Bulletin of the Mizunami Fossil Museum, no. 30 (2003), p. 137-140, 3 figs.
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The ichnofossil *Renichnus arcuatus* Mayoral, 1987 in the Pleistocene of Jamaica

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Abstract

The trace fossil *Renichnus arcuatus* Mayoral, 1987 is reported from Jamaica for the first time, based upon multiple specimens preserved in an algal substrate from the Upper Pleistocene (Sangamonian; oxygen isotope stage 5e) Falmouth Formation. This trace fossil is attributed to the etching action of vermetid gastropods, which have also been recorded from this unit as body fossils.

Key words: Ichnology, *Renichnus*, Pleistocene, Jamaica, reef

Introduction

An abundant literature now exists describing the trace fossils produced by bioerosive activities on lithified substrates, such as borings and embedment structures, from the Plio-Pleistocene of Jamaica (see, for example, Pickerill *et al.*, 1996, 1998; Pickerill and Donovan, 1997, 1998, 1999; Mitchell *et al.*, 1998). This area of research has only developed in Jamaica during the past decade, and it is not surprising that further ichnotaxa continue to be discovered from sequences that have been studied by geologists and palaeontologists for many years (see, for example, Donovan, 2002). The present communication adds a further distinctive ichnotaxon to this growing list, providing new information for a particularly well-known unit widely exposed on the coast.

Systematic Ichnology

Ichnogenus *Renichnus* Mayoral, 1987

Type species: *Renichnus arcuatus* Mayoral, 1987, by original designation.

Diagnosis: (Translated from the original Spanish; Mayoral, 1987, p. 56) Kidney-shaped depressions in the form of a half moon, disposed in a crude row or coarsely coiled.

Discussion: Radwański (1977, p. 247, pl. 9; pl. 10, figs. a-c) discussed cementation and embedment of modern vermetid gastropods, and their implications for ichnology (see also Gould, 1969; Bromley, 1970, p. 63; Warme, 1975, p. 216; Savazzi, 1996; and references therein). Bromley and Martinell (1991) discussed the similarities between *Renichnus* and *Centrichnus* Bromley and Martinell, the latter interpreted as the etching traces of anomiid bivalves and verrucid cirripedes.

Renichnus arcuatus Mayoral, 1987

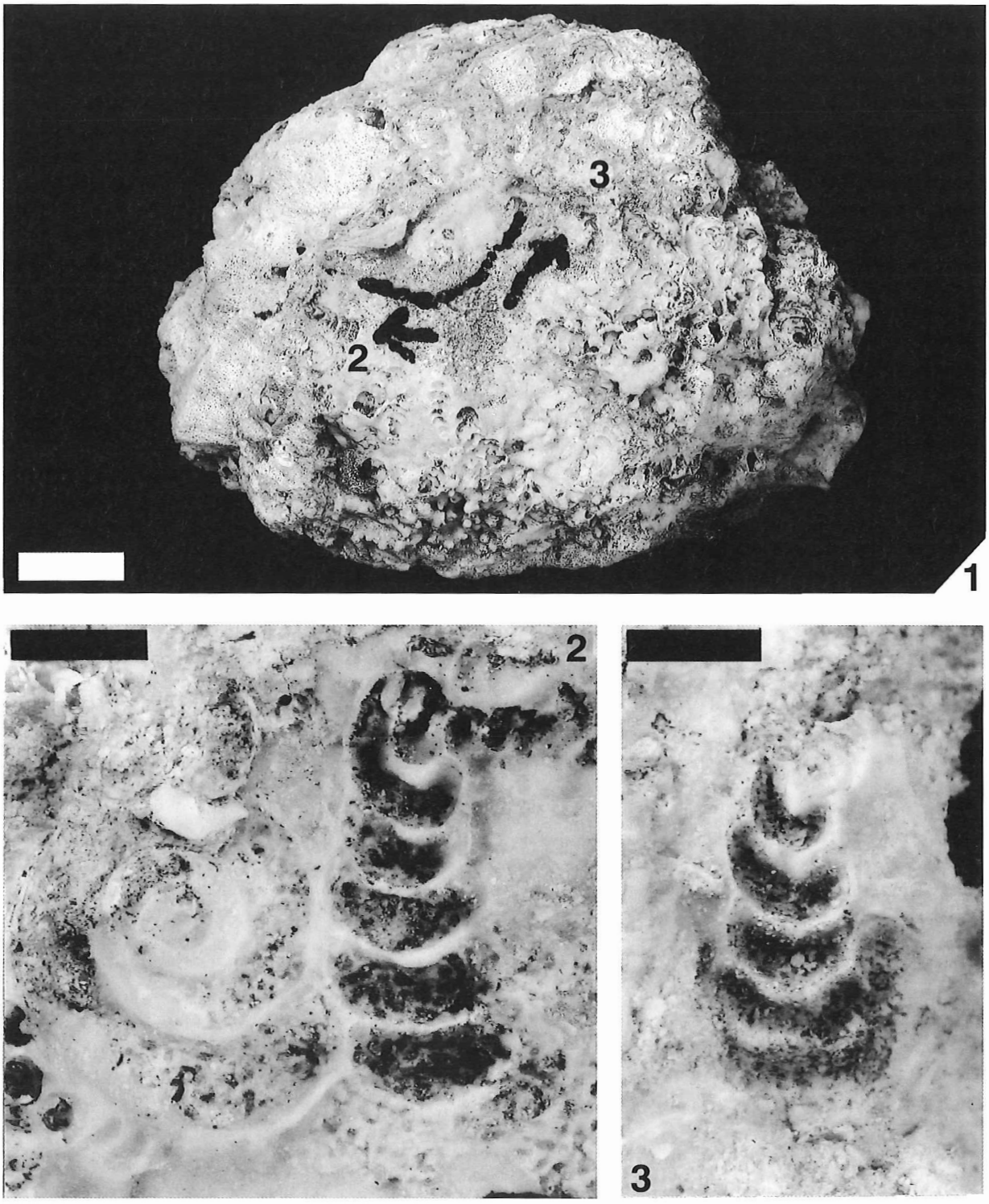
(Figs. 1-3)

1987 *Renichnus arcuatus* Mayoral, pp. 56-57, pl. 2, fig.13, text-fig. 3.
1992 *Renichnus arcuatus,* Bromley, fig. 1.
1993 *Renichnus arcuatus* Mayoral, Bromley and Asgaard, pp. 104, 111, 113, tables 1, 2.
1994 *Renichnus arcuatus*, Bromley, p. 147, fig. 5.1.
1999 *Renichnus arcuatus* Mayoral, Taddei Ruggiero, p. 171, fig. 10-P.
2003 *Renichnus arcuatus* Mayoral, Jagt, p. 177, pl. 2, fig. 3.

Material: More than 20 specimens preserved on a single substrate, Nationaal Natuurhistorisch Museum, Leiden (RGM 216052).

Locality and horizon: West Rio Bueno Harbour, parish of Trelawny, north coast of central Jamaica (NGR 012 026, 1:50,000 sheet "Falmouth-Browns Town" (metric edition); GPS reading N 18° 28.63' W 77° 27.66'). The exposure is in the first small bay to the east of the restaurant. Falmouth Formation, Upper Coastal Group (Robinson, 1969, p. 1). Upper Pleistocene (Sangamonian; oxygen isotope stage 5e). The Falmouth Formation is a raised reef deposit (Larson, 1983).

Preservation: *Renichnus arcuatus* in RGM 216052 is preserved



Figs.1-3. *Renichnus arcuatus* Mayoral, 1987, RGM 216052, Upper Pleistocene. Fig. 1. General view of scleractinian coral, encrusted by algae, into which were embedded vermetid gastropods. (2) and (3) are the specimens illustrated in Figs. 2 and 3, respectively. Scale bar represents 10 mm. Fig. 2. *Renichnus arcuatus* (right) adjacent to the embedment of a coiled serpulid worm (left) (compare with Radwański, 1977, pl. 10, figs. d, e). It is uncertain if *R. arcuatus* in this view represents two specimens or a single, long, albeit geniculated individual. Fig. 3. A further well-preserved specimen. Note the skeletal structure of the scleractinian coral apparent in the base of embedment structures in both Figures 2 and 3. Scale bars represent 2 mm unless stated otherwise.

as embedment structures in a calcareous algal sheet that encrusts a fragment of a massive, colonial scleractinian coral (Fig. 1), possibly *Porites* sp. Also present are spiral embedments attributable to serpulid worms (Fig. 2). The coral skeleton has been penetrated by elongate, thread-like borings, *Trypanites weisei* Magdefrau, 1937, and shells of an embedding balanomorph barnacle, *Megatrema* sp. Other included structures are more equivocal.

Diagnosis: As for the genus.

Description: Straight to gently curved succession of closely associated, progressively broader, kidney-shaped depressions with smooth walls. Up to seven depressions per specimen (if the specimen in Fig. 2 is geniculate, this should be revised up to ten). Walls between depressions either perpendicular to surface or slightly oblique; if the latter, all are oblique in the same direction and to the same degree. Lining apparent in some depressions is presumably a remnant of the original gastropod shell. In some examples the structure of the coral is apparent in the base of the depressions (Figs. 2, 3). Close packing of *R. arcuatus* and other structures on surface has led to many specimens being incomplete or indeterminate.

Discussion: This is the first record of *Renichnus arcuatus* from the fossil record of Jamaica. It is generally accepted that *R. arcuatus* represents the cementation and embedment trace produced by attachment of a vermetid gastropod. Six vermetid species are found in the modern shallow-water environments of the Greater Antilles (Warmke and Abbott, 1961, pp. 65-67; Humfrey, 1975, pp. 82-83), attached to rocks, wharf pilings and dead corals. Most of these species have been identified from the Falmouth Formation on the eastern side of Rio Bueno Harbour, in a broadly similar lithofacies to west Rio Bueno (Donovan and Littlewood, 1993). Four of the extant Antillean species are attributed to *Petaloconchus* Lea, a genus known to have produced *R. arcuatus* traces in the Miocene of southern Poland (Radwański, 1977, p. 247).

The algal substrate appears to represent a sheet into which the embedding shell was attached, rather than it growing subsequently around *in situ*, cemented vermetids. The occurrence of 20 or more examples of *R. arcuatus* in close association is a reflection of the gregarious habit of vermetids (Warme, 1975, p. 216; Humfrey, 1975).

Acknowledgements

This research was supported by National Geographic Society grant # 7278-02, which is gratefully acknowledged. I thank Phil Crabb (Photographic Unit, The Natural History Museum, London (BMNH)) for taking the photographs and Roger W. Portell (Florida Museum of Natural History, Gainesville) for commenting on the barnacles. Dr. John W. M. Jagt (Natuurhistorisch Museum Maastricht) is thanked for his constructive review. This is a contribution to BMNH project #301 "Palaeoecology of hard substrates," and my RGM projects "Trace fossil studies" and "Caribbean palaeontology".

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Manuscript accepted on 3rd June, 2003