

A NEW UNSTALKED CRINOID FROM THE PHILIPPINE ISLANDS.

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In a preliminary account of a collection of comatulids from the Philippine Islands I recorded a specimen of *Comaster multifida* as having been taken by the U. S. Bureau of Fisheries steamer *Albatross* near Port Dos Amigos, Tawi Tawi. This specimen fits the available descriptions of *C. multifida* exactly; but recently, during a visit to Paris, I was enabled to examine the type of Müller's species, and I found, much to my surprise, that it is quite a different thing from what I had supposed.

Comaster multifida is very closely related to *C. typica*, but it is a smaller species with a much smaller number of arms; these are about forty in number and show, so far as it is developed, the same scheme of arm division characteristic of *C. typica*.¹ The centrodorsal is not so much reduced as it is in *C. typica*, and usually bears a few cirri.

The *Comaster variabilis* described by Prof. F. J. Bell in 1884 is founded upon specimens both of *C. typica* and of *C. multifida*, the type being one of the former.

In the *Challenger* report Carpenter placed *Comaster multifida* in his "Parvicirra Group," far removed from *C. typica*, which was the type of his "Typica Group;" although I recognized the fact that both *multifida* and *variabilis* belonged in the genus *Comaster*, the wide separation of the forms, and the important structural differences shown by Carpenter, prevented me from detecting their fundamental agreement with *C. typica*, which was at once evident upon examination of the types.

C. multifida was supposed to differ radically from *C. typica* in having the ossicles of the division series united by synarthry instead of by syzygy. It is true that the ossicles of the division series are united by synarthry in *C. multifida*, but I have recently shown that the supposed syzygy which unites these ossicles in *C. typica* is not a syzygy at all, but a peculiarly modified synarthry, possessing many of the characters of a syzygy, a type of articulation for which I suggested the name pseudosyzygy.

¹ This is shown in Professor Döderlein's figure (Denkschr. Ges. Jena, vol. 8, 1898, pl. 36, fig. 4, "*Actinometra belli*") of a young specimen.

The specimen from Tawi Tawi agrees with *C. multifida* in having true synarthries between the ossicles of the outer division series; but it differs markedly in the scheme of arm division, and in its larger and permanent cirri. It is probably most nearly allied to *C. delicata*, but represents a very distinct new species, which may be described as follows:

COMASTER TAVIANA, new species.

Phanogenia carpenteri A. H. CLARK, Proc. U. S. Nat. Mus., vol. 36, 1909, p. 392.

Description.—Centrodorsal discoidal, broad, the polar area flat, 5 mm. in diameter; cirrus sockets arranged in a single crowded, somewhat irregular, marginal row.

Cirri XX–XXII, 16–18, moderately slender, 13 mm. to 15 mm. long; first two segments about twice as broad as long, third slightly longer than broad, fourth—seventh or eighth half again as long as broad, the following gradually decreasing in length, the terminal seven or eight being about one-third again as broad as long; ninth a transition segment, rounded in cross section and with a dull surface like the preceding in the proximal three-fourths, polished like the succeeding in the distal fourth; following the transition segment the segments become rather strongly compressed laterally, so that in a lateral view the cirrus appears to thicken from this point onward; transition and following segments with the distal dorsal edge produced, this production rapidly becoming more sharply rounded, and soon Λ -shaped, the segments at the same time becoming distally more carinate dorsally, so that the later segments are provided with a small but sharp subterminal tubercle; in addition, the segments from the eleventh or twelfth onward have, just before their middle, a second, more rounded median dorsal tubercle, not quite so high as that in the distal portion, presenting, therefore, the same appearance as the cirrus segments of *Oligometra adeonæ*; opposing spine represented by a small median tubercle arising from the entire dorsal surface of the penultimate segment, the apex usually forming in lateral view slightly more than a right angle, though occasionally more sharp; terminal claw somewhat longer than the penultimate segment, stout basally but becoming more slender distally, moderately curved.

Ends of the basal rays visible as small tubercles in the angles of the calyx; radials only slightly visible in the angles of the calyx, over the ends of the basal rays; IBr_1 very short and broad, more or less (sometimes wholly) concealed by the centrodorsal, just in contact basally but diverging distally; IBr_2 broadly pentagonal, almost triangular, twice as broad as long, or even somewhat broader; IIBr 4 (3 + 4); IIIBr 2; IVBr 2, but irregular in occurrence; division series free laterally though not widely separated, rounded dorsally, but not especially convex.

Thirty-six arms about 100 mm. long; first brachial short, wedge shaped, almost entirely united interiorly, twice as broad as its interior length or slightly broader; second brachial similar, but slightly larger; third and fourth (syzygial pair) not quite so long as broad; next two brachials oblong, about twice as broad as long, then becoming triangular, about half again as broad as long, after the end of the proximal third of the arm gradually becoming wedge shaped, and in the terminal portion wedge shaped, about as long as broad; fourth and following brachials with strongly produced and finely spinous distal ends. The arm increases gradually in diameter up to the tenth brachial, then tapers away very gradually distally. Syzygies occur between the third and fourth brachials, again usually between the thirteenth and fourteenth, and distally at intervals of four (more rarely five) oblique muscular articulations.

Disk covered with rather coarse papillæ; mouth submarginal, anus subcentral.

P_1 10 mm. long, slender, with thirty-five segments, of which the first is short oblong, about two and one-half times as broad as long, and the following are rhombic, at first nearly twice as broad as long, gradually becoming longer and about as long as broad after the sixth; second and following segments with the corners cut away, this gradually decreasing distally and disappearing entirely after about the twelfth segment; second to tenth or eleventh segments with long single or double spines projecting vertically from the dorsal surface, at first about equal to half the diameter of the joint in height, but slowly decreasing in length distally; terminal comb short, very prominent, rising abruptly, with six or seven teeth which are subequal, triangular, slightly longer than broad, rather strongly recurved, rather longer than the diameter of the segments which bear them, the bases in apposition; P_2 5 mm. long, with twenty segments, resembling P_1 but weaker and more slender; P_3 3.5 mm. long with fifteen segments, resembling P_2 ; P_4 and following pinnules stouter than the preceding, 6 mm. long, with about twenty segments, the first two short, the remainder squarish, becoming longer than broad distally; the distal ends of the segments are spinous and strongly overlapping, and the more proximal segments are usually furnished with more or less prominent dorsal spines in addition; distally the pinnules gradually become shorter and more slender, the distal pinnules being 6 mm. long, very slender, with about twenty segments, the first two short, the third longer than broad, the remainder elongated, with slightly expanded ends, becoming about twice as long as broad distally; terminal combs occur usually on most of the genital pinnules, and at intervals on those in the distal part of the arm.

The color is chrome yellow, the skeleton yellowish white.

Habitat.—Philippine Islands (Tawi Tawi group).

Depth.—49 fathoms.



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