

A NEW SPECIES OF EPIPHYtic BRYOZOAN FROM THE AEGEAN SEA

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Résumé

Une nouvelle espèce de Bryozoaire Chilstome a été récoltée sur les côtes de l'île de Chios, dans la Mer Egée. Elle ne se trouve que sur les feuilles de la Phanérogame *Posidonia oceanica* et peut être considérée comme spécifique pour cette plante. Au premier abord, semblable aux autres espèces du genre *Rhamphostomella*, elle présente pourtant des différences notables. L'étude de la morphologie de la frontale indique plusieurs caractéristiques fondamentales qui ne permettent pas d'inclure cette espèce dans le genre boréal. Un nouveau genre *Rhamphostomellina* est introduit.

Introduction

An unrecognized species of Cheilostome bryozoan was recorded with some frequency in a collection of material from the Aegean Island of Chios. Numerous colonies were found encrusting the leaves of *Posidonia oceanica*; it was not found on any other substratum and is concluded to be an epiphyte specific to the Mediterranean eel grass. The species appears to be undescribed; while it bears a superficial resemblance to species of the genus *Rhamphostomella*, a close examination of its morphology reveals several fundamental differences from *Rhamphostomella* which militate against inclusion in that genus. The structure of the species is considered to be sufficiently distinctive to warrant the introduction of a new genus.

RHAMPHOSTOMELLINA gen. nov.

Diagnosis:

Colony encrusting. Primary frontal wall of zooid smooth and imperforate, with the exception of a single pair of pores, situated one each side of the orifice. Primary orifice orbicular, without lyrula or cardellae; obscured by extensive persistomial calcification enclosing

a single avicularian cystid, situated lateral to the orifice. Ovicell hyperstomial, pierced by several large, frontal lacunae; not closed by zooidal operculum. Numerous basal pore chambers (dietellae) present.

Type species:

Rhamphostomellina posidoniae sp. nov.

RHAMPHOSTOMELLINA POSIDONIAE sp. nov.

Holotype:

British Museum (Natural History) registered number 1974. 2.2.1.

Description:

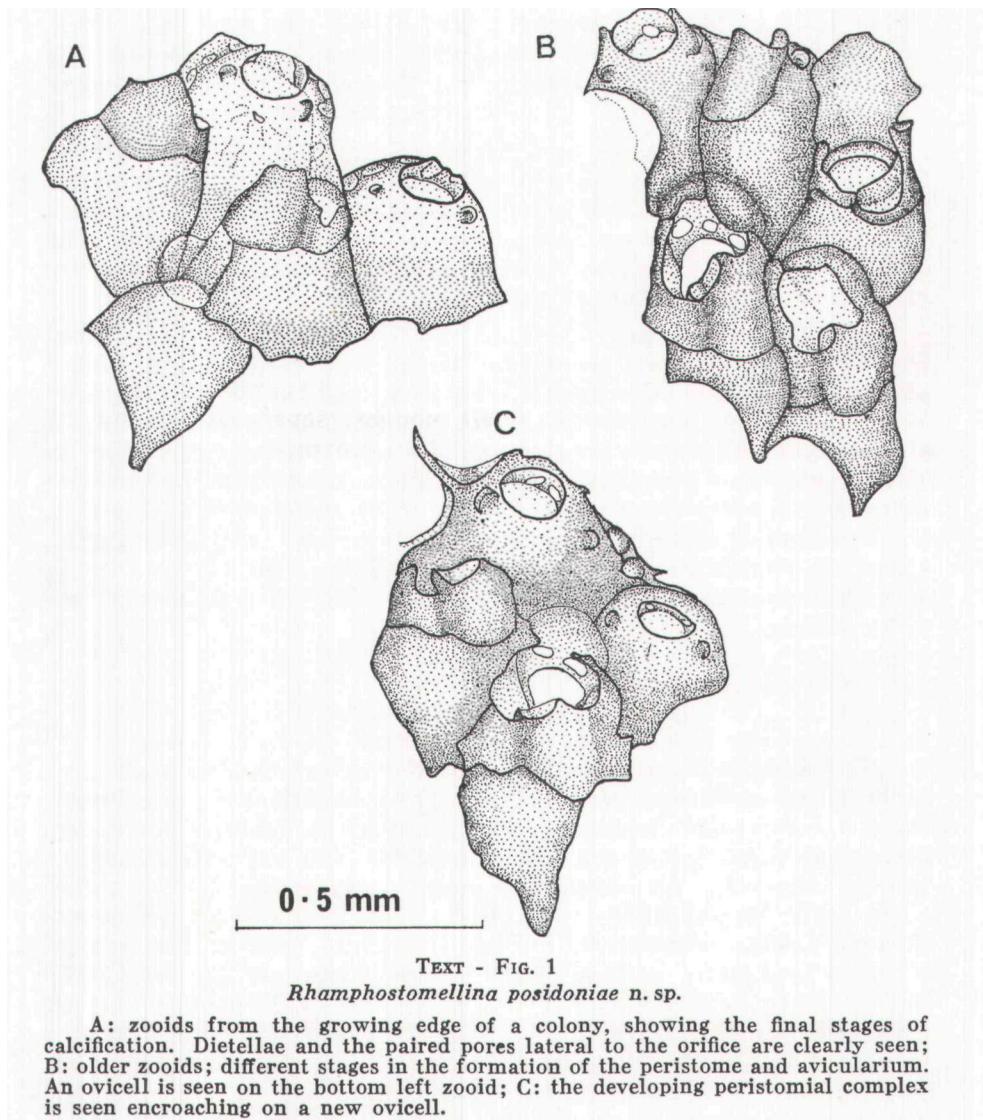
Colony white, forming circular patches on the leaves of *Posidonia oceanica*. Zooids decumbent, small, convex, separated by shallow grooves. Primary orifice orbicular, the proximal border slightly concave. No oral spines. Secondary orifice broad and asymmetrical, surmounting a deep peristome; a single, prominent avicularium situated proximolaterally on the rim of the peristome. Mandible triangular, almost vertical, directed distally. A projection on the opposite side of the proximal rim of the peristome delimits a deep, rounded pseudosinus. Frontal wall convex, smooth, finely granular, apparently imperforate although three or four small, round pores at the distal and proximal corners are revealed in the scanning electron micrograph (plate 1, A). Ovicell hyperstomial, obscured by the peristome, rather flattened in front and bearing two to four large perforations, in a transverse linear series. When examined in basal view, six to ten pore chambers (dietellae) may be seen disposed in an arc around the distal half of the zooid. Ancestrula of the tatiform type, 0.2 mm in diameter, with a membranous frontal wall and up to eight hollow, cylindrical spines evenly spaced around its periphery.

Measurements (means of 20 values) :

L zooid	$0.438 \pm \text{sd } 0.042$ mm	L orifice	$0.088 \pm \text{sd } 0.011$ mm
1 zooid	$0.203 \pm \text{sd } 0.032$ mm	1 orifice	$0.108 \pm \text{sd } 0.018$ mm

There is a great difference in appearance between young (neanic) and older (ephebic) zooids. The characteristic asymmetrical peristome and the avicularium are produced in the phase of secondary calcification. Primary calcification of the frontal wall begins after the establishment of the basal wall, the lateral vertical walls and the basal pore chambers. The calcification proceeds distally along a broad concave front, delimiting the rim of the primary orifice as it approaches the distal end of the zooid. The last areas to calcify are a small area proximal to the orifice, which may be apparent for some time as an open lacuna, and the distal rim of the orifice together with the middle section

of the terminal wall (Text-fig. 1, A). It is clear from the micrographs (Plate 1) that formation of the peristomial wall is simultaneous with the secondary calcification of the zooid frontal wall. The peristome comprises elements of the frontal calcification of several adjoining zooids, rather than a single structure; it encloses the ovicell and extends onto the proximal part of the frontal wall of succeeding



TEXT - FIG. 1
Rhamphostomellina posidoniae n. sp.

A: zooids from the growing edge of a colony, showing the final stages of calcification. Dietellae and the paired pores lateral to the orifice are clearly seen; B: older zooids; different stages in the formation of the peristome and avicularium. An ovicell is seen on the bottom left zooid; C: the developing peristomial complex is seen encroaching on a new ovicell.

zooids. The peristomial complex develops rapidly, following the completion of primary calcification of the frontal, and intermediate stages are only rarely found on the periphery of the colony. It is initiated by the development of a single lamina on each side of the orifice. These laminæ arise from beside two large, irregularly shaped pores situated at the base of the lateral zooid walls, adjacent to the orifice,

and which perhaps may be connected to the basal pore chambers. The laminae at first rise vertically and then develop low rims bordering the proximal side of the orifice, one swelling proximally to form the basis of the avicularian cystid (Text-fig. 1,B). The calcification then proceeds proximally as an even sheet over the frontal wall of the zooid, continuous with a pair of ridges which form the disto-lateral components of the peristomes of the two preceding zooids in the series (Plate 1,C). Thus, the proximal part of the peristome, the avicularium, and sometimes low disto-lateral ridges, are developed first and the distal part is completed during the secondary calcification of the succeeding generation of zooids (Text-fig. 1,C).

The ovicell originates as a narrow sheet of calcification arising from the distal rim of the primary orifice. It grows and expands distally, forming a flattened, pear-shaped sheet, the edge of which then upturns and grows proximally to form the frontal surface. The basal wall may be seen to be underlain by elongations of the two most distal pore chambers of the mother zooid.

The Chios collections consisted of a large number of samples from numerous habitats around the Island (Hayward, 1974). *Rhamphostomellina posidoniae* was collected in August 1967 from Dhiaporia, at depths of 30 m, where it was found in abundance in several samples of *Posidonia*. No other substratum was found to be utilised by it. The colonies were generally small, rarely exceeding 5 mm in diameter; many zooids were ovicelled and some contained embryos, which in spirit-preserved material retained a deep orange-red colour. The species is characterized by its extreme fragility; the calcification is very thin, possibly an adaptation to life on such a frail substratum as *Posidonia*.

Systematic remarks

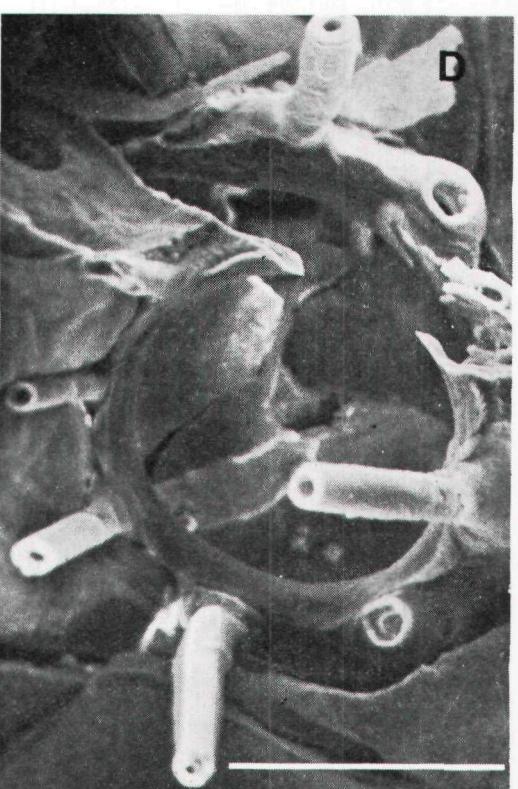
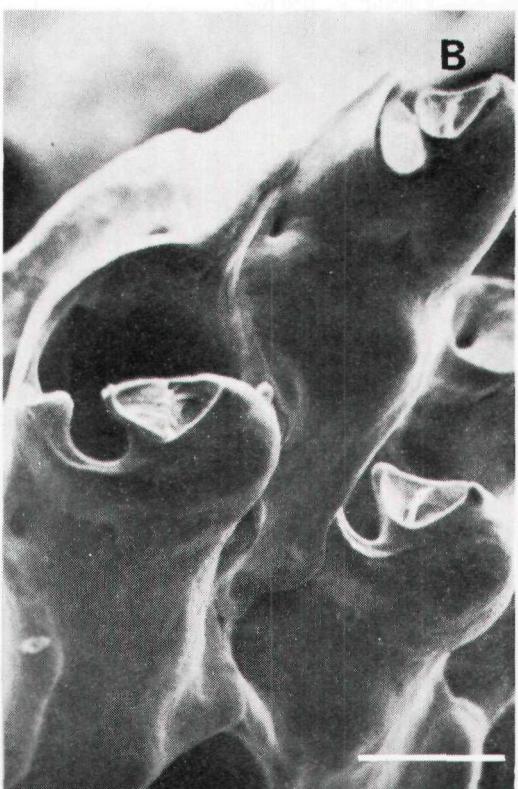
The superficial resemblance which *Rhamphostomellina posidoniae* bears to species of *Rhamphostomella* may be attributed to the asymmetrical peristome and laterally placed avicularium, features commonly associated with that genus. *Rhamphostomella* was introduced by Lorenz (1886) for six boreal and arctic species; his diagnosis was expanded by Hincks (1889) but neither author indicated a type species. Norman (1903) selected *R. scabra* (Fabricius), one of the species included by Lorenz, as type of the genus. Canu and Bassler (1917) independently proposed another of Lorenz' species, *R. costata*, as type, a choice favoured by Harmer (1957:1101) on the grounds that *R. scabra* was insufficiently described by Fabricius. Despite Harmer's opinion,

PLATE I *Rhamphostomellina posidoniae* n. sp.

SEM micrographs of gold-palladium coated specimens. Scale = 100 μ .

A: mature zooids showing well developed peristomes. The pores in the corners of the frontal wall are well shown; B: zooids from the growing edge. The cup shaped structure to the right marks the beginning of a new peristome; C: mature zooids showing anovicelled individual and the interlocking components of the peristome; D: the ancestrula.

A, B and C magnified X 200, D X 375.



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PLATE I

Norman's selection has indisputable priority. The generic diagnosis of *Rhamphostomella* has been constantly augmented by various authors (see Rogick 1956:282) and as presently constituted is an ill-defined entity. Osburn (1952:425) noted that the species currently assigned to *Rhamphostomella* appear to fall broadly into two groups, differing in the presence or absence of cardellae and the degree of calcification of the frontal wall. In both groups a lyrula may be present or absent, although the homology proposed with respect to this structure in the different species may be false.

Despite this confusion, the majority of the species assigned to *Rhamphostomella* appear to be alike in one important respect. Examination of specimens of *R. costata*, *R. plicata* and several other species represented in the collections of the British Museum (Natural History) has shown that the development of the frontal wall is of the type described as « umbonuloid » by Harmer (1902), or « gymnocystidean » by Silén (1942). In this type of development the frontal membrane of the zooid, bearing a functional operculum, is completed before the development of the calcareous frontal wall, which is derived from a fold of the gymnocyst overarching the frontal membrane. Although a complete developmental series of *Rhamphostomellina posidoniae* is not available, the material is sufficient to show that this type of frontal wall development does not pertain, the operculum remaining undifferentiated until late in the calcification of the frontal wall. The material that is available suggests, rather, a single, distally advancing layer of calcification closely applied to the membranous frontal surface of the growing zooid; the « gymnocystidean » type of Cook (1973:257).

Rhamphostomellina also differs from *Rhamphostomella* in the possession of basal pore chambers, the lack of areolae and « costae » and, by inference, in the manner of secondary calcification of the frontal wall. Such fundamental differences in the morphology and calcification processes are assumed to be sufficient for the introduction of a new genus. However, consideration of the phylogenetic relationships of the new genus must await an evaluation of the importance to be attached to such differences in the construction of familial groupings.

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Summary

A new species of cheilostome bryozoan is reported from the Aegean. Numerous small colonies were found encrusting leaves of the eel grass *Posidonia oceanica*. Despite a superficial resemblance to species of the genus *Rhamphostomella*, fundamental morphological differences are revealed. A new genus, *Rhamphostomellina*, is introduced to accommodate the species, which is named *R. posidoniae*, in reference to its epiphytic habit.

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