

A New Species, *Bicellariella fragilis* (Flustrina: Cheilostomata: Bryozoa) from Jejudo Island, Korea

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Abstract: A new species of bryozoan, *Bicellariella fragilis* n. sp. is reported from Jejudo Island, Korea. It was collected at Munseom I. and Supseom I. off Seogwipo city by the fishing net and SCUBA diving from 1978 to 2009. The new species has characteristics of four to five dorso-distal spines and two proximal spines, whereas ten to twelve spines of *B. sinica* are not separated into two groups of the distal and proximal ones. And this species shows the difference from *B. levinseni* in having no avicularium.

Key words: new species, Flustrina, Bryozoa, Jejudo Island, Korea

INTRODUCTION

Nine species of three genera belonging to the family Bugulidae, such as six of *Bugula*, one of *Caulibugula* and two of *Dendrobeania* have been reported from Korean waters so far (Seo, 2005). The genus *Bicellariella* belonged to the family Bicelliariellidae was transferred to the family Bugulidae (Soule, Soule and Chaney, 1995), because two families were merged and the name Bugulidae has priority over Bicelliariellidae Levinsen, 1909. The genus *Bicellariella* includes only five species, *B. ciliata* Linnaeus, 1758, *B. cookie* Rao and Ganapati, 1974, *B. gracilis* (Busk, 1852), *B. levinseni* Harmer, 1926 and *B. sinica* Liu, 1984 from all over the world, and is thus newly introduced to the Korean fauna in this study. In terms of zoogeographical distribution, *B. cookie* was reported from India and the rest four species were from the Pacific Ocean (Busk, 1852; Harmer, 1926; Liu, 1984; Rao and Ganapati, 1974).

The present study aims to describe the species new to science and the genus new to the Korean bryozoan fauna. A table and a key to the species of the genus *Bicellariella* are

also provided by reviewing the related species to new species. New species is illustrated with SEM photomicrographs, the photograph by underwater camera and colony photograph taken in the laboratory.

The materials for this study were collected from Munseom I. (33°13'25"N, 126°33'58"E) and Supseom I. about 1km away off the southern coast of Seogwipo, the southern city of Jejudo Island located in the southern end of South Korea, which shows somewhat subtropical climate. The specimen at first was collected from 30 m in depth in vicinity of Munseom I. by the fishing net dredged on 3 Dec. 1978. It was not until a few years ago that the second and third collections in August, 2006 and 2009 were done from 5-30 m in depth of same area by SCUBA diving. The part of the colony was taken and bleached with care, and then coated with ion sputter coater for the Scanning Electron Microscopy (SEM).

Holotype will be deposited in the National Institute of Marine Bio-Resources (provisional name) in 2013. One of paratypes will be kept in the Depository Institution of Marine-resources in Hannam University and the rest are currently in the collection of the author.

SYSTEMATIC ACCOUNTS

Phylum Bryozoa Ehrenberg, 1831
Class Gymnolaemata Allman, 1856
Order Cheilostomata Busk, 1852
Suborder Flustrina Smitt, 1868
Superfamily Buguloidea Gray, 1848
Family Bugulidae Gray, 1848
Genus *Bicellariella* Levinsen, 1909

Diagnosis. Colony erect and branching, growing from upright ancestrula; attached by rhizoids which issue distally from basal face of autozooids. Autozooids arranged in two series, alternating; horn-shaped with short, wide, forked

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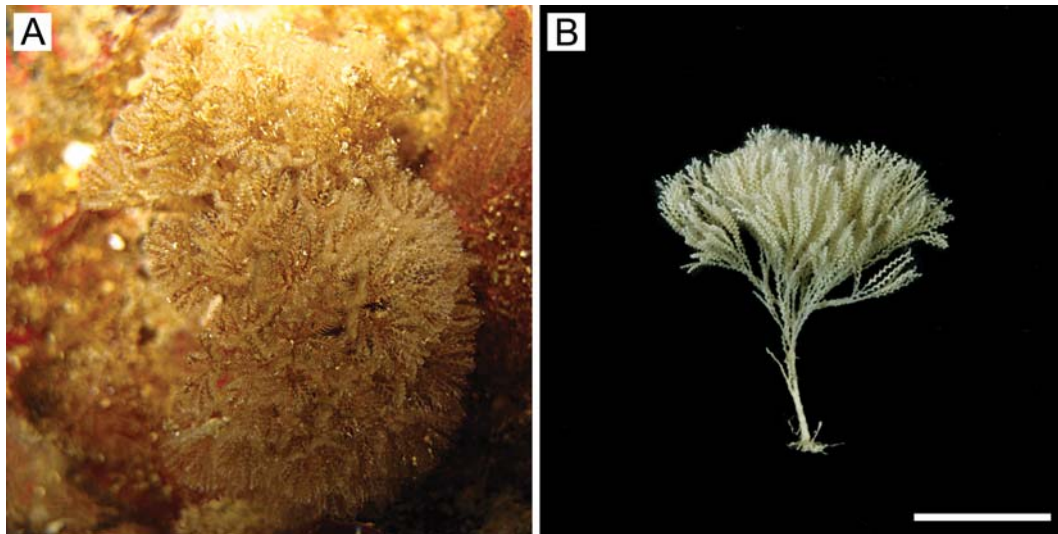


Fig. 1. *Bicellariella fragilis* n. sp. A, underwater photograph of colony; B, colony. Scale bar=1 cm (B).

base separated by constriction from slender, cylindrical middle portion, in turn separated from flaring distal portion by second constriction. Frontal membrane oval, incorporating operculum; several long marginal spines present. Avicularium, pedunculate, shaped like bird's head, attached proximal to frontal membrane, sometimes wanting. Ooecia helmet-shaped, attached by peduncle to inner margin of membranous area at right angles to branch axis.

Type species: *Sertularia ciliata* Linnaeus, 1758

Other species: *B. cookie* Rao and Ganapati, 1974; *B. gracilis* (Busk, 1852); *B. levinsoni* Harmer, 1926; *B. sinica* Liu, 1984; *B. fragilis* n. sp.

***Bicellariella fragilis* n. sp. (Figs. 1, 2)**

Material examined. Holotype: Hangaechang at Munseom I., 8 Jan. 2009 (JE Seo, BS Min and HJ Yang) from 5-30 m in depth by SCUBA diving. Paratypes: three colonies, the vicinity of Munseom I., 3 Dec. 1978 (BJ Rho) from 30 m in depth by the fishing net dredged; eight colonies, Hangaechang at Munseom I., 12 Aug. 2006 (JE Seo, SJ Seo, YH Gong and BS Min) from 30 m in depth by SCUBA diving; 22 colonies, Hangaechang at Supseom I., 13 Aug. 2006 (JE Seo, SJ Seo and BS Min) from around 20 m in depth by SCUBA diving; four colonies, same as holotype.

Substratum. The stem of seaweeds.

Description. Colour of colony light yellow in alive (Fig. 1A), nearly white in alcohol (Fig. 1B), growing up to 5.7 cm in height, attached by entangled rhizoids, growing from a long peduncle arisen from rhizoids, curling frontally

towards their extremity, bushy, very fragile, delicate, ramified. Zooids arranged biserially and alternatively (Fig. 2A). Zooecia 0.50-0.61 mm long, 0.13-0.19 mm wide, divided into three sections by two joints; distal section turbinate, mainly free, flaring and curving outwards; middle section slender, cylindrical; proximal section very short, forked, contiguous, but rarely indistinctive (Fig. 2B). Frontal membrane oval (Fig. 2C), oblique, occupying half of distal section. Spines very long, four to five distally and two proximally, connected with zooecium by joint; distal spines arising just from distal end of dorsal surface; proximal spines from just below frontal membrane, bent inwards. Mode of bifurcation type 4 (Harmer, 1923) showing less than distal half of axillary zooid. Axillary zooid not curved outwards, with one distal spine, one lateral somewhat proximally and one proximal spine (Fig. 2D). No avicularium. Ovicell shaped like comb pen shell (*Atrina pectinata*) or scallop, broader than long, prominent, attached by short peduncle to inner margin of membranous area at right angles to branch axis, incurved, so that opening faces frontal membrane, covering half of frontal membrane (Fig. 2E).

Etymology. The scientific name is derived from *fragilis*, Latin, easily broken, referring to the fragile colony.

Remarks. The genus *Bicellariella* includes six species including *B. fragilis* n. sp. Of which, this new species resembles to *B. sinica* from China (Liu, 1984) in having no avicularium. However, in terms of location of the spines, new species has the distal spines distinguished from the proximal ones, whereas the spines in *B. sinica* are not divided into two groups. In addition, the spines of *B. sinica* are much shorter than the ones of new species in length. *B.*

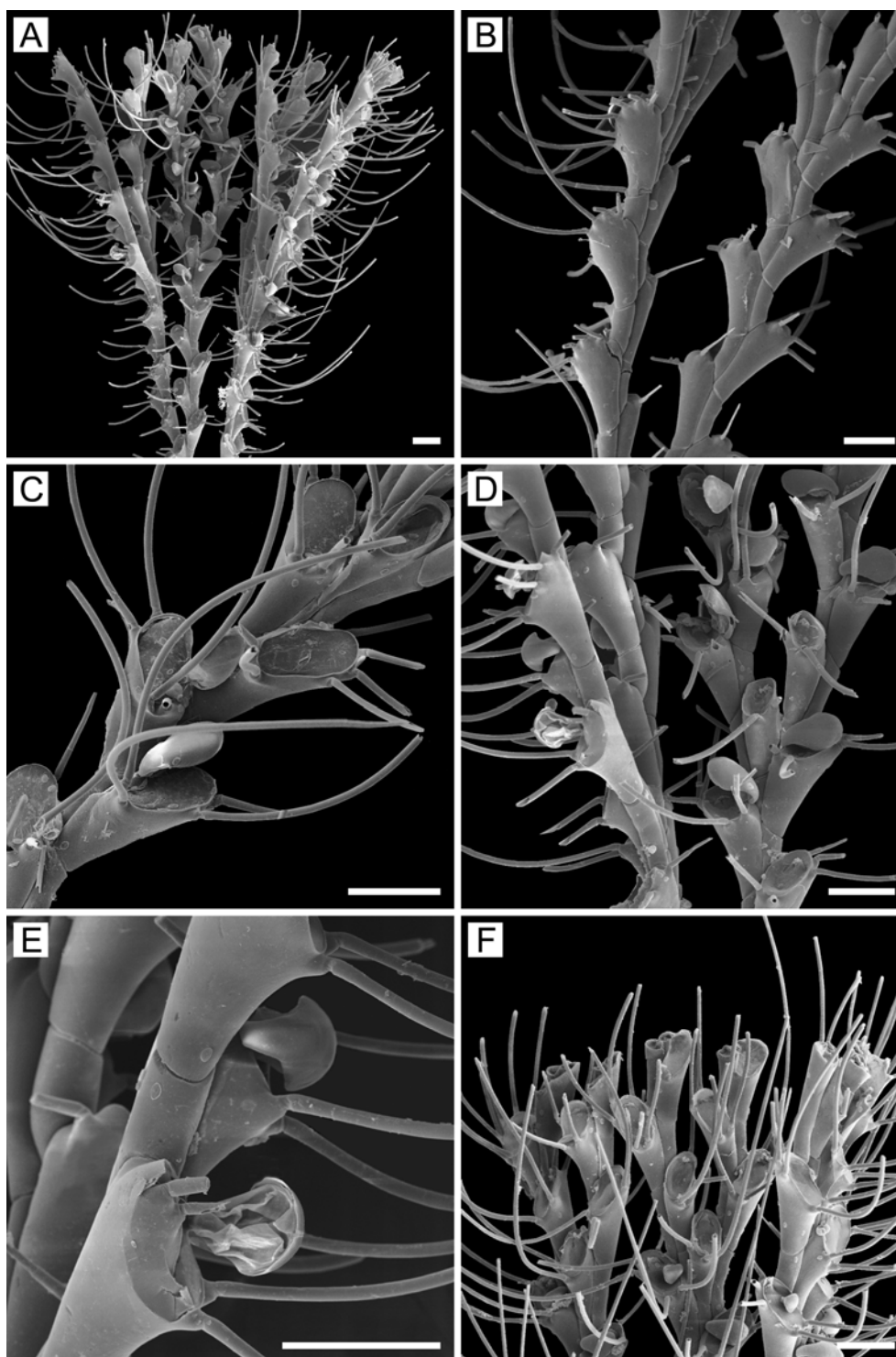


Fig. 2. *Bicellariella fragilis* n. sp. A, arrangement of zooids; B, basal view showing branch bifurcation and three sections divided by the joints in zooid; C, close-up zooids with four distal spines and two proximal spines; D, axillary zooid at bifurcation; E, both sides of ovicell; F, extremity of colony. Scale bars=0.2 mm.

fragilis is also similar to *B. levinseni* in numbers of both distal and proximal spines. The latter, however, shows the difference from the former in having avicularium (Harmer, 1926). *B. cookie* reported from India by Rao and Ganapati

(1974) couldn't be reviewed by the authors. The comparison of the characters between new species and its related four species is shown in Table 1. A key to four species of the genus *Bicellariella* is as follows.

Table 1. The comparison of characters between *B. fragilis* n. sp. and its related species

Scientific name	Characters	No. of dorsal spine	No. of distal spine	No. of proximal spine	Avicularium	Ovicell	Distribution
<i>B. ciliata</i>		1	4-9	1	present	helmet-shaped	Austral., Europe
<i>B. gracilis</i>		2-3	3	2	present	globose	Austral., China
<i>B. levinsini</i>		absent	4-6	2-3	present	broader	Indonesia
<i>B. sinica</i>		absent	10-12		absent	broader	China
<i>B. fragilis</i> n. sp.		4-5		2	absent	broader	Korea

- A key to the species of the genus *Bicellariella*
- 1. Avicularium absent 2
Avicularium present 3
 - 2. Spines not divided into two groups *B. sinica*
Spines divided into distal and proximal groups
.....*B. fragilis* n. sp.
 - 3. Dorsal spine absent *B. levinsini*
Dorsal spine present 4
 - 4. One proximal spine *B. ciliata*
Two proximal spines *B. gracilis*

Distribution. Korea (southern part of Jejudo Island).

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