

## Short Note

A solitary coral-larger benthic foraminifera association  
from the late Eocene of Jamaica

Thomas Albert STEMANN\* &amp; Natalie ROBINSON

T.A. Stemann, Department of Geography and Geology, The University of the West Indies, Mona Campus, Kingston 7, Jamaica; thomas.stemann@uwimona.edu.jm \*corresponding author

N. Robinson, Department of Geography and Geology, The University of the West Indies, Mona Campus, Kingston 7, Jamaica; natalie.robinson02@mymona.uwi.edu

**KEY WORDS** - *Scleractinia*, *Lepidocyclus*, *settling behaviour*, *Paleogene*, *Caribbean*.

There are many records of solitary discoid or patellate corals attached at their base to large benthic foraminifera from the Cretaceous through the Paleogene throughout the Tethyan region. Russo et al. (1996) gave a detailed overview of this coral/foraminiferal association and its links to automobility in some small solitary corals. This association involves preservation of a particular settling behaviour seen in some small discoid scleractinians, in which their base is centered on a large disc or lens-shaped foraminifer, often *Nummulites* sp. or *Discocyclus* sp. Russo et al. (1996) documented that some 19 different species of corals have been shown to possess this settling behaviour. These include species from the genera *Cyclolites*, *Cyclolitopsis*, *Cycloseris*, *Funginellastraea* and others. In the Eocene, especially, there are numerous examples from throughout the Mediterranean and Indo-Pacific (e.g., Duncan, 1880; Oppenheim, 1900; Russo et al., 1996).

To date, there are no reports of this coral/foraminiferal association from the Caribbean. This may be due to the fact that there are very few records of small discoidal scleractinians from the Caribbean. Wells (1934) described one discoid solitary coral, *Cyclolites jamaicensis* Wells, 1934, from the Upper Cretaceous of Jamaica. While this coral has been found in abundance in Jamaica, there are no records of it settling on foraminifera. One other record from Jamaica (Wells, 1935) is of a single discoid coral from an unknown locality. This material is probably Cretaceous in age based on the similarity of its preservation to other Jamaican material of that age. No solitary discoid scleractinians are recorded from large faunas described from the Caribbean Paleogene (Budd et al., 1992; Stemann, 2004) or the Neogene (Budd et al., 1994).

## MATERIAL

This study presents the first record of a discoid coral settling on foraminifera from the Caribbean. Our material

comes from the Paleogene portion of the White Limestone Group near the community of Philadelphia in the parish of St. Ann, Jamaica (Lat. 18° 23' 36.622" N; Long. 77° 19' 55.952" W). The White Limestone Group includes a series of formations composed of pure carbonate deposited in platform and basinal settings (Mitchell, 2013). These units range in age from middle Eocene to early Miocene and contain a rich fauna of reefal scleractinians (Stemann, 2004). At the studied locality, the area is complexly faulted and the material collected is apparently from a block faulted into the upper Eocene Somerset Formation. The rocks here exposed are pure carbonate comprised of grainstones and packstones deposited in a mostly outer

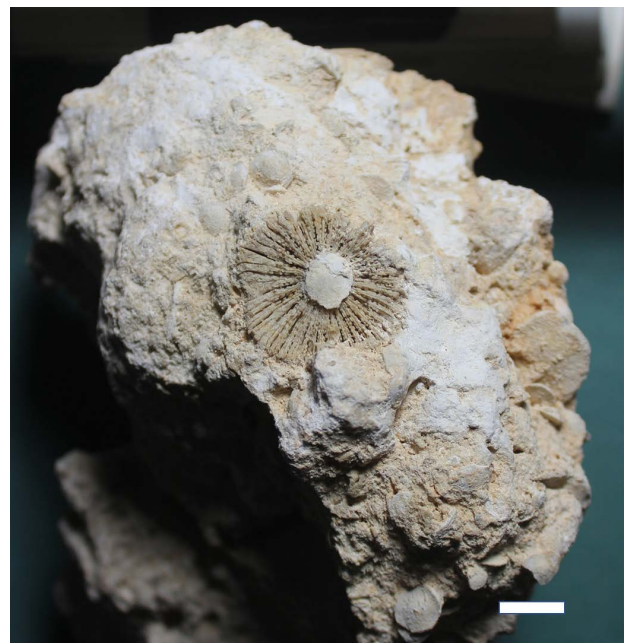


Fig. 1 - (color online) Specimen showing solitary coral centred on a large benthic foraminiferal test, *Lepidocyclus pustulosa* (UWIGM 2020.01.0001). Scale bar = 1cm.

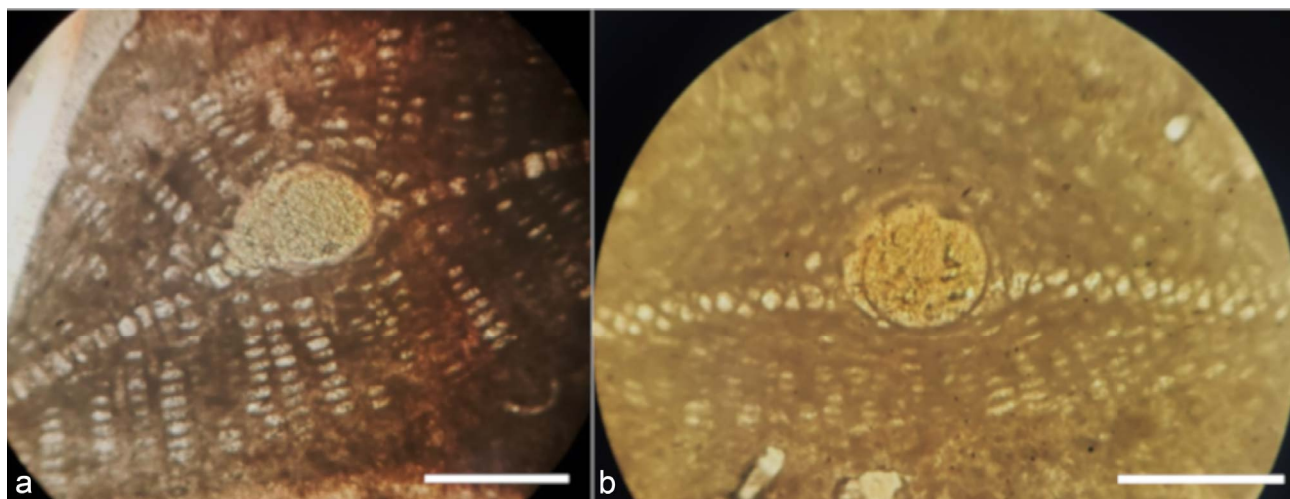


Fig. 2 - (color online) Thin section images of *Lepidocyclus* foraminifera identified in this sample, showing protoconch and equatorial chambers. a) *Lepidocyclus pustulosa trinitatis* (UWIGM 2020.01.0002); b) *Lepidocyclus pustulosa* s.s. (UWIGM 2020.01.0003). Scale bars = 0.5 mm.

platform environment based on the benthic foraminifer fauna. The studied unit yields a small fauna of mouldic examples of chiefly thin-branched colonial corals and some solitary species. The studied locality is unusual for this part of the White Limestone Group in that it includes some corals preserved as casts. It also contains a flood of the lens-shaped foraminifer, *Lepidocyclus* spp., many of which attain diameters of greater than 1.5 cm.

The material is stored in The University of the West Indies Mona Campus Geology Museum (UWIGM).

#### CORAL/FORAMINIFERAL ASSOCIATION

The coral figured here (Fig. 1) is a solitary discoid form, 1.3 cm in diameter, that is centered on a specimen of *Lepidocyclus pustulosa* (Douvillé, 1917) with a diameter of 0.7 cm. The mouldic preservation of the coral and the fact that the foraminifer covers much of the coral's axial structure precludes identification of the specimen to the genus or species level. Its discoid form, lack of epitheca and abundant septa that are porous axially suggests that it belongs to the Family Cyclolitiidae. This is the first reliable record of this group from the Paleogene of the Caribbean.

The large lenticular foraminifera found at this site are identified as *Lepidocyclus pustulosa*. Here, *L. pustulosa* is characterised by the protoconch being ~0.5 mm, the few pillars, the height of the lateral chambers being low and with a high thickness for the chamber roofs and floor. Two morphs of *L. pustulosa* were identified, *L. pustulosa trinitatis* (Vaughan, 1928) and *L. pustulosa* s.s. (Fig. 2). These are normally found in the upper Eocene of the White Limestone Group, in outer platform to platform margin facies (Robinson & Mitchell, 1999). The largest foraminifera in the sample including the specimen associated with the coral in Fig. 1 are microspheric forms. Unfortunately, these forms generally do not yield the taxonomic characteristics needed to identify them to the species level. For this reason, the foraminifer attached to the coral cannot be identified to the subspecies level.

#### DISCUSSION

This report represents the first record of a discoid “cyclolitiid” coral in the Paleogene of Jamaica. This indicates an extension of the range of these discoid corals into the Caribbean in the Paleogene and an extension of their particular settling behaviour as well. It is interesting to note that this coral/foraminifer association involves the genus *Lepidocyclus*, a genus that has never been recorded as part of these associations from the Mediterranean or Indo-Pacific. This may suggest that in these associations the particular foraminifer taxon selected by the coral as a settling site is less important than its the size, shape and availability.

#### ACKNOWLEDGEMENTS

We would like to acknowledge the extensive assistance provided by Prof. Simon Mitchell of the UWI Department of Geography and Geology in discussions concerning the stratigraphy seen at the study site and assistance with foraminifer identification. The University of the West Indies Department of Geography and Geology assisted with field work.

#### REFERENCES

- Budd A.F., Stemann T.A. & Johnson K.G. (1994). Stratigraphic distributions of genera and species of Neogene to Recent Caribbean reef corals. *Journal of Paleontology*, 68: 951-977.
- Budd A.F., Stemann T.A. & Stewart R.H. (1992). Eocene Caribbean reef corals; a unique fauna from the Gatuncillo Formation of Panama. *Journal of Paleontology*, 66: 570-594.
- Douvillé H. (1917). Les Orbitoides Développement et Phase Embryonnaire, Leur Evolution Pendant le Cretaceous. Paris Academy of Science, 161: 1-844.
- Duncan P.M. (1880). Sind fossil Corals and Alcyonaria. *Memoirs of the Geological Survey of India, Palaeontographica India*, VII & XIV, 1: 1-110.
- Mitchell S.F. (2013). Stratigraphy of the White Limestone. *Bulletin de la Société Géologique de France*, 184: 111-118.
- Oppenheim P. (1901). Priabonachsichten und ihre Fauna. *Palaeontographica*, 47: 1-348.

- Robinson E. & Mitchell S.F. (1999). Middle Eocene to Oligocene stratigraphy and palaeogeography in Jamaica: a window on the Nicaragua Rise. Prepared for the Fourth Annual Meeting of IGCP 393, 12-18 July 1999. Contributions to Geology UWI Mona, 4: 1-47.
- Russo A., Cherchi A. & Schroeder R. (1996). An example of auto-mobility and host substrate relationship in “*Cycloseris*” *escosurae* Mallada, 1887, scleractinian coral from the Lower Aptian of Spain. *Bollettino della Società Paleontologica Italiana*, Special Volume 3: 191-203.
- Stemann T.A. (2004). Reef corals of the White Limestone Group of Jamaica. *Cainozoic Research*, 3: 83-107.
- Vaughan T.W. (1928). Species of Large Arenaceous and Orbitoidal Foraminifera from the Tertiary Deposits of Jamaica. *Journal of Paleontology*, 1: 277-298.
- Wells J.W. (1934). Some fossil corals from the West Indies. *Proceedings of the United States National Museum*, 83: 71-110.
- Wells J.W. (1935). Corals from the Cretaceous and Eocene of Jamaica. *Annals and Magazine of Natural History*, 10: 183-194.

Manuscript submitted 15 December 2019  
Revised manuscript accepted 6 September 2020  
Published online 26 October 2020  
Guest Editor Cesare Andrea Papazzoni