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POLYANDROCARPA ZORRITENSIS
(VAN NAME, 1931)
**A COLONIAL ASCIDIAN NEW
TO THE MEDITERRANEAN RECORD**

by Riccardo BRUNETTI

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ABSTRACT

The colonial styelid *Polyandrocarpa zorritensis* (Van Name, 1931) has been found in the harbour of La Spezia (North Tirreno). The morphology and sexual reproduction pattern are described. The species which is viviparous has eggs and larvae in the peribranchial chamber from May to September.

MATERIAL

The species was first found in the shallow water of the inner section of the Roads of La Spezia during the summer of 1974. Some colonies were periodically observed in the field, and pieces of them collected in 1975 and 1976.

The *colony* (Fig. 1 a) consists of zooids in all stages of development, closely crowded together, and often has the aspect of a cushion.

Adult *zooids* (Fig. 1 b) are yellow-green; very young zooids are almost transparent. The *oral syphon* is apical, the *cloacal syphon* is slightly eccentric. Both are four-lobed, but the lobes of the oral syphon, especially in the largest zooids, again tend to be secondarily bilobed. Every lobe has two dark brown, almost black, bands. Between bands the pigment is yellowish in adult zooids

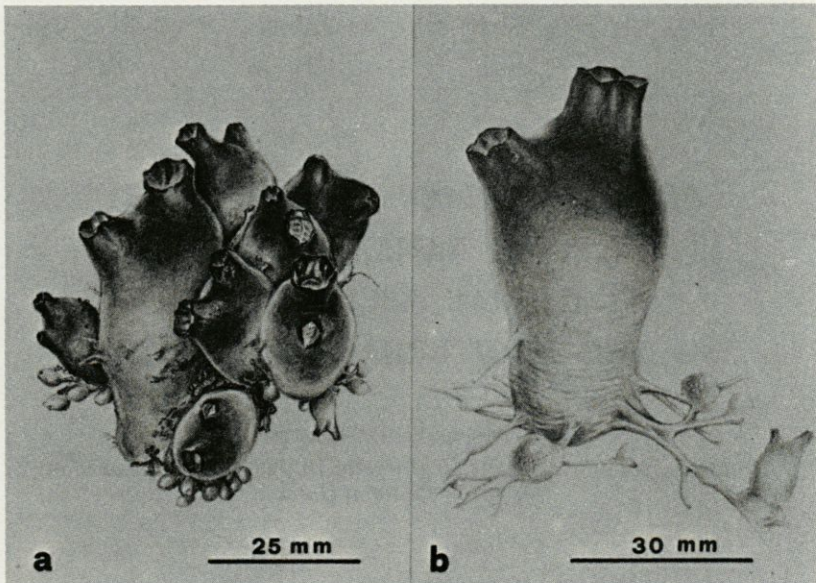


FIG. 1. — a : colony; b : zooid with stolons and a new young zooid.

and whitish in younger ones. Single zooids are subcylindrical, globose in the upper half; they are connected basally with each other by stolons.

Along these latter, frequently there are some swellings (Fig. 1 b), more or less spherical in shape; viewed through their transparent surface they appear to be formed of several closely set yellowish globular bodies. These bodies are evaginations of the vascular wall.

From such swellings in the stolons develop the new zooids, which remain connected with the parental zooid.

ANATOMY

The *mantle* is thin and transparent.

Tentacles (Fig. 2) of two or three size ranges, are simple, generally 32 in number, and are more or less regularly distributed.

The button-shaped *dorsal tubercle* (Fig. 2) has a crescent-shaped opening with the concavity facing the posterior end.

The *branchial sac* (Fig. 3 and 4) has four folds per side, the most ventral being less developed. Between the folds we have never found more than two internal longitudinal vessels. Transverse vessels are of two size ranges, but this is clearly visible only if observed from the side of the peribranchial chamber. Very rarely there are short tracts of small vessels crossing the stigmata (Fig. 3, arrow).

The *dorsal lamina* is flat and has a smooth edge (Fig. 4).

The *intestinal tube* (Fig. 5), located to the left of the branchial sac, may be divided into a short oesophageal tract, a stomach, of the same length as the oesophagus, with about 15 longitudinal folds, a third tract, having a rather uniform diameter, which after having made a loop in the form of a very regular ring encircling a large endocarp, abruptly turns perpendicularly and terminates in an anal opening with a smooth edge. Along its distal two thirds, this latter tract is connected to the mantle by a mesentery.

Gonads are hermaphroditic, longitudinally placed on either side of the endostyle (Fig. 5 and 6). In the larger zooids there are usually up to ten gonads on the right side and five on the left side.

SEXUAL REPRODUCTION

In colonies collected at intervals of about one month from 1974 to 1976, fertilized eggs in various stages of development, including larvae ready to be released, were found in the peribranchial chamber from May through September. The number of embryos is highest in May and decreases progressively during the summer months. Some single unfertilized eggs were still found in zooids collected in December.

ECOLOGY

The species was collected at a depth of about one meter. In this area, the sea water is heavily laden with sewage discharge (BRUNETTI and MIALIORINI, 1976). The annual range of the sea water temperature calculated from monthly means of surface values was 10.4 °C for 1975 (mean of January : 15.77 °C; mean of July : 27.17 °C). The surface salinity presents a minimum in spring

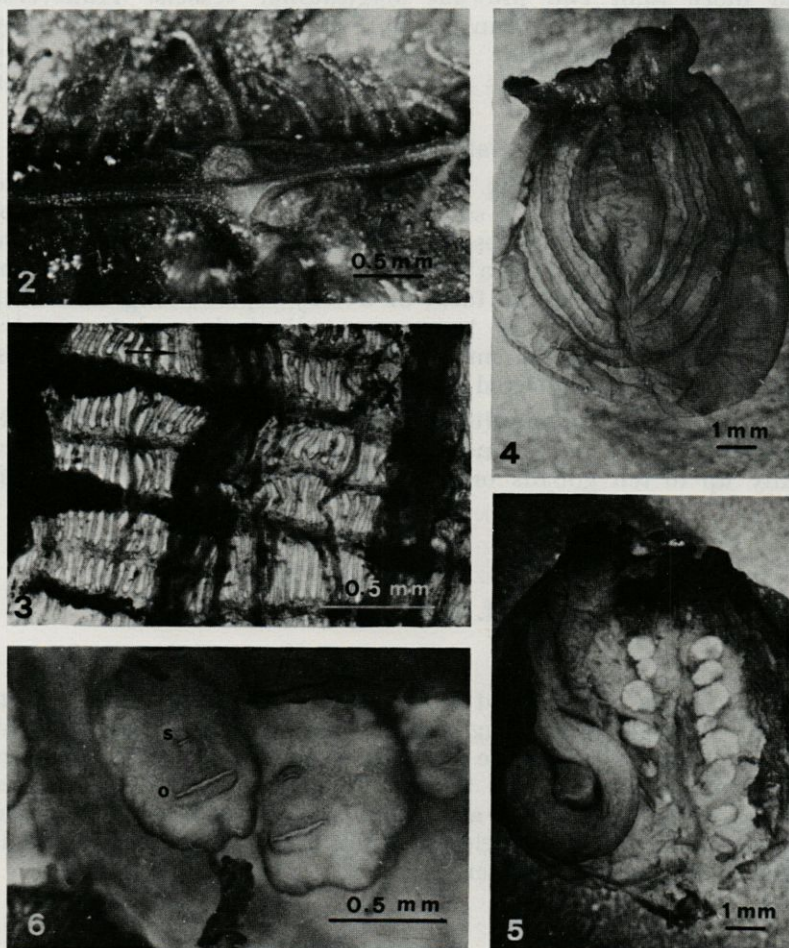


FIG. 2. — Tentacles and dorsal tubercle.

FIG. 3. — Piece of branchial sac; arrow indicates a tract of transversal vessel across the stigmata.

FIG. 4. — Zooid dissected from endostyle side.

FIG. 5. — Zooid dissected from dorsal side, the branchial sac was eliminated to show the gonad disposition.

FIG. 6. — Particular of Fig. 5 to show the openings of testicular follicles (s) and ovary (o). The endostylar ridge is situated above the upper border.

(mean of April 1975 : 31.85 ‰) and a maximum in summer (mean of August 1975 : 36.81 ‰).

The sea water temperature during the period of sexual reproduction was always over 10 °C.

DISCUSSION

The species described here has so far not been included among Mediterranean ascidians (PERES, 1958). The specimens from the Roads of La Spezia are in agreement with the description by VAN NAME (1931; 1945), except that the number of gonads is higher.

All gonads are hermaphroditic though the number of eggs and testicular follicles decrease in the more posterior ones.

The embryonic development takes place in the peribranchial chamber, but we have not found embryonic annexa.

VAN NAME reports to have found "some large single eggs... attached to the walls of the peribranchial cavity" (1945, p. 247) but he rejects the hypothesis that these may be unicellular female gonads. Our observations on specimens collected during December confirm this opinion; they are probably eggs lately expelled from the ovary and not fertilized.

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RÉSUMÉ

L'Ascidie coloniale de la famille des Stylidae, *Polyandrocarpa zorritensis* (Van Name, 1931) a été trouvée dans la rade de La Spezia (nord de la Mer Tyrrhénienne).

La morphologie et la reproduction sexuée sont décrites. L'espèce, vivipare, porte ses œufs et ses larves dans la chambre péribranchiale de mai à fin septembre.

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