

The mid-Palaeozoic camerate crinoid *Scyphocrinites* Zenker in southwest England

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Abstract

Přidolí (Upper Silurian) and Devonian rocks of the British Isles are mainly non-marine. The only occurrence of the wide-ranging planktonic crinoid *Scyphocrinites sensu stricto* in the British Isles is in Cornwall, southwest England. Although this occurrence was long thought to be Silurian, either Wenlock or Ludlow, the range of this genus is restricted to Přidolí (Upper Silurian) and lowermost Lochkovian (Lower Devonian). Available evidence supports a Lochkovian age for the Cornish specimens; Silurian rocks are absent from this area. These fossils were not illustrated in the original report; this omission is rectified herein.

Key words: Crinoidea, Scyphocrinites, England, Silurian, Devonian

Introduction

In the course of collaborative research with Professor G. D. Sevastopulo and co-workers on the Silurian (Ludlow) crinoid '*Actinocrinites*' *pulcher* M'Coy, 1851, which represents a new genus of monobathrid camerate perhaps ancestral to planktonic *Scyphocrinites* Zenker, we were reminded of the occurrence of loboliths of *Scyphocrinites sensu stricto* in the Silurian of southwest England. Loboliths are modified attachment structures that are interpreted as serving as floats; *Scyphocrinites* was thus planktonic. These were documented by Bather (1907) over 100 years ago, since which the only detailed re-examination was in an unpublished Ph.D. thesis (Ramsbottom, 1953). No illustration of any of these specimens was published until recently (Donovan *et al.*, 2008a, fig. 5) and their stratigraphic position has remained equivocal (see below).

The purpose of the present paper is not descriptive. The Cornish specimens, although diagnostic of *Scyphocrinites* loboliths, are poorly preserved. They add nothing to our knowledge of loboliths, structures that have been amply documented elsewhere. Rather, our aim is two-fold: to adequately illustrate some of the British specimens (Fig. 1), although they are admittedly poor specimens; and to clarify their stratigraphic position. This short communication is therefore provided as a supplement to Bather's original paper and a slightly belated centennial celebration of the original report of the only *Scyphocrinites*-bearing deposits in the British Isles.

Terminology of the crinoid endoskeleton follows Ubaghs (1978a) and Moore *et al.* (1978). Higher classification of crinoids follows Simms & Sevastopulo (1993). Our philosophy of open nomenclature follows Bengtson (1988). The specimen discussed herein is deposited in the British Geological Survey, Keyworth (BGS GSM).

Locality and horizon

All specimens are from Catasuent Cove, Porthluney, Cornwall, southwest England [approximate NGR SW 980 408], and were collected by C. Reid and W. G. Fearnside in 1904 (Ramsbottom, 1953, p. 201). See Sadler (1974, text-fig. 1) for a simplified geological map of this area. Green (1904, p. 289) reported "minute ossicles of crinoids" from this locality, which may have been derived from multiplied loboliths. The only other crinoids described from this area are Ordovician (Donovan, 1995, p. 160, text-fig. 48L, M).

The British Geological Survey (BGS) Palaeosaurus database (M. Howe, written comm.) notes that BGS GSM 85519 (Fig. 1C) came from a limestone lenticle. It is (erroneously) identified as the rhombiferan cystoid *Pseudocrinites magnificus* Forbes, 1848, which Paul (1967, pp. 321–322) considered a junior synonym of *Pseudocrinites bifasciatus* Pearce, 1843. This species is only known from the Much Wenlock Limestone Formation of Dudley, West Midlands (Wenlock). Palaeosaurus further noted that BGS GSM 85529 came from "Limestone and dolomite in a crush breccia along big overthrust." Bather (1907, p. 191) recorded these fossils coming from "Black slates with limestone lenticles or inclusions."

Ramsbottom (1953, p. 201) considered the horizon "probably Silurian." BGS Palaeosaurus considers it Wenlock based on the misidentification of a lobolith as *Pseudocrinites*. The presence of loboliths of *Scyphocrinites* indicate a higher stratigraphic position, probably Přidolí, but possibly even lowermost Lochkovian (Haude, 1992). Indeed, Sadler (1974) considered that Lower and Middle Devonian slates, volcanic rocks and quartzites rest with non-angular unconformity on the Ordovician Gorran Quartzites, with no mention of Silurian. Matthews (*in* House *et al.*, 1977, p. 25) noted that the rocks

that had previously yielded supposed Ludlow cephalopods were now found to include Devonian conodonts. Current interpretations include the Lower Palaeozoic and older Devonian rocks of south Cornwall in an olistostromic succession (Barnes, 1983; Bluck *et al.*, 1992, p. 57). Therefore, a Devonian (lowermost Lochkovian) stratigraphic position for the Cornish loboliths must be preferred.

Systematic palaeontology

- Class Crinoidea J. S. Miller, 1821
- Subclass Camerata Wachsmuth and Springer, 1885
- Order Monobathrida Moore and Laudon, 1943
- Suborder Glyptocrinina Moore, 1952
- Superfamily Melocrinitacea d'Orbigny, 1852
- Family Scyphocrinitidae Jaekel, 1918
- Genus *Scyphocrinites* Zenker, 1833

Type species: *Scyphocrinites elegans* Zenker, 1833, p. 25, by monotypy (Ubaghs, 1978b, p. T489).

Diagnosis: (After Ubaghs, 1978b, p. T489.) "Calyx large, expanding or contracting toward arm bases, with interradian areas depressed or protuberant, largely formed of fixed pinnulars; fixed secundibrachs 10 to 20 or even more, 1st pinnule borne by fixed secundibrach 2 (outer) and 2nd pinnule by fixed secundibrachs 4 (inner). Anal tube strong, subcentral on tegmen. Free arms composed of very short brachials arranged uniserially or biserially. Column ending distally either in small encrusting root or (more typically) in large bulbous chambered structure designated separately as *Lobolithus* or *Camarocrinus* with walls of minute irregular plates, having their origin in bifurcations and modifications of innumerable root-branches; axial canal of stem quinquelobate to sharply quinquestellate."

Range: Upper Silurian (Přidoli) to Lower Devonian (lowermost Lochkovian), global in distribution (Haude, 1992).

Remarks: *Camarocrinus* Hall, 1879, was considered to be merely a name for the chambered basal termination of the stem by Ubaghs (1978b), that is, similar to *Lobolithus*, but Haude (1992, p. 176 *et seq.*) re-established it as a valid genus.

Scyphocrinites sp.

(Fig. 1)

- 1907 *Scyphocrinus*; Bather, pp. 192–196.
- 1907 *Scyphocrinus*; Kitchen, p. 73.
- 1907 *Scyphocrinus*; Reid [loc. cit. Ramsbottom, 1953, p. 203].
- 1953 *Scyphocrinites* sp.; Ramsbottom, pp. 201–203, text-fig. 12A–C, pl. 29, figs. 1–3.
- 1958 *Scyphocrinites*; Ramsbottom, p. 106.
- 1977 *Scyphocrinites*; Matthews in House *et al.*, p. 25.
- 1992 *Scyphocrinites*; Matthews in Cocks *et al.*, p. 17.

2008a *Scyphocrinites* sp.; Donovan *et al.*, p. 36, fig. 5, table 1.

2008b *Scyphocrinites* sp.; Donovan *et al.*, p. 339, table 15.3.

Material: Twelve rocks fragments and slabs bearing loboliths, fragments of column and possibly plates of crowns, BGS GSM 85519–85530 (Fig. 1).

Locality and horizon: See above.

Description: See Bather (1907) and, particularly, Ramsbottom (1954, pp. 201–203).

Remarks: These specimens represent typical *Scyphocrinites* loboliths (Fig. 1), although their preservation is poor. *Scyphocrinites* Zenker was a highly distinctive camerate crinoid with an unusually wide geographic distribution. This was presumably due to its planktonic habit. This was facilitated by the distal 'attachment' forming the lobolith or flotation device. Its rarity in the British Isles, which perhaps can be considered the cradle of systematic crinoid studies (Miller, 1821; Knell, 2000, pp. 102–104), is undoubtedly facies controlled. Most Přidoli and Devonian rocks in the British Isles are non-marine in origin, the Old Red Sandstone. Only in southwest England are there common marine Devonian rocks, and only in southwest Cornwall do there appear to be marine Devonian(?) rocks of the correct age and facies to include *Scyphocrinites*.

Acknowledgements

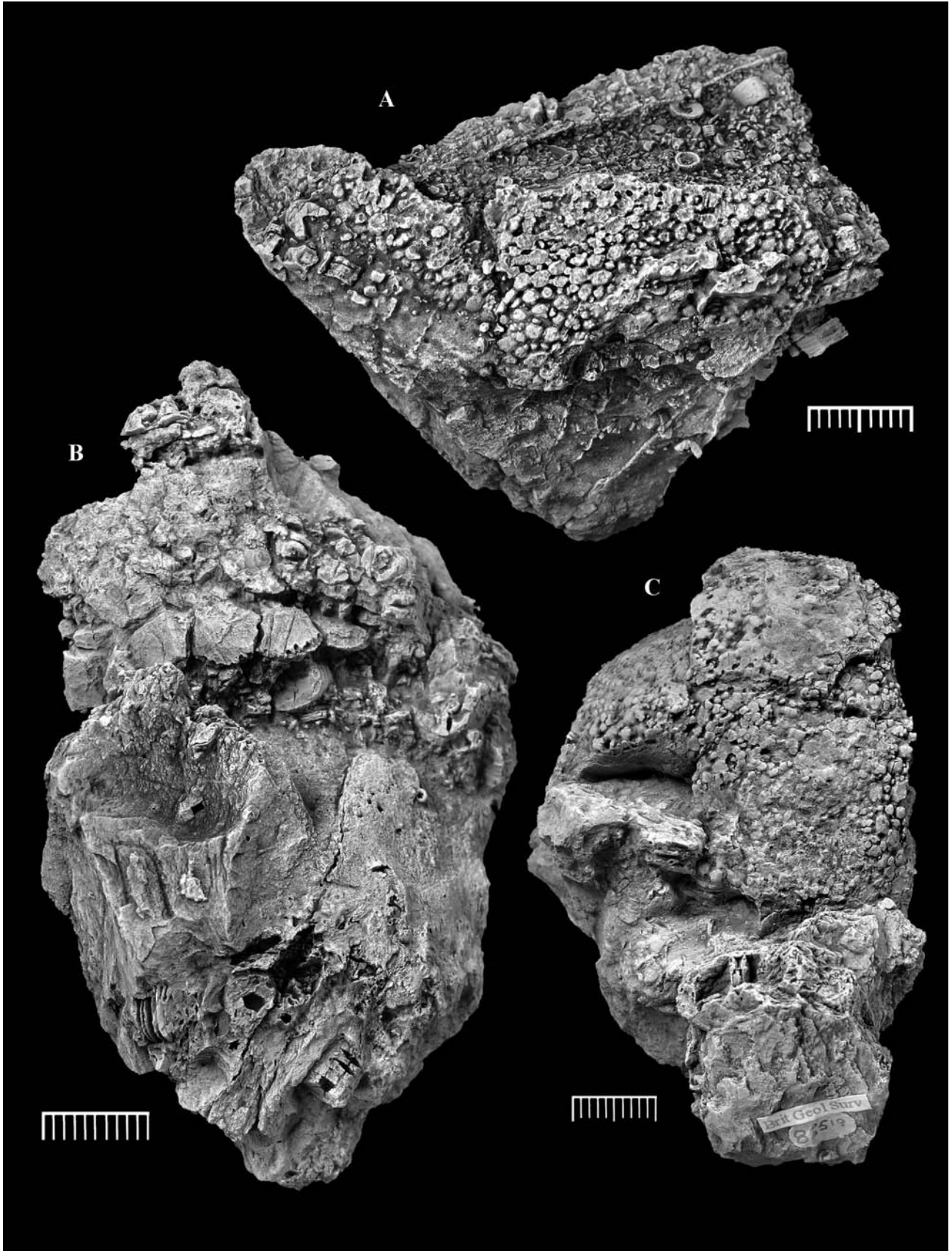
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→Fig. 1.

Scyphocrinites sp., Catasuent Cove, Porthluney, Cornwall, southwest England. A, BGS GSM 85522, lobolith plating (centre) with associated crinoid debris, the robust brachial (left) agrees well with that illustrated from Bohemia by Bather (1907, p. 194). B, BGS GSM 85523, crinoid debris. C, BGS GSM 85519, *non Pseudocrinites magnificus* Forbes, 1848. Specimens whitened with ammonium chloride. Scale bars in mm.



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