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A REVISION OF THE CRINOID FAMILY MARIAMETRIDÆ.

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At the present time the endocyclic comatulids possessing more than ten arms in which all the division series consist of two ossicles, the outer cirrus segments bear single median dorsal processes, and the enlarged proximal pinnules are flagellate, at least distally, are distributed among the genera *Pontiometra* (included in the family Pontiometridae), *Oxymetra* (of which the genus *Selenometra* is a synonym), *Mariametra* and *Dichrometra* (included in the family Mariametridae). In addition to the genus *Pontiometra* the family Pontiometridae contains only the highly aberrant genus *Epimetra*.

The family Pontiometridae was originally differentiated from the family Mariametridae on the ground of certain striking morphological peculiarities which I am now led to believe are of purely secondary systematic importance.

At the time of its description the genus *Epimetra* was provisionally associated with *Pontiometra* in the family Pontiometridae on account of the strong general resemblance of the two types. A closer study of this genus indicates that it should properly be referred to the family Colobometridae and placed near the genus *Cyllometra*, the grounds upon which this disposition is suggested being (1) the deficient pinnulation, (2) the lateral broadening of the dorsal processes on the outermost cirrus segments (including the broadly bifurcate opposing spine), and (3) the close correspondence of the details of the arm structure.

Of the genera *Pontiometra*, *Oxymetra*, *Mariametra* and *Dichrometra*, which together form a perfectly natural family, the

family Mariametridæ, the first three are homogeneous and satisfactory units, but the last is quite heterogeneous and far from satisfactory, having been used, in fact, to include all such forms as are referable to the Mariametridæ but which do not fall within the scope of the others.

It is possible by the division of the genus *Dichrometra* as now understood into three natural sections to so rearrange the various species that they will fall into groups which will be found to be strictly comparable to the other genera in the family Mariametridæ, and to the genera in the most nearly related families.

The lines along which the generic divisions within the family Mariametridæ would then fall are indicated by the following key:

KEY TO THE GENERA OF MARIAMETRIDÆ.

- a*<sup>1</sup> Cirri very large and long, with more than 40 (usually 50-80) segments
- b*<sup>1</sup> P<sub>1</sub> on the outer arms greatly elongated and flagellate, more than five times as long as the following pinnules; division series very narrow, very deep dorso-ventrally, and very widely separated
- (1) *Pontometra*
- b*<sup>2</sup> P<sub>1</sub> only very slightly, if at all, longer than P<sub>2</sub>, and of the same character; division series nearly or quite in apposition laterally through the extension of their ventrolateral borders
- (2) *Olymetra*
- a*<sup>2</sup> cirri short or of moderate length, with less than 40 segments
- b*<sup>1</sup> P<sub>2</sub> and P<sub>3</sub> similar, and of equal length
- (3) *Liparometra* (nov.)
- b*<sup>2</sup> P<sub>2</sub> and P<sub>3</sub> of unequal length
- c*<sup>1</sup> P<sub>2</sub> markedly longer, and more or less stouter, than P<sub>3</sub> or P<sub>1</sub>
- (4) *Lamprometra* (nov.)
- c*<sup>2</sup> P<sub>3</sub> markedly longer than P<sub>2</sub>, which in turn is markedly longer than P<sub>1</sub>
- d*<sup>1</sup> lateral portions of the dorsal surface of the division series perfectly smooth; division series never carinate, and never with a narrow dark median line; disk naked
- (5) *Dichrometra*
- d*<sup>2</sup> lateral portions of the dorsal surface of the division series with a prominent granular, tubercular or spinous ornamentation; a faint median carination or a narrow dark median line on the division series and arm bases, often both occurring together; disk completely covered with calcareous plates
- (6) *Mariametra*

The genera which collectively form the family Mariametridæ, with the original references, the genotypes, the geographical and bathymetrical ranges, and the named species included in them, are the following:

1. **Pontiometra** A. H. Clark.

*Pontiometra* 1907. A. H. CLARK, Smiths. Miscell. Coll. (Quarterly Issue), Vol. 50, p. 354.

*Genotype*.—*Antedon andersoni* P. H. Carpenter, 1889.

*Range*.—From the Mergui Archipelago and the Andaman Islands eastward to the Moluccas, New Caledonia, the Pelew Islands and the Philippines.

*Depth*.—0-24 fathoms.

*Nominal Species included in the Genus*.—*Andersoni*, *insperatus* and *polypus*.

2. **Oxymetra** A. H. Clark.

*Oxymetra* 1909. A. H. CLARK, Proc. Biol. Soc. Wash., Vol. 22, p. 13.

*Genotype*.—*Antedon crinacea* Hartlaub, 1890.

*Range*.—From the Andaman Islands eastward to New Britain and the Philippine Islands.

*Depth*.—0-42 fathoms.

*Nominal Species included in the Genus*.—*Arauca*, *crinacea*, *finschii*, *gracilipes*, *tonnicirra* and *viridis*.

3. **Liparometra** gen. nov.

*Diagnosis*.—A genus of Mariametridæ in which the cirri are of moderate length and consist of less than 40 segments, and P<sub>2</sub> and P<sub>3</sub> are of equal length, longer than P<sub>1</sub> and P<sub>4</sub>, rather slender, and flagellate.

*Genotype*.—*Himerometra grandis* A. H. Clark, 1908.

*Range*.—From Queensland and the Moluccas to the Tonga Islands, and northward to southwestern Japan.

*Depth*.—0-40 fathoms.

*Nominal Species included in the Genus*.—*Articulata*, *grandis* and *regalis*.

4. **Lamprometra** gen. nov.

*Diagnosis*.—A genus of Mariametridæ in which the cirri are of moderate length or short, composed of less than 40 segments, with the outer segments furnished with a median dorsal keel or slight dorsal tubercles, and P<sub>2</sub> is markedly longer and stouter than P<sub>3</sub>, and also longer and stouter than P<sub>1</sub>.

*Genotype*.—*Antedon imparipinna* P. H. Carpenter, 1882.

*Range*.—From the Red Sea eastward to and throughout the East Indies, reaching Australia, New Caledonia, the Solomon Islands, Samoa, Tonga, Fiji, the Philippine Islands, the Marshall Islands, the Caroline Islands, the Hawaiian Islands and Hong Kong.

*Depth*.—0-20 (?36) fathoms.

*Nominal Species included in the Genus.*—*Æquipinna, amboinensis, brevicuneata, conjungens, dividua, gyges, heliaster, imparipinna, klauzingeri, larvicirra, lepida, leucomelas, occulta, okelli, palmata, polyactinis, protectus, regina, scita, similis, subtilis* and *tenera*.

5. **Dichrometra** A. H. Clark.

*Dichrometra* 1909. A. H. CLARK, Proc. Biol. Soc. Wash., Vol. 22, p. 12.

*Genotype.*—*Alecto flagellata* J. Müller, 1841.

*Range.*—Southeastern Africa and the Bay of Bengal to the Sunda Islands, the Moluccas, New Guinea and the Pelew Islands, and northward to southern Japan.

*Depth.*—0-84 fathoms.

*Nominal Species included in the Genus.*—*Afra, bimaculata, ciliata, döderleini, elongata, flagellata, pulcher, stylifer* and *tenuicirra*.

6. **Mariametra** A. H. Clark.

*Mariametra* 1909. A. H. CLARK, Proc. Biol. Soc. Wash., Vol. 22, p. 144.

*Genotype.*—*Himerometra subcarinata* A. H. Clark, 1908.

*Range.*—From Great West Torres Island to Timor, the Macclesfield Bank and southern Japan.

*Depth.*—22-84 fathoms.

*Nominal Species included in the Genus.*—*Delicatissima, margaritifera, subcarinata, tenuipes, tuberculata* and *ricaria*.

FAMILY MARIAMETRIDÆ A. H. Clark.

*Mariametrinae* 1909. A. H. CLARK, Proc. Biol. Soc. Wash., Vol. 22, p. 176.

*Range.*—Indian and western Pacific Oceans; east Africa from Madagascar and Zanzibar to Suez, and eastward, including the southern coast of Asia and the northern coast of Australia, and the shores of all the intervening islands, to New Caledonia, Fiji, Tonga, Samoa, the Hawaiian, Marshall, Caroline and Pelew Islands, and southern Japan.

*Depth.*—Littoral and sublittoral, ranging from the low tide mark (and occasionally tide pools) down to 42 fathoms, and to 84 fathoms in southern Japan.