ASED http://e-ASED.org
Animal Systematics, Evolution and Diversity

Anim. Syst. Evol. Divers. Vol. 39, No. 1: 27-33, January 2023
https://doi.org/10.5635/ASED.2023.39.1.053

The First Record of *Jellyella eburnea*, with Reviews of Three Membraniporids (Cheilostomatida, Bryozoa) from Korean Waters

Geon Woo Noh[1], Hyun Sook Chae[2], Ho Jin Yang[3], Ji Eun Seo[2,3,*]

[1]Department of Food Science and Biotechnology, Graduate School, Woosuk University, Wanju 55338, Korea
[2]Department of Life Science, Woosuk University, Jincheon 27841, Korea
[3]Marine Bryozoans Resources Bank of Korea, Jincheon 27841, Korea

ABSTRACT

The specimens collected from five localities during the period from 2004 to 2022 were observed. As a result of this study, *Jellyella eburnea* was found to be new to the Korean fauna and three membraniporids were reviewed. Two species, *Jellyella eburnea* and *Biflustra grandicella*, were redescribed and illustrated with the collected specimens in this study. *Membranipora perfragilis* from Korea is changed into *Biflustra grandicella*. *Jellyella eburnea* is new to the Korean fauna and first reported outside subtropical and tropical seas of the South Pacific and Indo-Pacific Ocean. This fact proves that the seas in Korea are warming. Additionally, *Biflustra crenulata* reported from the West Sea, South Sea and Jejudo waters of Korea is synonymized into *Biflustra okadai*. *Membranipora irregulata* is transferred into the genus *Biflustra*. Five of Korean membraniporids, *Biflustra grandicella*, *Biflustra irregulata*, *Biflustra okadai*, *Jellyella eburnea*, and *Jellyella tuberculata*, are reported in the Korean fauna as a result of this study. The photos taken in the field and by Scanning Electron Microscopy of two species, *Biflustra grandicella* and *Jellyella eburnea*, are provided herein.

Keywords: *Biflustra*, Bryozoa, *Jellyella*, new record, redescription, Korea

INTRODUCTION

Because some kelps encrusted with membraniporid species seem to be sick, they are often considered as inedible seaweed, especially in Korea. Also, membraniporids as a fouling animal are easily found in plastic and rubber goods floating on the seawater near shore, although they are largely overlooked by the public.

The family Membraniporidae Busk, 1852 has been extensively defined for anascans with the frontal membrane which is not calcified, until Taylor and Monks (1997) proposed to restrict the definition of the family to the genera whose species develop from a twinned ancestrula. Of six genera belonging to the family Membraniporidae traditionally, two genera, which are *Conopeum* and *Tamanicella* were transferred into the family Electridae. The genus *Acanthodesia* is considered as a subjective synonym of *Biflustra*, although it is still doubtful in status (Tilbrook, 2006; Taylor and Tan, 2015; Vieira et al., 2016). Currently, the family Membraniporidae includes three genera, *Biflustra*, *Jellyella* and *Membranipora*, based on morphological characters of the type specimens (Almeida et al., 2017). According to Almeida et al. (2017), the genus *Membranipora* has no cryptocystal and gymnocystal calcification, *Jellyella* with moderate to well-developed gymnocystal tubercles and *Biflustra* with variable gymnocystal and cryptocystal calcification which can develop denticles.

The family Membraniporidae consists of 48 extant species worldwide. Of them, six species, *Biflustra crenulata*, *Jellyella tuberculata*, *Membranipora irregulata*, *Membranipora perfragilis*, *Membranipora savartii*, and *Membranipora villosa* have been reported from Korea so far (Okada, 1923; Rho and Song, 1980; Rho and Seo, 1985, 1986, 1990; Seo, 1992, 1998a, 1998b, 2005, 2010; Song and Won, 1992; Gong and Seo, 2003; Seo and Min, 2009; Chae et al., 2016; Chae and Seo, 2019). After three genera belong to the family Membraniporidae based on morphological characters are defined (Alme-

*To whom correspondence should be addressed
Tel: 82-43-531-2891, Fax: 82-43-531-2862
E-mail: jeseo@woosuk.ac.kr

eISSN 2234-8190

ida et al., 2017), Korea's six membraniporid species also needed to be reviewed, thus both *Jellyella tuberculata* and *Membranipora villosa* were revised from *Membranipora tuberculata* and *Membranipora serrilamella*, respectively (Chae and Seo, 2019).

This study aims to review the remaining four membraniporids and clarify the identification of the family Membraniporidae from Korean waters.

MATERIALS AND METHODS

The specimens of two species reported here were collected from five localities of Korean coasts during the period from 2004 to 2022 (Table 1). The specimens of fouling species were taken from the plastic bottle and rubber flip-flops floating on the coast, and the remainders were collected from the shell of *Mytilus galloprovincialis* and stone in the intertidal zone. All specimens collected have been preserved in 95% ethanol and bleached with hot aqueous sodium hypochlorite, washed, and gold coated, prior to examination using a SNE-3200M Mini-SEM (SEC Co. Ltd., Suwon, Korea).

RESULTS AND DISCUSSION

Order Cheilostomatida Busk, 1852
Suborder Membraniporina Ortmann, 1890
Superfamily Membraniporoidea Busk, 1854
Family Membraniporidae Busk, 1852
Genus *Biflustra* d'Orbigny, 1852

***Biflustra grandicella* (Canu and Bassler, 1929) (Fig. 1)**

? *Amphiblestrum perfragile*: Ortmann, 1890: 29 (*non Biflustra perfragilis* MacGillivray, 1881).
Acanthodesia grandicella Canu and Bassler, 1929: 68, Pl. 1, figs. 9–11; Tung and Wang, 1960: 192; Wang and Cai, 1977: 17, fig. 5.
Membranipora perfragilis: Osburn, 1950: 24, Pl. 2, fig. 8; Rho and Seo, 1990: 147; Seo, 1998a: 208; 2005: 302, Pls. 21B, 24A; 2010: 15, fig. 3; Gong and Seo, 2003: 5.
Membranipora savartii (part): Mawatari, 1974: 26 (*non* Audouin, 1826).
Membranipora grandicella: Liu, 1992: 120, figs. 9, 10; Liu et al., 2001: 419: Pl. 11, figs. 2–4.
Biflustra grandicella: Grange and Gordon, 2005: 2, figs. 4–6; Gordon et al., 2008: 41, fig. 3.1; 2009: 289; Tilbrook, 2012: 181, figs. 4, 5; Gordon, 2016: 606; Almeida et al., 2017: 1468, fig. 3a–f.
Biflustra perfragilis: Chae et al., 2016: 553.

Material examined. Korea: Gyeongsangnam-do: Tongyeong-si, Tongyeong Marine Ranch, 9 Aug 2004, Seo JE; Busan: Gijang-gun, Daebyeon Port, 12 Oct 2010, Min BS, Yang HJ; Chungcheongnam-do: Taean-gun, Cheongpodae, 21, 22 Jun 2016, 21 Oct 2016, 18 Nov 2016, 1 Oct 2019, from intertidal zone, Noh GW.

Substratum. Shell of *Mytilus galloprovincialis* from Tongyeong Marine Ranch and Daebyeon Port, and stone from Cheongpodae.

Description. Colony initially encrusting but becoming erect and bilamellar-foliaceous, forming massive brittle growths up to 25 cm or more. Zooids rectangular, 352.21–436.66 (401.76 ± 24.94) μm long, 125.72–281.13 (187.89 ± 27.86) μm wide, with corners more or less at right angles; distal margin of parent zooid at bifurcation of zooid rows slightly oblique. Zooidal rows bifurcated with large zooid producing two daughter zooids, proximal boundary between them produced proximally as ridge about one-third of way along floor of parent zooid, or scarcely at all. Gymnocyst absent. Cryptocystal rim somewhat crenulated distally, straight or weakly arcuate, lateral cryptocystal rim granular. Cryptocystal shelf broadest proximally, of variable length, maximally comprising slightly more than one-third of zooidal length or opesia abuts against proximal zooidal rim; length of proximal cryptocyst mostly 10–20% of zooid length; lateral and distal cryptocyst extremely narrow or vestigial. Opesia, large, elongate-oval, less-rounded distally.

Table 1. Sampling localities in southern Korean waters

Locality	Coordinates	Date	Depth
Guryongpo Port, East Sea	35°59'19.79"N, 129°33'16.57"E	7 Jul 2021	Intertidal
Daebyeon Port, East Sea	35°13'27.06"N, 129°13'42.3"E	12 Oct 2010	Intertidal
Tongyeong Marine Ranch, South Sea	33°27'15.53"N, 128°26'04.45"E	9 Aug 2004	10–20 m
Cheongpodae, Yellow Sea	36°38′15.88″N, 126°17′56.73″E	21, 22 Jun 2016 21 Oct 2016 18 Nov 2016 1 Oct 2019	Intertidal
Sinchang-ri, Jeju-do	33°20′45.79″N, 126°10′12.07″E	23 Oct 2022	Intertidal

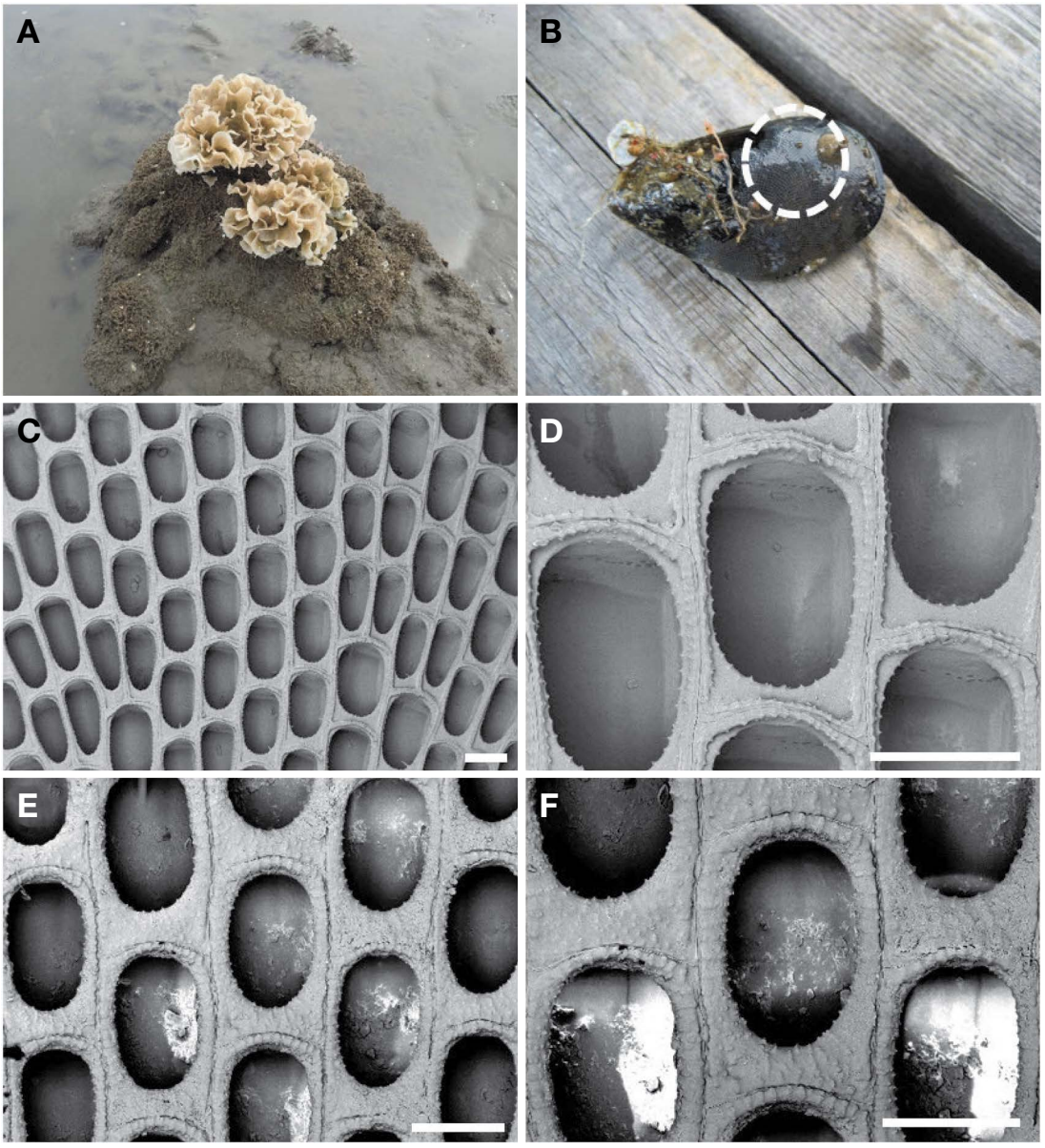

Fig. 1. *Biflustra grandicella*. A, Two massive colonies attach to rock in intertidal zone of Cheongpodae; B, Small colony encrusting the shell of *Mytilus galloprovincialis* collected from Daebyeon Port; C, Zooidal arrangement, from Cheongpodae; D, Detailed zooid showing less calcified cryptocyst, from Cheongpodae; E, Zooidal arrangement, from Daebyeon Port; F, Detailed zooid showing cryptocystal calcification, from Daebyeon Port. Scale bars: C–F = 200 μm.

Remarks. In Korean waters, *B. grandicella* has been identified as *Biflustra perfragilis* MacGillivray, 1881. The precedents for this misidentification include Ortmann (1890), reporting on Japanese bryozoans, and Osburn (1950), with respect to the Californian fauna. Ortmann (1890: 29) cited his material as *Amphiblestrum perfragile*, reporting it from Maizuru and 'Tanagawa' (possibly an error for Kanagawa), respectively on western and eastern coasts of Honshu. Osburn (1950: 24) cited his material as *Membranipora perfragilis* and included Ortmann's record in his synonymy. Whereas Ortmann did not illustrate his material, Osburn (1950, Pl. 2, fig. 8) did, and his figure indeed closely resembles *Biflustra grandicella*, which was formally described in the 1920s, the type locality being the "China Sea, in the vicinity of Hong Kong", at 161 m depth (Canu and Bassler, 1929). Zooids are distinguished on the basis of their relatively large size and the size of the opesia. The communication pores in the transverse walls between zooids occur as a transverse band of uniporous perforations across the

middle of the wall, occasionally accompanied by 1–2 multiporous septula that are not side by side. Oddly, however, the species has not subsequently been reported from California.

With the exception of *B. grandicella*, which he did not mention, Mawatari (1974) united the species in the above synonymy as *Membranipora savartii* (Audouin, 1826). There has long been misunderstanding concerning Audouin's species, which was made the type of *Acanthodesia* Canu and Bassler, 1919. Unfortunately, the *savartii* of authors has been misattributed as it bears no resemblance to that illustrated by Savigny (1817), which has no cryptocystal denticles and has small tubercles in the proximofrontal corners of zooids. Nothing resembling Audouin's species has subsequently been found in the Eastern Mediterranean or Red Sea (the latter is the probable provenance of *savartii*) since its discovery at the time of the 1798–1801 French Campaign in Egypt and Syria conducted by Napoléon Bonaparte. Indeed, the *only* related taxon that closely resembles Audouin's species is *Biflustra similis* (Liu, 1992) (see Liu et al., 2001, Pl. 8, fig. 6); the potential relation of these two species needs to be further explored, which is difficult in the absence of any types of *A. savartii*. In the meantime, the genus *Acanthodesia* should be abandoned, the opinion of Taylor and Tan (2015) notwithstanding.

Biflustra perambulata Louis and Menon, 2009, first described from Cochin, India, but also known from Johor Strait, Singapore (Tilbrook and Gordon, 2016), and northwestern peninsular Malaysia (Taylor and Tan, 2015), greatly resembles *B. grandicella*. Louis and Menon (2009) noted colour differences between the two species, declaring *B. perambulata* colonies to be more delicate and smaller than those of *B. grandicella*, with slightly smaller zooids and the opesia extending much closer to the proximal zooidal margin. In the event, this latter feature is variable in both *B. grandicella* and *B. perambulata*, with the character state overlapping in expression in the two species. Taylor and Tan (2015) suggested that molecular sequence data may be needed to determine if these really are two species, or merely expressions of intrinsic variability.

Distribution. Korea (East Sea, South Sea, Yellow Sea), Japan, China Sea (vicinity of Hong Kong), Australia, New Zealand, and Brazil.

***Biflustra irregulata* (Liu, 1991)**

Membranipora irregulata Liu, 1991: 57, fig. 1; 1992: 124, figs. 14–18; Liu et al., 2001: 416, Pl. 10, figs. 3–6; Seo and Min, 2009: 20, fig. 2.

Biflustra irregultata: Gordon et al., 2007: 46, fig. 1D; Almeida et al., 2017: 70, fig. 4a–d.

Acanthodesia cf. *irregulata*: Taylor and Tan, 2015: 9, fig. 3G–L.

Remarks. *Biflustra irregulata* is characterized by a frontal membrane with cuticular spinules, densely granular cryptocyst with some denticles projecting into the opesia, and distal and transverse walls with 2 and 2–3 multiporous mural septula, respectively (Almeida et al., 2017). *Membranipora irregulata* from Korea showed single or a pair of blunt tubercles referred as a dense calcification of cryptocyst in some zooids (Seo and Min, 2009). Neither spinules in the material which is bleached or mural septula were observed in this study. However, based on the presence of cryptocystal calcification, Korean *Membranipora irregulata* is transferred into the genus *Biflustra*. This species is not observed in this study.

***Biflustra okadai* Almeida, Scouza and Vieira, 2017**

Membranipora crenulata Okada, 1923: 224, fig. 24.

Membranipora savartii: Rho and Seo, 1985: 54, figs. 1–3; 1990: 147; Seo, 1998a: 208; 2005: 303; Gong and Seo, 2003: 5; Seo and Min, 2009: 21.

Biflustra crenulata: Tilbrook, 2006: 21, Pl. 2B; Seo, 2010: 17; Chae et al., 2016: 553.

Biflustra okadai Almeida et al., 2017: 1472, figs. 6a–d.

Remarks. *Biflustra okadai* was proposed by Almeida et al. (2017) to replace *Membranipora crenulata* Okada, 1923 which is a junior homonym of *Membranipora crenulata* d'Orbigny, 1852. Korean *Membranipora savartii* misidentified by Rho and Seo (1985, 1990) and Seo (2005) was transferred into *Biflustra crenulata* (Seo, 2010), and then *Biflustra crenulata* is synonymized into *Biflustra okadai* that is the new name of *Membranipora crenulata* Okada, 1923 here. This species is not observed in this study.

Genus *Jellyella* Taylor and Monks, 1997

[1*]***Jellyella eburnea* (Hincks, 1891) (Fig. 2)**

Membranipora eburnea Hincks, 1891: 289, Pl. 7, fig. 5.

Jellyella eburnea: Taylor and Monks, 1997: 42, figs. 1–13, Moyano, 2005: 88, figs. 1–6; Gordon et al., 2007: 48, fig. 1E; Taylor and Tan, 2015: 9, 10, fig. 4.

Material examined. Korea: Gyeongsangbuk-do: Pohang-si, Guryongpo Port, 7 Jul 2021, Seo JE; MABIK IV00172830, Jeju-do: Jeju-si, Sinchang-ri, 23 Oct 2022, Seo JE.

Substratum. Plastic bottle from Guryongpo Port, rubber flip-flops from Sinchang-ri.

Description. Colony encrusting, multiserial, unilamellar. Zooids rectangular, subhexagonal when gymnocyst developed, rounded distally, 416.31–762.28 (528.99 ± 144.17) μm long, 152.20–406.59 (248.40 ± 75.328) μm wide, porcelaneous,

Korean name: [1*]상아막이끼벌레(신칭)

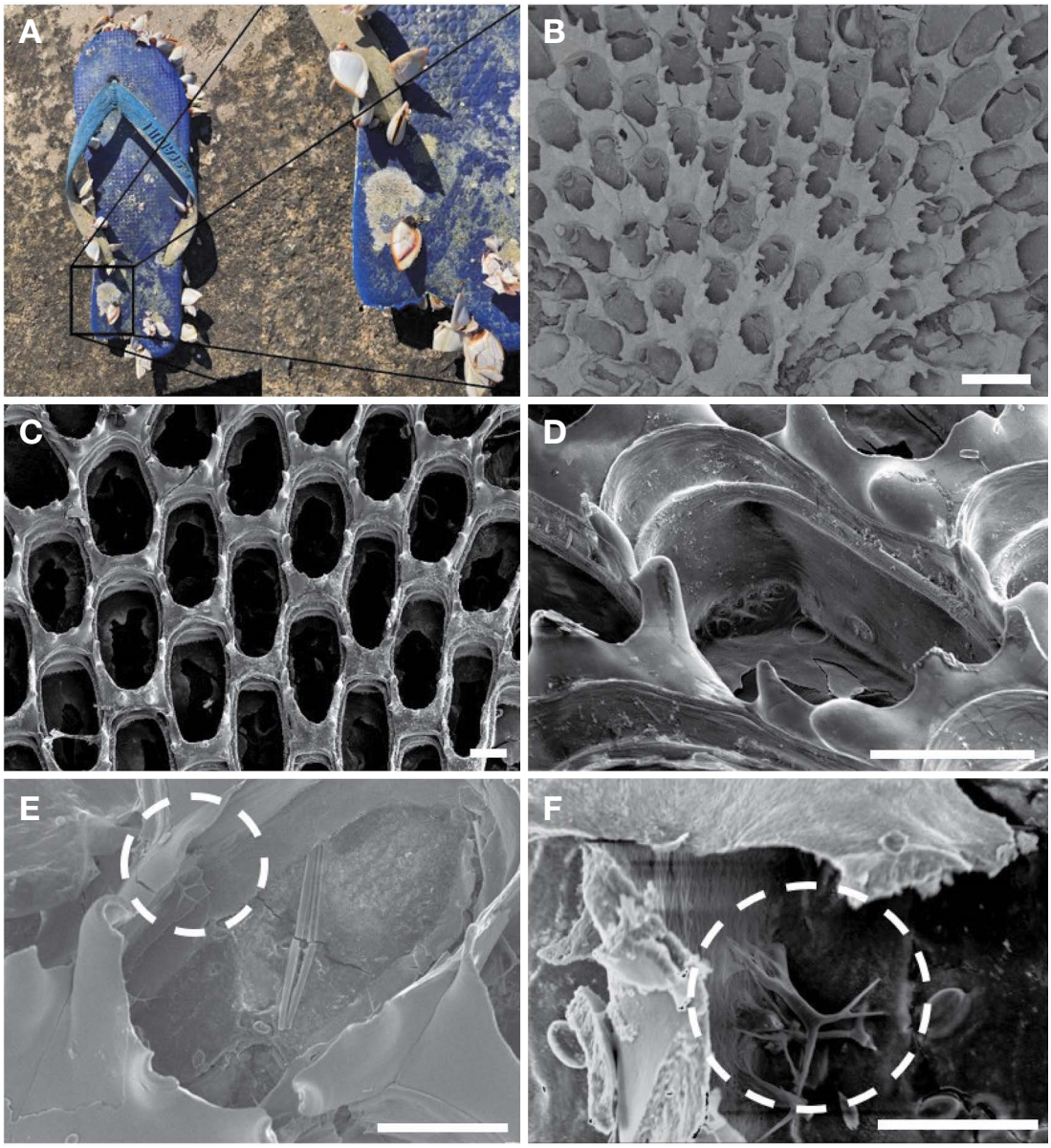

Fig. 2. *Jellyella eburnea*. A, Colony encrusting the rubber flip-flops, from Sinchang-ri; B, Arrangement of zooids showing well-developed gymnocystal spines, tubercles and rucks, from Sinchang-ri; C, Zooids with gymnocystal spines and tubercles, from Guryongpo Port; D, Multiporous septulae in transverse vertical wall and simple pores in lateral vertical wall, from Guryongpo Port; E, Branched spinules in a newly budded zooid, from Sinchang-ri, ×650; F, Complicatedly branched spinules in detail, from Sinchang-ri, ×2,000. Scale bars: B–D = 200 μm, E = 50 μm, F = 20 μm.

with white and glossy surface, Opesium large, occupying nearly entire frontal surface, elongate-oval, less-rounded distally; concealed by several stout gymnocystal tubercles proximally and laterally. Operculum large, semicircular, at very top of frontal membrane. Cryptocyst narrow, arcuate distally; lateral cryptocyst extremely narrow or vestigial, granular; length of proximal cryptocyst mostly 10% of zooid. Proximal gymnocyst occupying one-third to half of frontal area, tapering distally along lateral margins of opesium and lacking in half to distal third of zooid; calcified surface folded into rucks, tubercles, or spines variable in prominence, shape and number; spines short, hook-like, those adjacent to opesium bending over frontal membrane. Multiporous septulae developed in transverse wall and simple pores in lateral vertical walls separating zooidal series. Complicatedly branched spinules from lateral walls in zooids at growing edge projecting into opesium,

antler-like. No ovicells and avicularia.

Remarks. The family Membraniporidae is characterized by the twinned ancestrula (Taylor and Monks, 1997), but unfortunately we couldn't observe it in this study. *Jellyella eburnea* is distinguished by the presence of intricately branched process (spinules) projecting into the zooidal chambers (Taylor and Monks, 1997). Some branched spinules are shown in the newly budded zooids in high magnification (×650 and ×2,000) in the Korean specimens. The proximal gymnocyst is not as well developed as that in Taylor and Monks' description (Taylor and Monks, 1997).

Plastic debris and glass bottles were encrusted by *Jellyella eburnea*, a coloniser of floating biological and man-made objects that is becoming widespread in the tropics and subtropics of the world's oceans (Taylor and Tan, 2015). Korean *Jellyella eburnea* was also encrusting the plastic bottle and flip-flops made of rubber floating on the sea. *Jellyella eburnea* lives mainly as an encruster of the drifting shells of dead *Spirula* (Taylor and Monks, 1997), which is known to be a tropical and subtropical animal. Thus, this species has apparently been distributed in the tropics and subtropics. It is remarkable that *Jellyella eburnea* appears first in the temperate sea in this study. In the face of this fact, it can be seen that the sea in Korea is getting warmer recently.

Distribution. Korea (East Sea, southeastern Jejudo waters), Indo-Pacific (Fiji, Australia, New Caledonia, Malaysia, Bangladesh, Madagascar, Mauritius, South Africa, Kenya), South Pacific (Easter Island), and Atlantic (Florida).

ORCID

Geon Woo Noh: https://orcid.org/0000-0001-9664-5222
Hyun Sook Chae: https://orcid.org/0000-0002-2702-9095
Ho Jin Yang: https://orcid.org/0000-0003-4592-8542
Ji Eun Seo: https://orcid.org/0000-0001-5764-5457

CONFLICTS OF INTEREST

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

ACKNOWLEDGMENTS

This research was supported by National Marine Biodiversity Institute of Korea (2022M01100), and was supported by a grant from the National Institute of Biological Resources (NIBR), funded by the Ministry of Environment (MOE) of the Republic of Korea (NIBR202231206).

REFERENCES

Almeida ACS, Souza FBC, Vieira LM, 2017. Malacostegine bryozoans (Bryozoa: Cheilostomata) from Bahia State, northeast Brazil: taxonomy and non-indigenous species. Marine Biodiversity, 48:1463-1488.

Audouin JV, 1826. Explication sommaire des planches de polypes de l'Egypte et de la Syrie, publiées par Jules-César Savigny. In: Description de l'Egypte, ou receuil des observations et des recherches qui ont été faites en Egypte pendant l'Expedition de 'Armée française. Histoire naturelle. Vol. 1, Part 4. Imprimerie Impériale, Paris, p. 339.

Canu F, Bassler RS, 1929. Bryozoa of the Philippine region. Bulletin of the United States National Museum, Issues 100. U.S. Government Printing Office, Washington, DC, pp. 1-685.

Chae HS, Kil HJ, Seo JE, 2016. Taxonomic study on bryozoans: new additions to the Korean fauna and new species of Petraliella from Seogwipo waters of Jeju Island. Journal of Species Research, 5:551-565. https://doi.org/10.12651/JSR.2016.5.3.551

Chae HS, Seo JE, 2019. Fouling Bryozoa of Korean ports and harbours. Animal Systematics, Evolution and Diversity, 35:204-217. https://doi.org/10.5635/ASED.2019.35.4.033

Gong YH, Seo JE, 2003. Fouling Bryozoa from the East Sea. Journal HRDEC, 4:1-22.

Gordon DP, 2016. Bryozoa of the South China Sea: an overview. Raffles Bulletin of Zoology Supplement, 34:604-618.

Gordon DP, Hosie AM, Carter MC, 2008. Post-2000 detection of warm-water alien bryozoan species in New Zealand: the significance of recreational vessels. Virginia Museum of Natural History Special Publication, 15:37-48.

Gordon DP, Hossain MM, Wood TS, 2007. The known and anticipated bryozoan diversity of Bangladesh. Journal of Taxonomy and Biodiversity Research, 1:45-58.

Gordon DP, Taylor PD, Bigey FP, 2009. Phylum Bryozoa: moss animals, sea mats, lace corals. In: New Zealand Inventory of Biodiversity. Vol. 1. Kingdom Animalia: Radiata, Lophotrochozoa, Deuterostomia (Ed., Gordon DP). Canterbury University Press, Christchurch, pp. 271-297.

Grange KR, Gordon DP, 2005. The spread and potential impact of the introduced bryozoan *Biflustra grandicella*. Final Research Report for Ministry of Fisheries Research Project ZBS 2003-07. National Institute of Water and Atmospheric Research, Wellington, pp. 1-30.

Hincks T, 1891. XXXII. Contributions towards a general history of the Marine Polyzoa. Annals and Magazine of Natural History, Series 6, 7:285-298.

Liu X, 1991. A study on the anascan-cribrimorphan bryozoans from Nansha Islands of China. Bulletin of the Marine Biology of Nansha Islands and Neighbouring Seas, 5:56-81.

Liu X, 1992. On the genus *Membranipora* (Anasca: Cheilostomata: Bryozoa) from South Chinese Seas. Raffles Bulletin of Zoology, 40:103-144.

Liu X, Yin X, Ma J, 2001. Biology of marine-fouling bryozoans

in the coastal waters of China. Science Press, Beijing, pp. 1-860.

Louis S, Menon NR, 2009. *Biflustra perambulata* n. sp. (Cheilostomata: Bryozoa), a new alien species from Cochin Harbour, Kerala, India. Zootaxa, 2066:59-68. https://doi.org/10.11646/zootaxa.2066.1.3

Mawatari S, 1974. Studies on Japanese anascan Bryozoa 3. Division Malacostega (1). Bulletin of the National Science Museum, 17:17-52.

Moyano H, 2005. Bryozoa de la expedición chilena CIMAR 5 Islas Oceánicas I: el género *Jellyella* Taylor and Monks 1997 (Bryozoa, cheilostomatida) en la Isla de Pascua. Ciencia y Tecnología del Mar, 28:87-90.

Okada Y, 1923. On a collection of Bryozoa from the Straits of Corea. Annotationes Zoologicae Japonenses, 10:215-234.

Osburn RC, 1950. Bryozoa of the Pacific coast of America. Part 1. Cheilostomata-Anasca. Allan Hancock Pacific Expeditions, 14:1-269.

Ortmann A, 1890. Die Japanische Bryozoenfauna. Bericht über die von Herrn Dr. L. Döderlein in Jahre 1880-81, gemachten Sammlungen. Archiv für Naturgeschichte, 56:1-74.

Rho BJ, Seo JE, 1985. A systematic study on the marine bryozoans in Korea 5. Journal of the Korean Research Institute for Better Living, 35:53-68.

Rho BJ, Seo JE, 1986. A systematic study on the marine bryozoans in Cheju-do. The Korean Journal of Zoology, 29:31-60.

Rho BJ, Seo JE, 1990. A systematic study on the marine bryozoans in Korea. 7. Suborder Anasca. Korean Journal of Systematic Zoology, 6:145-160.

Rho BJ, Song JI, 1980. A systematic study on the marine bryozoans in Korea 2. Anascan Cheilostomata. Commemoration papers for Professor C. W. Kim's 60th Birthday Anniversary. pp. 147-162.

Savigny JC, 1817. Description de l'Egypte, ou recueil des observations et des recherches qui ont été faites en Egypte pendant l'expédition de l'Armée française, publié par les ordres de sa Majesté l'Empereur Napoléon le Grand. Histoire Naturelle. Imprimerie Royale, Paris, pp. 1-339.

Seo JE, 1992. A systematic study on the bryozoans from the South Sea in Korea I. Cheilostomata. Korean Journal of Systematic Zoology, 8:141-160.

Seo JE, 1998a. Marine bryozoans from Geojedo Island in Korea. Korean Journal of Systematic Zoology, 14:207-217.

Seo JE, 1998b. Taxonomic of the marine bryozoans from Namhaedo Island and its adjacent waters, Korea. Korean Journal of Systematic Zoology, 14:415-424.

Seo JE, 2005. Illustrated encyclopedia of fauna and flora of Korea, Vol. 40. Bryozoa. Ministry of Education and Human Resources Development, Seoul, pp. 1-596.

Seo JE, 2010. Bryozoa: Gymnolaemata: Cheilostomata: Inovicellata, Malacostega, Flustrina, Ascophora. Bryozoans. Invertebrate Fauna of Korea, 29:1-149.

Seo JE, Min BS, 2009. A faunistic study on cheilostomatous bryozoans from the shoreline of South Korea, with two new species. Korean Journal of Systematic Zoology, 25:19-40. https://doi.org/10.5635/KJSZ.2009.25.1.019

Song JI, Won JH, 1992. Marine cnidariauos, bryozoans and tunicates in Cheju Island. A report on the Floral and Fannal Survey of Chuja Island. pp. 117-148.

Taylor PD, Monks N, 1997. A new cheilostome bryozoan genus pseudoplanktonic on molluscs and algae. Invertebrate Biology, 116:39-51. https://doi.org/10.2307/3226923

Taylor PD, Tan SHA, 2015. Cheilostome Bryozoa from Penang and Langkawi, Malaysia. European Journal of Taxonomy, 149:1-34. https://doi.org/10.5852/ejt.2015.149

Tilbrook KJ, 2006. Cheilostomatous Bryozoa from the Solomon Islands. Santa Barbara Museum of Natural History Monographs, 4:1-385.

Tilbrook KJ, 2012. Bryozoa, Cheilostomata: first records of two invasive species in Australia and the northerly range extension for a third. Check List, 8:181-183. https://doi.org/10.15560/8.1.181

Tilbrook KJ, Gordon DP, 2016. Checklist of Singaporean Bryozoa and Entoprocta. Raffles Bulletin of Zoology, 34:593-603.

Tung YM, Wang FT, 1960. Studies on marine Bryozoa of Chekiang. I. Acta Zoologica Sinica, 12:191-200 (in Chinese, English summary).

Vieira LM, Almeida ACS, Winston JE, 2016. Taxonomy of Intertidal cheilostome Bryozoa of Maceió, northeastern Brazil. Part 1. Suborders Inovicellina, Malacostegina and Thalamoporellina. Zootaxa, 4097:59-83. https://orcid.org/10.11646/zootaxa.4097.1.3

Wang FT, Cai RX, 1977. Report on Ectoprocta (Bryozoa) from the East China Sea. Marine Science and Technology, 7:14-47 (in Chinese).

Received November 15, 2022
Revised November 25, 2022
Accepted November 27, 2022