

# A Faunistic Study on Cheilostomatous Bryozoans from the Shoreline of South Korea, with Two New Species

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## ABSTRACT

Seventy-one species of the order cheilostomatous bryozoans are reported from coasts of southern Korea. Among them, *Callpora inaviculata* and *Integripelta meta* are described as new species and the following eight species are reported as new records of Korea: *Membranipora irregulata*, *Tegella crenulata*, *Beania regularis*, *Celleporaria brunnea*, *Exochella tricuspis*, *Calypthotheca parcimunita*, *Microporella borealis*, *Celleporina rostellata*.

**Key words:** taxonomy, fauna, new species, Cheilostomata, Bryozoa, South Korea

## INTRODUCTION

Cheilostomata is the largest and most diverse order of the phylum Bryozoa. Since Scanning Electron Microscope has dramatically been used for its taxonomic work, new species are being added in the fauna of bryozoans continually as well as many species are currently being revised. However, quite a few species are still uncertain in their taxonomic status, and thus needed to be revised.

Since Okada (1923) reported 49 species from the Strait of Korea, the faunistic studies of the Korean cheilostomatous bryozoans have been done mainly by Seo. Seo (2005) reviewed 102 species of cheilostomatous bryozoans known until that time. Since this work, Seo and Gong (2006) recorded *Buffonellaria acutirostris* as a new species and *Thalamoporella sibogae* Soule, Soule and Chaney, 1992 and *Schizomavella acuta* Osburn, 1952 both as new records of Korea. However, more new species and new records are expected to be found from Korea.

This paper deals with the descriptions of two new species and eight new records of Cheilostomata from South Korea. New collection data for previously recorded species are also reported.

## MATERIALS AND METHODS

Seventy one species of cheilostomatous bryozoans were collected from 51 sites of South Korea during the period

from 1970 to 2007 (Fig. 1). Collecting specimens was done from various habitats such as rocky bottom, shells and other substrata in intertidal zone, fishing nets, subtidal zone, test panels for ecological research, and aquaculture facilities, etc. For scanning electron microscopy, the materials were bleached, and then coated with ion sputter coater and examined with a Scanning Electron Microscope (SEM). Holotypes will be deposited in the National Institute of Biological Resources, Korea and paratypes are kept in the collection of the corresponding author.

## SYSTEMATIC ACCOUNTS

Phylum Bryozoa Ehrenberg, 1831  
Class Gymnolaemata Allman, 1856  
Order Cheilostomata Busk, 1852  
Suborder Inovicellata Jullien, 1888  
Superfamily Aeteoidea Smitt, 1867  
Family Aeteidae Smitt, 1867  
Genus *Aetea* Smitt, 1867  
*Aetea anguina* (Linné, 1758)

*Material examined.* Sangchujado Island, 16 Jul. 1987 (J.W. Lee) by SCUBA diving from 15 m in depth.

*Substratum.* Other bryozoan.

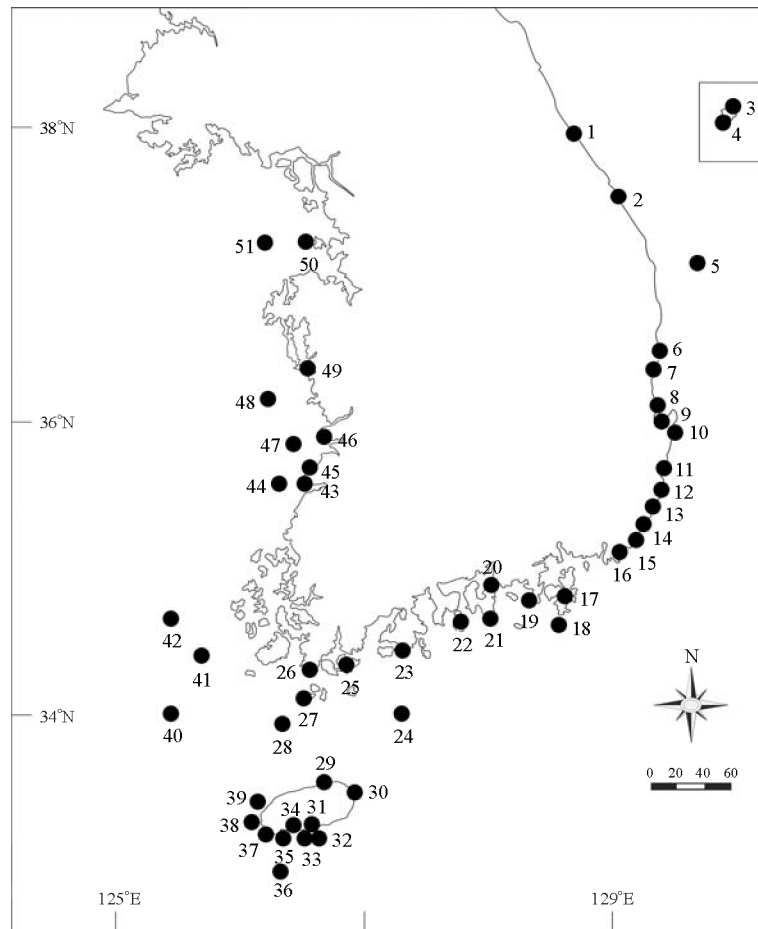
*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea and Jeju-do.

Suborder Malacostega Levinsen, 1909  
Superfamily Membraniporoidea Busk, 1854  
Family Membraniporidae Busk, 1854

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**Fig. 1.** A map showing the collection localities in South Korea. 1, Namae Port; 2, Yonguimeori, Daejin; 3, Wadal-ri, Ulreungdo Island; 4, Tonggumi, Ulreungdo Island; 5, Wangdolcho, Uljin; 6, Changpo 2-ri, Gyeongjeong; 7, Geondal, Yeongdeok; 8, Sobongdae, Yangpo; 9, Masan and 1-ri, Balsan; 10, Samjeong, Guryongpo; 11, Chuksa and Gampo Port, Gampo; 12, Wolseong; 13, Ulgi light house; 14, Dangsa, Ulsan; 15, Seuldo Island, Bangeojin; 16, Mipo, Busan; 17, Daepo, Gabae, Gudo Island, Gujora, Hangmakjung, Heungnam, Hyangmyeongchon, Janghang, Susan and Yunpo, Geojedo Island; 18, Dongseom Island, Maemuldo Island; 19, Bongdo Island, Budo Island, Chukdo Island, Daejangdudo Island, Daemangjado Island, Godo Island, Hahangdo Island, Hangdo Island, Hodo Island, Hwado Island, Ido Island, Jangdo Island, Jukdo Island, Junghangdo Island, Jungpyeon in Gollido Island, Pildo Island, Saryangdo Island, Taedo Island, Tongyeong Marine Ranch, Uldo Island, Yudo Island and Yujado Island, Tongyeong; 20, Adudo Island, Bakdeungdo Island, Gaeseom Island, Hyanggido Island, Keungaeseom Island, Mokdo Island, Samcheonpo and Solseom Island, Sacheon; 21, Mijo-ri and Sangju-ri, Namhaedo Island; 22, Ohak-ri, Geumdo Island; 23, Jijukdo Island; 24, Baekdo Island and Husuwolsan light house in Seodo Island, Geomundo Island; 25, Cheokdo Island and Daechilgido Island, Wando Island; 26, Jeungdo Island, Haenam; 27, Jung-ri and Mokdo Island, Bogildo Island; 28, Chujado Island and Sangchujado Island; 29, Gimnyeong; 30, Seongsanpo; 31, Seogwipo and Seogwipo Breakwater; 32, Munseom Island and Hangaechang in Munseom Island; 33, Beomseom Island; 34, Daepo; 35, Hyeongjeseom Island; 36, Marado Island; 37, Moseulpo; 38, Chaguido Island; 39, Biyangdo Island; 40, Gaerinyeo Island, Geumdongyeo Island and Mangbuseok, Gageodo Island; 41, Manjaedo Island; 42, Dwitdaemok, Gonchon, Jin-ri and Sa-ri, Heuksando Island; 43, Chaeseokgang Breakwater, Gunghang, Gyeokpo and Mohang, Gyeokpo; 44, Dae-hyeongjedo Island, Wido Island; 45, Byeonsan beach; 46, Naecho-dong, Gimje; 47, Jangjado Island, Maldo Island, Sinsido Island, and Sohoenggyeongdo Island, Gogunsan Islands; 48, Burando Island, Daecheon, Dukseom Island, Mongdeokdo Island, Oehyeonggyeondo Island, Seokdo Island, Sohoenggyeondo Island and Sudo Island, Boryeong; 49, Geomeunyeo Island, Ocheon; 50, Yeongheungdo Island; 51, Jin-ri, Deokjeokdo Island.

Genus *Membranipora* de Blainville, 1830

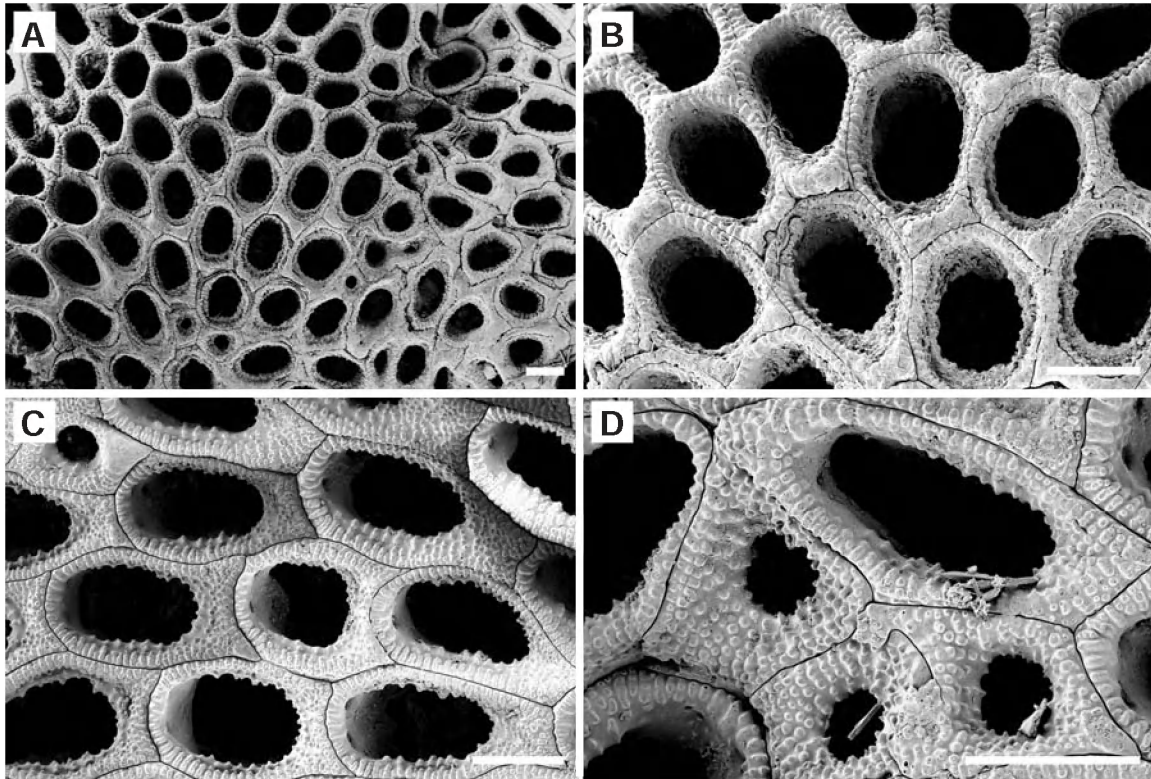
124, figs. 14-18; Liu et al., 2001, p. 416, pl. 10, figs. 3-6.

<sup>1</sup>\* *Membranipora irregulata* Liu, 1991 (Fig. 2)

*Membranipora irregulata* Liu, 1991, p. 57, fig. 1; 1992, p.

*Material examined.* Byeonsan beach, 8 Apr. 1993 (J.E. Seo).

<sup>1</sup>\* 불규칙막이끼벌레 (신칭)



**Fig. 2.** *Membranipora irregulata* Liu, 1992. A, arrangement of zooids; B, zooids with blunt tubercles on cryptocyst; C, zooids showing cryptocyst without tubercles; D, bleached zooids remaining chitinous spines. Scale bars=0.2 mm (A-D).

*Substratum.* Gastropod shells.

*Description.* Colony encrusting gastropod shells; unilamellar or forming multilaminar mass. Zooecium somewhat regular or radial in arrangement, 0.28-0.30 mm wide, 0.39-0.44 mm long, quadrangular, pentagonal or elongate-hexagonal, angular at their four corners; outlines marked by very distinct dark brown lines. Opesia and cryptocyst covered by frontal membrane occupying whole frontal area. Mural rim salient and bead-like. Cryptocyst well developed proximally than distally and laterally, serrated on its inner border, granulated densely and roughly on its surface. No gymnocyst. Two multiporous mural porechambers on transverse wall near proximal wall. One or two blunt tubercles sometimes present on proximal cryptocyst of some zooids, mostly lacking. Kenozooids intercalated among autozooids, much smaller than autozooids, variable in size and shape, having frontal membrane, opesia and extensive cryptocyst with granular surface and serrated inner border.

*Remarks.* Chitinous spinules on the surface of membrane and operculum which are known as variable in number and located irregularly on surface (Liu, 1991) were not observed in the present work because the frontal membrane and oper-

culum was already removed. However, some of chitinous spinules were fortunately found among the zooids. Single or a pair of blunt tubercles are seen in Korean specimens in comparison with the Chinese one showing spherical tubercles. All of the kenozooids in our specimen have the opesia while some kenozooids of Chinese ones were recorded to have no opesia.

*Distribution.* Korea (Yellow Sea) and South China Sea.

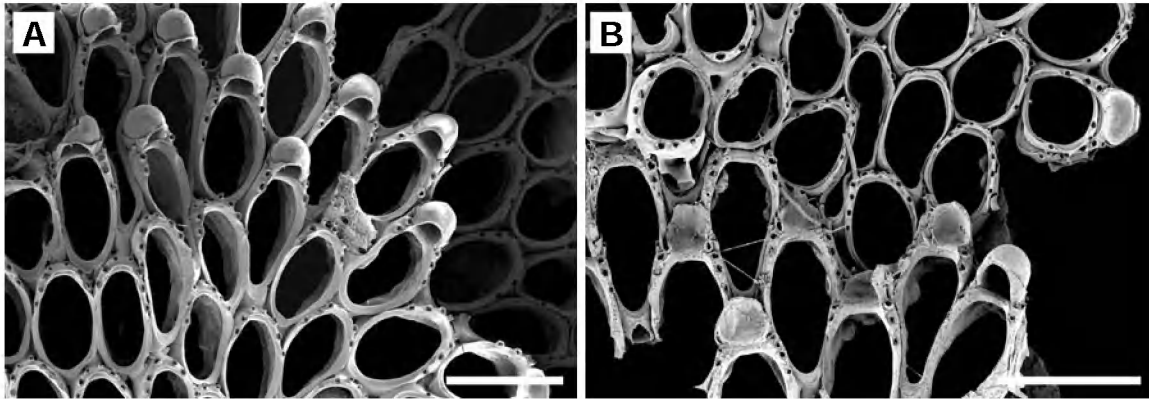
#### *Membranipora perfragilis* (MacGillivray, 1881)

*Material examined.* Naecho-dong, Gimje, 26 Oct. 1999 (S.J. Seo); Chaguido Island, 6 Nov. 2000 (J.I. Song) by SCUBA diving from 25 m in depth; Tongyeong Marine Ranch, 9 Aug. 2004 (J.E. Seo) by SCUBA diving from 10-20 m in depth.

*Substratum.* Seaweeds stem.

*Remarks.* This species encrusts corals and the stem of seaweeds, and is the typical fouling bryozoan frequently attaching to ropes hanging on the wharf and aquaculture cages.

*Distribution.* Pacific, including Japan and all coasts of southern Korea.



**Fig. 3.** *Callopora inaviculata* n. sp. A, arrangement of ovicellate zooids; B, zooid showing intact spine. Scale bars=0.5 mm (A, B).

***Membranipora savartii* (Audouin, 1826)**

*Material examined.* Chaguído Island, 8 Jun. 2000 (J.I. Song); Munseom Island, Jeju-do, 11 Jun. 2000 (J.I. Song); Sangju-ri, Namhaedo Island, 3 Dec. 2002 (J.E. Seo).

*Substratum.* Cement test panels.

*Remarks.* This species is a fouling bryozoan that has been collected from fishing nets. It is newly reported from the South Sea.

*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea, Jeju-do and Yellow Sea.

***Membranipora serrilamella* Osbrun, 1950**

*Material examined.* Wangdolcho, Uljin, 25 Aug. 2002 (J.E. Seo) by SCUBA diving from 15 m in depth; Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Yujado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo).

*Substratum.* Unknown.

*Remarks.* This species is reported for the first time from the South Sea.

*Distribution.* Pacific, including Japan and Korea (South Sea and Yellow Sea).

***Membranipora tuberculata* (Bosc., 1802)**

*Material examined.* Gujora, Geojedo Island, 13 Jul. 1999 (S. Shin); Hyangmyeongchon, Geojedo Island, 15 Jul. 1999 (S. Shin); Yonguimeori, Daejin, 16 Sep. 1999 (J.E. Seo); Beomseom Island, Jeju-do, 29 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Munseom Island, Jeju-do, 24 Feb. 2003 (J.E. Seo) from 17 m in depth.

*Substratum.* Seaweeds and stones.

*Remarks.* This species is usually found to encrust kelps such

as *Ecklonia cava*. As a fouling species, it also attaches to buoys and plastic pipes.

*Distribution.* Cosmopolitan. In Korea, it is found from the East Sea, South Sea, and Jeju-do.

Family Electridae Stach, 1937

Genus *Electra* Lamouroux, 1816

***Electra tenella* (Hincks, 1880)**

*Material examined.* Sangju-ri, Namhaedo Island, 3 Dec. 2002 (J.E. Seo).

*Substratum.* Cement test panels.

*Remarks.* This species is one of the fouling bryozoans which attach on the cement panels made for the ecological experiment and was also found from the test panels which were set up in the power plants at Wolseong and Seocheon.

*Distribution.* Cosmopolitan. In Korea, it is found from the East Sea, South Sea and Yellow Sea.

Suborder Flustrina Smitt, 1868

Superfamily Calloporoidea Norman, 1903

Family Calloporidae Norman, 1903

Genus *Callopora* Gray, 1848

**<sup>1</sup>\* *Callopora inaviculata* n. sp. (Fig. 3)**

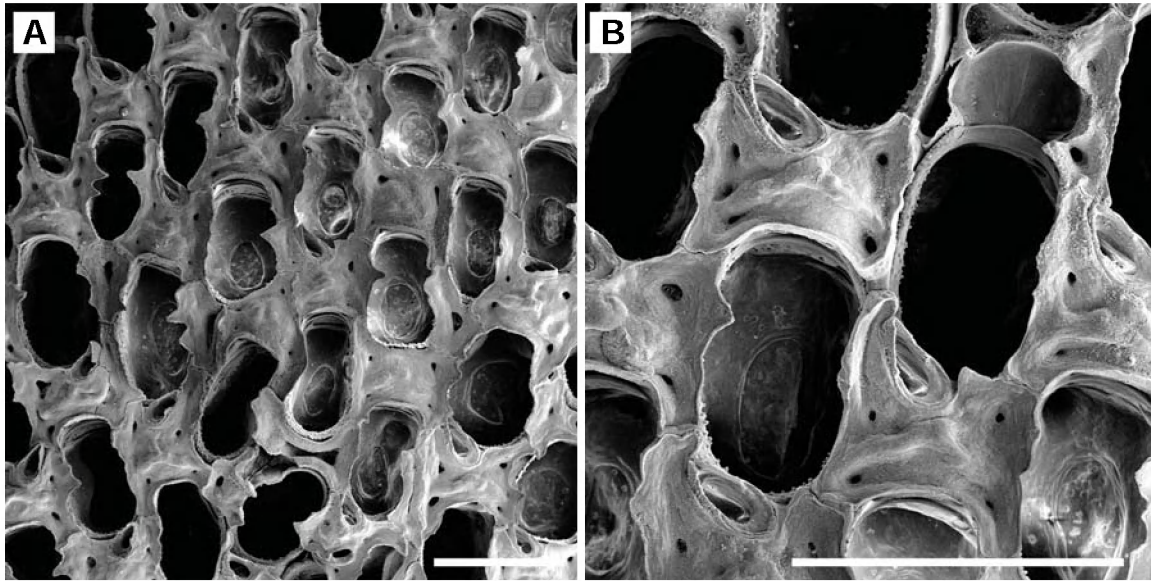
*Material examined.* Holotype: One colony from Geomeunyeo Island, Ocheon (36° 24'20.35" N, 126° 27'40.56" E), 6 Apr. 2003 (Y.H. Gong and K.B. Lee) by SCUBA diving from 5 m in depth. Paratype: One colony from same as holotype. Holotype will be deposited in the National Institute of Biological Resources, Korea. Paratype is kept in the collection of the corresponding author.

*Substratum.* Oyster shells.

*Description.* Colony encrusting oyster shells, unilamellar.

<sup>1</sup>\*민조두체고운이끼벌레 (신칭)





**Fig. 4.** *Tegella crenulata* (Okada, 1929). A, zooids with crenulated opesia; B, ovicellate zooids with avicularium. Scale bars=0.5 mm (A, B).

Zooids separated distinctly by deep grooves. Zooecium 0.26-0.27 mm wide, 0.44-0.53 mm long, oval or elongate elliptical. Gymnocyst and cryptocyst rarely developed, but gymnocyst somewhat developed proximally, raised in some zooids. Opesia very large, occupying entire surface of front, surrounded by three pairs of long spines facing inward on disto-lateral walls. A pair of spines on distal end directed distally. No avicularium. Ovicell hyperstomial; entoecium smooth; ectoecium having membranous triangular area frontally.

**Remarks.** Large number of species of *Callopora* have numerous spines along the opesia border ranging 4-11 pairs in total. This new species is thus easily distinguished from the other species of *Callopora* in having only three pairs of spines. This new species is also characteristic of having no avicularium. Five species of *C. depressa* Cook, 1968, *C. derjugini* Kluge, 1915, *C. discreta* Hincks, 1862, *C. obesa* Kluge, 1952 and *C. whiteavesi* Norman, 1903 have no avicularium. However, three species (*C. derjugini*, *C. obesa* and *C. whiteavesi*) are circumpolar species, and the rest two species (*C. depressa* and *C. discreta*) inhabit the Atlantic Ocean. In addition, the latter two species show the difference from new species by having 6-11 pairs of spines, and 4-5 pairs, respectively (Mawatari and Mawatari, 1980). The other species of Korean *Callopora*, *C. lineata* (Linné, 1758) was also found only from the Yellow Sea as this new species.

**Etymology.** The scientific name is derived from *in*, Latin, without, referring to having no avicularium.

Genus *Cauloramphus* Norman, 1909

***Cauloramphus korensis* Seo, 2001**

**Material examined.** Yujado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Daehyeongjedo Island, Wido Island, 13 Jun. 2007 (B.S. Min); Dukdo Island, Boryeong, 25 Jun. 2007 (J.E. Seo); Seokdo Island and Bulando Island, Boryeong, 26 Jun. 2007 (J.E. Seo).

**Substratum.** Unknown.

**Remarks.** This species is newly added from the South Sea and easily recognizable with its purplish brown spines.

**Distribution.** Korea (East Sea, South Sea and Yellow Sea).

Genus *Tegella* Levinsen, 1909

**<sup>1</sup>\**Tegella crenulata* (Okada, 1929) (Fig. 4)**

*Ellisina crenulata* Okada, 1929, p. 12, pl. 4, fig. 1.

*Tegella crenulata*: Sakakura, 1935, p. 107; Okada and Mawatari, 1938, p. 449, pl. 24, figs. 2, 3; Mawatari, 1952, p. 263; Mawatari and Mawatari, 1980, p. 98, fig. 35.

**Material examined.** Tongyeong Marine Ranch, 29 Aug. 2004 (J.E. Seo) by SCUBA diving from 10-20 m in depth.

**Substratum.** Unknown.

**Description.** Colony encrusting seaweeds, shells and stones, and forming somewhat thick and grayish incrustation. Zooecia elongated quadrangular, 0.31-0.40 mm wide, 0.65-0.71 mm long, arranged alternatively in radiating lines, separated by indistinct interzooidal grooves by secondary calcification.

<sup>1</sup>\*연거친거미이끼벌레 (신칭)

Frontal wall covered by frontal membrane. Gymnocyte developed a little proximally with a few of marginal pores, but soon heavily calcified causing to be thick and undulating to conceal frontal avicularia or ovicell. Lateral expansion of proximal gymnocyte of neighbouring zooid usually projecting into opesia to make its margin irregular and crenulated near middle. Opesia elongate oval, 0.28-0.35 mm wide, 0.49-0.58 mm long occupying about 2/3 of frontal surface. Cryptocyst not developed in older zooids. No spines. A single avicularium, situated laterally on proximal gymnocyte, becoming immersed in older zooids formed by secondary calcification, directing obliquely distally and upward, elongate triangular directing obliquely distally and upward, with no cross bar. Ovicell hemispherical, as wide as opesia, broader and long, immersed in heavily calcified, margin of which comprise thick, curved transverse ridge. Ancestrula not observed.

*Remarks.* This species resembles to *Tegella incrustans* Silén, 1941. However, the avicularium is situated in the center of the gymnocyte in *T. incrustans*, whereas the one of this new species is located in the lateral side of the gymnocyte when it is associated with ovicell. Besides, the zoecium and opesia are smaller than the ones of Japanese specimen (Mawatari and Mawatari, 1980). Also this species shows the difference from *T. incrustans* in having no spine.

*Distribution.* Korea (South Sea) and Japan.

#### ***Tegella incrustans* Silén, 1941**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Baekdo Island, Geomundo Island, 28 Mar. 2002 (J.J. Sim) by SCUBA diving from 20 m in depth.

*Substratum.* Sponges.

*Remarks.* Most of the species belonging to *Tegella* are not easy species to identify because of its heavy calcification. This species is a fouling bryozoan which has been collected from the plastic buoy.

*Distribution.* Korea (East Sea, South Sea and Yellow Sea) and Japan.

Family Antroporidae Vigneaux, 1949

Genus *Antropora* Norman, 1903

#### ***Antropora tincta* (Hastings, 1930)**

*Material examined.* Jung-ri, Bogildo Island, 11 Aug. 1995 (J.E. Seo) from fishing nets; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Sudo Island, Boryeong, 27 Jun. 2007 (J.E. Seo).

*Substratum.* Hermit crab.

*Remarks.* This species is easily recognizable with its pinkish color. The Yellow Sea is added to the distribution of this species.

*Distribution.* Korea (South Sea and Yellow Sea), Japan, Pacific and Atlantic.

Family Chaperiidae Jullien, 1888

Genus *Chaperia* Jullien, 1891

#### ***Chaperia acanthia* (Lamouroux, 1825)**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is newly collected from the Yellow Sea.

*Distribution.* Korea (South Sea and Yellow Sea) and Japan.

Superfamily Buguloidea Gray, 1848

Family Bugulidae Gray, 1848

Genus *Bugula* Oken, 1815

#### ***Bugula californica* Robertson, 1905**

*Material examined.* Gaeseom Island and Keungaeseom Island, Sacheon, 14 Jun. 2000 (J.E. Seo) by SCUBA diving from 5 m in depth; Sangju-ri, Namhaedo Island, 2, 3 Nov. 2002 (J.E. Seo) from test panels; Sangju-ri, Namhaedo Island, 2 Feb. 2002 (J.E. Seo) from test panels; Uldo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Hwado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo).

*Substratum.* Cement test panels, seaweeds and plastic bottles.

*Remarks.* This species is a fouling bryozoan.

*Distribution.* Cosmopolitan.

#### ***Bugula dentata* (Lamouroux, 1816)**

*Material examined.* Seongsanpo, 9 Jun. 2000 (J.I. Song); Beomseom Island, Jeju-do, 3 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Marado Island, 4 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Chaguido Island, 6 Nov. 2000 (J.I. Song) by SCUBA diving from 25 m in depth; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

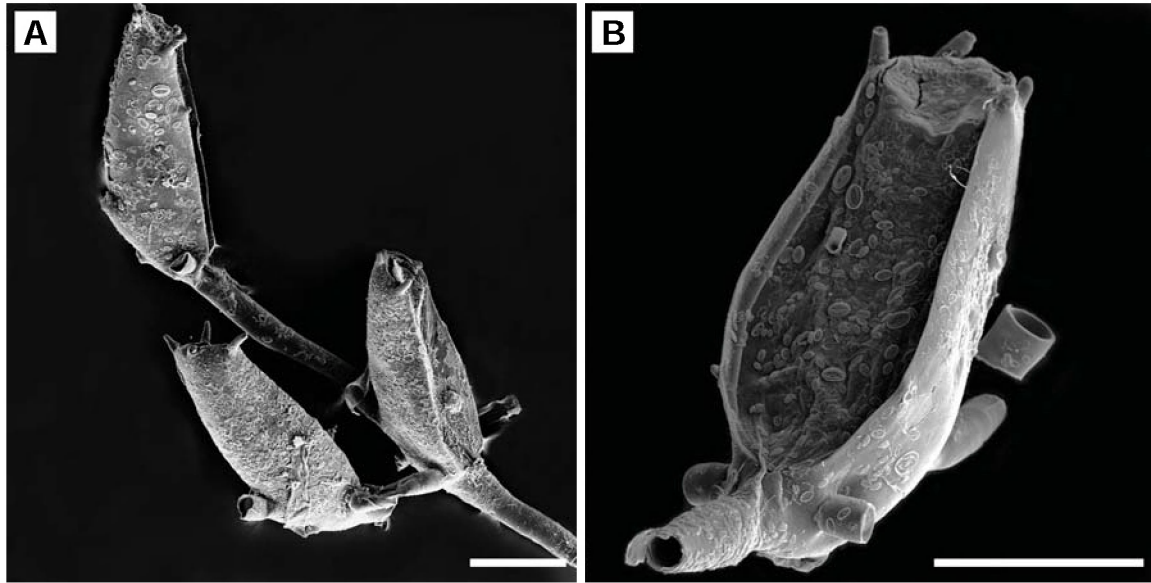
*Substratum.* Worm tubes.

*Remarks.* Gageodo Island belonging to the Yellow Sea is the additional locality for this species.

*Distribution.* Cosmopolitan.

#### ***Bugula neritina* (Linné, 1758)**

*Material examined.* Mokdo Island, Bogildo Island, 11 Aug.



**Fig. 5.** *Beania regularis* Thornely, 1916. A, arrangement of zoids showing four connection tubes; B, close-up of zoid showing four spines on distal end. Scale bars=0.2 mm (A, B).

1995 (J.E. Seo); Susan, Geojedo Island, 29 Jan. 1997 from 10 m in depth; Sobongdae, Yangpo, 14 Sep. 1999 (J.E. Seo); Keungaeseom Island, Sacheon, 14 Jun. 2000 (J.E. Seo) by SCUBA diving from 5 m in depth; Jungpyeon, Gollido, 23 Jul. 2001 (J.E. Seo); Sangju-ri, Namhaedo Island, 2 Nov. 2002 (J.E. Seo) from test panels; Sangju-ri, Namhaedo Island, 3 Dec. 2002 (J.E. Seo) from test panels; Sangju-ri, Namhaedo Island, 17 Feb. 2003 (J.E. Seo) from test panels; Tongyeong Marine Ranch, 29 Aug. 2004 (J.E. Seo) by SCUBA diving from 10-20 m in depth; Chukdo Island, Tongyeong, 26 Jun. 2006 (J.E. Seo); Godo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Uldo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Daehyeongjedo Island, Wido Island, 13 Jun. 2007 (J.E. Seo).

*Substratum.* Shells, ropes hanging on the wharf, cement test panels and seaweeds.

*Remarks.* *Bugula neritina* is a cosmopolitan species distributed through the ocean as a typical fouling bryozoan. It is remarkable that this is not yet found from Jeju Island waters, though. *Bugula neritina* looks similar to *B. dentata* in bushy shape of colony, however the latter which is dark green in color clearly differs from the former which is reddish brown.

*Distribution.* Cosmopolitan. In Korea, it is found from the East Sea, South Sea and Yellow Sea.

#### ***Bugula robusta* MacGillivray, 1869**

*Material examined.* Junghangdo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo).

*Substratum.* Unknown.

*Distribution.* Cosmopolitan. In Korea, it is found only from the South Sea.

#### ***Bugula subglobosa* Harmer, 1926**

*Material examined.* Chaguido Island, 6 Jun. 2000 (J.I. Song) by SCUBA diving from 25 m in depth; Beomseom Island, Jeju-do, 10 Jun. 2001 (J.I. Song) by SCUBA diving from 35 m in depth.

*Substratum.* Worm tubes.

*Distribution.* Pacific, including Japan and Korea (South Sea and Jeju-do).

#### ***Bugula umbelliformis* (Yanagi and Okada, 1918)**

*Material examined.* Daehyeongjedo Island, Wido Island, 13 Jun. 2007 (J.E. Seo).

*Substratum.* Unknown.

*Remarks.* This species is reported for the first time from the Yellow Sea.

*Distribution.* Korea (East Sea, South Sea and Yellow Sea) and Japan.

Family Beaniidae Canu and Bassler, 1927

Genus *Beania* Johnston, 1840

#### ***Beania discodermae* (Ortmann, 1890)**

*Material examined.* Gaerinyeo, Gageodo Island, 13 Aug.

1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is a fouling bryozoan collected from fishing nets. The Yellow Sea is the first record for this species in Korea.

*Distribution.* Pacific, including Japan and all coasts of southern Korea.

***Beania hexaceras* (Ortmann, 1890)**

*Material examined.* Chuksa, Gampo, 2 Jul. 1998 (S. Shin); Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Bongdo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo).

*Substratum.* Unknown.

*Distribution.* Japan and all coasts of southern Korea.

**<sup>1</sup>\* *Beania regularis* Thornely, 1916 (Fig. 5)**

*Beania regularis* Thornely, 1916, p. 161, text-fig. 6; Harmer, 1926, p. 418, pl. 28, figs. 11, 12; Hastings, 1932, p. 409; Mawatari, 1965, p. 607, fig. 78e, f; Liu, 1984, p. 264, fig. 9; Mawatari and Mawatari, 1986, p. 85, fig. 5; Liu et al., 2001, p. 478, pl. 26, fig. 1.

*Material examined.* Jijukdo Island, 2 Jul. 1991 (J.E. Seo); Chaeseokgang breakwater, Gyekpo, 3 May 1997 (J.E. Seo); Samjeong, Guryongpo, 17 Jul. 2001 (S. Shin); Jeungdo Island, Haenam, 25 Mar. 2005 (Y.H. Gong and B.S. Min).

*Substratum.* Shells of Brachiopoda, Shells of Mollusca, worm tubes and stones.

*Description.* Colony attaching to substrata by rootlets given off by basal surface, usually one by each zooecium near proximal end of its expanded part. Neighbour zooids forming meshes by four connecting tubes protruding from proximal end. Zooecia elongate elliptical, 0.18-0.19 mm wide, 0.43-0.57 mm long, its expanded part stands up at considerable angle from basal network. Opesia occupying whole front, widened proximally. Proximal part of zooecium long, tubular, which connecting to basal tube rising from mother zooid. Lateral connecting tubes arising in both proximal ends. Spines two or four, very small, restricted to distal end. No avicularium and ovicell found.

*Remarks.* Harmer (1926) described that this species had usually three spines and occasionally two or four. However, our specimens have usually four spines, sometimes two. No avicularium was found in our specimens. Harmer also described that the avicularium was rarely found. Colony can be visible only under microscope because it looks thin thread in shape.

*Distribution.* Korea (South Sea and Yellow Sea) and western

Pacific.

***Beania vegae* Silén, 1941**

*Material examined.* Susan, Geojedo Island, 29 Jan. 1997 (J.E. Seo) from 10 m in depth; Chaguido Island, 8 Jun. 2000 (J.I. Song); Solseom Island, Sacheon, 12 Jun. 2000 (J.E. Seo); Bakdeungdo Island, Sacheon, 13 Jun. 2000 (J.E. Seo); Godo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Bongdo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Daejangdudo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Jangdo Island, Tongyeong, 29 Jun. 2006 (J.E. Seo).

*Substratum.* Seaweeds and shells.

*Distribution.* Korea (South Sea) and Japan.

Family Candidae d'Orbigny, 1851

Genus *Amastigia* Busk 1852

***Amastigia rudis* (Busk, 1852)**

*Material examined.* Seongsanpo, 9 Jun. 2000 (J.I. Song); Marado Island, 4, Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Beomseom Island, Jeju-do, 21 Feb. 2001 (J.I. Song) by SCUBA diving from 20 m in depth; Marado Island, 7 Jun. 2001 (J.I. Song); Munseom Island, Jeju-do, 26 Feb. 20 (J.E. Seo) by SCUBA diving from 30 m in depth; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is known to be a fouling bryozoan encrusting the anchors.

*Distribution.* Pacific including Japan and all coasts of southern Korea, and Indian.

***Amastigia xishensis* Xixing, 1984**

*Material examined.* Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Seongsanpo, 9 Jun. 2001 (J.I. Song) by SCUBA diving from 20 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is endemic to the Far East which is collected only from Jeju Island waters and Chinese Seas so far.

*Distribution.* Pacific, including Korea (Jeju-do).

Genus *Caberea* Lamouroux, 1816

***Caberea boryi* (Audouin, 1826)**

*Material examined.* Chaguido Island, 8 Jun. 2000 (J.I. Song);

<sup>1</sup>\*아기왕관퐁이끼벌레 (신칭)



Seongsanpo, 9 Jun. 2000 (J.I. Song); Beomseom Island, Jeju-do, 3 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Marado Island, 22 Feb. 2001 (J.I. Song) by SCUBA diving by 18 m in depth; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Seaweeds.

*Remarks.* This species is cosmopolitan, however the Yellow Sea is added in its Korean distribution herein and thus the East Sea remains to be investigated.

*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea, Jeju-do and Yellow Sea.

### ***Caberea lata* Okada, 1923**

*Material examined.* Beomseom Island, Jeju-do, 3 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Marado Island, 4 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Beomseom Island, Jeju-do, 21 Feb. 2001 (J.I. Song) by SCUBA diving from 20 m in depth; Marado Island, 22 Feb. 2001 (J.I. Song) by SCUBA diving from 18 m in depth; Marado Island, 7 Jun. 2001 (J.I. Song); Beomseom Island, Jeju-do, 10 Jun. 2001 (J.I. Song) by SCUBA diving from 35 m in depth; Baekdo Island, Geomundo Island, 28 Feb. 2002 (J.J. Sim) by SCUBA diving from 20 m in depth; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Tongyeong Marine Ranch, 29 Aug. 2004 (J.E. Seo) by SCUBA diving from 10-20 m in depth; Pildo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Yujado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo).

*Substratum.* Sponges and barnacles.

*Remarks.* *Caberea lata* is distinguishable from *C. hataii* Okada, 1929 in having no scutum. This species is a fouling bryozoan collected from fishing nets.

*Distribution.* Pacific including Japan and all coasts of southern Korea, and Indian.

Genus *Scrupocellaria* van Beneden, 1845

### ***Scrupocellaria maderensis* Busk, 1860**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* The Yellow Sea is added to the Korean distribution of this species.

*Distribution.* Pacific including Japan and Korea (South Sea, Jeju-do and Yellow Sea), and Atlantic.

Genus *Tricellaria* Fleming, 1828

### ***Tricellaria occidentalis* (Trask, 1857)**

*Material examined.* Mokdo Island, Bogildo Island, 11 Aug. 1995 (J.E. Seo); Dangsa, Ulsan, 1 Jul. 1998 (S. Shin); Chuksa, Gampo, 2 Jul. 1998 (S. Shin); Daechilgido Island, Wando Island, 14 Jun. 1999 (Y.H. Gong); Heungnam, Geojedo Island, 13 Jul. 1999 (S. Shin); Hyangmyeonchon, Geojedo Island, 15 Jul. 1999 (S. Shin); Sa-ri, Heuksando Island, 11 Aug. 1999 (J.E. Seo); Dwitdaemok, Heuksando Island, 12 Aug. 1999 (J.E. Seo); Changpo 2-ri, Gyeongjeong, 13 Sep. 1999 (J.E. Seo); Ulgi light house, 14 Sep. 1999 (J.E. Seo); Masan, Balsan, 14 Sep. 1999 (J.E. Seo); 1-ri, Balsan, 15 Sep. 1999 (J.E. Seo); Yonguimeori, Daejin, 16 Sep. 1999 (J.E. Seo); Geondal, Yeongdeok, 16 Sep. 1999 (J.E. Seo); Munseom Island, Jeju-do, 6 Jun. 2001 (J.I. Song); Sangju-ri, Namhaedo Island, 2 Nov. 2002 (J.E. Seo) from test panels; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Ido Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Jukdo Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Jangdo Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Hodo Island, Tongyeong, 30 Jun. 2006 (J.E. Seo).

*Substratum.* Shells, seaweeds, colonial tunicates, sponges.

*Remarks.* This species is not only one of three commonest fouling bryozoans, but also the second commonest in intertidal zone of South Korea.

*Distribution.* Pacific, including Japan and all coasts of southern Korea.

Superfamily Microporoidea Gray, 1848

Family Steginoporellidae Hincks, 1884

Genus *Steginoporella* Smitt, 1873

### ***Steginoporella magnilabris* (Busk, 1854)**

*Material examined.* Baekdo Island, Geomundo Island, 28 Mar. 2002 (J.J. Sim) by SCUBA diving from 20 m in depth; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Sponges.

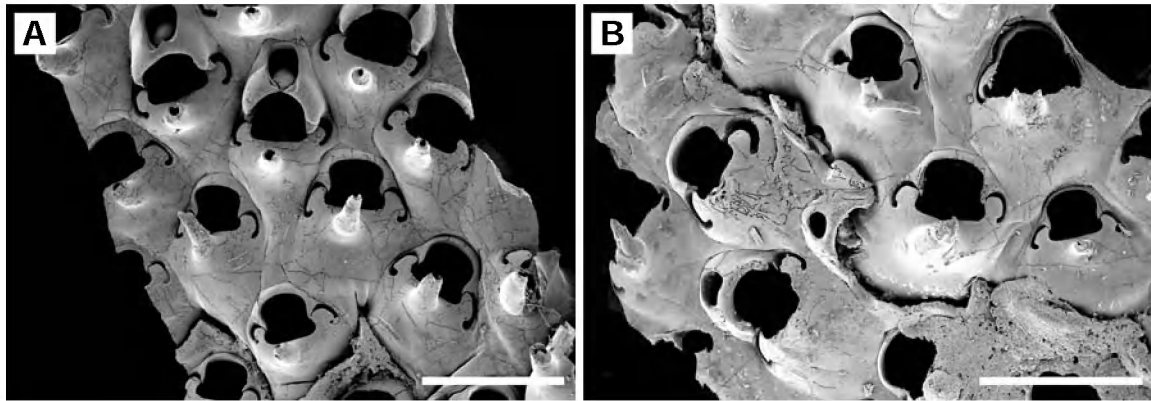
*Remarks.* This species is a subtropical species and has been reported from the South Sea and Jeju Island waters of Korea so far. Gageodo Island belonging to the Yellow Sea affected by the warm current is added to the distribution of this species herein.

*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea, Jeju-do and Yellow Sea.

Family Thalamoporellidae Levinsen, 1909

Genus *Thalamoporella* Hincks, 1887

### ***Thalamoporella lioticha* (Ortmann, 1890)**



**Fig. 6.** *Integripelta meta* n. sp. A, ovicellate zooids showing conical projection just below orifice; B, variable ovicells and foramens in size and shape (compare with left picture). Scale bars=0.5 mm (A, B).

*Material examined.* Biyangdo Island, 12 Dec. 1988; Gaerinyeo, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Geumdongyeo, Gageodo Island, 15 Aug. 1998 (J.E. Seo) by SCUBA diving from 27 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is a fouling bryozoan attaching the ropes hanging by the wharf. The Yellow Sea is added to the distribution of this species.

*Distribution.* Pacific, including Japan and Korea (South Sea, Jeju-do and Yellow Sea).

***Thalamoporella sibogae* Soule, Soule and Chaney, 1992**

*Material examined.* Seogwipo, 12 Apr. 1975; Daepo, Jeju-do, 16 Jan. 1985; Hyeongjeseom Island, Moseulpo, 21 Jul. 1998 (H.S. Go) by SCUBA diving from 15-20 m in depth.

*Substratum.* Stones.

*Distribution.* Korea (Jeju-do) and southwestern Pacific.

Superfamily Cellarioidea Lamouroux, 1821

Family Cellariidae Lamouroux, 1821

Genus *Cellaria* Ellis and Solander, 1786

***Cellaria punctata* (Busk, 1852)**

*Material examined.* Manjaedo, 23 Aug. 1988 (J.K. Jae) from 25 m in depth; Daepo, Geojedo Island, 8 Jul. 1996 (J.E. Seo) from 70 m in depth; Marado Island, 4 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Beomseom Island, Jeju-do, 10 Jun. 2001 (J.I. Song) by SCUBA diving from 35 m in depth; Marado Island, 16 Aug. 2001 (J.I. Song); Baekdo Island, Geomundo Island, 28 Mar. 2002 (J.J. Sim) by SCUBA diving from 20 m in depth; Gaerinyeo Island, Gageodo Island 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in

depth; Gampo Port, 25 Feb. 2003 (Y.H. Gong); Bongdo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo).

*Substratum.* Fishing nets (70 m deep), sponges and stones.

*Remarks.* This species is newly reported as a fouling bryozoan herein.

*Distribution.* Cosmopolitan.

Suborder Ascophora Levinsen, 1909

Infraorder Acanthostega Levinsen, 1902

Superfamily Catenicellidea Busk, 1852

Family Catenicellidae Busk, 1852

Genus *Catenicella* de Blainville, 1830

***Catenicella elegans* Busk, 1852**

*Material examined.* Chaguído Island, 8 Jun. 2000 (J.I. Song); Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Chaguído Island, 6 Jun. 2000 (J.I. Song) by SCUBA diving from 25 m in depth; Munseom Island, Jeju-do, 6 Jun. 2001 (J.I. Song); 7 Jun. 2001 (J.I. Song); Seongsanpo, 9 Jun. 2001 (J.I. Song) by SCUBA diving from 20 m in depth; Marado Island, 16 Jun. 2001 (J.I. Song).

*Substratum.* Worm tubes.

*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea, Jeju-do and Yellow Sea.

Family Eurystomellidae Levinsen, 1909

Genus <sup>1\*</sup>*Integripelta* Gordon, Mawatari and Kajihara, 2002

<sup>2\*</sup>***Integripelta meta* n. sp. (Fig. 6)**

*Lepralia bilabiata*: Okada, 1929, p. 24, fig. 10, pl. 2, fig. 3; Sakakura, 1935, p. 25, fig. 7.

*Eurystomella bilabiata*: Mawatari, 1952, p. 280; Gong and Seo, 2004, p. 14, fig. 2E [not *E. bilabiata* (Hincks, 1884)].

<sup>1\*</sup>민벽이끼벌레속 (신칭), <sup>2\*</sup>원뿔민벽이끼벌레 (신칭)

*Material examined.* Holotype: One colony from Geomeunyeo Island, Ocheon (36° 24' 20.35" N, 126° 27' 40.56" E), 6 Apr. 2003 (Y.H. Gong and K.B. Lee) by SCUBA diving from 5 m in depth. Paratypes: Sa-ri, Heuksando Island, 11 Aug. 1999 (J.E. Seo); Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Uldo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Hangdo Island, Tongyeong, 29 Jun. 2006 (J.E. Seo). Holotype will be deposited in the National Institute of Biological Resources, Korea. Paratypes are kept in the collection of the corresponding author.

*Substratum.* Oyster shells, seaweeds and rocks.

*Description.* Colony encrusting rocks, thin, unilamellar. Self-overgrowth found. Zooecium 0.34-0.38 mm wide, 0.54-0.61 mm long, contiguous, pentagonal, quincuncially arranged. Gymnocystal frontal shield flat, imperforate. Prominent spinous projection, conically pointed at end, on middle of gymnocyst, just below lower margin of zoecial orifice. Orifice nearly as long as wide, somewhat dumbbell-shaped, anter arched and rounded with proximal corners somewhat condyle-like; poster not wider than anter, proximal rim nearly straight. Orifice of maternal zooids a little larger than in autozooids. Conspicuous crescentic slits curve proximolaterally from corners of poster. Ooecium-associated kenozooid well developed, with a single large foramen, variable in size and shape. No avicularium and spine.

*Remarks.* Gordon et al. (2002) synonymized *Eurystomella bilabiata* Hincks, 1884 described by Okada (1929) with *Integripelta shirayamai* Gordon, Mawatari and Kajihara, 2002. However, the former is much different from the latter in having prominent spinous projection on the middle of the gymnocyst. *Integripelta bilabiata* by Okada is very similar to our specimens, instead. Both all the zooecia of Korean and Okada's specimens have conical projection, whereas no conical projection was found in *I. shirayamai* of Gordon et al. (2002). This new species also resembles to *I. umbonata* Gordon, Mawatari and Kajihara, 2002 in having the umbo below the orifice, however the latter has a low umbo in the centre of the gymnocyst and no long crescentic slits.

*Etymology.* The scientific name is derived from *meta*, Latin, conical column, referring to the conical projection.

*Distribution.* Korea (South Sea and Yellow Sea).

Infraorder Hippothoomorpha Gordon, 1989

Superfamily Hippothooidea Fischer, 1866

Family Hippothoidae Fischer, 1866

Genus *Hippothoa* Lamouroux, 1821

***Hippothoa distans* MacGillivray, 1869**

*Material examined.* Bakdeungdo Island, Sacheon, 13 Jun.

2000 (J.E. Seo).

*Substratum.* Other bryozoan (*Escharoides* sp.).

*Distribution.* Cosmopolitan. In Korea, it is found only from the South Sea.

Infraorder Umbonulomorpha Gordon, 1989

Superfamily Adeonooidea Busk, 1884

Family Adeonellidae Busk, 1884

Genus *Adeonella* Waters, 1888

***Adeonella platalea* Busk (Busk, 1854)**

*Material examined.* Chaguído Island, 8 Jun. 2000 (J.I. Song); Seongsampo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Chaguído Island, 6 Jun. 2000 (J.I. Song) by SCUBA diving from 25 m in depth; Marado Island, 22 Feb. 2001 (J.I. Song) by SCUBA diving from 18 m in depth; Munseom Island, Jeju-do, 6 Jun. 2001 (J.I. Song); Seongsampo, 9 Jun. 2001 (J.I. Song) by SCUBA diving from 20 m in depth; Marado Island, 16 Aug. 2001 (J.I. Song) by SCUBA diving.

*Substratum.* Unknown.

*Remarks.* This species is endemic to Jeju Island waters so far.

*Distribution.* Korea (Jeju-do) and Japan.

Superfamily Umbonuloidea Canu, 1904

Family Celleporariidae Harmer, 1957

Genus *Celleporaria* Lamouroux, 1821

***Celleporaria aperta* (Hincks, 1882)**

*Material examined.* Solseom Island, Sacheon, 12 Jun. 2000 (J.E. Seo); Jungpyeon in Gollido Island, 23 Jul. 2001 (J.E. Seo); Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Chukdo Island, Tongyeong, 26 Jun. 2006 (J.E. Seo); Junghangdo Island, Tongyeong, 27 Jun. 2006; Yujado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo).

*Substratum.* Ropes hanging on the wharf.

*Remarks.* This species is a fouling bryozoan collected from test panels in the power plants at Wolseong and Seocheon.

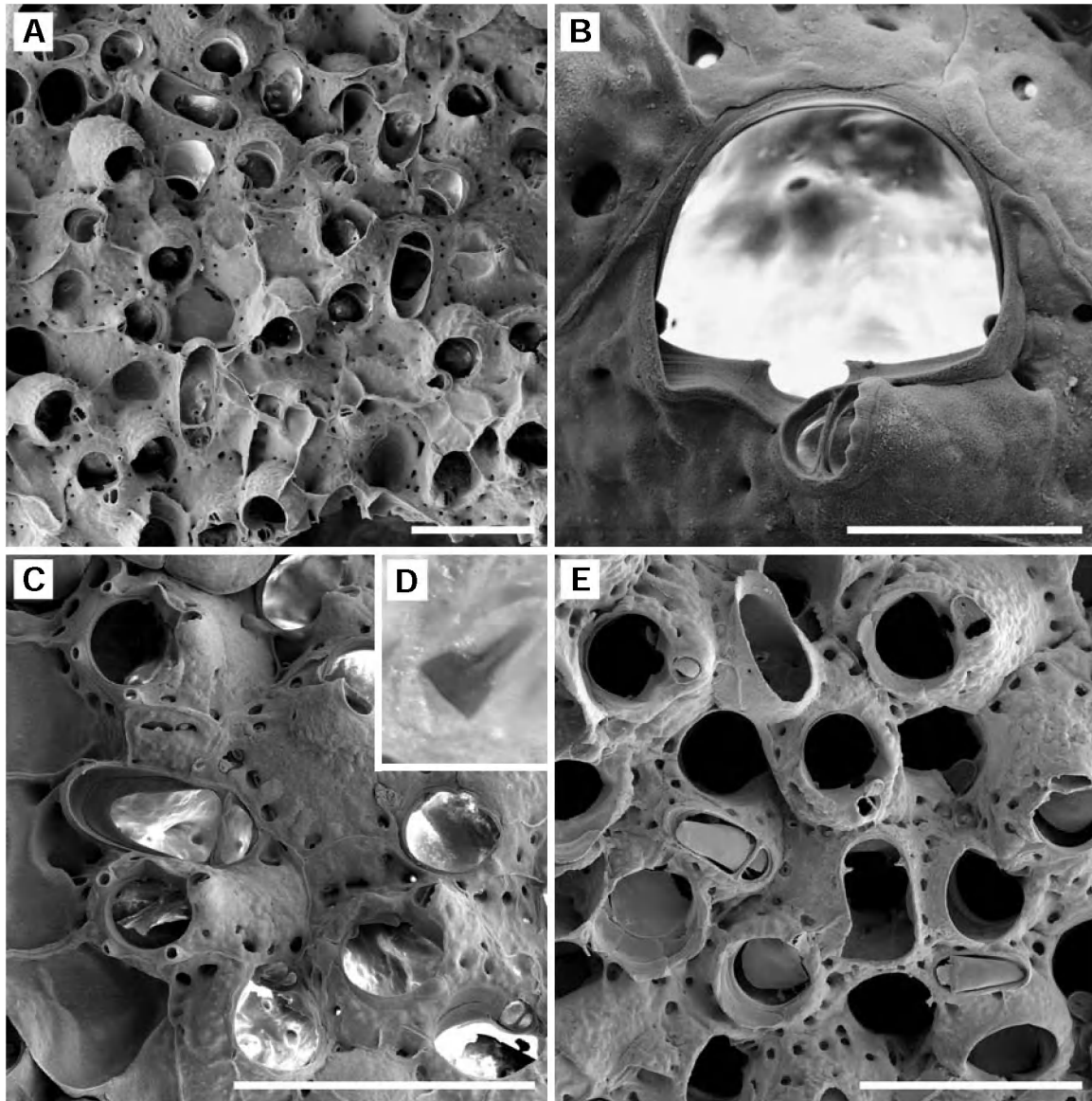
*Distribution.* Cosmopolitan. In Korea, it is found from the East Sea, South Sea and Yellow Sea.

<sup>1</sup>\* ***Celleporaria brunnea* (Hincks, 1884) (Fig. 7)**

*Cellepora brunnea* Hincks, 1884, p. 56; O'Donoghue and O'Donoghue, 1926, p. 21.

*Holoporella brunnea*: Hastings, 1930, p. 731, p. 16, fig. 7, 108-110; Osburn, 1952, p. 496, pl. 62, figs. 10-12; Soule and Duff, 1957, p. 127; Soule, 1961, p. 33; Pinter, 1969, p. 210.

<sup>1</sup>\* 갈색섬유이끼벌레 (신칭)



**Fig. 7.** *Celleporaria brunnea* (Hincks, 1884). A, arrangement of zooids with two spines and interzooidal avicularia; B, semicircular orifice with a pair of condyles and suboral avicularium with serrated rostral tip; C, close-up zooids with three spines; D, mandible of interzooidal avicularium showing dark brown sclerite (taken with Nikon D100 attached to stereomicroscope Carl Zeiss SV6); E, interzooidal avicularia showing intact mandible. Scale bars=0.5 mm (A, C, E), 0.1 mm (B).

*Celleporaria brunnea*: Soule and Soule, 1973, p. 601, fig. 79; Banta, 1980, p. 396, fig. 24, 103; Soule et al., 1995, p. 267, pl. 101A-C.

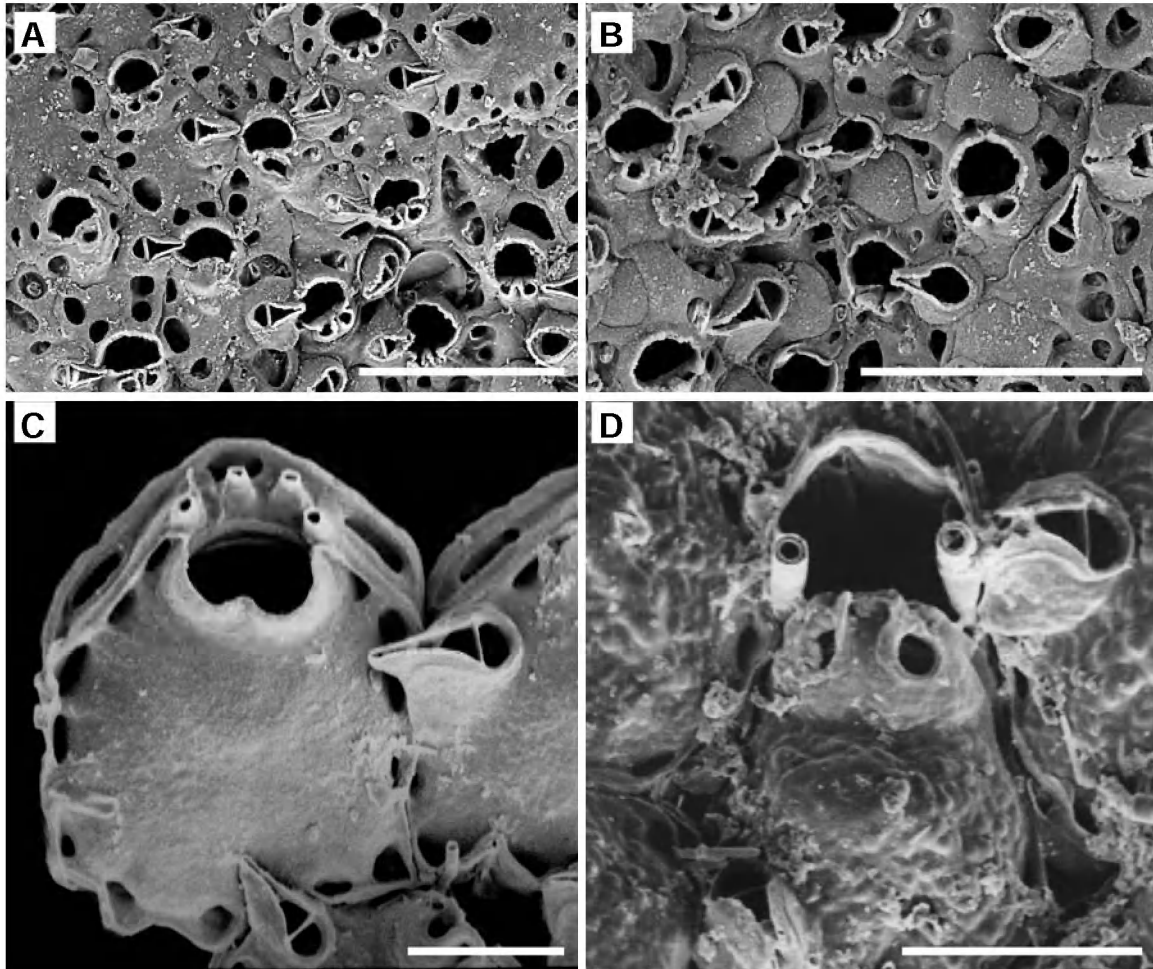
*Material examined.* Tongyeong Marine Ranch, 29 Aug. 2004 (J.E. Seo) by SCUBA diving from 10-20 m in depth.

*Substratum.* Aquaculture steel cages.

*Description.* Colony encrusting substrata, forming coarse brown or gray incrustation or rising to form irregular cylindrical mass. Zooecia heaped, erratically oriented, 0.33-0.42

mm wide, 0.42-0.53 mm long, interzooidal boundaries indistinct, with more than ten areolar pores. Orifice semicircular, with usually two spines, sometimes three when spine presents, with almost straight proximal border having midline notch, bounded by horizontal, shelflike condyles that almost meet in center, also with a pair of small lateral condyles. Secondary peristome with pseudosinus beside low umbo bearing a small, raised avicularium with serrated rostral end. Large interzooidal avicularia scattered, with large palate; mandible with large spade shaped brown reinforcing sclerite





**Fig. 8.** *Exochella tricuspis* (Hincks, 1881). A, arrangement of zooids with areolar pores; B, ovicellate zooids heavily calcified; C, periancestrular young zooid with four spines; D, close-up zooid with two spines. Scale bars=0.5 mm (A, B), 0.1 mm (C, D).

in midline, narrowed at tip. Ovicell, hyperstomial, hood-shaped, covered frontally by secondary calcification.

*Remarks.* This species is very characteristic of having brown sclerite of mandible. Therefore, the specimens from Maldo described and figured by Seo and Rho (1989) under this name may belong to another species. This species is the one of the commonest species in California and Baja California waters (Soule et al., 1995), so it is considered to be the introduced species from eastern Pacific Ocean.

*Distribution.* Pacific including Korea (South Sea).

***Celleporaria wakayamensis* (Okada and Mawatari, 1938)**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* The Yellow Sea is added in the distribution of this

species.

*Distribution.* Korea (South Sea, Jeju-do and Yellow Sea) and Japan.

Family Exochellidae Bassler, 1935

Genus *Escharoides* Milne-Edwards, 1836

***Escharoides excavata* (MacGillivray, 1860)**

*Material examined.* Seogwipo Breakwater, 2 Aug. 1970 (B.J. Rho); Jin-ri, Deokjeokdo Island, 16 Oct. 1985 (H.S. Choi); Bakdeungdo Island, Sacheon, 13 Jun. 2000 (J.E. Seo); Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Bongdo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Daejangdudo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo).

*Substratum.* Stones.

*Remarks.* This species is a fouling bryozoan collected from the anchors and fish traps.

*Distribution.* Pacific including all coasts of southern Korea,

and Indian.

Genus <sup>1\*</sup>*Exochella* Jullien, 1888

<sup>2\*</sup>*Exochella tricuspis* (Hincks, 1881) (Fig. 8)

*Mucronella tricuspis* Hincks, 1881, p. 125.

*Exochella areolata* Okada and Mawatari, 1937, p. 440, pl. 11, figs. 3-5, text-fig. 3; Rho and Lee, 1980, p. 119.

*Exochella tricuspis*: Brown, 1952, p. 289; Powell, 1967, p. 312; Uttley and Bullivant, 1971, p. 45; Gordon, 1984, p. 71, pl. 24, A-C; Hayward, 1991, p. 310, fig. 4C, D.

*Material examined.* Sinsido Island and Jangjado Island, Gogunsan Islands, 27 Jul. 1980 (B.J. Rho and K.H. Lee); Seogwipo, 22 May 1982 (J.I. Song); Mipo, 23 Aug. 2003.

*Substratum.* Seaweeds.

*Description.* Colony encrusting seaweeds, unilamellar, forming circular patch. Zooecia 0.25-0.29 mm wide, 0.40-0.58 mm long, hexagonal, trapezoid, distinct, separated by grooves in young colony, later obscured by heavy calcification. Frontal wall smooth with about ten large, widely spaced areolar pores. Primary orifice transversely oval, obscured by peristome; a pair of indentations in form of rounded W appear in developing peristome, then sealed off distally by fusion of incurved edges of indentation, leaving a pair of peristomial spiramina in form of narrow shafts leading to compensation space beneath. Oral spines four in ancestrula and periancescicular zooids, two or three spines in autozooids and mature zooids. Single or a pair of avicularia from areolae proximal to orifice on frontal wall, raised at rostral tip, with acute rostrum, directed laterally or obliquely, with complete pivot bar. Ovicell smooth, at first recumbent on distal zooid, later completely immersed by frontal calcification of that zooid and detectable only as bulge of frontal wall.

*Remarks.* *Exochella areolata* Okada and Mawatari, 1937 which was reported as a new species by Okada and Mawatari (1937) is considered to be synonymized into *E. tircuspis* in having conical projection characteristic to this new species. The specimen described and illustrated from South Australia seems to be young colony showing three spines and distinct zooecial boundaries, whereas our specimens show the indistinct zooecial boundaries and ovicellate zooids.

*Distribution.* Korea (Yellow Sea), Japan and southern Pacific.

Infraorder Lepraliomorpha Gordon, 1989

Superfamily Smittinoidea Levinsen, 1909

Family Smittinidae Levinsen, 1909

Genus *Parasmittina* Osburn, 1952

***Parasmittina contraria* Seo, 1993**

*Material examined.* Seogwipo, 2 Aug. 1972 (B.J. Rho); Mipo,

15 Jul. 1974 (B.J. Rho); Mipo, 25 Apr. 1975 (B.J. Rho); Moseulpo, 18 Jun. 1985 (J.E. Seo); Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is endemic to Jejudo Island waters and Geojedo Island, South Sea so far. Gageodo Island of the Yellow Sea is newly added to the fauna of *P. contraria* herein. However, Gageodo Island is located in the farthest west-southern of the Yellow Sea which is strongly affected by the Kuroshio Warm Current. It is considered that *P. contraria* seems to be a warm temperate or subtropical species. This species is a fouling bryozoan collected from fishing nets.

*Distribution.* Korea (South Sea, Jeju-do and Yellow Sea).

***Parasmittina crosslandi* (Hastings, 1930)**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Remarks.* The Yellow Sea is newly added to the distribution of this species in addition to Jejudo Island waters.

*Distribution.* Pacific including Korea (Jeju-do and Yellow Sea).

Genus *Smittoidea* Osburn, 1952

***Smittoidea pacifica* Soule and Soule, 1973**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is a fouling bryozoan collected from fishing nets.

*Distribution.* Pacific including Japan and Korea (East Sea, Jeju-do and Yellow Sea).

***Smittoidea prolifica* Osburn, 1952**

*Material examined.* Wolseong, 5 Feb. 1985; Maldo Island, 10 Jul. 1986; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Hangaechang in Munseom Island, Jeju-do, 26 Feb. 2003 (J.E. Seo) by SCUBA diving from 28 m in depth.

*Substratum.* Unknown.

*Remarks.* The zooecia of this species usually have two to four spines, however five spines are found in only one zooecium in the colony which is collected from Munseom Island.

*Distribution.* Pacific including Japan and all coasts of south-

<sup>1\*</sup>파리이끼벌레 (신칭). <sup>2\*</sup>삼첨파리이끼벌레 (신칭)

ern Korea.

Family Bitectiporidae MacGillivray, 1895

Genus *Codonellina* Bassler, 1934

***Codonellina montferrandii* (Audouin, 1826)**

*Material examined.* Beomseom Island, Jeju-do, 22 Oct. 1991 (J.I. Song) by SCUBA diving; Chaguindo Island, 8 Jun. 2000 (J.I. Song); Beomseom Island, Jeju-do, 3 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Marado Island, 4 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Husuwolsan light house in Seodo Island, Geomundo Island, 10 Nov. 1991 (J.K. Park) by SCUBA diving from 15-20 m in depth; Wadal-ri, Ulreungdo Island, 7 Aug. 1992; Baekdo Island, Geomundo Island, 28 Mar. 2002 (J.J. Sim) by SCUBA diving from 20 m in depth; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Sponges, hydrozoans, other bryozoan (*Watersipora* sp.) and seaweeds.

*Distribution.* Pacific including Japan and Korea (South Sea, Jeju-do and Yellow Sea), and Indian.

***Codonellina parviaviculata* Rho and Seo, 1988**

*Material examined.* Ohak-ri, Geumodo Island, 5 Aug. 1983 (J.I. Song); Samcheonpo, 20 Jul. 1984 (J.E. Seo); Saryangdo Island, 5 Jul. 1993 (J.E. Seo) from 5 m in depth; Uldo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo).

*Substratum.* Stones, other bryozoan and shells.

*Remarks.* This species is endemic to Korean waters so far, and the South Sea is newly added in its distribution herein. This species is a fouling bryozoan collected from fishing nets.

*Distribution.* Korea (East Sea, South Sea and Yellow Sea).

Genus *Schizomavella* Canu and Bassler, 1934

***Schizomavella acuta* Osburn, 1952**

*Material examined.* Tonggumi, Ulreungdo Island, 8 Aug. 1992 (J.K. Park) by SCUBA diving.

*Substratum.* Unknown.

*Remarks.* The East Sea is recorded as new distribution of this species.

*Distribution.* Pacific including Japan and Korea (East Sea and South Sea), and Indian.

Family Watersiporidae Vigneaux, 1949

Genus *Watersipora* Neviani, 1895

***Watersipora platypora* Seo, 1999**

*Material examined.* Beomseom Island, Jeju-do, 3 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Seongsanpo, 9 Jun. 2001 (J.I. Song) by SCUBA diving from 20 m in depth.

*Substratum.* Other bryozoan.

*Remarks.* This species is endemic to Korean waters so far.

*Distribution.* Korea (South Sea and Jeju-do).

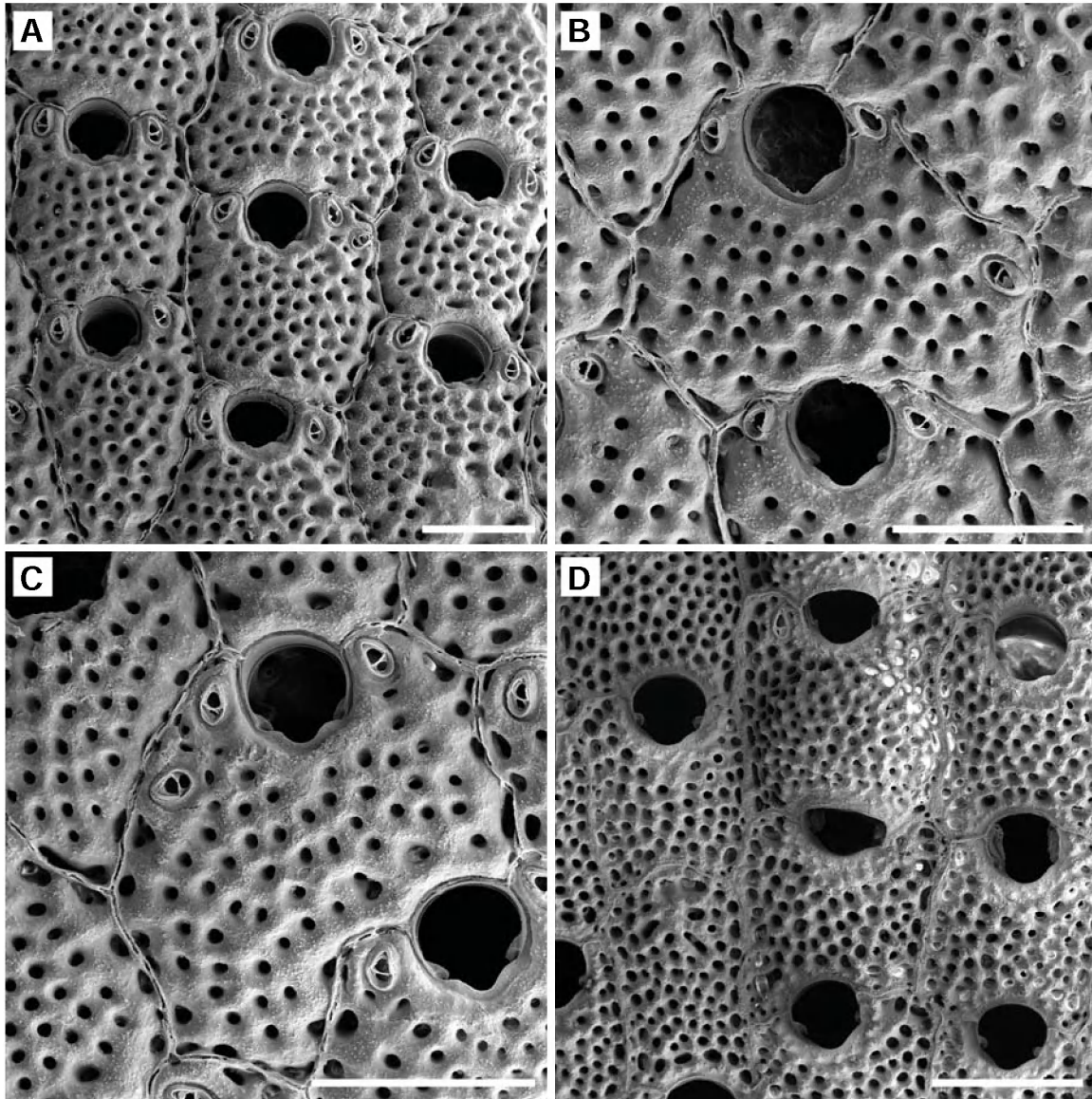
***Watersipora subtorquata* (D'Orbigny, 1842)**

*Material examined.* Gunghang, 9 Jul. 1998 (S. Shin); Gyeokpo, 9 Jul. 1998 (S. Shin); Mohang, 9 Jul. 1998 (S. Shin); Daecheon, 10 Jul. 1998; Hangmakjung, Geojedo Island, 14 Jul. 1999 (S. Shin); Yunpo, Geojedo Island, 14 Jul. 1999 (S. Shin); Janghang, Geojedo Island, 15 Jul. 1999 (S. Shin); Sari and Gonchon, Heuksando Island, 11 Aug. 1999 (J.E. Seo); Jin-ri, Heuksando Island, 12 Aug. 1999 (J.E. Seo); Changpo 2-ri, Gyeongjeong, 13 Sep. 1999 (J.E. Seo); Sobongdae, Yangpo, 14 Sep. 1999 (Y.H. Gong); Balsan 1-ri, 15 Sep. 1999 (J.E. Seo); Yonguimeori, Daejin, 16 Sep. 1999 (J.E. Seo); Adudo Island, Sacheon, 12 Jun. 2000 (J.E. Seo); Gae-seom Island, Keungaeseom Island and Hyanggido Island, Sacheon, 14 Jun. 2000 (J.E. Seo); Beomseom Island, Jeju-do, 3 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Chaguindo Island, 6 Jun. 2000 (J.I. Song) by SCUBA diving from 25 m in depth; Jungpyeon in Gollido Island, 23 Jul. 2001 (J.E. Seo); Mijo-ri, Namhaedo Island, 2 Nov. 2002 (Y.H. Gong); Sangju-ri, Namhaedo Island, 2 Nov. 2002 (J.E. Seo) from test panels; Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Sangju-ri, Namhaedo Island, 3 Dec. 2002 (J.E. Seo) from test panels; Sangju-ri, Namhaedo Island, 17 Feb. 2003 (J.E. Seo) from test panels; Tongyeong Marine Ranch, 29 Aug. 2004 (J.E. Seo) by SCUBA diving from 10-20 m in depth; Chukdo Island, Tongyeong, 26 Jun. 2006 (J.E. Seo); Godo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Uldo Island, Tongyeong, 26 Jun. 2006 (J.E. Seo); Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Yudo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Daemangjado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Hodo Island, Tongyeong, 30 Jun. 2006 (J.E. Seo); Oehoenggyeondo Island and Burando Island, Boryeong, 26 Jun. 2007 (J.E. Seo); Sohoenggyeongdo Island, Gogunsan Islands, 8 Jun. 2007 (J.E. Seo); Dae-hyeongjedo Island, Wido Island, 13 Jun. 2007 (J.E. Seo); Sudo Island, Boryeong, 27 Jun. 2007 (J.E. Seo).

*Substratum.* Ropes hanging on the wharf, shells, plastics, seaweeds, sponges, cement test panels, worm tubes, stones and tunicates.

*Remarks.* This species is the commonest fouling bryozoan as well as the commonest in intertidal zone of Korean waters.





**Fig. 9.** *Calyptotheca parcimunita* Harmer, 1957. A, arrangement of zooids; B, close-up zooid with three avicularia; C, another zooids with three avicularia; D, ovicellate zooids. Scale bars=0.3 mm (A-C), 0.5 mm (D).

*Distribution.* Cosmopolitan.

Superfamily Schizoporelloidea Jullien, 1883

Family Schizoporellidae Hincks, 1877

Genus *Schizoporella* Hincks, 1877

***Schizoporella unicornis* (Johnston, 1847)**

*Material examined.* Byeonsan beach, 8 Apr. 1993 (J.E. Seo); Daecheon, 10 Jul. 1998 (S. Shin); Yeongheungdo Island, 23 Jul. 1998 (S. Shin); Heungnam, Geojedo Island, 13 Jul. 1999 (S. Shin); Mipo, 14 Jul. 1999 (S. Shin); Gabae, Geojaedo Island, 14 Jul. 1999 (S. Shin); Hyangmyeongchon, Geojedo

Island, 15 Jul. 1999; Janghang, Geojedo Island, 15 Jul. 1999 (S. Shin); Yunpo, Geojedo Island, 14 Jul. 1999 (S. Shin); Ssari, Heuksando Island, 11 Aug. 1999 (J.E. Seo); Mangbuseok, Gageodo Island, 16 Aug. 1999 (J.E. Seo); Balsan 1-ri, 15 Sep. 1999 (J.E. Seo); Mokdo Island, Sacheon, 12 Jun. 2000 (J.E. Seo); Keungaeseom Island and Hyanggiseom Island, Sacheon, 14 Jun. 2000 (J.E. Seo); Mijo-ri, Namhaedo Island, 2 Nov. 2002 (Y.H. Gong); Godo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Ulido Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Junghangdo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Bongdo Island, Tongyeong, 28 Jun. 2006; Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Hodo Island, Tongyeong,



30 Jun. 2006 (J.E. Seo); Daehyeungjaedo Island, Wido, 13 Jun. 2007 (J.E. Seo); Sudo Island, Boryeong, 27 Jun. 2007 (J.E. Seo).

*Substratum.* Shells, stones, tunicates, barnacles and boat's hull.

*Remarks.* This species is a fouling bryozoan.

*Distribution.* Pacific including Japan and Korea (East Sea, South Sea and Yellow Sea), Atlantic and Arctic.

Family Lanceoporidae Harmer, 1957

Genus *Calyptotheca* Harmer, 1957

<sup>1</sup>\* *Calyptotheca parcimunita* Harmer, 1957 (Fig. 9)

*Calyptotheca parcimunita* Harmer, 1957, p. 1015, pl. 68, figs. 12, 13.

*Material examined.* Mipo, 13 Jul. 1974 (B.J. Rho); Saryangdo Island, 5 Jul. 1993 (J.E. Seo) from 5 m in depth.

*Substratum.* Shells and anthozoans.

*Description.* Colony encrusting substrata. Zooecia arranged regularly, separated by distinct grooves, nearly square, 0.47-0.66 mm wide, 0.69-0.67 mm long, somewhat longer than wide, or irregular pentagonal, flat with evenly scattered minute pores and larger areolar pores. Orifice about as long as wide, with a pair of strong condyles forming large and rounded v-shaped sinus. A pair of avicularia on distal half of lateral to orifice, very narrow and acute, minute, directed distally. Sometimes, one more avicularium found near orifice or near to areolar pore. Ovicell, large, perforate as in frontal wall, endooecial in proceeding zooecium.

*Remarks.* This species is characteristic of a pair of minute and acute avicularia on the distal half of lateral to orifice, compared with the other species belonging to *Calyptotheca*.

*Distribution.* Southwestern Pacific including Korea (South Sea), and Indian.

### *Calyptotheca symmetrica* (Ortmann, 1890)

*Material examined.* Mipo, 15 May 1980 (B.J. Rho); Chujado Island, 25 May 1987 (J.E. Seo) from 100 m in depth; Gimyeong, 15 Jul. 1991 (J.E. Seo); Gudo Island, Geojedo Island, 6 Feb. 1996 (J.E. Seo); Marine Institute in Gaebae, Geojedo Island, 8 Jul. 1996 (J.E. Seo); Sobongdae, Yangpo, 14 Sep. 1999 (J.E. Seo); Chaguideo Island, 17 Aug. 2002 (J.I. Song) by SCUBA diving; Daejangdudo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo).

*Substratum.* Stones, shells, seaweeds, anthozoans and worm tubes.

*Remarks.* This is a fouling bryozoan collected from tires hanging on the wharf.

*Distribution.* Korea (South Sea and Jeju-do) and Japan.

### *Calyptotheca wasiensis* (Waters, 1909)

*Material examined.* Dongseom Island, Maemuldo Island, 11 Apr. 2002 (J.E. Seo); Chaguideo Island, 8 Jun. 2000 (J.I. Song); Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Tunicates.

*Distribution.* Pacific including Korea (South Sea, Jeju-do and Yellow Sea), and Indian.

Family Cryptosulidae Vigneaux, 1949

Genus *Cryptosula* Canu and Bassler, 1925

*Cryptosula pallasiana* (Moll, 1803)

*Material examined.* Yunpo, Geojedo Island, 14 Jul. 1999 (S. Shin); Hangmakjung, Geojedo Island, 14 Jul. 1999 (S. Shin); Sa-ri, Heuksando Island, 11 Aug. 1999 (J.E. Seo); Masan, Balsan, 15 Sep. 1999 (J.E. Seo).

*Substratum.* Stones and shells.

*Remarks.* This species is newly found for the first time from the Yellow Sea and a fouling bryozoan found from boat's hull and piece of clothing.

*Distribution.* Cosmopolitan. In Korea, it is found from the East Sea, South Sea and Yellow Sea.

Family Microporellidae Hincks, 1879

Genus *Fenestulina* Jullien, 1888

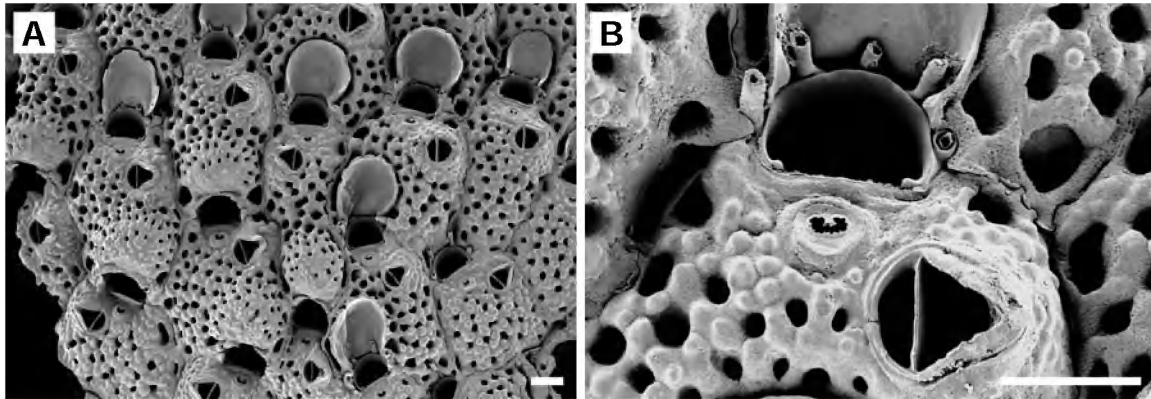
*Fenestulina malusii* (Audouin, 1826)

*Material examined.* Cheokdo Island, Wando Island, 13 Jun. 1999 (Y.H. Gong); Solseom Island and Adudo Island, Sacheon, 12 Jun. 2000 (J.E. Seo); Jungpyeon in Gollido, 23 Jul. 2001 (J.E. Seo); Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Hodo Island, Tongyeong, 30 Jun. 2006 (J.E. Seo); Godo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Uldo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo); Junghangdo Island, Tongyeong, 27 Jun. 2006; Hahangdo Island, Tongyeong, 27 Jun. 2006; Daejangdudo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Yujado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Daemangiado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Jangdo Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Mongdeokdo Island and Sudo Island, Boryeong, 27 Jun. 2007 (J.E. Seo).

*Substratum.* Seaweeds and bivalve shells.

*Remarks.* This species is a fouling bryozoan found from ropes hanging on the wharf.

<sup>1</sup>\*작은조두세은협이끼벌레 (신칭)



**Fig. 10.** *Microporella borealis* Suwa and Mawatari, 1998. A, arrangement of zooids; B, close-up zooid showing five spines, ascopore and avicularium. Scale bars=0.1 mm (A, B).

*Distribution.* Cosmopolitan.

***Fenestulina mutabilis* (Hastings, 1932)**

*Material examined.* Uldo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo).

*Substratum.* Unknown.

*Remarks.* This species is distinguishable from *F. malusii* showing smaller zooid and broader basal membranous part.

*Distribution.* Pacific including Japan and all coasts of southern Korea, and Atlantic.

Genus *Microporella* Hincks, 1877

**<sup>1</sup>\**Microporella borealis* Suwa and Mawatari, 1998 (Fig. 10)**

*Microporella borealis* Suwa and Mawatari, 1998, p. 902, fig. 3A-M.

*Material examined.* Geomeunyeo Island, Ocheon, 6 Apr. 2003 (Y.H. Gong and K.B. Lee) by SCUBA diving from 5 m in depth.

*Substratum.* Oyster shells.

*Description.* Colony encrusting substrata. Zooecium 0.25-0.34 mm wide, 0.39-0.52 mm long, hexagonal or somewhat irregular in shape. Frontal wall slightly convex, coarsely granular, with evenly distributed pores. Orifice semicircular, with serrated proximal lip and prominent condyles at corners. Oral spines four or five. When ovicell presents, two or three middle spines hidden by ovicell and two lateral only seen. Ascopore close to proximal lip of orifice, separated from it by distance equivalent to about one-third of orifice length, crescentic, with denticulate edge, raised on cup-shaped thin prominence, proximal part of which sometimes develops into umbo. Avicularium single, on right or left, proximolateral

to ascopore. Avicularian chamber fairly large occupying 1/4-1/3 of frontal wall; rostrum short triangular, raised at tip, directed laterally. Ovicell subimmersed, coarsely granular, perforated with a number of pores which generally smaller than pores of frontal wall, perforation rare near top and proximally.

*Remarks.* Our specimen was collected from oyster shells, while Japanese one from scallop shells. Korean specimen shows the difference from Japanese one in having no cribrate plate at bottom of pores. Suwa and Mawatari described and illustrated that ovicellate zooids have no oral spines, however the authors consider that the oral spines just were hidden by the ovicell.

*Distribution.* Korea (Yellow Sea) and Japan.

Family Calwellidae MacGillivray, 1887

Genus *Onchoporella* Busk, 1884

***Onchoporella selenoides* Ortmann, 1890**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Hangdo Island, Tongyeong, 29 Jun. 2006 (J.E. Seo).

*Substratum.* Unknown.

*Remarks.* This species is newly found from the Yellow Sea.

*Distribution.* Korea (South Sea, Jeju-do and Yellow Sea) and Japan.

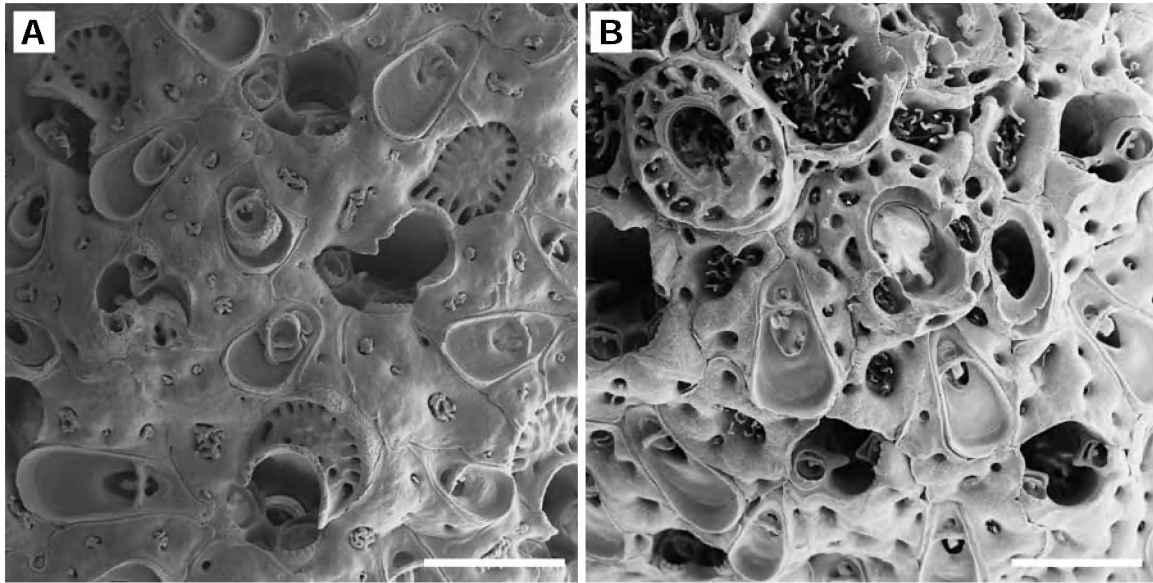
Family Petraliellidae Harmer, 1957

Genus *Hippopetraliella* Stach, 1936

***Hippopetraliella magna* (D'Orbigny, 1852)**

*Material examined.* Marado Island, 4 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Marado Island, 22 Feb. 2001 (J.I. Song) by SCUBA diving from 18 m in depth.

<sup>1</sup>\*냉수소공이기벌레 (신칭)



**Fig. 11.** *Celleporina rostellata* Harmer, 1957. A, irregular arrangement of ovicellate zooids and variable interzooidal avicularia in size and shape; B, zooids showing orifice and a pair of suboral avicularia. Scale bars=0.2 mm (A, B).

*Substratum.* Unknown.

*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea and Jeju-do.

Genus *Mucropetraliella* Stach, 1936

***Mucropetraliella mucroaviculata* (Okada and Mawatari, 1938)**

*Material examined.* Seongsanpo, 9 Jun. 2000 (J.I. Song).

*Substratum.* Unknown.

*Distribution.* Korea (Jeju-do) and Japan.

Family Crepidacanthidae Levinsen, 1909

Genus *Crepidacantha* Levinsen, 1909

***Crepidacantha poissoni* (Audouin, 1826)**

*Material examined.* Gaerinyeo Island, Gageodo Island, 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is newly collected from the Yellow Sea.

*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea and Yellow Sea.

Family Lacernidae Jullien, 1888

Genus *Arthropoma* Levinsen, 1909

***Arthropoma cecillii* (Audouin, 1826)**

*Material examined.* Biyangdo Island, 6 Feb. 1986 (J.E. Seo);

Chukdo Island, Tongyeong, 26 Jun. 2006 (J.E. Seo).

*Substratum.* Scallop shells.

*Distribution.* Cosmopolitan. In Korea, it is found from the South Sea and Jeju-do.

Superfamily Celleporoidea Lamouroux, 1821

Family Celleporidae Lamouroux, 1821

Genus *Celleporina* Gray, 1848

**\**Celleporina rostellata* Harmer, 1957 (Fig. 11)**

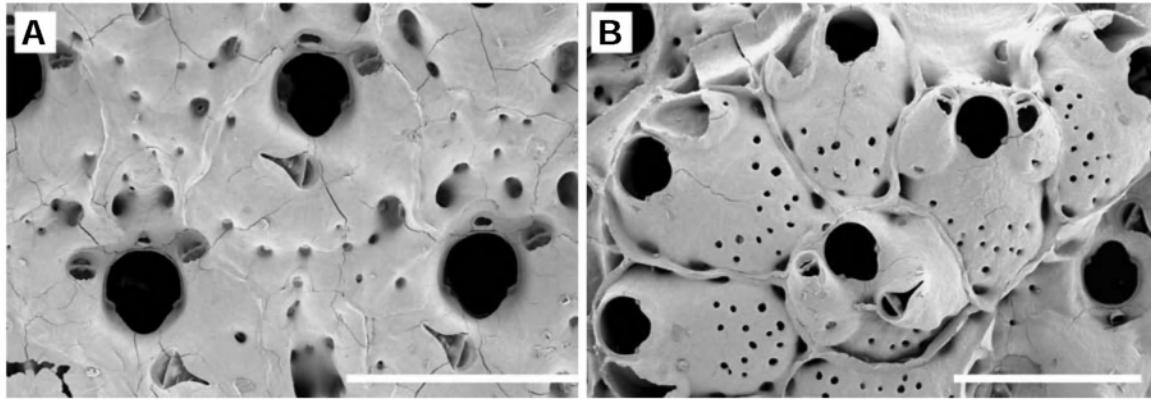
*Celleporina rostellata* Harmer, 1957, p. 907, pl. 62, figs. 18, 19; Hayward and Ryland, 1995, p. 565, figs. 14F, 15A, B.

*Material examined.* Manjaedo Island, 23 Aug. 1988 (J.E. Seo) from 20 m in depth; I-ri, Balsan, 15 Sep. 1999 (J.E. Seo).

*Substratum.* Fishing nets (40-50 m deep).

*Description.* Colony at first encrusting substrata, soon later forming nodules or cylinders. Zoecia smoothly calcified, closely packed causing irregular arrangement of zooids, 0.23-0.28 mm wide, 0.37-0.59 mm long. Frontal wall developing as reticulate circle with central opening. Primary orifice slightly longer than wide, with deep and U-shaped sinus occupying half of its total width, with a pair of condyles. Peristome surrounding orifice and incorporating a pair of proximo-lateral, suboral avicularia with oval, vertically orientated rostrum, distal rim finely denticulate; medio-proximal rim deeply notched, opposite proximo-lateral edge devel-

<sup>1</sup>\*부리조두제가지이끼벌레 (신칭)



**Fig. 12.** *Buffonellaria acutirostris* Seo and Gong, 2006. A, rare zooid showing a pair of avicularia lateral to orifice; B, ancestrula and periancestrular zooids. Scale bars=0.5 mm (A, B).

oped as thickened umbo. Avicularia faces laterally; its proximal edge produced as a sub-triangular process projecting above peristomial notch. Interzooidal avicularia very frequent, varying in size; its rostrum broadened distally and deeply cupped; crossbar complete; palate with an extensive foramen. Ovicell hemispherical, frontally showing radiating ribs formed by two rows of pores.

*Remarks.* This species is a fouling bryozoan.

*Distribution.* Pacific, including Korea (East Sea).

***Celleporina porosissima* (Okada, 1923)**

*Material examined.* Chuksa, Gampo, 2 Jul. 1998 (S. Shin); Sa-ri and Gonchon, Heuksando Island, 11 Aug. 1999 (J.E. Seo); Dwitdaemok, Heuksando Island, 12 Aug. 1999 (J.E. Seo); Changpo 2-ri, Gyeongjeong, 13 Sep. 1999 (J.E. Seo); Ulgi light house, 14 Sep. 1999 (J.E. Seo); Seuldo Island, Bangeojin, 14 Sep. 1999 (J.E. Seo); 1-ri, Balsan, 15 Sep. 1999 (J.E. Seo); Gyeongjeong, 17 Sep. 1999 (J.E. Seo); Gaerinyeo Island, Gageodo Island 13 Aug. 1998 (J.E. Seo) by SCUBA diving from 18-23 m in depth; Taedo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Bongdo Island, Tongyeong, 28 Jun. 2006 (J.E. Seo); Daemangjado Island, Tongyeong, 29 Jun. 2006 (J.E. Seo); Daehyeungjedo Island, Wido Island, 13 Jun. 2007 (J.E. Seo); Oehoenggyeondo Island, Boryeong, 26 Jun. 2007.

*Substratum.* Stones, seaweeds and shells.

*Remarks.* This species is a fouling bryozoan found from fishing nets mostly.

*Distribution.* All coasts of southern Korea and Japan.

Genus *Buffonellaria* Canu and Bassler, 1917

***Buffonellaria acutirostris* Seo and Gong, 2006 (Fig. 12)**

*Buffonellaria acutirostris* Seo and Gong, 2006, p. 13, fig. 2.

*Remarks.* The specimen from Munseom Island reported by Seo and Gong (2006) shows ancestrula and a pair of avicularia lateral to orifice.

*Distribution.* Korea (Jeju-do).

Family Phidoloporidae Gabb and Horn, 1862

Genus *Iodictyum* Harmer, 1933

***Iodictyum axillare* (Ortmann, 1890)**

*Material examined.* Beomseom Island, Jeju-do, 3 Nov. 2000 (J.I. Song) by SCUBA diving from 30 m in depth; Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth.

*Substratum.* Unknown.

*Remarks.* This species is easily recognizable because of its red colony.

*Distribution.* Korea (South Sea and Jeju-do) and Japan.

Genus *Phidolopora* Gabb and Horn, 1862

***Phidolopora pacifica* (Robertson, 1908)**

*Material examined.* Chujado Island, 25 May 1987; Marine Institute in Gaebae, Geojedo Island, 10 Jul. 1996 (W.J. Lee); Seongsanpo, 5 Nov. 2000 (J.I. Song) by SCUBA diving from 20 m in depth; Chaguideo Island, 6 Jun. 2000 (J.I. Song) by SCUBA diving from 25 m in depth; Baekdo Island, Geomundo Island, 28 Mar. 2002 (J.I. Sim) by SCUBA diving from 20 m in depth; Budo Island, Tongyeong, 27 Jun. 2006 (J.E. Seo).

*Substratum.* Sponges.

*Remarks.* This is a fouling species collected from fish traps.

*Distribution.* Pacific, including Japan and Korea (East Sea, South Sea and Jeju-do).



Genus *Reteporellina* Harmer, 1933

***Reteporellina denticulata* (Busk, 1884)**

*Material examined.* Munseom Island, Jeju-do, 26 Feb. 2003 (J.E. Seo) by SCUBA diving from 28m in depth.

*Substratum.* Unknown.

*Distribution.* Cosmopolitan. In Korea, it is found from the East Sea and Jeju-do.

Family Unplaced ascophoran genus

***Robertsonidra argentea* (Hincks, 1881)**

*Material examined.* Seogwipo, 13 Jul. 1979 (H.K. Kim).

*Substratum.* Seaweeds.

*Distribution.* Cosmopolitan. In Korea, it is found only from Jeju-do.

## DISCUSSION

Two new species and eight new records from Korea are added in the Korean bryozoan fauna in the present study. Accordingly, a total of 113 species of cheilostomatous bryozoans are reported from South Korea waters. It is remarkable that twenty seven of 71 species reported in the present study were collected from Gageodo Island waters. Of which, *Antropora tincta*, *Chaperia acanthia*, *Bugula dentata*, *Caberea boryi*, *Scrupocellaria maderensis*, *Steginoporella magnilabris*, *Thalamoporella lioticha*, *Integripelta meta*, *Celleporaria wakayamensis*, *Parasmittina contraria*, *P. crosslandi*, *Codonellina montferrandii*, *Calyptotheca wasiensis*, *Onchoporella selenoides* and *Crepidacantha poissoni* of 15 species have been reported only from the South Sea or Jeju-do waters, or both Seas so far. The rest were found from the East Sea in addition to the South Sea and Jeju-do Island waters. Gageodo Island located in the farthest westsouthern of the Yellow Sea is strongly affected by the Kuroshio Warm Current, thus it is likely that the fauna of marine invertebrates from Gageodo Island waters is similar to the fauna of South Sea or Jeju-do Island waters. In terms of marine sponges, thirty four of 35 species from Gageodo Island waters also were found only from the South Sea and Jeju-do Island waters (Sim and Kim, 2002) with exception of one species from the East Sea. The coincidental results from both bryozoans and sponges suggest that Gageodo Island waters rather belongs to Jeju-do Island waters or the South Sea, not the Yellow Sea zoogeographically.

## ACKNOWLEDGEMENTS

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