

Two New Records of Colobometridae (Echinodermata, Crinoidea, Comantulida) in Korea

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ABSTRACTS

Some crinoids collected by scuba divers from Jeju Island are identified. Of which two species, *Cyllometra manca* (Carpenter, 1888) and *Decametra tigrina* (A.H. Clark, 1907), belonging to the family Colobometridae and order Comantulida, turned out to be new to the Korean fauna. The Colobometridae is reported in Korea for the first time.

Key words: Taxonomy, Colobometridae, Comantulida, Crinoidea, Korea

INTRODUCTION

The systematic studies of Korean crinoids were done by Shin (2001) and Won and Rho (2001). From these studies, eight species of two families such as Comantulidae and Antedonidae were known in Korean waters.

A.H. Clark (1947) published the monograph of comantulids including Colobometridae and Marametridae collected by Albatross, in which some of species collected from the Korea Strait were included. However collecting was actually done not in Korean, but in Japanese water. He also described that the family Colobometridae is mainly confined to the shallow water, 9 of the 17 its genera being represented along the shore line, though on the other hand 4, so far as known, are not represented above 100 meters. This encouraged us to investigate crinoids continuously. Here, we report primarily the systematic information about the colobometrid species in the Comantulida.

The crinoid specimens used in this work were collected by scuba diving at subtidal zone in the

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southern coast of Jeju Island. First of all they were photographed in the sea water and then were preserved in 70% methyl alcohol. The important morphological parts of specimen were photographed by using stereomicroscope. The morphological terms of external features and the systematic scheme on the identified crinoids in A.H. Clark (1947) and Kogo (1998) were followed.

In the present study two species identified as *Cyllometra manca* (Carpenter, 1888) and *Decametra tigrina* (A.H. Clark, 1907) belonging to the family Colobometridae and order Comantulida are reported. These species turned out to be new to the Korean fauna and their morphological characteristics are redescribed. Therefore four species of crinoids are reported to be distributed in the Jeju Island of Korea.

SYSTEMATIC ACCOUNTS

Pylum Echinodermata Klein, 1734 극피동물문
 Class Crinoidea Müller, 1821 바다나리강
 Subclass Articulata A.H. Clark, 1908 관절아강
 Order Comantulida A.H. Clark, 1908 바다나리목
 Suborder Oligophreatina A.H. Clark, 1911 협중강아목
 Superfamily Mariametrida Gislén, 1924 가시갯고사리상과 (신칭)
 Family Colobometridae A. H. Clark, 1909 돌기발갯고사리과 (신칭)

Key to the genera of family Colobometridae in Korea

More than ten arm; cirri short and rather stout with dorsal spines *Cyllometra*
 Ten arms; cirri moderately long and slender with well-defined dorsal spines *Decametra*

Genus *Cyllometra* A.H. Clark 1907 줄무늬갯고사리속 (신칭)

1. *Cyllometra manca* (Carpenter, 1888) 줄무늬갯고사리 (신칭) (Fig. 1A-G)

Antedon manca Carpenter, 1888, p. 226.

Cyllometra manca: A.H. Clark, 1907, p. 350; 1918, p. 115; 1947, p. 137, pls. 17-22, figs. 86-108; Gislén 1922, p. 79, figs. 66, 67; Utinomi and Kogo, 1965, p. 276, fig. 8; 1968, p. 50; A.M. Clark, 1972, p. 127; Liao and Clark, 1995, p. 43, fig. 23; Kogo, 1998, p. 40, fig. 31.

Material examined. 1 individual, Seogwipo (at 25 m depth), 12 Dec. 2001, by scuba diving; 2 individuals, Seogwipo (at 15-30 m depth), 24 Jan. 2002, by scuba diving; 1 individual, Moseulpo (at 30 m depth), 6 Feb. 2002, by scuba diving.

Diagnosis. The cirri are 23-26 in number, have usually 21-23 segments, and are most frequently 8-10 mm long. The longest cirrus segments are from about as long as broad to half again as broad. There are 15-19 arms which are usually 55-70 mm long.

Description. Centrodorsal discoidal and 2.8-3.4 mm in diameter. Polar area rather broad and flat. Cirrus sockets arranged in 1 or 2 and more or less alternating rows. Cirri with long curved and sharply pointed claws, 23-26 in number, about 21-23 segments and 8-10 mm long. Cirrus segments rather short, mostly broader than long and segments in the proximal cirri usually more or less constricted basally. Longest segments nearly as long as broad. Dorsal spines of cirri usually the



Fig. 1. *Cyllometra manca* (Carpenter, 1888). A, ventral view; B, dorsal view; C, D, centrodorsal, cirri and proximal part of arms; E, G, mouth, anus and proximal pinnules; F, cirrus; G, proximal pinnule. Scale bars = 3 cm (A, B), 3 mm (C-G).

form of paired dorsal tubercles which most frequently small at first represented by a simple transverse ridge, though rather conspicuous in lateral side. Arms presumably 15-19 in number, reaching from 55 to 70 mm long and 1.2 mm wide at first syzygy. Synarthrial articulations with weak tubercles and laterally compressed. Syzygial pairs occurring at 3+4, 9+10, 13+14, 17+18.... Division series well separated laterally. IBr series 2; IBr₁ oblong and 3 times as broad as long; IBr₂ broadly pentagonal, roughly about twice as long as the IBr₁; II Br and III Br series are 2 and somewhat longer than IBr series. Pinnules rather slender, variable in number of segments and also in length. The first two short and broader than following ones. P_a usually absent, P₂ longer and stouter than the other pinnules. Segments of P₂ everted distally with prominent spines on their distal edges. P₁ < P₂ > P₃ < P₄ < P_m.

Colour. When it is alive, the color of a body is brown.

Remarks. The centrodorsals of our specimens are discoidal, which is a contrast to Kogo (1998)'s low hemispherical. But the other characteristics are all the same.

Distribution. Korea (Jeju Island); Southern Japan; Hong Kong; Hainan Island; Philippines; Indonesia; Somalia; Arabian Gulf.

Genus *Decametra* A.H. Clark, 1911 십완갯고사리속 (신칭)

2. *Decametra tigrina* (A.H. Clark, 1907) 범얼룩갯고사리 (신칭) (Fig. 2A-I)

Antedon tigrina A.H. Clark, 1907, p. 147.

Decametra tigrina: A.H. Clark, 1918, p. 117; 1947, p. 178, pl. 19, fig. 98, pl. 22, fig. 112, pl. 24, figs. 123, 124, pl. 26, fig. 133; Utinomi and Kogo, 1965, p. 14; Utinomi and Kogo, 1968, p. 50; Kogo, 1998, p. 78, fig. 63.

Material examined. 1 individual, Moseulpo (at 20 m depth), 8 Feb. 1999, by scuba diving; 1 individual, Seogwipo (at 15 m depth), 12 Dec. 2001, by scuba diving; 6 individuals, Seogwipo (at 5-20 m depth), 24 Jan. 2002, by scuba diving; 2 individuals, Seogwipo (at 20 m depth), 7 Feb. 2002, by scuba diving.

Diagnosis. The cirri are usually 28 in number, consist of commonly 28 segments and 13-18 mm long. The dorsal pairs of tubercles on the distal segments are often indistinct or more or less fused. P₂ is markedly longer than P₁ or P₃. There are only 10 arms which are 105-110mm long.

Description. Centrodorsal discoidal, 3.5 mm in diameter. Polar area rather broad and flat, 2.8-3.0 mm across. Cirrus sockets tightly arranged in a single row or partially double marginal row. Cirri with long curved and sharply pointed claws, rather long, 26-30 in number, about 28 segments and up to 18 mm long. All segments of cirri broader than long. Each transverse ridge arising at middle cirrus segments, becoming to a single dorsal spine in distal cirri. Division series separated from neighboring series. Synarthrial articulations with weak tubercles. Radials concealed to centrodorsal; IBr series 2. IBr₁ oblong, 3 times as broad as long; IBr₂ pentagonal, twice as broad as long, 1.3 mm wide at first syzygy. Syzygial pairs occurring at 3+4, 9+10 and 14+15, and distally at intervals of 4-5 muscular articulations. Pinnules slender and their segments smooth, varying in length from broader than long to as long as broad. P_a absent. P₁ long, slender and tapering gradually from the base to the tip. P₂ much longer and considerably stouter than any of the other pinnules and the first 3 or 4 segments of P₂ about as long as broad. P₁ < P₂ > P₃ > P₄ > P_m.

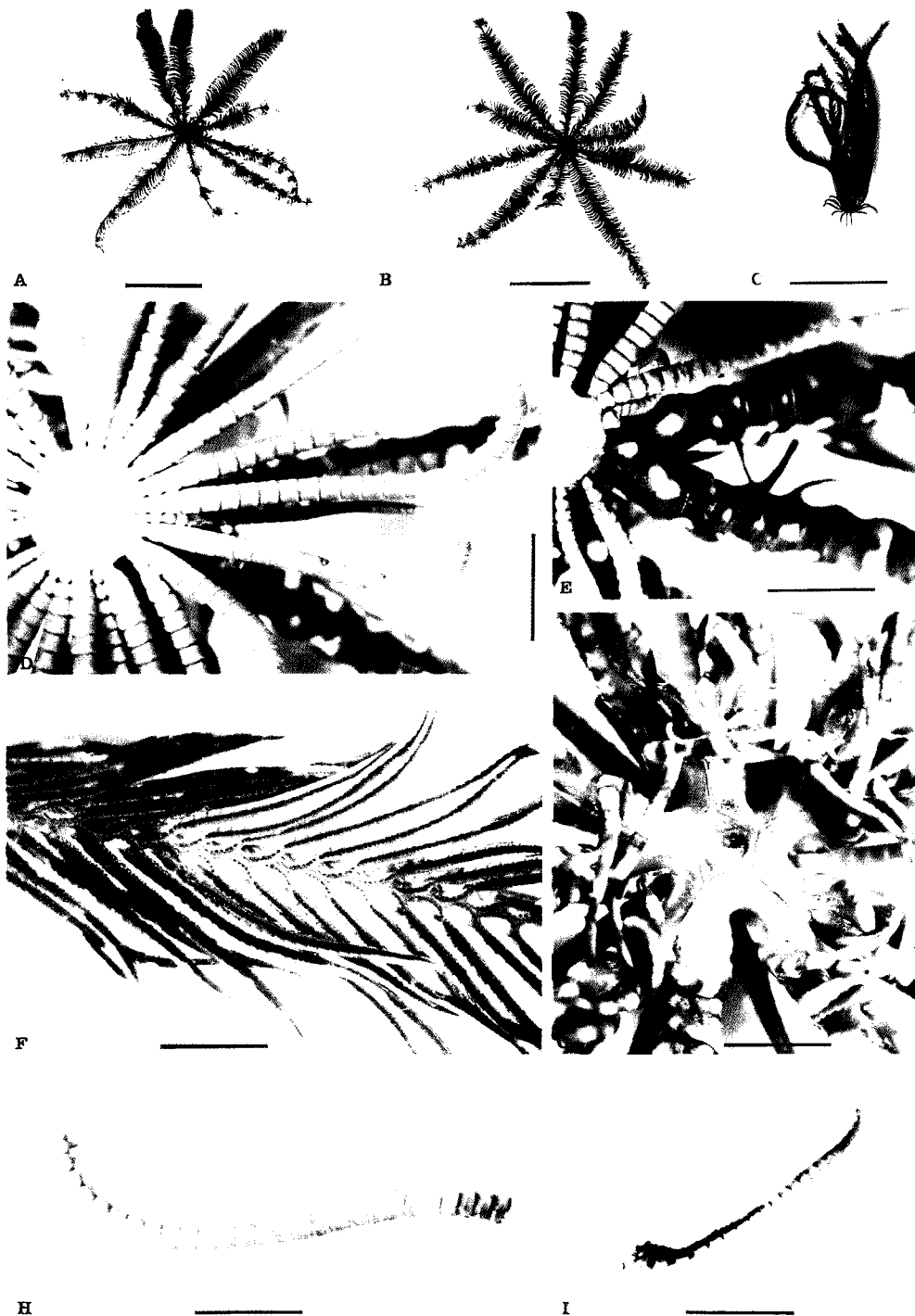


Fig. 2. *Decametra tigrina* (A.H. Clark, 1907). A, ventral view; B, dorsal view; C, lateral view; D, centrodorsal and cirri; E, proximal part of arms; F, pinnules of arm; G, mouth, anus and proximal pinnules; H, cirrus; I, proximal pinnule. Scale bars = 5 cm (A-C), 3 mm (D-I).

Color. When it is alive, the color of a body is yellowish brown. But the arms are broadly banded with dark purple and edged with deep reddish brown. The IBr series and proximal 6 or 7 brachials are dark purple with irregular bands of light brown. The lower pinnules are banded with dark purple.

Remarks. According to Kogo (1998), P_a is present in most cases of the Japanese specimens of *D. tigrina* and therefore *D. tigrina* may be included in the genus *Oligometra*. However, our specimens in Jeju Island do not have P_a which is same as ones of A.H. Clark (1947).

Distribution. Korea (Jeju Island); Japan (middle and western Honshu).

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REFERENCES

- Carpenter, P.H., 1888. Crinoidea. 2. The unstalked crinoides. Rep. Sci. Results Voy. 'Challenger' (Zool.) **26** (60): 1-339, 70 pls. (cited from Kogo, 1998).
- Clark, A.H., 1907. Description of new species of recent unstalked crinoids from the coast of northeastern Asia. Proc. U.S. Natn. Mus., **33**: 127-156.
- Clark, A.H., 1918. The unstalked crinoids of the Siboga expedition. Siboga Exped., **42b**: 1-300, 28 pls.
- Clark, A.H., 1947. A monograph of the existing crinoids. Bull. U. S. Natn. Mus., 82, **1**(3): 1-816, pls. 1-82.
- Clark, A.M., 1972. Some crinoids from the Indian Ocean. Bull. Brit. Mus. (Natn. Hist), **25**(7): 73-156, 17 figs.
- Gislén, T. 1922. The crinoids from Dr. S. Bock's expedition to Japan 1914. Nova Acta Regie Soc. Sci. Upsal. ser., **4**, **5**(6): 1-179, 2 pls.
- Kogo, I., 1998. Crinoids from Japan and its adjacent waters. Osaka Mus. Nat. Hist., **30**: 1-146.
- Liao, Y. and A.M. Clark, 1995. The echinoderms of southern China. Science Press. Beijing, 614 pp, 23 pls.
- Shin, S., 2001. Four species of the shallow-water Comantulids (Echinodermata, Crinoidea) from Geomundo Island; New records in Korea. Korean J. Syst. Zool., **17**(2): 251-262.
- Utinomi, H. and I. Kogo, 1965. On some crinoids from the coastal sea of Kii Peninsula. Publ. Seto. Mar. Biol. Lab., **13**(4): 263-286.
- Utinomi, H. and I. Kogo, 1968. A revised catalogue of crinoids collected from Japanese waters. Proc. Jap. Soc. Syst. Zool., **4**: 46-53 (in Japanese).
- Won, J.H. and B.J. Rho, 2001. Taxonomy of the Family Antedonidae (Echinodermata, Crinoidea, Comantulida) in Korea. Korean J. Biol. Sci., **5**(4): 299-302.

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한국산 돌기발갯고사리류 (극피동물문, 바다나리강, 바다나리목)의 2미기록종

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요 약

제주도의 하조대에서 채집된 갯고사리류를 동정 분류한 결과, 바다나리목 (Comantulida), 돌기발갯고사리과 (Colobometridae)의 줄무늬갯고사리, *Cyllo-metri manca* (Carpenter, 1888)와 범얼룩갯고사리, *Decametra tigrina* (A.H. Clark, 1907)가 한국 미기록종으로 밝혀져 보고한다. 그리고 돌기발갯고사리과는 우리나라에서 처음으로 보고된다.