

A bryozoan from the Upper Pliocene Hopegate Formation of north central Jamaica

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ABSTRACT. Bryozoans are poorly known from the Cenozoic limestones of Jamaica. This probably reflects a combination of limited collecting effort and unfavourable preservation, the thin encrusting colonies that are the dominant bryozoans in post-Palaeozoic tropical carbonates seldom being visible in hard limestones. Here we report the presence of the anascan cheilostome bryozoan *Steginoporella*, represented by a single colony, in the Upper Pliocene Hopegate Formation, parish of Trelawny. This specimen is too poorly preserved for species-level identification, but appears to differ from the contemporaneous *S. parvicella* Canu and Bassler from the Bowden shell bed, parish of St. Thomas. The latter is one of 43 species of bryozoan known from the Bowden shell bed. This extreme disparity in known diversity between coeval deposits on the same island is largely attributable to different methodologies of collecting and diagenetic effects.

Key words: *Steginoporella*, parish of Trelawny, preservation, reef limestones.

Bryozoans are a phylum of aquatic invertebrates that are a common component of the modern, shallow-water environments of the Caribbean Sea (e.g., Fransen, 1986; Kaplan, 1988; Montoya-Cadavid et al. 2007; Cortés et al., 2009), yet they remain poorly known from the otherwise diverse fossil record of Jamaica. The only deposit on the island to have yielded well-documented and diverse bryozoans is the siliciclastic Upper Pliocene Bowden shell beds, Bowden Formation, Lower Coastal Group (Taylor and Foster, 1998). In contrast, the thick successions of Cenozoic limestones in Jamaica have yielded remarkably few specimens. Whether this paucity of bryozoans is real or due to collecting bias is uncertain, although the latter is undoubtedly a contributory factor. Yet the late Hal Dixon, for example, was fascinated by bryozoans, and looked long and hard in the Upper Oligocene of the White Limestone Group of the area around Browns Town, parish of St. Ann. He discovered a hitherto unknown diversity of some fossil invertebrate groups in these rocks, at both the macro- and microscopic scales (e.g., Dixon et al., 1994; Dixon and Donovan, 1998; Donovan, 2011, p. 44), but only one species of bryozoan, the lacernid cheilostome *Lacerna* sp. (Taylor in Dixon and Donovan, 1999, pp. 29-30). Bryozoans do not appear to be a common component of the island's Cenozoic limestones.

It is therefore of some interest to record the occurrence of a bryozoan in one of the most intractable limestones to collect from in the

Cenozoic of Jamaica, the well-lithified and largely re-crystallised and/or dolomitized Upper Pliocene Hopegate Formation. This fossil was found as a result of a systematic macropalaeontological investigation of this formation that involved at least 400-500 man hours of collecting between 2003 and 2005. Groups that were examined included scleractinian corals (T.A. Stemann, research in progress), decapod crustaceans (=crabs) and benthic molluscs (R.W. Portell, research in progress), echinoids (Donovan and Portell, in press), sponges (Donovan and Stemann, 2007) and trace fossils (Donovan, research in progress). To these may be added the rare bryozoan described herein, deposited in the collections of the Netherlands Centre for Biodiversity – Naturalis, Leiden (RGM 621 007).

1. LOCALITY AND HORIZON

The specimen described below comes from Locality 7 of Donovan and Portell (in press) (Figure 1 herein), in the parish of Trelawny. Donovan and Portell described the site as a new road cut close to the top of a cliff that was being quarried away, west of the Rio Brac rest stop, inland from A1 and above the east end of Locality 3 [approximate NGR 005 026; GPS 18° 28.4' W 77° 28.0']. This is the sponge locality of Donovan and Stemann (2007, p. 240) and has yielded only indeterminate regular echinoids, including cidaroids (Donovan and Portell, in press, table 1).

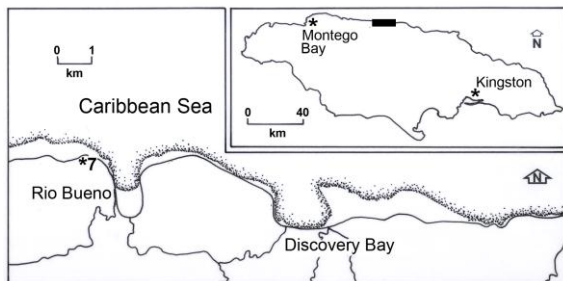


Figure 1. Locality map of the bryozoan site, Upper Pliocene Hopegate Formation, parish of Trelawny (*7), north central Jamaica (modified after Donovan and Portell, in press, fig. 1). Principal roads are shown; the bryozoan *Steginoporella* sp. comes from Locality 7 of Donovan and Portell. The inset outline map of Jamaica shows the approximate position of the main map (in black).

2. SYSTEMATIC PALAEOLOGY

Phylum Bryozoa Ehrenberg
 Class Gymnolaemata Allman
 Order Cheilostomata Busk
 Suborder Anasca Levinsen
 Family Steginoporellidae Hincks
 Genus *Steginoporella* Smitt, 1873

Type species. – *Steginoporella elegans* Smitt, 1873 [= *Membranipora magnilabris* Busk, 1854], by the subsequent designation of Jullien (1888) (Bassler, 1953, p. G172).

Diagnosis. – See Bassler (1953, p. G172).

Remarks. – Most species of *Steginoporella* possess two types of autozooids; ‘normal’ A-zooids, and rarer B-zooids with enlarged opercula and opesia. The well-developed cryptocyst usually has a median process, often hypertrophied in the B-zooids. Ovicells are lacking. Pouyet and David (1979) revised the c. 80 species, and discussed the phylogeny and palaeobiogeography of *Steginoporella*.

Range. – Eocene (Lutetian) to Recent (Taylor, 1993, p. 469).

Steginoporella sp.
 Figure 2

Material and locality. – A single specimen, RGM 621 007 (Figure 2).

Description. – Colony multiserial, unilamellar, apparently encrusting, surface largely obscured by lithified sediment and cement. Basal walls of zooids concavo-convex, locally with transverse growth lines. Ratio of number of A-zooids to B-zooids about 5:1.

A-zooids large, 0.73-1.07 mm long, 0.49-0.60 mm wide, well rounded distally. Cryptocystal frontal wall occupying more than half of zooidal length, depressed, non-porous, lacking opesiules, a pit or hole sometimes visible immediately below the opesia. Opesia semicircular with complete, straight, raised proximal edge and a narrow distal shelf, wider than long, 0.30-0.33 mm long, 0.42-0.50 mm wide.

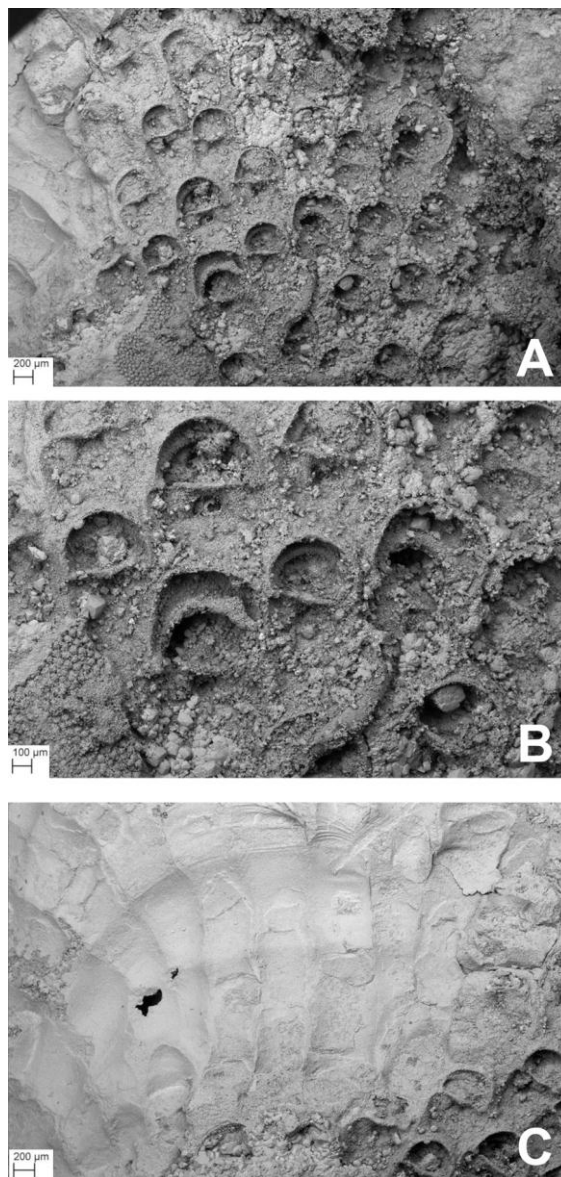


Figure 2. *Steginoporella* sp., RGM 621 007, Upper Pliocene Hopegate Formation, near Rio Brac rest stop, parish of Trelawny, north Jamaica. A, best preserved area of the colony. B, group of A-zooids and two B-zooids with deeper opesial shelves. C, concave basal walls of zooids visible in area of colony where frontal walls are not preserved. Scanning electron micrographs of the uncoated specimen (for technique, see Taylor, 1986).

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B-zooids larger than A-zooids, 1.11-1.31 mm long, 0.64-0.67 mm wide, somewhat squared-off distally. Cryptocrystal frontal wall occupying about half of zooidal length, depressed, non-porous, lacking opesiules, a pit or hole present beneath the opesia. Opesia rounded quadrate with complete, straight, raised proximal edge and a broad shelf distally, wider than long 0.47-0.50 mm long, by 0.56-0.59 mm wide.

Remarks. – The preservation of this specimen precludes its identification beyond genus level. *Steginoporella* is already known from the Upper Pliocene of Jamaica. Taylor and Foster (1998, pp. 67-68, fig. 15) recorded *Steginoporella parvicella* Canu and Bassler, 1919, from the Bowden shell beds, parish of St. Thomas, southeast Jamaica, in a bryozoan fauna comprising 43 taxa. The Hopegate Formation *Steginoporella* does not appear to be *S. parvicella*: not only are the zooids somewhat larger, but the B-zooids are more spatulate. The proximal edge of the opesia is straight and complete in the Hopegate Formation species, but indented laterally in *S. parvicella*.

The great contrast in diversity of the coeval Hopegate Formation and Bowden shell beds is surely due to the influence of their different taphonomic histories influencing collecting methodologies. The friable siliciclastics ('marlstones') of the Bowden shell beds are easily

broken down for micropalaeontological analysis under a binocular microscope. In contrast, the well-lithified limestones of the Hopegate Formation force the collector to examine surface occurrences only. Many of the Hopegate Formation bryozoans were probably destroyed by diagenetic processes and surface weathering.

The Plio-Pleistocene (see Jackson and Donovan, 1994, p. 203, for discussion of correlation) Rockly Bay Formation of Tobago may be coeval. It has yielded 12 cheilostome and three cyclostome species (Taylor and Foster 1994), including one steginoporellid *Labioporella granulosa* (Canu and Bassler, 1928), but not *Steginoporella*.

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