

First Record of One Sessile Ctenophora, *Lyrocteis imperatoris*, and Its Embryos from Korea

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ABSTRACT

The sessile ctenophores, *Lyrocteis imperatoris* Komai, 1941 were collected for the first time from Garinyeo, offshore Seogwipo of Jeju Island by SCUBA diving on June 18, 2009. This species distributed in West North Pacific was newly recorded in Korean waters. Its embryos in various developmental stages were observed in the internal brood chamber.

Key words: taxonomy, *Lyrocteis imperatoris*, sessile, Ctenophore, Korea

INTRODUCTION

The order Platyctenida containing planktonic, creeping, or sessile ctenophores is greatly compressed in the oral-aboral axis. Especially, the oral portion of stomodaemum is permanently or temporarily everted to form a creeping sole. And also, comb rows are absent in adults except for the family Ctenoplanidae (Harbison and Madin, 1982). In 1982, the genus *Lyrocteis* was belonged to family Coeloplanidae together with *Coeloplana* and *Vallicula* by Harison and Madin, and then it was classified to monotypic family Lyroctenidae (Mills, 1998).

There has been a lack of knowledge of platyctenid ctenophore in Korean waters. This sessile ctenophore, *Lyrocteis imperatoris* newly recorded was curiously appeared at 15-25 m deep offshore Seogwipo on May, 2009. However, we couldn't collect more samples from the area, after we caught two on June 18, 2009.

The purpose of this study is clarify the fauna and distribution of ctenophores in Korean waters.

MATERIALS AND METHODS

Two ctenophore specimens were collected from 18-22 m deep at Garinyeo (126° 32'225" E, 33° 14'189" N), offshore Seogwipo by SCUBA diving on June 18, 2009. The sedentary animals with its oral end down firmly were attached to ropes by the edge of deep furrow of trunk (Fig. 1).

For the identification, various parts of them were measured and taken on the base of morphological characters by a digi-

tal camera (Olympus 5060-WZ) with an Underwater Patima 7070 Housing before anesthesia with menthol and fixation in 5% neutral formalin.

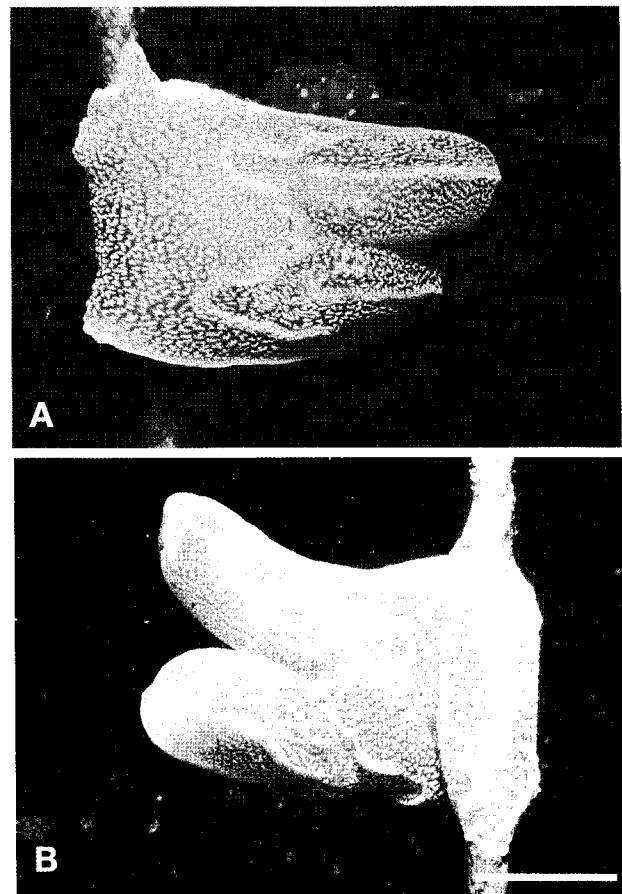


Fig. 1. Color variation of *Lyrocteis imperatoris*. A, B, animals attached to ropes by the edge of deep furrow of trunk. Scale bar=5 cm.

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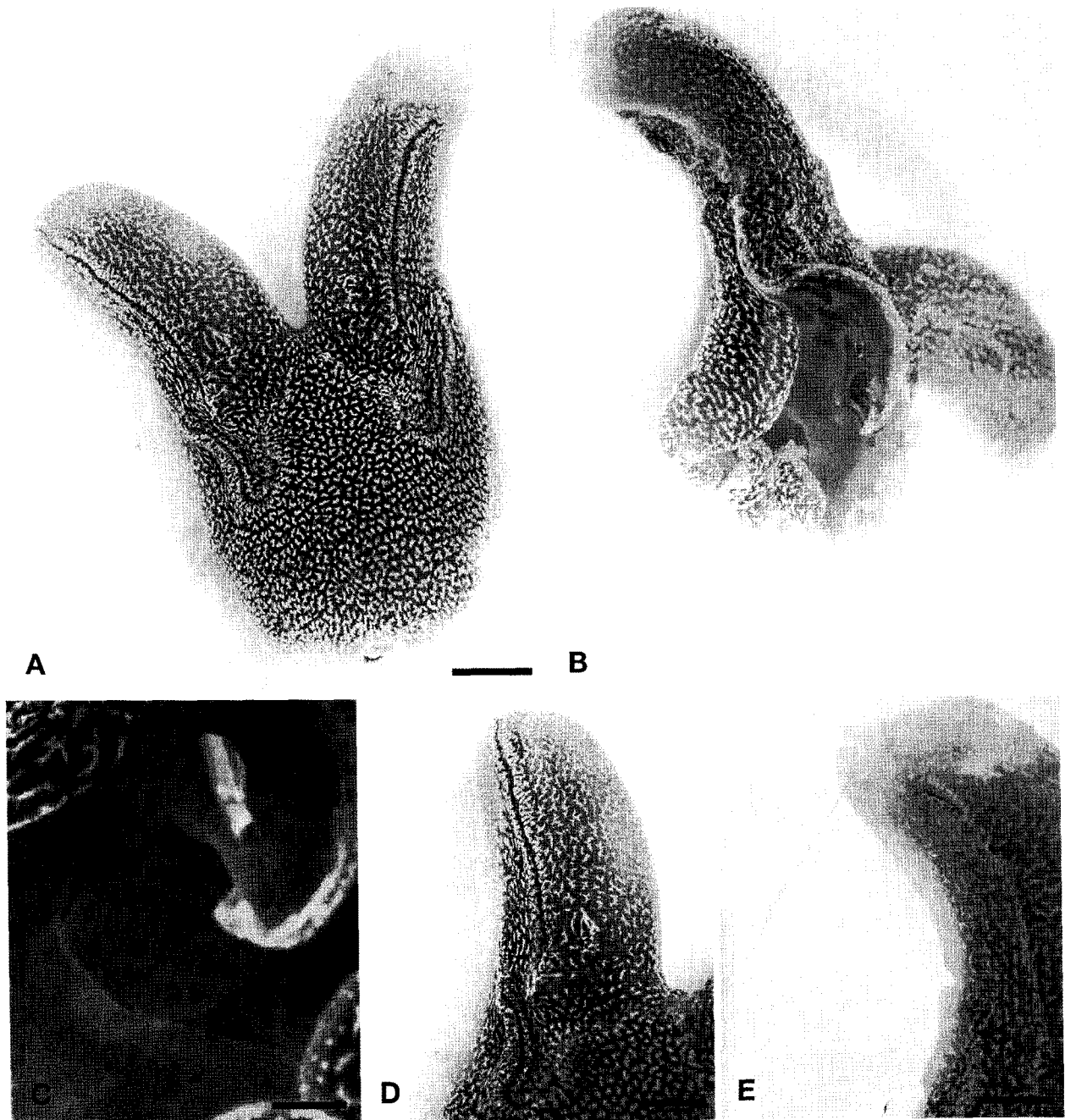


Fig. 2. *Lyrocteis imperatoris*. A, external feature; B, relaxed animal extending to two tentacles and opening the attaching part of trunk; C, a mouth opening at the deepest part of furrow of trunk; D, arm-like process with two lines consisting of a series of compact pyriform masses; E, arm-like process with a tentacle extended. Scale bars=20 mm (A, B), 5 mm (C), 10 mm (D, E).

The species newly known in Korea was described in detail with figures. Its embryos in various developmental stages were taken under a stereomicroscope (Zeiss, Stemi SV-6) and a light microscope (Olympus BH2) and also measured with an ocular micrometer. The fragile specimens and their embryos are deposited in Natural History Museum, Ewha

Womans University.

SYSTEMATIC ACCOUNTS

Phylum Ctenophora Eschscholtz, 1829

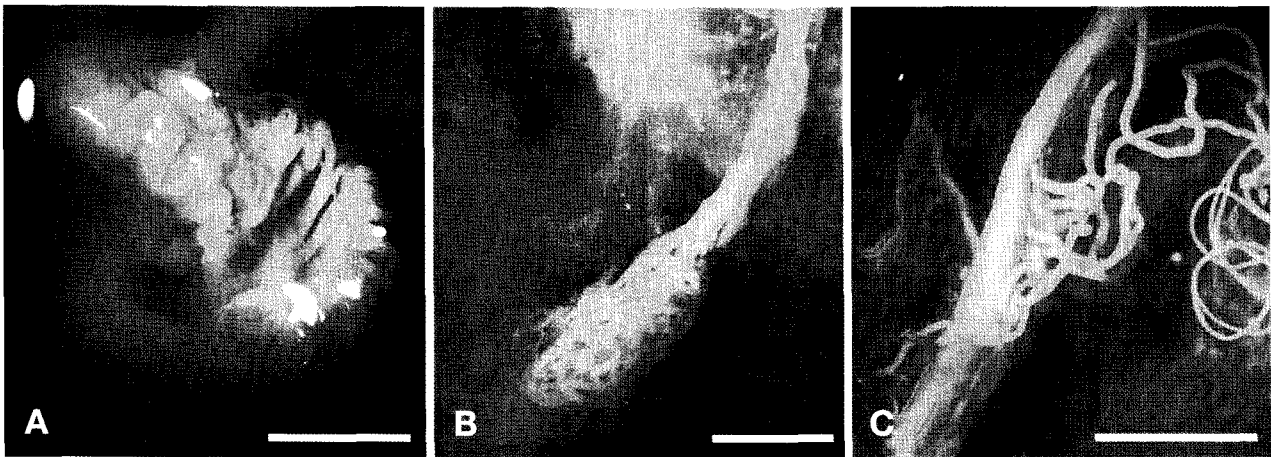


Fig. 3. Pinnate tentacles. A, tentacular base; B, middle part of tentacle sheath; C, one side branches of tentacle. Scale bars=5 mm.

Class Tentaculata Eschscholtz, 1825

¹*Subclass Typhlocoela Ospovat, 1985

²*Order Platyctenida Bourne, 1900

(=Coeloplanidea Stechow, 1922)

Aberrant ctenophores, compressed in oral-aboral plane to flattened form with two tentacles and sheaths. Comb rows absent in adults.

³*Family Lyroctenidae Komai, 1942

Monotypic family including genus *Lyrocteis*. Comb rows absent in adults. An aboral sense organ present. Tentacles bear side branches, retract into sheaths. Meridional canals branched and anastomosing. Tentacular canals bifid. Gonads developed on canals, with opening of spermatoducts externally, and with oviducts opening into gastrovascular system.

⁴*Genus *Lyrocteis* Komai, 1941

Pharynx permanently everted and flattened, and has an oral turned up in prominent chimneys. Species of *Lyrocteis* have specialized brood chambers. *Lyrocteis* not associated with benthic organisms, but sessile and capable slow locomotion.

⁵**Lyrocteis imperatoris* Komai, 1941 (Figs. 1-4)

Lyrocteis imperatoris Komai, 1941, p. 216; 1942, p. 15, figs. 1-6, p. 109, fig. 7B, p. 215; 1955, p. 13; Uchida, 1962, p. 306, fig. 13; Uchida and Utinomi, 1958, p. 178, fig. 5; Tokioka, 1968, p. 228, figs. 3D, 7C, 9C; Mills, 1998, p. 8.

Material examined. Two inds., Garinyeo (offshore Seogwipo,

Jejudo Is.), 18 June 2009 (S.J. Hwang and E.J. Choi), 18-22 m deep by SCUBA.

Description. Lyre-shaped, flattened, and consists of a saddled-shaped main part and an arm-like process on either side. Due to elongation of tentacular axis and shortened sagittal axis, former axis bending into U-shape, and folding into two along this axis. In life, body about 13-14 cm in whole length, 7 cm wide and 3-4 cm thick. Of which arms 6.5 cm long and 2.7-3.5 cm wide. Preserved specimens smaller than usual.

Distal part of retractile pinnate tentacles with one side branches project from furrow near tip of each arm (Fig. 2B, E). Two pinnate tentacles having colloblasts in their surface entirely retracted into each tentacle sheath. Tips of tentacle globular (0.04 × 0.04 mm in dia.), its side and main branches slender, 0.20-0.25 mm and 1 mm in dia. respectively, and then gradually thicker and entangled towards tentacular base (12 × 8 mm in dia.) inside of tentacle sheath (Fig. 3A-C).

External margin encircled by a deep furrow, inside of which homologous with creeping surface of *Coeloplana*, wall of outer portion of pharynx of ordinary ctenophores. In middle part of body, its furrow deepest 3 cm deep, about 1/3 of height of body (Fig. 2B, C).

Margin of furrow frilled, especially lower margin of trunk (Fig. 2A, B). Each arm bears four longitudinal parallel fringes on each surface, margins of which more or less serrated. Entire surface of body shows corrugated appearance, while inner side of furrow comparatively smooth (Fig. 2A, C).

At deepest part of furrow of trunk, an opening leading into center of gastrovascular system, 2.0 × 1.5 cm in diameter. Inside part of opening represents inner portion of pharynx of ordinary ctenophores, similar to lip, 1 × 1 cm in diameter (Fig. 2B, C).

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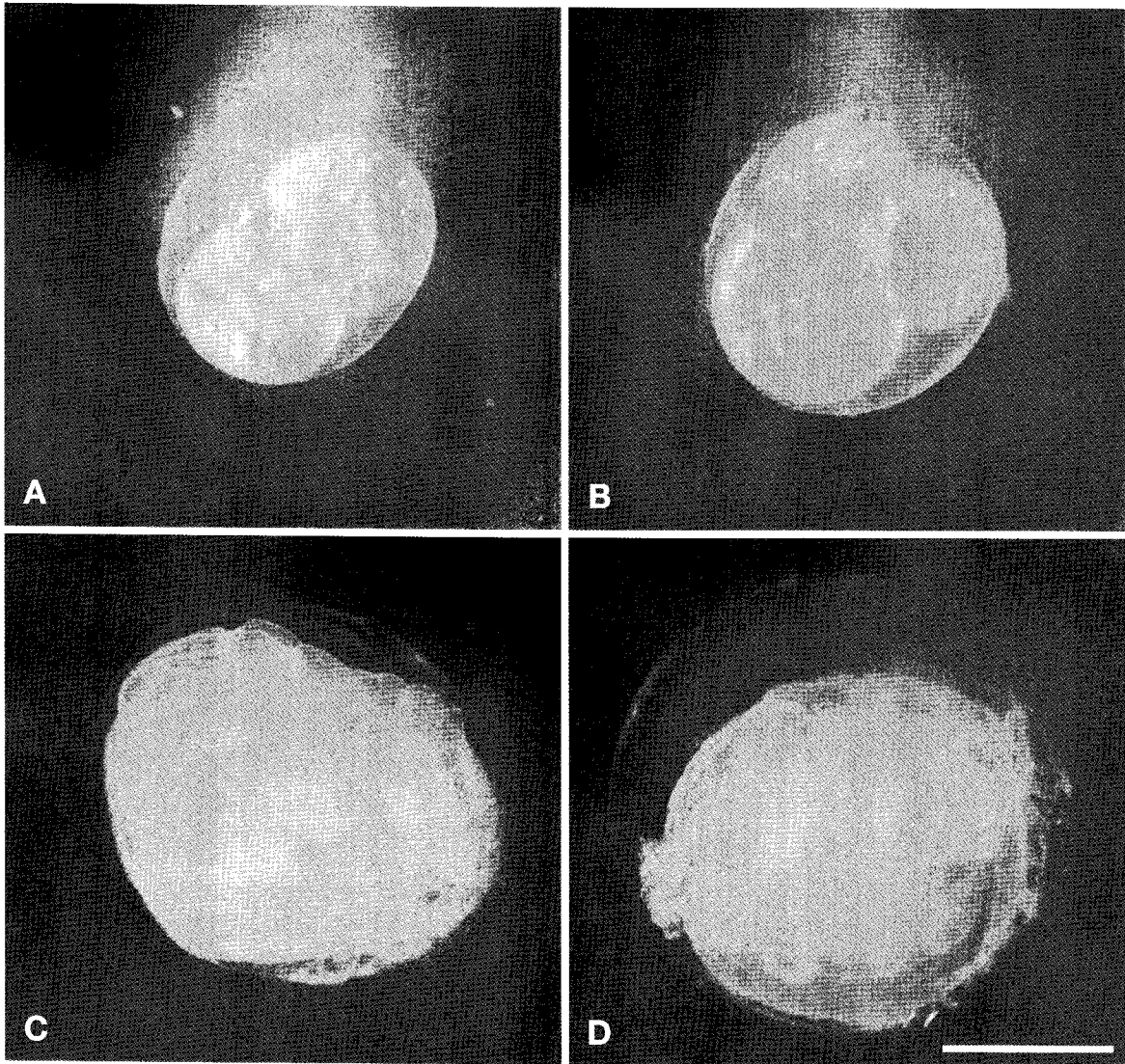


Fig. 4. Embryos in various developmental stages. A, 2-cell stage; B, 3-cell stage to become 4-cell stage; C, embryo with ribs retracted; D, embryo developing two tentacles before hatching. Scale bar=1 mm.

Another pole of main axis coincides with site of aboral sense organ if it occurs (Fig. 2A, D). Two lines which consist of a series of compact pyriform masses run parallel to margin and between longitudinal fringes, each outer subpharyngeal row and each inner subtentacular row (Figs. 1A, B, 2A, D).

Color. Soft, translucent, and beautiful colored variation of individuals, pinkish or reddish body with milky warty prominences (Figs. 1A, B, 2A-E). Tentacles milky white, semi-transparent, except for orange covering of tentacular base and sheath (Fig. 3A-C).

Embryos. Each embryo in various developmental stages enclosed within each distinct membrane (Fig. 4A-D). 1.5×1.5 mm in diameter, gradually increased to older stages, 2.1

$\times 1.6$ mm in diameter. In their younger stages, they show little differences from ordinary ctenophores. However, their older stages appear remarkable feature of platyctenid embryos with aboral sense organ, radial ribs, two tentacles, inner portion of pharynx and ventral furrow before hatching (Fig. 4D).

Habitat. This species without the characteristic combs in adult was very soft and fragile, and secreted intense mucus when disturbed. The sedentary animals with its oral end down firmly attached to ropes by the edge of deep furrow of trunk, and also moved very slowly by a skirt on the base of its trunk around the oral area (Fig. 1A, B). The adhesive tentacles extended to lengthen for catching food. Its body and arms usually bent to the same direction of current flow with ten-

tacles streaming out (Fig. 2B, E).

Remarks. We couldn't find spermaries and ovaries running parallel to margin and between longitudinal fringes (Komai, 1941) because of their fragile after fixation. However, lots of embryos in various developmental stages were fixed within the collapsed tissues.

This species is distinguished from another species, *Lyrocteis flavopallidus*, which shows pale straw yellow in color and has been found from 36 to 76 m deep in Antarctic and southern Ocean (Robilliard and Dayton, 1972). In Japan, *L. imperatoris* known a deep sea ctenophore has been dredged from 70 m deep in Sagami Bay, although it was collected from 18-22 m deep offshore Seogwipo of Jeju Island, Korea.

Distribution. Korea (Jeju Is.), Japan (Sagami Bay), Hawaii, Okinawa, West North Pacific.

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