gastropoda; *Megastomia conspicua*; parasite; *Sabella spallanzanii*; Acitrezza; Sicily.

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INTRODUCTION

Pyramidellids (Gastropoda Heterobranchia) are molluscs generically reported as ectoparasites. Among their hosts, of which direct observations are known, there are other molluscs, i.e. gastropods, bivalves and chitons (Harbo et al., 2013) and polychaete worms (Fretter & Graham, 1949; Harbo et al., 2013). For their peculiar alimentary habits pyramidellids utilize a more or less long acrembolic proboscis, which is contained inside a sheath and could be entirely protruded from an aperture in the mentum, being the retractor muscles inserted distally with respect to the everted proboscis. The same type of proboscis is shared by some parasite Prosobranch families, i.e. Epitoniidae, Aclididae or Eulimidae, and Architectonicidae among Heterobranchia. The general structure of a pyramidellid proboscis was described and figured by Fretter & Graham (1949: p. 252). They reported some species of *Odostomia*

J. Fleming, 1813, possessing a long proboscis used to parasitize their hosts: *O. unidentata* (Montagu, 1803) and *O. lukisii* Jeffreys, 1859 on the polychaete *Pomatoceros Philippi*, 1844, *O. eulimoides* Hanley, 1844 on *Pecten maximus* (Linnaeus, 1758), *O. scalaris* MacGillivray, 1843 on *Mytilus edulis* Linnaeus, 1758. Fretter & Graham (1949) also carefully described the feeding activity of *Spiralinella spiralis* (Montagu, 1803) on the polychaete *Sabellaria* (Savigny, 1818) and of *Turbonilla elegantissima* (= *T. lactea* Linnaeus, 1758) on the polychaete *Cirratulus cirratus* (O.F. Müller, 1776).

Initially, Fretter & Graham (1949) considered that “each species of pyramidellid appears to be associated with one definite host”. Further studies proved that “some, and possibly all, are now known not to be host specific” (Fretter et al., 1986). Therefore each species may possibly feed on various kind of hosts, but it is not clear if the alternative host represents an equivalent solution, or pyramidellid has been forced

to that alternative “source of food” by the lack of the preferred host (Fretter & Graham, 1962; Cheng, 1967). Changes in host preferences surely occur in alien species, being generalist as primary condition to survive in different geographical regions.

As concerns other molluscs, Oliverio & Vega-Luz (1997) reported the gastropod *Talisman scrobilator* (Linnaeus, 1758) as the host of *Chrysallida canariensis* Nordsieck et Talavera, 1979.

Relations between pyramidellids and Polychaete were instead indicated by Harbo et al. (2013) for *Evalea tenuisculpta* (Carpenter, 1865) on the Sabellid *Eudistylia catharinae* Banes, 1979 (and on other molluscs as well). Previously Ankel (1959) studied the feeding behaviour of *O. plicata* (Montagu, 1803) on *Pomatoceros*: the mollusc is attached with the posterior end of the sole to the margin of the tube and the proboscis is extended to reach the pinnate tentacles of the worm. The pyramidellid *Spiralinella spiralis* (Montagu, 1803), a mainly Atlantic species, recorded only in the more western part of the Mediterranean Sea, has been reported by Ankel (1959) feeding on *Pomatoceros* and by Fretter & Graham (1949) feeding on *Sabellaria*. Killeen & Light (2000) indicated the hosting of *Noemiamea dolioliformis* (Jeffreys, 1848) and *Graphis albida* (Kanmacher, 1798) on *Sabellaria* spp. along the coast of Northern France. Contrary to the indication of Troncoso & Urgorri (1990) that *Turbonilla acuta* (Donovan 1804) feeds on *Owenia fusiformis* Delle Chiaje, 1844 and *Nephtys hombergii* Savigny in Lamarck, 1818, in the middle of the Adriatic Sea, inside the studied area, Solustri & Micali (2004) noticed that, in the stations where these two Polychaete resulted most abundant, the density of *T. acuta* was very low.

For numerous species of Pyramidellidae no data about the host preferences and the biology/ecology and life history are really available. One of these species is *Megastomia conspicua* (Alder, 1850), distributed from Norway (Høisæter, 2014) to Britain (Fretter et al., 1986) to the whole Mediterranean. Reported by Peñas & Rolán (1999) for the Mediterranean Spanish coast, on rocky coralligenous bottom (“... *en fondo de gorgonias*”) at 24–50 m depth, and in the coralligenous bottom of the Alboran Island at 80–200 m. Along the Italian coast Micali (unpublished data) has been found from Northern Tyrrhenian to Adriatic sea (see the following data reported below). Moreover Scaperrotta et

al. (2011) reported it from Palinuro (south Tyrrhenian Sea) 50 m depth, Öztürk et al. (2013) from Aegean Sea, Micali & Palazzi (1992) and Buzzurro & Greppi (1996) from Levantine Sea. This species is characterised by the light brown or pinkish shell colour, the conical outline, the helicoid protoconch, perpendicular to teleoconch (type A2), the presence of lirae on the inside of outer lip and the large dimensions for the genus, reaching a total height of about 9 mm (10 mm for the here studied specimens) in largest specimens.

The introduction of some specimens of *S. spallanzanii* in a Mediterranean aquarium for auto-ecological observations, lead to the discovery of two living specimens of *M. conspicua* among some tufts of red algae attached on the tube of the Annelid. This gave the possibility to collect some data on the mode of parasitizing this Polychaete by *O. conspicua* and to link to this latter the reddish-brown colour of the shell of the mollusc, which is peculiar among the normally colourless congenics.

MATERIAL AND METHODS

Some specimens of *S. spallanzanii* were collected alive handily with ARA and put in aquarium for auto-ecological observations. Two living specimens of *M. conspicua* were subsequently noticed crawling on the external tube of the Annelids and further observations on behavior of the molluscs were specifically performed, respecting the day/night alternates simulated in aquarium. Drawings of the external soft parts were realized with gray and colored pencils. The shells were picked up after death, determined at species level and photographed.

Dry materials served for taxonomic comparisons to the living specimens.

ACRONYMS. Pasquale Micali malacological collection, Fano, Italy (PMC); Danilo Scuderi malacological collection, Catania, Italy (DSC); sh/s.: empty shells; sp/s.: living collected specimen/s.

RESULTS AND DISCUSSIONS

Megastomia conspicua (Alder, 1850)

MATERIAL EXAMINED. Acitrezza, Catania, Sicily, 2 sps. on the tube of a specimen of the Annelid *S.*

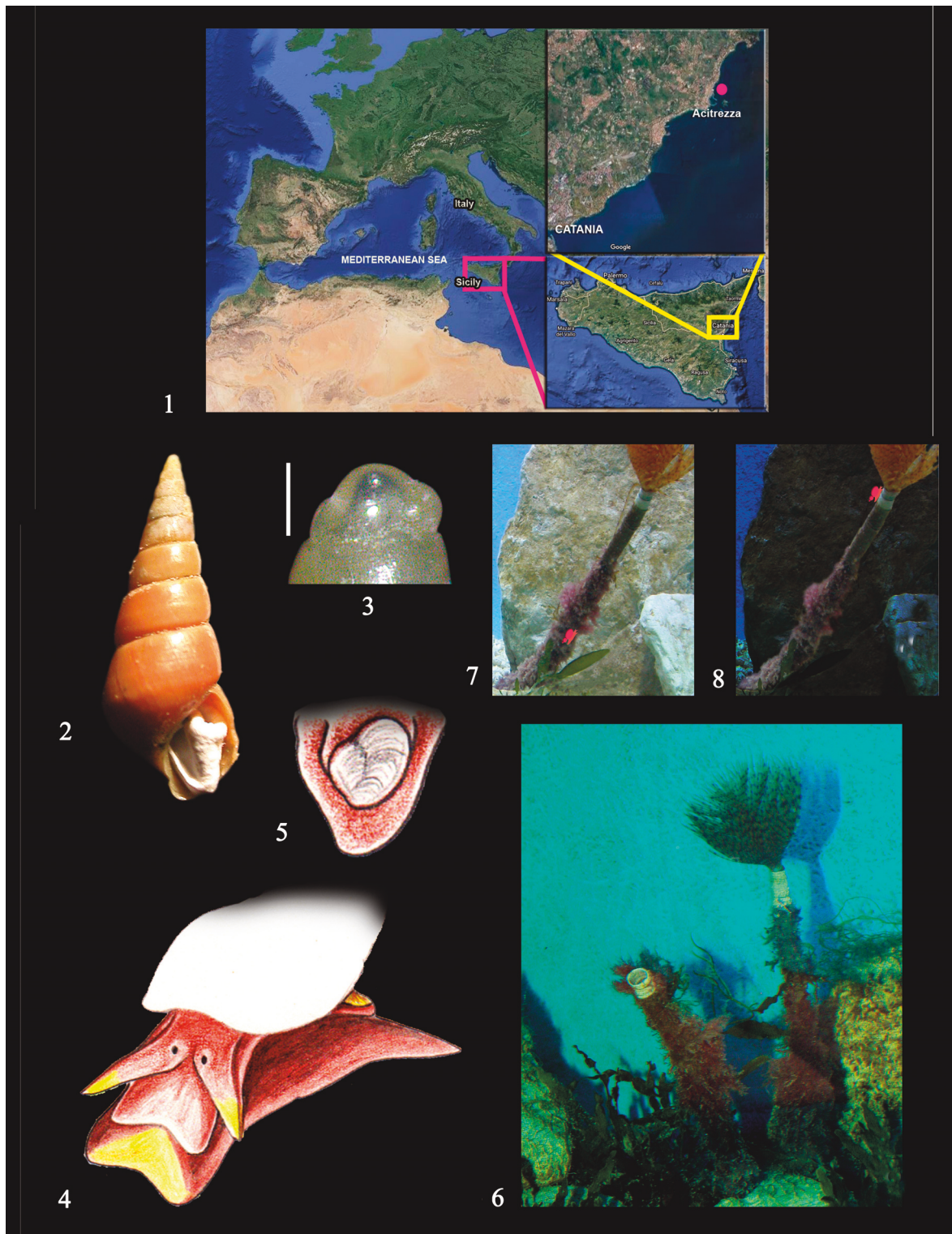


Figure 1. Geographic map of the record. Figure 2. *M. conspicua*, adult shell, Acitrezza, Catania, Sicily, h = 10 mm. Figure 3. *M. conspicua*, same data, protoconch (line = 0.5 mm). Figure 4. Drawing of the external soft parts. Figure 5. Detail of the posterior tip of the foot with operculum, same data. Figure 6. The two specimens of *S. spallanzanii* in aquarium where *M. conspicua* was found (note the red algae on part of the flexible tube of the Annelids). Figures 7, 8. Simulation of day/night activity of *M. conspicua*: the red stylized snail indicates the position along the tube during day (Fig. 7) and night (Fig. 8).

spallanzanii attached on a big lava stone at 20 m depth together with numerous specimens of *Cerithium membranaceus* (Gmelin, 1791), September 2001 (DSC).

Dry specimens: Marina di Camerota, 50 m depth, 1 sh. (PMC); Genova, 80–220 m depth, 1 sh. (PMC); Catania, Acitrezza, 80 m depth, 3 shs. (PMC); same locality, 60–80 m depth, among fishing net's residuals, 2 shs. (DSC); Golfo di Salerno, 20 m depth, 1 sh. (DSC).

DESCRIPTION OF THE EXTERNAL SOFT PARTS (Fig. 4). Foot wide, posteriorly pointed and anteriorly truncated and incised with marked lateral corners, as the mentum; cephalic tentacles with an anteromedial ciliated groove, flat and pointed, short, with eyes placed in the middle, at the base, sunken under the internal side. Color reddish-brown, with anterior foot and tentacle's tips intense yellow. Operculum (Fig. 5) calcareous, thin, heart-shaped, white.

REMARKS. Internal mantle stains, with different form and color, are visible through the shell in species of *Odostomia*/*Megastomia*. It was not possible to observe these latter on *M. conspicua* because of the thicker and colored shell.

Høisæter (2014) described the soft parts of conserved specimens of *M. conspicua* from Skagerrak (Norway) as “uniform yellowish white, ... Eyes very large and farther apart than in any other Norwegian species of the family”. But the above reported color is probably due to preserving substances where specimens were saved.

On account of our personal experience, external soft parts of *Odostomia* species are usually colorless, almost semi-transparent, differing mainly for the above mentioned mantle stains. A little group of species are yellowish, pale brownish, gray or blackish. A not uniform red colour background is shared by *Odostomia acuta* Jeffreys, 1848, which is well distinguished by the lack of yellow zones and the presence of alternated grayish semi-transparent zones, besides the different shells characters (DS personal observations). On account of the observations in aquarium, the shell colour of *M. conspicua* is supposed to be linked to the red-algae coverage present on part of the tube of *S. spallanzanii*. During the day-light hours (Fig. 7), in fact, *M. conspicua* lies covered up under red algae, avoiding being located by predators, while during the darkness hours (Fig. 8) it reaches the tip of the tube and parasitize

the worm near the branchial crown with its proboscis, whose real length was not possible to ascertain with reasonable certainty. Judging by the color of external soft parts, maybe a similar behavior could be shared by *O. acuta* too.

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