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Short communication

A Revision of *Thaumatometra tenuis* (Comatulida, Crinoidea, Echinodermata) in Korea

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ABSTRACT

Thaumatometra tenuis (A. H. Clark, 1907), an unstalked crinoid that lives on the muddy bottoms of the deep sea, is re-described with images in this study. This species distributes in the cold water zone of the northwestern Pacific and had been reported at the end of 1800s from South Korea but had not been found thereafter. So we thought that this species was no longer living in Korea. In March 2019, a large number of *T. tenuis* were found near the Sokcho-si, Gangwon-do, Korea. So the presence of *T. tenuis* in Korea is reconfirmed. This species, markedly fragile overall, is characterized by long segments of cirri and pinnules, and P_1 composed of 35 segments.

Keywords: revision, crinoids, *Thaumatometra tenuis*, Korea

INTRODUCTION

Clark (1907a) newly reported two species of *Antedon tenuis* and *A. ciliata* in the family Antedonidae. Then *A. stella* and *A. ciliata* were revised and classified as *A. tenuis* (Clark, 1907b, 1908c). Clark (1908a) established a genus *Thaumatometra*, and reported *A. tenuis* (=*A. ciliata*) as a type species of the genus *Thaumatometra*. Genus *Thaumatometra* has at least 25 cirri and 10–22 cirrus segments, the first pinnule has 20–35 segments and the second pinnule is smaller than the first.

Clark (1909a) included *Thaumatometra* in the subfamily Bathymetrinae, organizing genera and higher groups of unstaked crinoids. The subfamily Bathymetrinae, comprising deep-sea species living in cold water, has long segments of cirri and pinnules. In genus *Thaumatometra*, there are approximately 10 species globally, widely distributed in the deep sea except the Arctic region, known to live at more than 3,000 m in depth.

Thaumatometra tenuis, unlike other *Thaumatometra* species, has long arms approximately 130 mm and P_1 composed of approximately 35 segments. At the end of the 1800s, *T. tenuis* was found several times in the East Sea of North Korea (Clark, 1909b, 1913a) and South Korea (Clark, 1909b), but had not been found later in the Korea Strait. In this study, I found several *T. tenuis* caught in the fishing net at Gyo-dong, Sokcho-si, Gangwon-do, Korea in March 2019, so it is re-described with images and will be added to the Korean fauna of marine species.

SYSTEMATIC ACCOUNTS

Phylum Echinodermata
Class Crinoidea
Order Comatulida A. H. Clark, 1908
Family Antedonidae Norman, 1865
Subfamily Bathymetrinae A. H. Clark, 1909
[1]*Genus *Thaumatometra* A. H. Clark, 1908
Type species. *Antedon tenuis* A. H. Clark, 1907

Diagnosis. A genus of Bathymetrinae in which the cirri are at least XXV in number with 10–22 segments, all of which but the first one are longer than broad; P_1 has up to 20 segments in all the species except *T. tenuis*, where it has about 35; P_2 may be longer but usually a little shorter than P_1.

[2]****Thaumatometra tenuis* (A. H. Clark, 1907)**
(Fig. 1A–H)
Antedon tenuis Clark, 1907a: 80.

Korean name: [1]*긴마디갯고사리속 (신칭), [2]*얇은긴마디갯고사리 (신칭)

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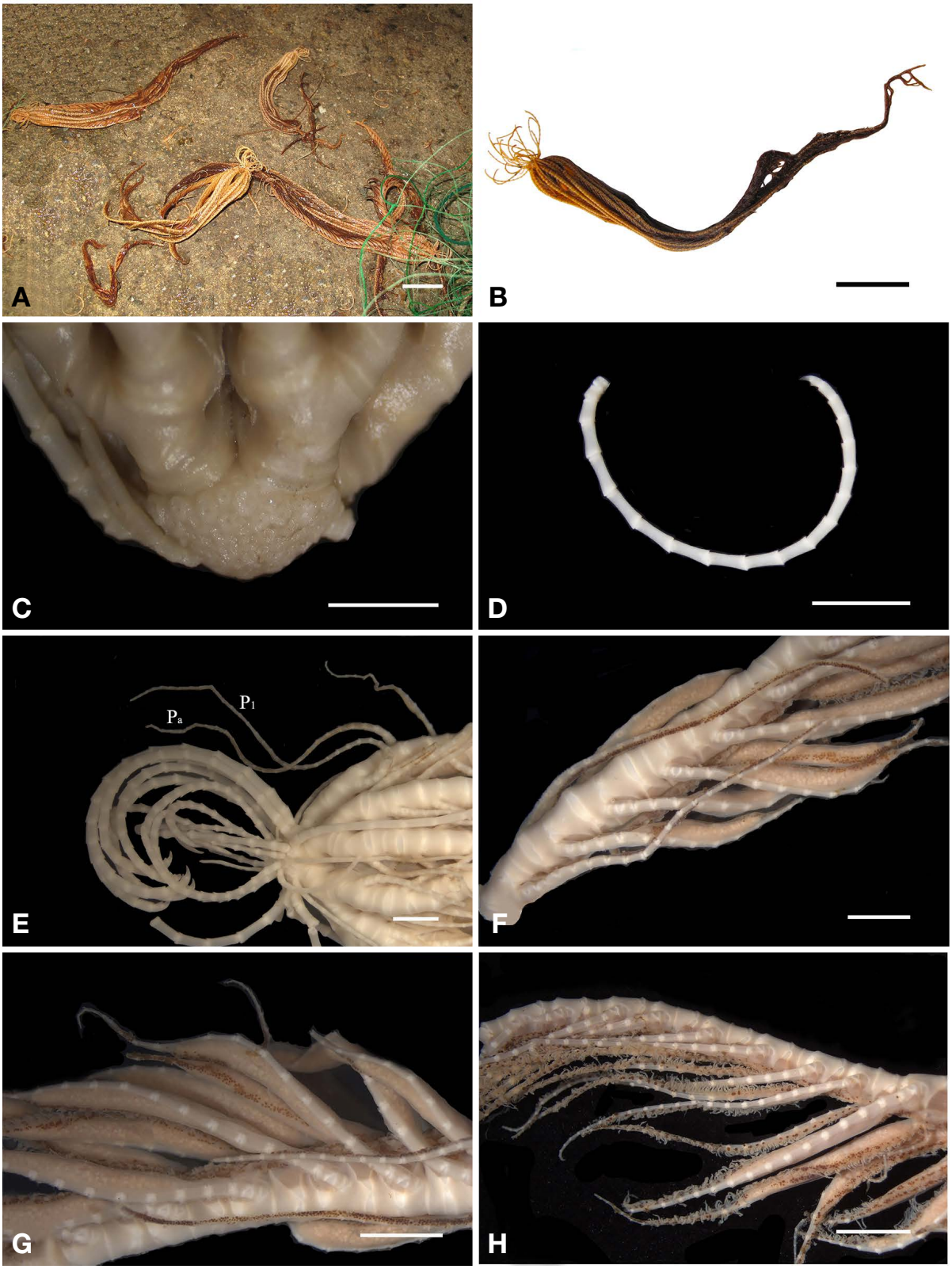

Fig. 1. *Taumatometra tenuis* (A. H. Clark, 1907). A, Several specimens in the port; B, Lateral view of the external feature; C, Centrodorsal; D, Cirrus; E, Cirri, arm bases and proximal pinnules; F, Proximal arm segments and pinnules; G, Genital pinnules; H, Distal pinnules (P_1, first outer pinnule; Pa, first inner pinnule). Scale bars: A, B = 2 cm, C–H = 2 mm.

Antedon ciliata Clark, 1907a: 81.
Antedon stella Clark, 1907b: 353; 1908c: 495.
Thaumatometra tenuis Clark, 1908a: 127; 1908b: 275, fig. 4; 1908d: 117, fig. 11; 1909b: 191; 1912: 245; 1913a: 182; 1913b: 65; 1915: 80; Clark and Clark, 1967: 744−749, fig. 47; Tommasi, 1969: 6; Kogo, 1998: 135−136, fig. 111.

Material examined. Korea: 20 specimens, Gangwon-do, Sokcho-si, Gyo-dong, 38°27′22″N, 128°55′62″E, 27 Mar 2019.
Description. Arms 10 in number, about 150 mm long, the larger ones up to 200 mm, 1.7−2.0 mm wide at first syzygy. Arms gets thinner and fragile overall, especially distal ends very easily damaged.

Color of body brownish, cirri and dorsal side of arms brighter (Fig. 1A, B).

Centrodorsal low hemispherical, 3.0−4.0 mm in diameter, 1.5−2.0 mm high, almost completely covered with closely crowded cirri (Fig. 1C). Polar area unclear.

Cirri very slender, XL−L, 18−21 (usually 20), up to 15.0−18.0 mm long (Fig. 1D). First segment short, about 2 times broader than long, second close to square, third twice as long as broad, longest segment fifth-seventh, more than three times as long as broad, followings slightly reducing in length, antepenultimate about twice as long as broad, penultimate about half again as long as broad, opposing spine small. Terminal claw prominent, as long as penultimate segment.

Radials narrow strip-like with smooth edges. IBr series 2. IBr_1 short, 4 times as broad as lateral length, broader proximally than distally, distal border slightly concave. IBr_2 rhombic, about as long as broad, posterior border rising to a round tubercle. Ossicles rounded dorsally. Syzygial pairs at 3 + 4, 9 + 10, 14 + 15, 17 + 18, and at intervals of 2−3 muscular articulations.

Pinnules fragile. P_1 arising at Br_2, about 35 segments, 18−20 mm, first 2 or 3 segments short, not as long as broad, followings become elongated, elongated segments 3−4 times as long as broad (Fig. 1E). P_2 about 18, 13 mm. P_3 20−23, 15 mm. P_4 similar to P_3. Pa present, similar to P_1. P_2−P_8 with gonad developed (Fig. 1F, G). $P_1 > P_2 < P_3 \fallingdotseq P_4 < Pm > Pd$ (Fig. 1H).
Distribution. Tartar strait, Sea of Japan (south to Nanao), northeastern coast of Korea.

DISCUSSION

In previous studies, *Thaumatometra tenuis* was often collected with *Heliometra gracialis*. And in this study, it was also collected with *H. gracialis*. *Thaumatometra tenuis* is easily distinguished from the *H. gracialis* as more brownish and with more delicate arms and cirri comprising elongate segments. *Thaumatometra tenuis* is also similar to *Boleometra clio*, but cirri of this species has more segments and distal segments of cirri are not longer than broad.

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CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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