

## Marine Bryozoans from Geojedo Island in Korea

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### ABSTRACT

Twenty nine species of marine bryozoans are reported from Geojedo Island, Korea. Of these, two species, *Chaperia acanthina* and *Antropora tinctoria* are new to Korean fauna. Only two species, *Amathia distans* and *Tricellaria occidentalis*, included in this paper, were previously recorded from Geojedo Island. Therefore twenty five species of marine bryozoans is newly recorded from Geojedo Island.

Key words: marine bryozoans, Geojedo Island, Korea

### INTRODUCTION

Geojedo Island is the second largest island in Korea and is located in the uncontaminated waters of the South Sea. Geojedo has a rocky coast which provides the best substrates for attached animals.

In the taxonomical research of marine bryozoans, one of the attached animals was in such poor condition that only two species, *Amathia distans* and *Tricellaria occidentalis* have been reported from Haegeumgang in the southern part of Geojedo Island before now (Kim *et al.*, 1979).

The Korean government has instituted a new economic development policy for Geojedo Island which may effect the water quality of the area. Therefore the fauna of Geojedo Island need to be clarified before any change in the ecosystem occurs.

This paper is the result of the intensive survey of the fauna of Geojedo Island from 1996 to 1997, with an examination of materials collected in 1993. The collection was gathered from eight localities (Jisepo, Gujora, Susan, Yeocha, Daepo, Ssanggeun, Gabae, Gudo Island).

The specimens examined were collected from the intertidal zone, fishing nets, diving and ropes

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hanging from a pier. The specimens from Jisepo were collected from shrimp net; the ones from Gajora and Daepo (9 July 1996; 29 Jan. 1997) were collected by rope; the ones from Gabae were from the intertidal zone; and, the rest were collected by diving. They were bleached or burned for observation with a stereomicroscope. The two unrecorded species from Korea are illustrated with photographs derived from observation with a scanning electron microscope. The specimens are currently stored in the Department of Biology, Woosuk University, Korea.

## SYSTEMATICS

The species marked with one asterisk (\*) are new to Korean fauna; the ones with two asterisks (\*\*) were previously reported from Geojedo Island; and, the ones without an asterisk are newly added to Geojedo Island fauna.

Class Stenolaemata Borg, 1926 협후 강  
Order Cyclostomata Busk, 1852 원구 목  
Family Crisiidae Johnston, 1838 흰수염이끼벌레 과  
Genus *Crisia* Lamouroux, 1812 흰수염이끼벌레 속

**1. *Crisia eburneodenticulata* Smitt, 1865** 흰수염이끼벌레

**Material examined.** Jisepo, 8 July 1993.

**Habitat.** Not known.

**Distribution.** Korea (South Sea, Cheju Island, Yellow Sea), Japan, Philippine, Australia.

Class Gymnolaemata Allman, 1856 나후 강  
Order Ctenostomata Busk, 1852 줄구 목  
Family Vesiculariidae Johnston, 1847 주머니이끼벌레 과  
Genus *Amathia* Lamouroux, 1812 주머니이끼벌레 속

**\*\*2. *Amathia distans* Busk, 1886** 나선주머니이끼벌레

**Material examined.** Gabae, Gudo Island, 6 Feb. 1996; Ssanggeun, Daepo, 8, 9 July 1996; Gabae, 8, 10 July 1996.

**Habitat.** Seaweed; Rope; *Watersipora* sp.

**Distribution.** Korea (South Sea, Cheju Island, East Sea, Yellow Sea), Japan, Australia, Brazil.

Order Cheilostomatida Busk, 1852 순구 목  
Suborder Anasca Levinsen, 1909 무낭 아목  
Family Membraniporidae Busk, 1854 막이끼벌레 과  
Genus *Membranipora* de Blainville, 1830 막이끼벌레 속

**3. *Membranipora perfragilis* (MacGillivray, 1881)** 유연막이끼벌레

**Material examined.** Daepo, 8 July 1996.

**Habitat.** Rope.

**Distribution.** Korea (Yellow Sea), Japan, California, Australia.

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

**Material examined.** Jisepo, 8 July 1993; Susan, 29 Jan. 1997.

**Habitat.** Shell of Gastropoda.

**Distribution.** Korea (South Sea, Cheju Island), Japan, Cosmopolitan.

Family Chaperiidae Jullien, 1888 다음판이끼벌레 과 (신칭)

Genus *Chaperia* Jullien, 1881 다음판이끼벌레 속 (신칭)

**\*5. *Chaperia acanthina* (Lamouroux, 1825) 바늘이끼벌레 (신칭) (Fig. 1A, B)**

*Chaperia acanthina*: Calvet, 1904, p. 11; Marcus, 1921, p. 88; O'Donoghue and O'Donoghue, 1926, p. 86; Harmer, 1926, p. 229, pl. 14, figs. 9, 10; Silén, 1941, p. 46; Brown, 1952, p. 95, fig. 45; O'Donoghue, 1957, p. 74; Gordon, 1967, p. 51, fig. 14; Uttley and Bullivant, 1971, p. 17.

*Chaperia acanthina*: O'Donoghue and Waterville, 1944, p. 414.

**Material examined.** Susan, 29 Jan. 1997.

**Description.** Colony encrusting the rock. The zooid pentagonal, arranged like honeycomb. Opesia semicircular, occasionally nearly circular, the proximal lip slightly concave, the distal margin thickened and raised. The eight spines long, stout and bent, articulated at the distal part of the zooid.

**Remarks.** This species shows much variation in the number of spines. The specimen from South Africa has always nine spines; the ones from Japan nine to ten; the one from New Zealand four to seven, but our specimen has eight spines.

**Habitat.** Rock.

**Distribution.** Korea (South Sea), Japan, Bonin Islands, Vancouver Island Region, New Zealand, Torres Straits, Sulu Island, Natal, South Africa.

Family Calloporidae Norman, 1903 단단이끼벌레 과

Genus *Antropora* Norman, 1903 굴이끼벌레 속

**\*6. *Antropora tinctoria* (Hastings, 1930) 분홍이끼벌레 (신칭)**

*Crassimarginata tinctoria* Hastings, 1930, p. 708, pl. 5, figs. 16-19, pl. 17, fig. 120.

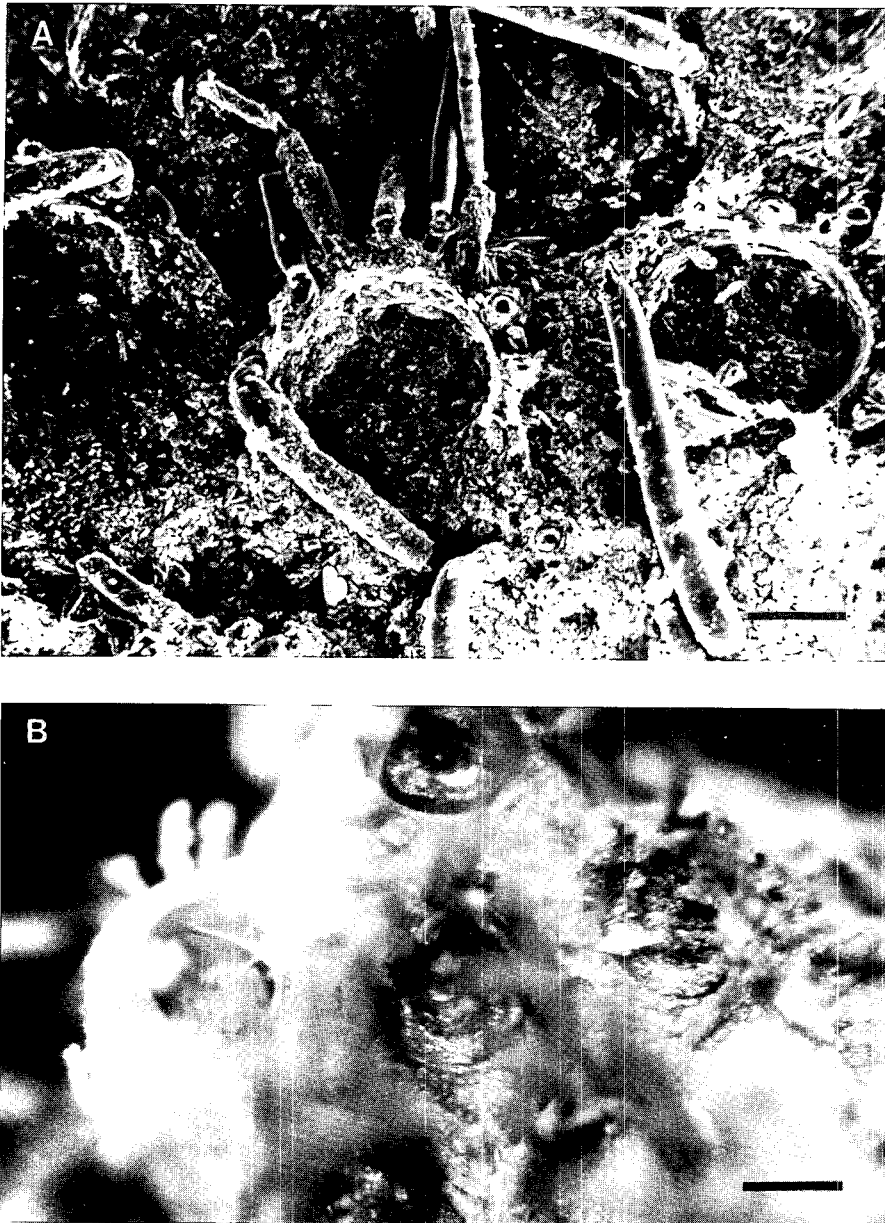
*Antropora tinctoria*: Osburn, 1950, p. 54, pl. 4, fig. 7, pl. 29, figs. 7, 8; Soule and Duff, 1957, p. 91; Soule, 1959, p. 12; Cook, 1968, p. 140, fig. 11; Woollacott and North, 1971, p. 471; Powell, 1971, p. 769; Banta, 1980, p. 371, fig. 24. 22; Mawatari and Mawatari, 1981, p. 30, fig. 4; Cook, 1985, p. 96; Fransen, 1986, p. 22, figs. 7a-e.

**Material examined.** Jisepo, 8 July 1993.

**Description.** Colony pinkish, encrusting the shell of hermit crabs and unilamellar. Zooecia arranged in longitudinal series, oval and elongated with one or two rounded triangular kenozooids at the proximal corners of each zooecium, which have central openings and sometimes have tubercle. Cryptocyst narrow, granular, sloping downward and proximally broad. Small interzooecial avicularia, ca. 1/3 of the length of the autozooid, scattered among the zooecia and mandible semicircular.

**Remarks.** The colony forms thin unilamellar patches in our specimens. It must be the young colony. Fransen (1986) described that the color of specimen from Caribbean is white to brown. However, ours has the same pinkish color as in the specimen of Panama (Hastings, 1930). It seems that the color of young stages is white and it gets pinkish in an older colony. The author could find only one interzooecial avicularium in our samples.

**Habitat.** Shell of Gastropoda.



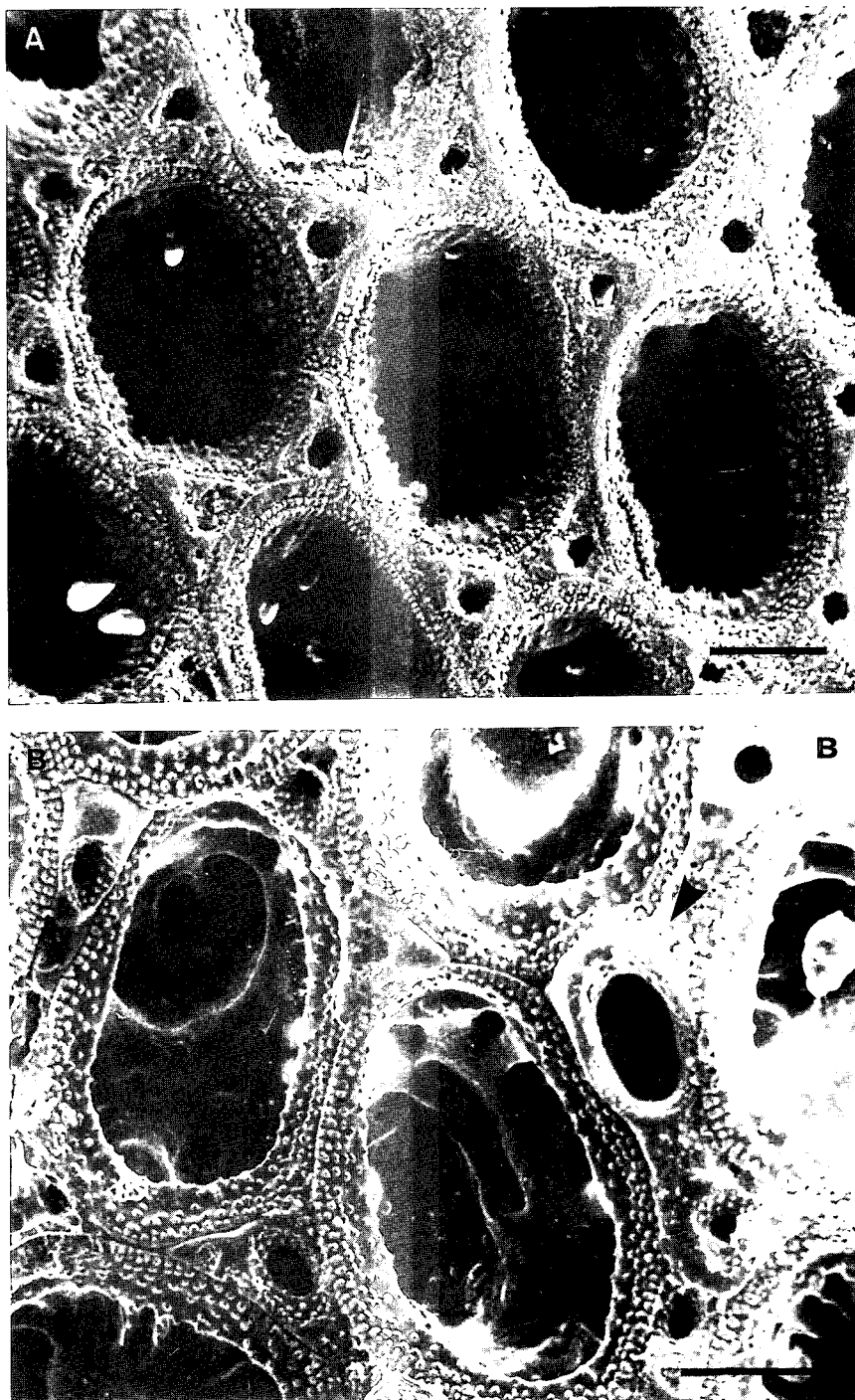
**Fig. 1.** *Chaperia acanthina* (Lamouroux, 1825). A, Zooids has 8 spines, scale is 0.1 mm; B, Opesia, scale is 0.2 mm.

**Distribution.** Korea (South Sea), Japan, California to Mexico, Peru, Galapagos Islands, Panama, Brazil, West Africa, Ghana. This species is the warm temperate and tropical one.

Family Bugulidae Gray, 1848 다발이끼벌레 과

Genus *Bugula* Oken, 1815 다발이끼벌레 속

**7. *Bugula dentata* (Lamouroux, 1816) 치상이끼벌레**



**Fig. 2.** *Antropora tinctoria* (Hastings, 1930). A, Arrangement of zooids with the triangular kenozooids; B, One kenozooid has tubercle. Arrow indicates interzooidal avicularium. Scales are 0.1 mm.

**Material examined.** Jisepo, 8 July 1993; Gudo Island, 6 Feb. 1996.

**Habitat.** Shell of Gastropoda.

**Distribution.** Korea (South Sea, Cheju Island, East Sea), Japan, Australia, South Pacific Ocean, Africa.

**8. *Bugula neritina* (Linné, 1758)** 큰다발이끼벌레

**Material examined.** Daepo, 8, 9 July 1996; Gujora 5 Oct. 1996.

**Habitat.** Rope; Other bryozoans.

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

Family Beaniidae Canu and Bassler, 1927 콩이끼벌레 과

Genus *Beania* Johnston, 1840 콩이끼벌레 속

**9. *Beania hexaceras* (Ortmann, 1890)** 육콩이끼벌레

**Material examined.** Ssanggeun, 8 July 1996.

**Habitat.** Seaweed.

**Remarks.** Rho and Seo (1990) and Seo (1992) described a wide variation in the numbers of spines in this species from the South Sea. This specimen also shows the variety of zooids with five to nine spines in the same colony. However this variation appears only in the specimens from the South Sea. Therefore, *Beania hexaceras* needs studying continually to clarify that this species from the Yellow Sea and the Sea of Japan shows the variations as well.

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

**10. *Beania vegae* Silén, 1941** 강장콩이끼벌레

**Material examined.** Gudo Island, 6 Feb. 1996.

**Habitat.** Shell.

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

Family Cabereidae Busk, 1852 카베레이아끼벌레 과

Genus *Tricellaria* Fleming, 1828 세방이끼벌레 속

**\*\*11. *Tricellaria occidentalis* (Trask, 1857)** 세방가사이끼벌레

**Material examined.** Gujora, 5 Oct. 1996.

**Habitat.** Rope.

**Distribution.** Korea (South Sea, Cheju Island, East Sea, Yellow Sea), Japan, Pacific Ocean.

Genus *Caberea* Lamouroux, 1816 카베레이아끼벌레 속

**12. *Caberea lata* Okada, 1929** 라타이끼벌레

**Material examined.** Jisepo, 8 July 1993; Gudo Island, 6 Feb. 1996; Yeocha, 9 July 1996.

**Habitat.** Tube of Polychaeta.

**Distribution.** Korea (South Sea, Cheju Island, East Sea, Yellow Sea), Japan, China Sea, Australia, Pacific Ocean, Indian Ocean.

Family Thalamoporellidae Levinsen, 1909 안방이끼벌레 과

Genus *Thalamoporella* Hincks, 1887 안방이끼벌레 속

**13. *Thalamoporella lioticha* (Ortmann, 1890)** 미끈안방이끼벌레

**Material examined.** Daepo, 8 July 1996; Daepo, 9 July 1996; Yeocha, 9 July 1996.

**Habitat.** Rope; Rock.

**Distribution.** Korea (South Sea, Cheju Island), Japan.

Family Cellariidae Lamouroux, 1821 마디이끼벌레 과

Genus *Cellaria* Ellis and Solander, 1786 마디이끼벌레 속

**14. *Cellaria punctata* (Busk, 1852)** 마디이끼벌레

**Material examined.** Jisepo, 8 July 1993; Gudo Island, 6 Feb. 1996; Ssanggeun, 8 July 1996.

**Habitat.** Shell of Gastropoda; Tube of Polychaeta; Sponge.

**Distribution.** Korea (South Sea, Cheju Island, East Sea, Yellow Sea), Japan, East China Sea, Australia.

Suborder Ascophorina Levinsen, 1909 유낭 아목

Family Eurystomellidae Levinsen, 1909 유리스토멜라 과

Genus *Eurystomella* Levinsen, 1909 유리스토멜라 속

**15. *Eurystomella bilabiata* (Hinck, 1884)** 두입술이끼벌레

**Material examined.** Gudo Island, 6 Feb. 1996; Daepo, 8 July 1996.

**Habitat.** Rock.

**Distribution.** Korea (South Sea), Japan, California; British Columbia, Van Couver, Mexico.

Family Exochellidae Bassler, 1935 우뚝이끼벌레 과

Genus *Escharoides* Milne-Edwards, 1836 혀이끼벌레 속

**16. *Escharoides excavata* (MacGillivray, 1860)** 난로이끼벌레

**Material examined.** Gudo Island, 6 Feb. 1996.

**Habitat.** Rock.

**Distribution.** Korea (South Sea, Cheju Island), California, Galapagos Islands, Australia, New Zealand, Albermale Strait.

Family Celleporariidae Harmer, 1957 섬유이끼벌레 과

Genus *Celleporaria* Lamouroux, 1821 섬유이끼벌레 속

**17. *Celleporaria wakayamensis* (Okada and Mawatari, 1938)** 섬유이끼벌레

**Material examined.** Jisepo, 8 July 1993; Daepo, 27 Jan. 1997; Susan, 29 Jan. 1997.

**Habitat.** Shell of Gastropoda; Barnacles.

**Distribution.** Korea (South Sea, Cheju Island, Yellow Sea), Japan.

**18. *Celleporaria brunnea* (Hincks, 1884)** 갈색섬유이끼벌레

**Material examined.** Daepo, 9 July 1996; 29 Jan. 1997.

**Habitat.** Rope.

**Distribution.** Korea (South Sea, Yellow Sea), British Colombia to Colombia, Panama, Galapagos Islands, Taboga Island, Queen Chalotte Island

Family Hippopodinidae Levinsen, 1909 말발이끼벌레 과

Genus *Codonellina* Bassler, 1934 종이끼벌레 속

**19. *Codonellina montferrandii* (Audouin, 1826)** 철빛종이끼벌레

**Material examined.** Daepo, 9 July 1996 .

**Habitat.** Shell.

**Distribution.** Korea (South Sea, Cheju Island), Japan, Netherlands, tropical West Africa;

Family Hippoporinidae Brown, 1952 말구멍이끼벌레 과

Genus *Calypthotheca* Harmer, 1957 은협이끼벌레 속

**20. *Calypthotheca symmetrica* (Ortmann, 1890)** 상청은협이끼벌레

**Material examined.** Gabae, 8 July 1996; Ssanggeun, 8 July 1996.

**Habitat.** Shell; Stem of seaweed.

**Distribution.** Korea (South Sea, Cheju Island), Japan.

Family Schizoporellidae Jullien, 1883 구멍이끼벌레 과

Genus *Arthropoma* Levinsen, 1909 관절이끼벌레 속

**21. *Arthropoma ceciliae* (Audouin, 1826)** 관절이끼벌레

**Material examined.** Gudo Island, 6 Feb. 1996.

**Habitat.** Not known.

**Distribution.** Korea (South Sea, Cheju Island), Japan, Cosmopolitan.

Family Smittinidae Levinsen, 1909 입이끼벌레 과

Genus *Parasmittina* Osburn, 1952 측입이끼벌레 속

**22. *Parasmittina contraria* Seo, 1993** 반향측입이끼벌레

**Material examined.** Jisepo, 8 July 1993.

**Habitat.** Not known.

**Distribution.** Korea (South Sea, Cheju Island).

Genus *Smittoidea* Osburn, 1952 태양입이끼벌레 속

**23. *Smittoidea levis* (Kirkpatrick, 1890)** 매끈입이끼벌레

**Material examined.** Daepo, 8 July 1996.

**Habitat.** Rock.

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

Family Escharellidae Levinsen, 1909 빛이끼벌레 과

Genus *Mucronella* Hincks, 1880 침이끼벌레 속

**24. *Mucronella perforata* Okada and Mawatari, 1937** 구멍침이끼벌레

**Material examined.** Daepo, 9 July 1996; 29 Jan. 1997.

**Habitat.** Shell.

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

Family Microporellidae Hincks, 1879 소공이끼벌레 과

Genus *Microporella* Hincks, 1877 소공이끼벌레 속

**25. *Microporella ciliata* (Pallas, 1766)** 섬모소공이끼벌레

**Material examined.** Jisepo, 8 July 1993.

**Habitat.** Seaweed.



**Distribution.** Korea (South Sea), Japan, Cosmopolitan.

Genus *Fenestrulina* Jullien, 1888 방사이끼벌레

**26. *Fenestrulina malusii* (Audouin, 1826)** 방사이끼벌레

**Material examined.** Daepo, 9 July 1996; Gujora, 5 Oct. 1996.

**Habitat.** Rope.

**Distribution.** Korea (South Sea, Cheju Island, East Sea, Yellow Sea), Japan, Mediterranean Sea, North Sea, tropical West Africa, Antarctic to Arctic.

Family Celleporidae Lamouroux, 1821 가지이끼벌레 과

Genus *Celleporina* Gray, 1848 가지이끼벌레 속

**27. *Celleporina porosissima* Harmer, 1957** 포로시씨마이끼벌레

**Material examined.** Susan, 29 Jan. 1997.

**Habitat.** Shell of Bivalvia.

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

**28. *Celleporina geminata* (Ortmann, 1890)** 가지이끼벌레

**Material examined.** Jisepo, 8 July 1993.

**Habitat.** Not known.

**Distribution.** Korea (South Sea, Cheju Island), Japan.

Family Phidoloporidae Gabb and Horn, 1862 연구멍이끼벌레 과

Genus *Phidolopora* Gabb and Horn, 1862 연구멍이끼벌레 속

**29. *Phidolopora pacifica* (Robertson, 1908)** 태양연구멍이끼벌레

**Material examined.** Gabae, 10 July 1996; Susan, 29 Jan. 1997.

**Habitat.** Not known.

**Distribution.** Korea (South Sea, Yellow Sea), Japan, British Colombia to Peru, Galapagos Islands.

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## 거제도의 해산 대형동물

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### 요 약

한국의 거제도로부터 29종의 해산 대형동물을 보고한다. 이들 중 *Chaperia acanthina*와 *Antropora tinctoria*의 2종은 한국 미기록종이며 거제도로부터 이미 밝혀진 종은 본 연구에서도 보고되는 *Amathia distans*와 *Tricellaria occidentalis*의 두 종뿐이다. 따라서 본 연구에서 새롭게 밝혀지는 거제도산 해산 대형동물은 25종이다.