

CRINOIDS

FROM DEPTHS EXCEEDING 6000 METERS

By TORSTEN GISLÉN †

Zoological Institute, Lund, Sweden

Several species of comatulids as well as stalked crinoids were collected during the Galathea Expedition in depths shallower than 6000 m, but only one locality in greater depth, the Kermadec Trench, yielded crinoids.

In 1869 the Porcupine Expedition secured a stalked crinoid, a *Bathyrinus*, from a depth of 4450 m in the Bay of Biscay. For a long time this was the deepest find of crinoids. The same species, *B. gracilis*, was collected in 1896 at a depth of about 5000 m, not far from the type-locality. During the Swedish Deep Sea Expedition in 1948 another species of the same genus was collected in the Mid-Atlantic in a depth of 5800 m. The family of the Bathyrinidae was repeatedly taken by the Galathea Expedition. It is represented by three genera in the collections. Still only one member of the genus *Bathyrinus* was recorded from depths exceeding 6000 m. This crinoid was found in an abyss of 8300 m, thus surpassing the earlier crinoid records by no less than 2500 m.

Bathyrinus australis (A. H. Clark)

Pl. 1.

For earlier literature see A. H. CLARK 1915.

Ilycrinus australis A. H. CLARK 1915 p. 154 ff.

Bathyrinus australis GISLÉN 1939 p. 16.

The Galathea Expedition 1950-52 St. 649. 35°16'S. 178°40'W. The Kermadec Trench. 8210-8300 m.

Description.

Crown 1: Stem of a proximal diameter of 1.8 mm. About 20 short segments before the one attaining L = br. Stem diameter here 1.1 mm. Distance from base of BB to a stem-joint having L = br: 8.5 mm.

Basal ring: diameter 1.9 mm, h = 1 mm, diameter of radial ring proximally 1.9 mm, distally 3.5 mm. Each RR: br. 1 mm proximally, 2 mm di-

stally, h 1.3 mm. I Br 1 + 2: h 4.2 mm. I Br 1: br 1.8 mm proximally, 2 mm distally, h 2.2 mm. I Br 2: br proximally 2.0 mm, distally 2.2 mm, h 2.0 mm. An indistinct knob dorsally at joint between I Br 1 and 2. Arms from I Br 1 to Br 5: 10 mm. A median rounded thickening along the dorsal side of the arm segments. The lateral sides of the arms in close contact with their corresponding neighbours by thin flanges running from I Br 2 to Br 2 or 3 on the outer sides of the arms and from Br 2 to Br 4 or 5 on the inner sides.

Articulations of the arm-bases Br 1 + 2 3 4 + 5, arms broken distally. Arms smooth with insignificantly thickened rims at articulations.

Crown 2: Proximal stem joints almost fused into one ossicle. Length of this part 3.5 mm. Diameter of stem proximally 1.6 mm, at segments L = br about 1.0 mm. Short joints about 20 segments. I Br 1 to Br 5: 9.8 mm. Proximal arm segments 1 + 2 3 4 + 5 6 7 + 8.

Crown 3, broken between BB and RR:

I Br 1 to Br 5: 10.5 mm. On the inner sides of the arms the flanges continue from Br 2 to Br 6 or 7. Articulations of arm-bases: 1 + 2 3 4 + 5 6 7 + 8 9 10 + 11 or 1 + 2 3 4 + 5 6 + 7 8 9 + 10 11. Pinnules begin distally of Br 11? Arms smooth.

Crown 4: A very small specimen. Only RR - I Br 2 - Br 4 present. Length 4.5 mm.

Several stem fragments:

Joints in median parts of stem smooth. Length quickly becoming = 2 br. Then increasing still more, L = 3 br, the joints growing slightly knobby at the articulations, sometimes with faintly discernible syzygies in the middle part. Length of ossicles about 3 mm, diameter of medial part 0.8 mm, at articulations 1 mm. In more distal parts of stem shorter joints again and still larger knobs at the articulations.

Distal parts of stem very much thickened at articulations. Length of stem joints 4.5 mm, medial

part narrower, diameter 1.5 mm. Knobs at articulations: broadest diameter 2.9 mm, narrowest diameter 2.0 mm. Broadest articulation as usual alternating with 90° for each consecutive joint. Distal ossicles shortened to $L = 1\frac{1}{5}$ medial br. Distalmost ossicles with smoother joints, branched, with rhizoids. Longest stem-fragment 75 mm.

There are in addition 4 smaller and thinner stems, broken between RR and BB. Basal ring br 1.2-1.6 mm. Proximal part of stalk with a diameter 1.0-1.2 mm. About 15-20 short segments. Diameter of stem joint at $L =$ br 1.0 mm. The proximal part of the stem with these short ossicles totalling 5 to 6 mm.

The two species *B. aldrichianus* Wyv. Thomson and *B. campbellianus* P. H. Carpenter represent in fact the same species. Dr. CARPENTER's *aldrichianus*, on the other hand, is something quite different from what WYV. THOMSON originally designated by the same name. Therefore, A. H. CLARK in 1907 p. 553, clearing up the whole complicated story, proposed a new name, *australis*, for *aldrichianus* sensu P. H. Carpenter.

B. aldrichianus Wyv. Thomson is a mid-atlantic species which was refound by the Swedish Deep Sea Expedition in the vicinity of the type-locality and described by me in 1951 (p. 51). Furthermore, under the name of *B. serratus* it was recorded from off Virginia and Maryland by A. H. CLARK in 1908 (p. 205).

B. australis, on the other hand, was hitherto recorded from two localities only, from between Crozet Island and Enderby Land.

The two species *australis* A. H. Clark (*aldrichianus* sensu P. H. Carpenter) and *aldrichianus* Wyv. Thomson (*campbellianus* sensu P. H. Carpenter) seem to be two well distinguished species, belonging to a group of Bathycrini which has more than 15 short proximal stem joints. (*B. australis* was figured under the name of *aldrichianus* by CARPENTER 1884 Pl. 7, and by DÖDERLEIN 1912 Pl. 6 fig. 7 under the name of *australis*. *B. aldrichianus* Wyv. Thomson was figured by CARPENTER 1884 pl. 8 under the name of *campbellianus*, by A. H. CLARK 1908, p. 206, under

the name of *serratus*, and by GISLÉN 1951 Pl. 1 fig. 1 under the name of *aldrichianus*).

Judging from the facts known *australis* seems to have the arms perfectly smooth, except for a small knob at the syzygies. The I Br. 1-2 are rather long with I Br 2 being as long as or longer than broad. These ossicles are rather broadly flanged and have a median rounded swelling along the dorsal side. *B. aldrichianus*, on the other hand, has serrate arms with rather short I Br 1-2, I Br 2 having the length shorter than the breadth. The dorsal side of the arm-joints in *aldrichianus*, as figured by H. P. CARPENTER under the name of *campbellianus* and well visible in the specimen from the Swedish Deep Sea Expedition too, is provided with some longitudinal low ridges, and has no knobs at the syzygies. Apart from an insignificant out-bending of the proximal part of the RR and a very tight fusing together of the short proximal stem-joints in the specimens obtained in the Kermadec Trench, I can see no difference between these and those formerly found of *B. australis*.

This new find from the Kermadec Trench extends the distribution of *B. australis* very considerably. It is evident that it must be regarded as an antarctic species occurring in deep to very deep water circum-antarctically. The occurrence at a depth surpassing that of the other known Bathycrini by 2500 m and that of former records of *B. australis* by 3650 m is remarkable.

LITERATURE

- CARPENTER, P. H. 1884: Report upon the Crinoidea. 1. — Rep. Challenger Exp. Zool. 11.
- CLARK, A. H. 1907: A new species of crinoid from the Pacific coast with a note on Bathycrinus. — Proc. U. S. Nat. Mus. 32, pp. 551-554.
- 1908: New stalked crinoids from the east coast of N. America. — Ibid. 34, pp. 205-208.
- 1915: Die Crinoiden der Antarktis. — Deutsche Südpol. Exp. 16, Zool. 8.
- DÖDERLEIN, L. 1912: Die gestielten Crinoiden der deutschen Tiefsee Exp. — Wiss. Ergebn. Valdivia. 17, 1.
- GISLÉN, T. 1939: A revision of the recent Bathycrinidae. — Kungl. Fysiogr. Sällsk. Handl. N. F. 49, 10.
- 1951: Crinoidea. — Report Swed. Deep Sea Exp. 2, Zool. 4.