

An isocrinid (*Echinodermata: Crinoidea*) from the Lower Pleistocene of Portland, eastern Jamaica

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Abstract — Crinoids are rare fossils in the Antillean region. The isocrinid cf. *Cenocrinus asterius* (Linné) is recognized from the Lower Pleistocene of eastern Jamaica on the basis of a single, dissociated, internodal columnal. Modern *C. asterius* is found at about 300 m depth on the deep fore reef at Discovery Bay, northern Jamaica.

INTRODUCTION

VERY FEW fossil crinoids have been described, or even mentioned, from the Antillean region. Crinoidal limestones of Cretaceous age have been reported from the Dominican Republic (Weyl, 1941, *loc. cit.*; Chubb, 1960). Valette (1926; Sánchez Roig, 1949) described two species

from Cuba, *Balanocrinus cubensis* (Lower Eocene) and *Austinocrinus cubensis* (Upper Cretaceous). A further species of *Balanocrinus*, *B. haitiensis*, was described by Springer (1924) from the Lower Miocene of Haiti. Apart from these reports, I am unaware of any other fossil crinoids described from the Caribbean. This is at least partly due to the migration of stalked crinoids out of shallow

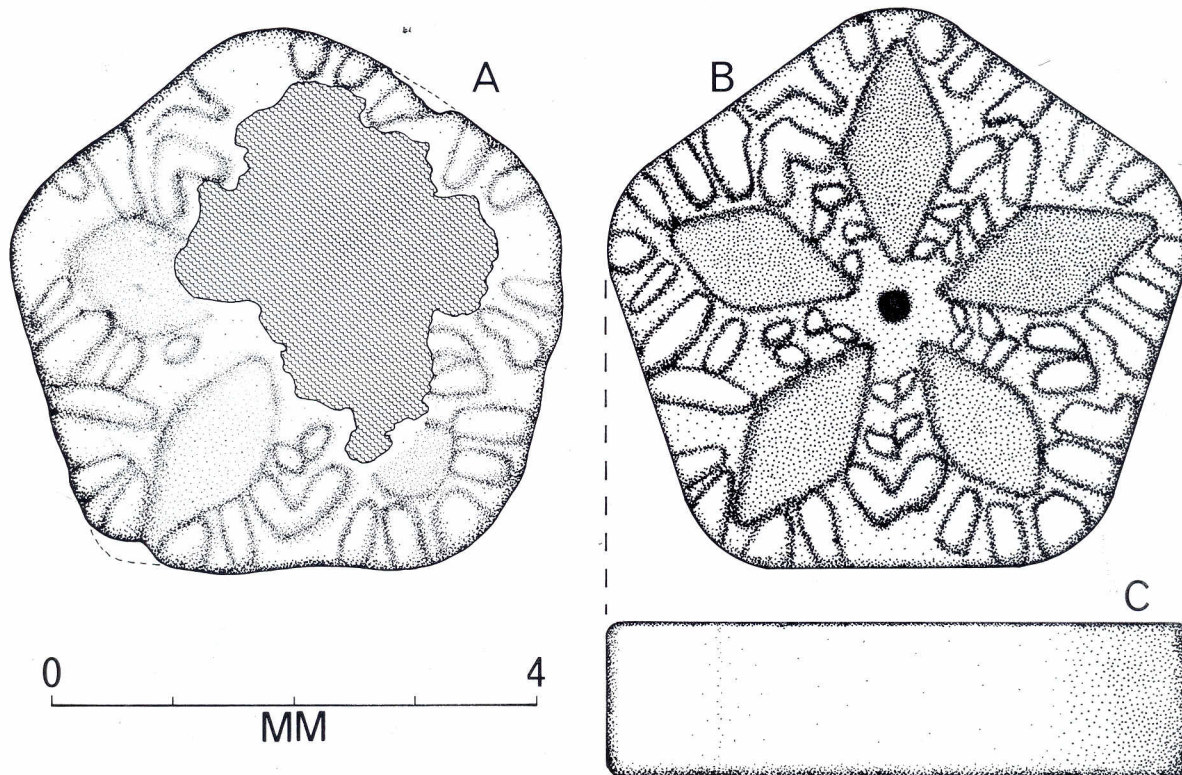


Figure 1. Cf. *Cenocrinus asterius* (Linné) from the Lower Pleistocene of San San Bay, Jamaica. A, BMNH E70448, camera lucida drawing of articular facet. B, C, restoration of same. B, articular facet. C, latus.

waters into the deep sea during the Upper Cretaceous, possibly in response to increased predation pressure (Meyer and Macurda, 1977; Jablonski *et al.*, 1983; Jablonski and Bottjer, 1987). The only modern shallow water crinoids are the so-called 'stemless' comatulids, in which the column is reduced to a single ossicle, the centrodorsal, bearing numerous cirri (attachment structures). Co-

matulids disarticulate rapidly after death to produce numerous small and unobtrusive ossicles. Even in deposits where comatulids are relatively common, centrodorsals and complete cups are difficult to find (for example, see Paul and Donovan, 1988). Stalked crinoids produce many more ossicles, the stem often being composed of hundreds or even thousands of distinctive columnals. However,

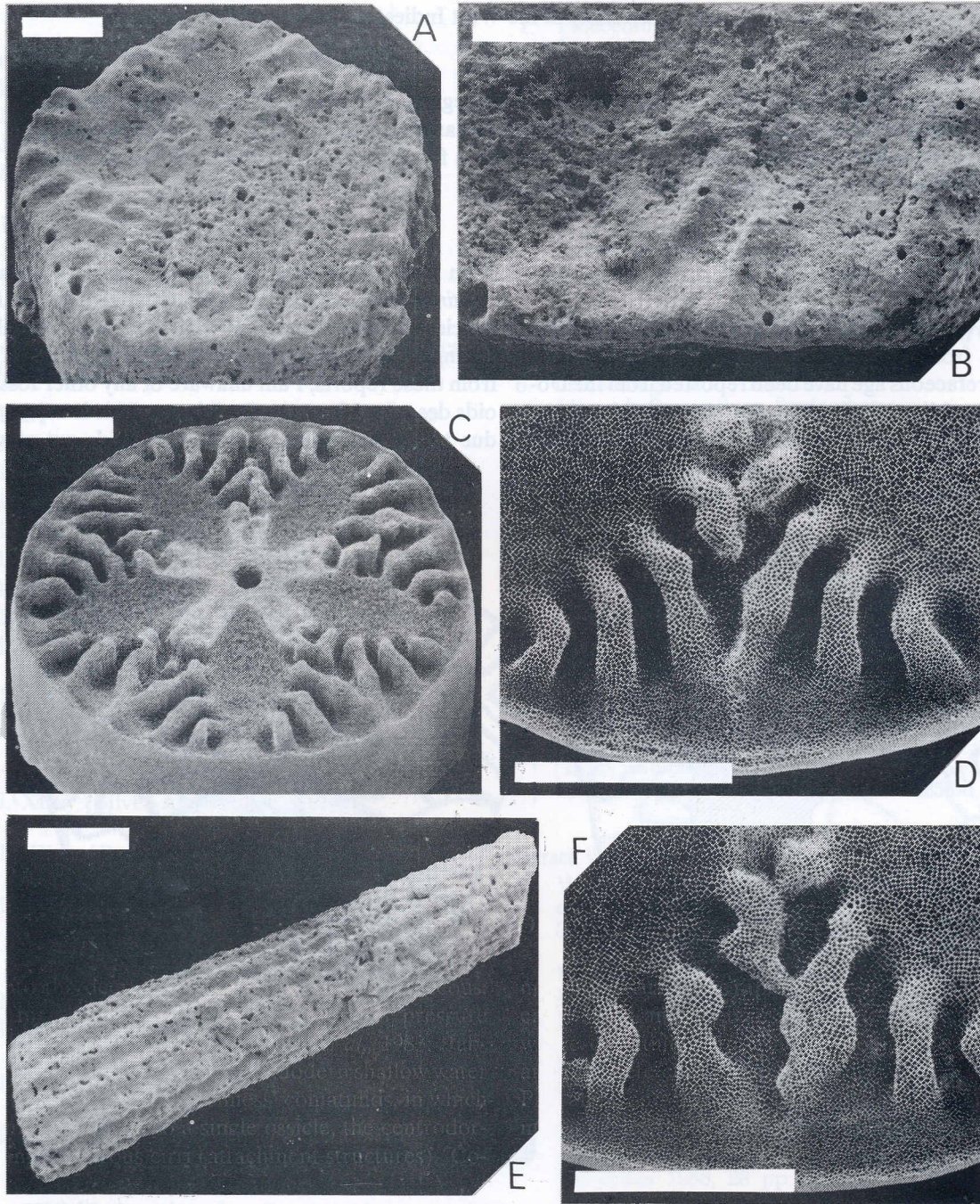


Figure 2. SE micrographs of Pleistocene and Recent echinoderms from Jamaica. All specimens coated with 60% gold-palladium. Scale bars represent 1 mm. A, B, *Cenocrinus asterius* (Linné), BMNH E70448, Lower Pleistocene, San San Bay. A, oblique view of articular facet and latus. B, crenularium. C, D, F, cf. *C. asterius*, Recent, Discovery Bay. C, BMNH E70449a, oblique view of articular facet and latus. D, F, crenularium. D, BMNH E70449a. F, BMNH E70449c. E, BMNH E70448, echinoid spine, Lower Pleistocene, San San Bay.

their distribution on the modern deep fore reef off Discovery Bay is patchy (personal observation), so the detection of crinoid debris in ancient, deeper water deposits in Jamaica is, at best, a matter of chance.

It is therefore pleasing to be able to describe an isocrinid crinoid from the Lower Pleistocene of Jamaica, albeit on the basis of only a solitary columnal. Crinoid terminology used in this paper follows Moore *et al.* (1968) and Ubaghs (1978).

SYSTEMATIC PALAEOLOGY

Class CRINOIDEA J.S. Miller, 1821

Subclass ARTICULATA von Zittel, 1879

Order ISOCRINIDA Sieverts-Doreck, 1952

Family ISOCRINIDAE Gislén, 1924

Genus CENOCRINUS Thomson, 1864

cf. *Cenocrinus asterius* (Linné, 1767)

Figs. 1A, 2A, 2B

1969 Crinoids; Robinson, p. 9.

1971 *Isocrinus*; Moore in Robinson, p. 215.

Material, locality and horizon. A single internodal columnal, British Museum (Natural History) (BMNH) E70448, collected from a loose block in a banana plantation, about localities ER143/21 to 24 of Robinson (1969, fig. 2, pp. 7-9), at San San Bay, Portland, northeast Jamaica, GR M588663. The original locality of Robinson is now obscured by a retaining wall and his original collection of crinoid ossicles is lost (see below). Navy Island Member, Manchioneal Formation, Upper Coastal Group. Foraminiferan Biozone N22 (Banner and Blow, 1965), Lower Pleistocene (Calabrian).

Description. A single, dissociated internodal columnal. Columnal outline pentagonal with rounded angles (Figs. 1A, 2A). Axial canal obscured by sediment. Articulation symplexial, arranged around five petal-like, depressed, diamond- to pear-shaped areola pits which correspond to the columnal angles. Areola petals closed and separate. Crenulae arranged from perpendicular to subparallel to petal circumferences. Crenulae short, unbranched but sometimes fused between adjacent petals (Figs. 1A, 2A, 2B). Latus planar, unsculptured. Dimensions: KD = 4.80 mm; KH = 1.25 mm; Hi = 26. A restoration of the columnal appears in Figs. 2B, C.

DISCUSSION

IN THE LATE 1960s, Professor Ted Robinson, of the University of the West Indies, made a collection of columnals from the San San section and sent them to Raymond C. Moore, at the University of Kansas, for identification (E. Robinson, personal communication). Unfortunately, Moore died after informing Professor Robinson of his taxonomic conclusions, and this collection cannot now be found at Kansas (Dr R.L. Kaesler, written communication) or at the University of Iowa (Dr J. Golden, written communication), where they may have been sent to the late Harrell L. Strimple for examination. This loss is particularly unhappy, because the section at San San Bay is now concealed by a retaining wall and the only rocks 'exposed' are loose blocks in the adjacent banana plantation. Examination of these blocks has yielded only a single columnal (Figs. 1A, 2A, 2B) and a few echinoid spines (Fig. 2E) as a sparse echinoderm fauna.

This is the first fossil crinoid to be described from Jamaica and is undoubtedly derived from an isocrinid. By comparison with Rasmussen (1978, figs. 572, 573.1), it is apparent that it is neither *Austinocrinus* nor *Balanocrinus*. It does not, therefore, belong to any of the fossil species hitherto described from the Greater Antilles. At least six extant isocrinids are known from the Caribbean: *Cenocrinus asterius* (Linné) and *Endoxocrinus parrae* (Gervais) have been recorded off Discovery Bay, Jamaica (Macurda and Meyer, 1974); *Neocrinus blakei* (Carpenter), *N. decorus* (Wyville Thomson) and *E. parrae* occur around Cuba (H.L. Clark, 1941; *E. prionodes* H.L. Clark, reported in the same paper, is a junior synonym of *E. parrae*; Meyer *et al.*, 1978, p. 425); *Diplocrinus maclearanus* (Wyville Thomson) from the Bahamas (Messing, 1985); and *D. carolinae* A.H. Clark from Puerto Rico (A.H. Clark, 1934). *N. decorus* and *C. asterius* are also known from Saba Island (Roux, 1977). The zoogeography of extant Caribbean crinoids is discussed in detail in Meyer *et al.* (1978). Comparison has been made between all of the above species and the San San Bay taxon.

Columnals of *E. parrae* are well illustrated by Roux (1977, fig. 14). The crenulae of this species are not in contact between adjacent pear-shaped petals, unlike the San San Bay specimen. Columnals of *N. blakei* have diamond-shaped areola petals similar to those of the San San Bay species. Roux (1977, fig. 18) illustrates *N. blakei* as having no apparent 'fusion' of crenulae in close contact between areola petals, although 'fusion' is shown by the specimen in Macurda and Meyer (1975, pl. 1, fig. 1). However, the facet outline of *N. blakei* is more rounded than pentagonal, unlike the San San Bay specimen. *N. decorus* has a similar columnal outline to *N. blakei*, with pear-shaped areola petals and crenulae that do not coalesce between

adjacent petals (Roux, 1977, fig. 19; Donovan, 1984). *D. maclearanus* has columnals that are very similar to the San San Bay specimen (cf. Macurda and Roux, 1981, pl. 15, Figs. 4-7). The outline of the columnal is pentagonal and culmina coalesce between adjacent petals. However, it differs from the San San Bay specimen in having open, rather than closed, areola petals which coalesce around the lumen. It is assumed that *D. carolinae* has a broadly similar columnal architecture (cf. *D. alternicirrus* and *D. wyvillethomsoni* in Roux, 1977, figs. 16, 17).

From the published figures, the closest approach to the San San Bay species is *C. asterius* (Roux, 1977, fig. 13). This is illustrated as a pentagonal columnal with rounded angles and slightly infolded sides, culmina that coalesce between adjacent petals and diamond-shaped areola petals that become elongate towards the circumference of the articular facet (cf. bottom left petal of Roux, 1977, fig. 13, with the petal in the same position in Fig. 1A herein). Dr J.D. Woodley kindly supplied me with a short length of distal stem from *Cenocrinus* cf. *asterius* from Discovery Bay, which has been disarticulated in bleach and examined by scanning electron (SE) microscope (BMNH E70449a-e; Figs. 2C, D, F). These columnals have a less angular outline than the San San Bay specimen (cp. Figs. 1A, 2A with 3C), but the articular facet sculpture of the fossil species, particularly the crenularium architecture, agrees reasonably closely with that of the Discovery Bay specimen (cp. Figs. 1A, B with 3D, F). It is therefore tentatively suggested that *C. asterius* (or, perhaps, a related species) is recognized from the Lower Pleistocene of Jamaica.

Robinson (1969, p. 9) noted the presence of deep-water alcyonarian corals in the Manchioneal Formation at San San Bay. The presence of isocrinids also indicates a deeper-water habitat (see comments above). Modern *C. asterius* occurs at 200-400 m on the deep fore reef at Discovery Bay.

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