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First record of the holectypoid echinoid *Echinoneus cyclostomus* Leske from the late Pleistocene Falmouth Formation of Jamaica

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ABSTRACT. The irregular echinoid *Echinoneus cyclostomus* Leske is reported from the late Pleistocene shallow marine Falmouth Formation, West Rio Bueno, Jamaica. The species has been reported from the deeper water shelf marlstones of the early Pleistocene Manchioneal Formation of eastern Jamaica, the Miocene horizon of Anguilla and the ?Miocene La Cruz marl of Cuba.

INTRODUCTION

The known echinoid fauna of the Pleistocene of Jamaica has at least twenty-two species belonging to nine orders (Donovan *et al.*, 1994; Donovan and Gordon, 1993; Donovan and Embden, 1996). Gordon (1990) and Gordon and Donovan (1992) published a detailed analysis of the echinoids from the late Pleistocene Falmouth Formation. Although both mentioned *Echinoneus cyclostomus* Leske as one of the Recent shallow water echinoids of Jamaica, it was not recorded amongst the 8,474 ossicles they identified from eight localities at East and West Rio Bueno and Discovery Bay. In this note, *E. cyclostomus* is recorded from the Falmouth Formation for the first time.

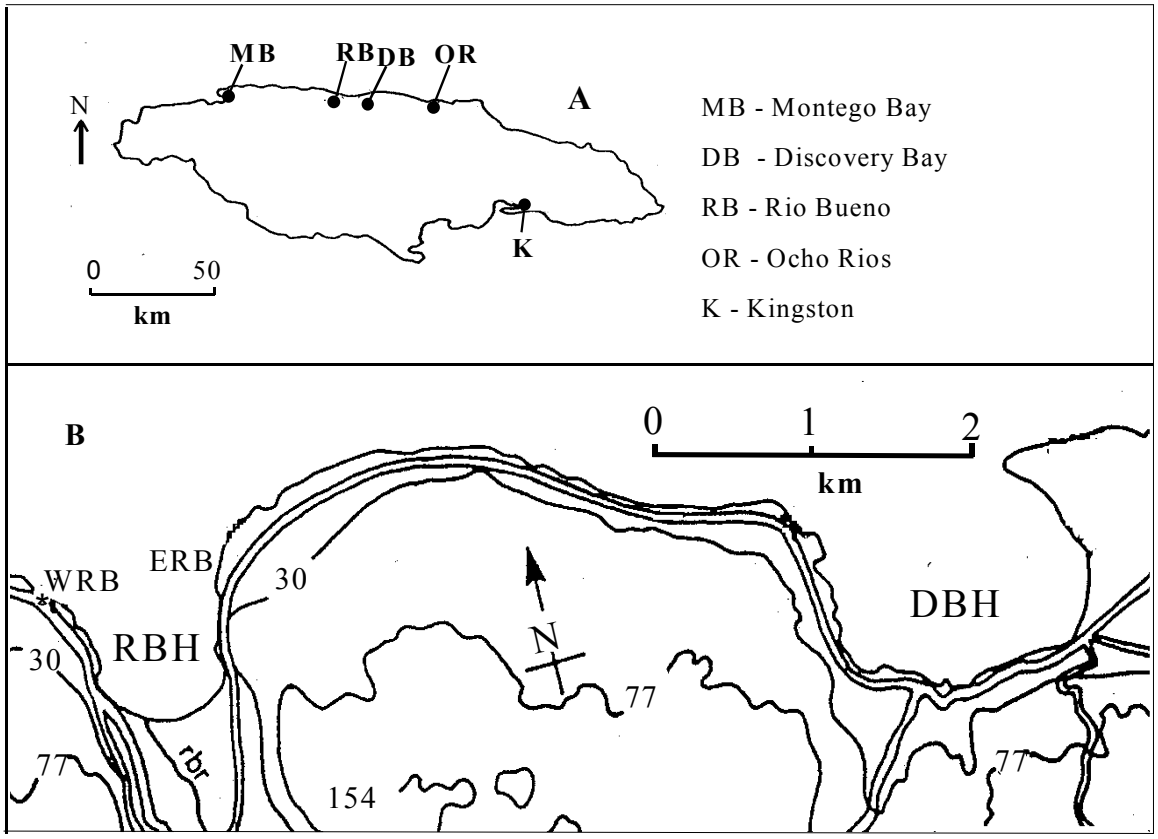

Fig. 1. A) Map of Jamaica showing locations. B) Topographical map of Rio Bueno Harbour (RBH) area showing the position of West Rio Bueno (WRB), East Rio Bueno (ERB) and Discovery Bay Harbour (DBH). Contours in metres.

METHODS

The Falmouth Formation at West Rio Bueno (Fig. 1) consists of coral rudstone and boundstone with a carbonate sand matrix rich in red algae and small molluscs. The corals present include *Acropora palmata* (Lamarck), *Diploria strigosa* (Dana), *Montastrea cavernosa* (Linnaeus), *M. annularis* (Ellis and Solander), *Porites* spp., and *Siderasterea* spp. A single test of *E. cyclostomus* was collected in a low terrace section in a crevice at the edge of a cliff face. The specimen is housed in the Geology Museum at the University of the West Indies with catalogue number UWIGM.1999.62.

SYSTEMATIC PALAEONTOLOGY

The classification used herein follows that of Smith (1984) and Smith and Wright (1989).

Order HOLECTYPOIDA Duncan, 1889
Family ECHINONEIDAE Agassiz and Desor, 1847
Genus *Echinoneus* Leske, 1778
Echinoneus cyclostomus Leske, 1778

Fig. 2

Material. One fragmented test (UWIGM.1999.62)

Description. Ovoid, fragmented test small, longer than wide (but broken in region of interambulacra II, III, IV), low, domed, rounded, and flattened in the apical region which slopes to the well-rounded ambitus. Apical system is slightly anterior to centre. The system has four depressed areas - gonopores. All gonopores are relatively symmetrical. Ocular and madreporite plates are indistinct due to profuse tuberculation.

Tubercles imperforate, smooth and noncrenulate, differentiate on apical surface into symmetrical primaries and secondaries; these are separated by miliary tubercles. Ambulacral and interambulacral tuberculation consists of conspicuously raised primary tubercles having symmetrical bosses. Tubercles on the oral surface have asymmetrical diamond shaped bosses; tubercles numerous increasing in size and density aborally (Fig. 2).

Two complete and a third partial ambulacra are preserved. Ambulacra narrow, slightly inflated, straight except for a gentle curve at the ambitus. Ambulacra I and V are longest. Interambulacra twice the width of ambulacra. Pores uniserial and isoporous; pore zone narrow, partly sunken and curves slightly at ambitus. Plate compounding indeterminate.

The oral surface is rounded but broken. The partly fragmented, periproct is inframarginal, posterior and left of centre of test, and has an ovoid tear-shaped outline. Initial observations indicate variations in position of periproct where the sample has the tear-shape with pointed end towards anterior as opposed to posterior of recent specimens. Peristome, ambulacra III and IV, interambulacra III, spines and pedicellaria are not preserved.

DISCUSSION

Two Recent species of *Echinoneus* are currently recognized: *E. abnormalis* De Loriol from the West Indies and *E. cyclostomus* from the Indo-Pacific (Mortensen, 1948, Donovan and Veale, 1996; Rose 1978). Mortensen (1948) remarked on the difficulties involved in differentiating between these two morphological similar species. *E. cyclostomus* lives across a range of depths (5 - 570 m) (Vaughan, 1922; Hendler *et al*., 1995) in turbulent waters with coarse substrate and coral rocks (Kier and Grant, 1965; Westergren, 1911; Mortensen, 1948; Rose, 1978).

In the Caribbean, fossil *E. cyclostomus* has previously been recorded from late Oligocene (Browns Town Formation) of Jamaica (Dixon and Donovan, 1998), early Miocene (Anguilla Formation) of Anguilla (Jackson, 1922; Poddubiuk and Rose, 1985), late Miocene of Cuba (Sanchez Roig, 1949), Pleistocene (reef terraces) of Barbados (Donovan and Veale, 1996) and early Pleistocene (Manchioneal Formation) of Jamaica (Hawkins in Trechmann, 1930: Donovan and Lewis, 1993; Donovan and Embden, 1996). The Browns Town specimen was from a shallow water shelf-edge limestone (Dixon and Donovan, 1998), the Manchioneal specimen was from bedded, nodular carbonates deposited in water depths of 100 m or more (Robinson, 1968; Donovan, 1993; Donovan and Embden, 1996), and the new specimen is from shallow water coral rudstones in the Falmouth Formation. These three occurrences are within the species Recent depth range (5 - 570 m: Hendler *et al*., 1995).

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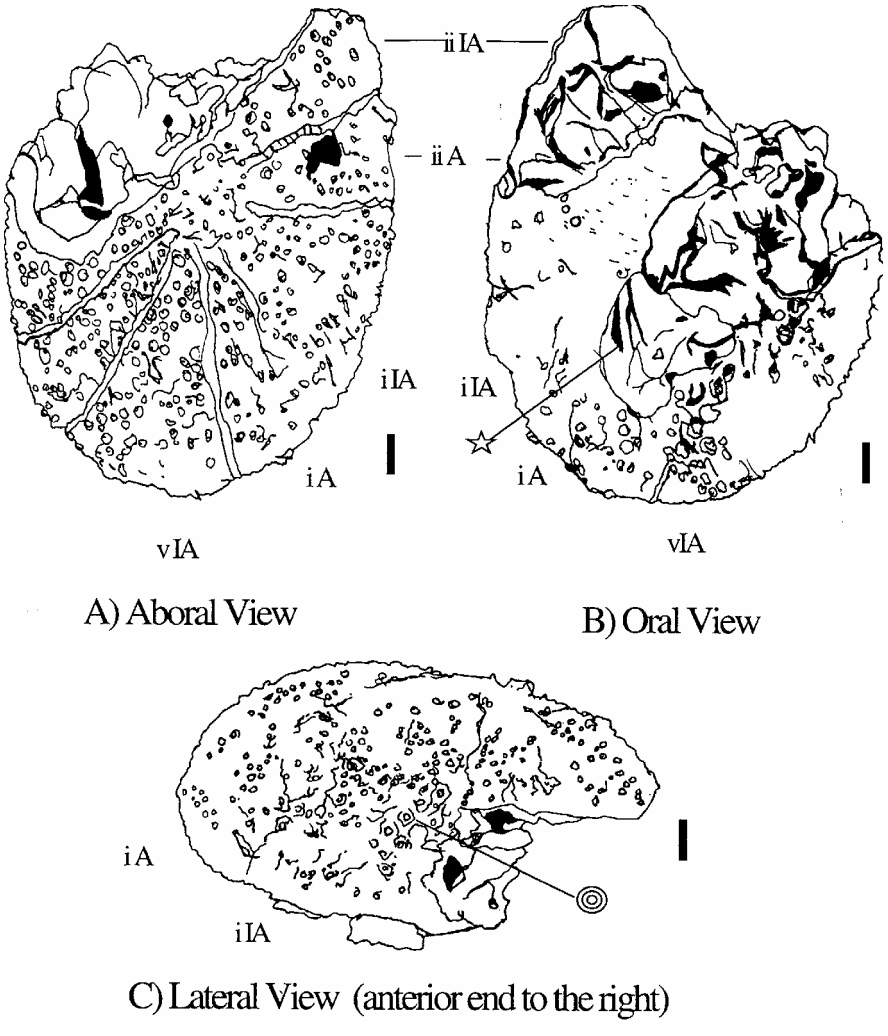

Fig. 2. Camera Lucida drawings showing *Echinoneus cyclostomus* Leske (UWIGM.1999.62). Star: peristome; circles: diamond-shaped bosses near ambitus; iA Ambulacrum; iIa Interambulacrum 1(numbers indicate coronal zone). Scale bar represents 1 mm.

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