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BRYOZOAN REVIEWED

By

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ABSTRAK

TINJAUAN MENGENAI BRYOZOA. *Banyak bryozoa dari perairan Indonesia telah dipertelakan di dalam laporan Siboga Ekspedisi. Seluruh spesimen yang dipertelakan berasal dari sebelah timur dari bujur timur 113°, Bryozoa adalah hewan akuatik. Biasanya merupakan koloni sesil yang bermacam-macam bentuknya (polymorphic). Antara koloni satu dengan koloni yang lain dapat dibedakan dari bentuk lophophorenya, yaitu organ untuk makan yang terdiri dari tentakel-tentakel yang bersilia. Keaneka-ragaman dan kelimpahan tertinggi dari binatang ini didapatkan pada zona cahaya (lighted zone) di perairan tropik. Seringkali didapatkan di bawah permukaan karang. Telaah taksonomik dari filum ini yang saat ini telah diikhtisarkan adalah dari spesimen yang dikoleksi dari Kepulauan Seribu. Hasil dari telaah tersebut mungkin berupa informasi mengenai kehadiran spesies, keaneka-ragaman dan hubungannya dengan bryozoa yang telah didapatkan dari perairan sekitarnya.*

INTRODUCTION

One animal phylum not studied in this country in recent years is the phylum Bryozoa. Many bryozoans were collected from Indonesian waters during the Siboga Expedition 1899-1900. The various species were described by HARMER (1915, 1926, 1934, 1957) in four thick volumes, part of the Siboga Expedition Reports. Harmer's descriptions presumable remain to this day the most comprehensive record for bryozoans in Indonesian waters.

To recommence study of the Indonesian bryozoan fauna, a taxonomic study was started early this year. The animals grow attached on reef corals collected by scuba equipment from the Thousand Islands Region at longitudes 106° - 104° E.

A few specimens were among rubble in the beach wash at Papa Theo Island. And one sample came from West Sumatra at Padang. No samples from the Siboga Expedition were collected from the localities since the Expedition left from Surabaya and proceeded East beyond longitude 113°E.

The main purpose of this article is to review the main characteristics of this less well known phylum. A short account of aims for the new study will form the conclusion to this report.

WHAT ARE BRYOZOA?

Bryozoa are aquatic invertebrates. Most bryozoans grow in form of sessile colonies, with colony sizes ranging from less than 1 mm to more than 1 m (GEORGE & GEORGE 1979). The colony is made up of many microscopic individuals, the zooids.

A bryozoan colony grows from a sexually produced larva which has meta-

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morphosed to the first zooid, or ancestrula; new zooids are added subsequently by a-sexual budding in the growth pattern characteristic for a given species.

Colonies grow in flattened single to multi layered crusts, from root-like tufts, erect with zooids arranged in single to multiseries (Figure 1); or from stolons with zooids at sixed intervals. Other variations of these basic patterns exist. Within the colony zooids are joined to one another by shared body walls and by tissue tracts which form the transport system which conveys nutrients throughout the colony. The body walls are either hard or they are soft, depending on the chemical make up. Zooids are polymorphic. The polymorphs are: feeding zooids (autozooids), defensive zooids (avicularia), brood chambers (ooecia) and empty zooids (kenozooids). The autozooids contain all tissues and organs needed to perform the metabolic, and other functions necessary for colony maintenance. In the avicularia most of the functional organs persist, and muscle tissue is pronouncedly developed. Ooecia form brood chambers where embryos are incubated; and kenozooids frequently form stolons.

The zooid body-shape is cylindrical, flattened or box-like. Within the body is the body cavity, supposedly a true coelom (RYLAND 1970) are the animal's soft parts, essentially a shapegut which connects at the anterior (the mouth) to the lophophore (Fig. 2, upper centre). The lophophore is the feeding organ not found in other colonies animals. It is shaped like a funnel made up of ciliated tentacles. During active feeding the lophophore protrudes into the surrounding water to catch food on the ciliated tentacles. The ciliated tentacles are the feature used to differentiate bryozoans from other filter feeding organisms with which they may be confused, e.g. hydroids.

The mechanism which effects protrusion and retraction of the lophophore is change in hydrostatic pressure which acts on the internal muscles. The muscles attach on the flexible frontal membrane or on the internal compensation sac, the ascus (Fig.2).

Recent bryozoa fall within 3 classes, one of which contains freshwater bryozoans, two are marine.

WHERE MAY BRYOZOANS BE FOUND?

Bryozoans are not easy to find, not only because many colonies are small but because they tend to grow in dark places. As filter feeders they occur in greatest abundance where currents are swift - especially in areas of narrows (CARSON, inpress). Most colonies grow attached on substrate; a few live free in fine sand (HAYWARD & COOK 1979).

Frehwater bryozoans occur in shallow lakes and swift creeks, attached on submerged branches or beneath lower rock surfaces. By far the greatest number of bryozoans live in the sea. They are present in all the seas, from the intertidal zone down to great depths (GEORGE & GEORGE 1979). Species in the intertidal zone are few in number, though the colonies frequently are very large, covering entire logs or they hang in thick crust on pilings beneath docks. In the intertidal zone colonies are thrown up with the beach wash as crusts on other invertebrates, molluscs, echinodermas, crustaceans; on seaweed and on drift wood.

Bryozoa are most abundant below tide within the light zone of tropical waters. Bryozoans are members of reef communities. They should be searched for on the under surfaces of reef coral or in crevasses, anywhere where they are shielded form light. Sessile organisms have no way of escape from predators (fishes, grazing nudibranchs, echinoid sprey on bryozoans), and darkness gives them protection. During recent years extensive studies on bryozoans as member of reef communities in Jamaica

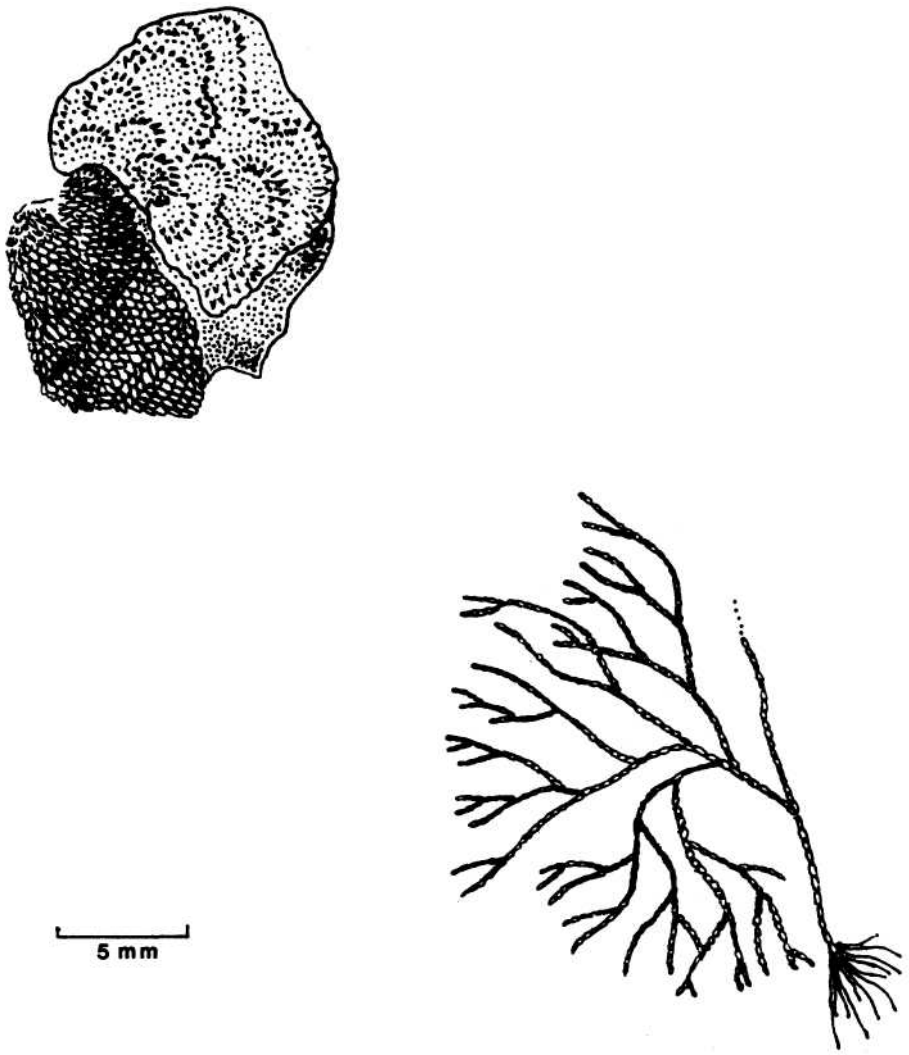


Figure 1 : Two growth forms of bryozoan colonies.

Upper left: A piece of coral rubble with a single layered bryozoan colony. The zooids grow in regular rows and the colony looks net-like.

Lower right : Branch of an erect colony.
Zooids in single series.

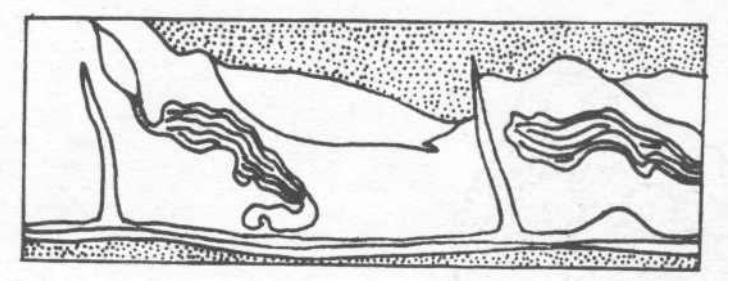
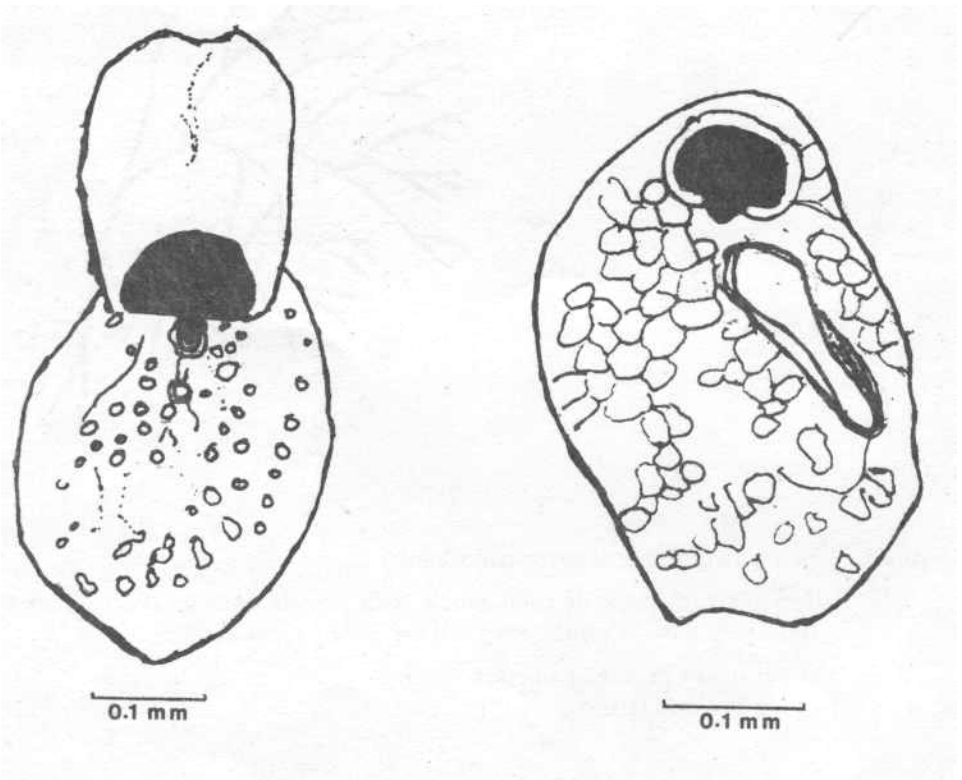


Figure 2 : Upper centre : Longitudinal section through the transverse wall of and AUTOZOOID of *Pentapora foliaces.* The tentacles of the lophophore are withdrawn into the box shaped body cavity. The compensation sac is outlined beneath the body wall (stpples). Adapted tracing from CARSON (1978, P1 .2, fig.7.x60)

Lower left: The OOECIUM of *Arthropoma cecilii* is a smooth inflated hood which is seen above the orifice (blackened area).

Lower right : The AVICULARIUM on the front wall of *Rhamphostomella argentea* slants at an oblique angle from the orifice (blackened area) to the zooids left. (CARSON 1978).



were made by JACKSON (1984), JACKSON & WINSTON (1982) and PALUMB1 & JACKSON (1982). The topics include studies of distribution and abundance; the influence of "host species" and lesion size; aggregation and abundance of encrusting organisms; and community development and life histories of encrusting cheilostome Bryozoa.

PURPOSE OF THE CURRENT STUDY OF INDONESIAN BRYOZOA

The values which may be derived from the taxonomic study of bryozoa of the 1000 Islands Region will be the following: A knowledge of the species occurrence and diversity in a region from which bryozoa have not been previously reported. An insight as to which of the species were reported previously from Indonesian waters elsewhere. Are there any new species in this region? The Java Sea opens to the Indian Ocean in the West; to the Banda Sea, Timor Sea hene Pacific Ocean in the East and to the South Cina Sea in the North. To the fauna of which of these seas do the animals in the study region relate most closely? Are any of the species not normally present at the geographic latitude of the study region? Finally, it is hoped that the results will satisfy the curiosity of the student of the animals and provide or contribution to the quest for knowledge in general.

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