

Echinoderms from Geojedo Island and Adjacent Sea Waters, Korea

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ABSTRACT

The echinoderms collected from 20 localities of Geojedo Island and its adjacent sea waters during the period from February 1995 to May 1998 turned out to be 47 species in 37 genus, 25 families, 11 orders, three classes. Of which one echinoid species, *Prionocidaris baculosa* (Lamarck, 1816), is newly added to the Korean fauna. Twenty two species are newly added to the echinoderm fauna of Geojedo Island with 25 previously known species and total 47 species are described in this report.

Key words: Echinodermata, fauna, Geojedo Island, Korea

INTRODUCTION

Geojedo Island is the second largest island in Korea whose southern region belongs to the Hanryu Marine National Park and is located in the Korea Strait which is influenced by the warm current driven from the Kuroshio.

Echinoderm fauna of Geojedo Island and its adjacent sea waters consist mostly of tropical forms and has not extensively investigated so far. Kim *et al.* (1979) reported three unidentified crinoid species, six asteroid species, five ophiuroid species, four echinoid species and one holothuroid species in the report on the fauna of Geojedo Island and five adjacent islands which have been surveyed by the Korean Association of Conservation of Nature. Rho and Kim (1966), Rho and Shin (1980), Shin (1992b) and Shin and Rho (1996) reported eight species in the asteroid fauna, Rho and Kim (1966), Rho (1979), Shin (1992a) and Shin and Rho (1996) reported six species in the ophiuroid fauna. While Rho and Kim (1966), Rho (1971), Rho and Shin (1981), and Shin and Rho (1996) recorded seven species in the echinoid fauna, and Rho and Won (1995) and Shin and Rho (1996) reported one species in the holothuroid fauna. Taken together nine asteroids, seven ophiuroids, eight echinoids and one holothuroid species were recorded. The aim of the present study

is to determine the fauna of echinoderms from Geojedo Island and its adjacent waters.

MATERIALS AND METHODS

The echinoderm specimens used for this study were collected from 20 localities in Geojedo Island and adjacent sea waters (Deokdong, Isudo, Heungnam, Oepo, Jangseungpo, Jisepo, Yundoldo, Yanghwa, Susan, Hongdo Island, Gugdo Island, Maemuldo, Yeocha, Daepo, Ssanggeun, Gabae, Gudo Island, Bijindo, Haksan, Sagog) during the period from February 1995 to January 1998 (Fig. 1). The specimens were obtained from the intertidal zone by the author and primarily from the subtidal zone by SCUBA diving and fishing nets. After the materials were fixed and preserved in about 75% methyl alcohol, they were deposited in the Department of Biology, Korean Sahmyook University, Korea. These specimens were identified on the basis of their morphological characteristics and for more detailed observation the research microscope and stereomicroscope were used. The species identified in this study and reported previously (Rho and Kim, 1966; Kim *et al.*, 1979; Rho, 1971, 1979; Rho and Shin, 1980, 1981; Shin, 1992a, 1992b; Rho and Won, 1995; Shin and Rho, 1996) were also included in the list of species. For the species newly reported in the Korean fauna, a brief description and the plates are introduced.

RESULTS

The echinoderms identified turned out to be 47 species in 37 genus, 25 families, 11 orders and three classes comprising 18 asteroid species in 14 genus, eight families, three orders; 13 ophiuroid species in eight genus, six families, two orders; 12 echinoid species in 11 genus, eight families, four orders and four holothuroid species in four genus, three families, two orders. Of which one echinoid species (asterisk **), *Prionocidaris baculosa* is newly reported in Korean fauna. The species newly recorded in Geojedo Island (asterisk *) are nine asteroid species, six ophiuroid species, four echinoid species and three holothuroid species and are presented in the systematic list. The species previously recorded from Geojedo Island and its adjacent water consisting of nine asteroid species, seven ophiuroid species, nine echinoid species and one holothuroid species are also represented in the "Previous records" section. Three crinoid species were obtained together, but remained unidentified and were not presented in this results.

Phylum Echinodermata Klein, 1734 극피동물 문
 Class Stellerioidea Lamarck, 1816 해성 강
 Subclass Asteroidea de Blainville, 1830 불가사리 아강
 Order Phanerozonia Sladen, 1889 현대 목
 Suborder Paxillosa Perrier, 1884 소주 아목
 Family Gonioplectinidae Verrill, 1899 모서리불가사리 과
 Genus *Astropecten* Gray, 1840 가시불가사리 속

1. *Astropecten polyacanthus* Müller et Troschel, 1842 가시불가사리

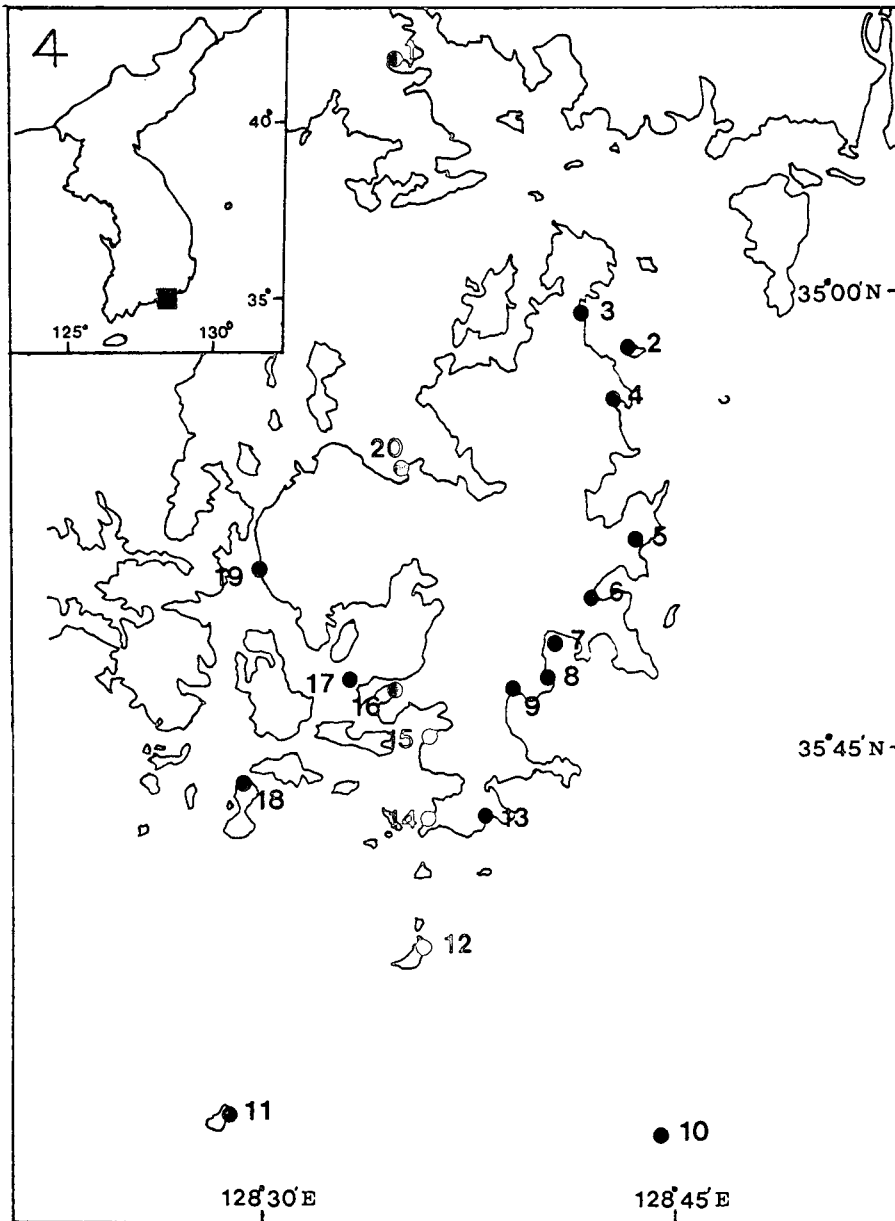


Fig. 1. A map showing the localities where the materials were collected. 1, Deokdong; 2, Isudo Island; 3, Heungnam; 4, Oepo; 5, Jangseungpo; 6, Jisepo; 7, Yundoldo Island; 8, Yanghwa; 9, Susan; 10, Hongdo Island; 11, Gugdo Island; 12, Maemuldo Island; 13, Yeocha; 14, Daepo; 15, Ssanggeun; 16, Gabae; 17, Gudo Island; 18, Bijindo Island; 19, Haksan; 20, Sagog.

Materials examined. Susan, 29 Jan. 1996, 6 inds.; Daepo, 7 July 1996, 1 ind.; Ssanggeun, 8 July 1996, 2 inds.

Previous records. Bijindo (Rho and Kim, 1966), Haegeumgang (Kim *et al.*, 1979; Rho and Shin, 1980), Gujora (Rho and Shin, 1980).

Genus *Ctenopleura* Fisher, 1913 측가시불가사리 속

***2. *Ctenopleura ludwigi* (De Loriol, 1899) 루드윅불가사리**

Materials examined. Deokdong, 6 July 1996, 1 ind.; Susan, 29 Jan. 1997, 1 ind.; Heungnam, 30 Jan. 1997, 2 inds.

Family Luidiidae Verrill, 1899 검은띠불가사리 과

Genus *Luidia* Forbes, 1839 검은띠불가사리 속

***3. *Luidia quinaria* von Martens, 1865 검은띠불가사리**

Materials examined. Daepo, 9 July 1996, 1 ind.; Susan, 29 Jan. 1997, 1 ind.; Heungnam, 13 Jan. 1998, 1 ind.

Suborder Valvata Perrier, 1884 연변 아목

Family Goniasteridae Forbes, 1841 뽕족불가사리 과

Genus *Mediaster* Stimpson, 1857 메디불가사리 속

***4 *Mediaster brachiatis* Goto, 1914 메디불가사리**

Materials examined. Yeocha, 9 July 1996, 1 ind.

Family Linkiidae Perrier, 1875 빨강불가사리 과

Genus *Certonatdoa* Clark, 1921 빨강불가사리 속

5. *Certonatdoa semiregularis* (Müller et Troschel, 1842) 빨강불가사리

Previous records. Gukdo (Kim *et al.*, 1979; Rho and Shin, 1980), Hongdo (Kim *et al.*, 1979; Rho and Shin, 1980).

Order Spinulosa Perrier, 1894 유극 목

Family Asterinidae Gray, 1840 별불가사리 과

Genus *Asterina* Nardo, 1834 별불가사리 속

6. *Asterina pectinifera* Müller et Troschel, 1842 별불가사리

Materials examined. Isudo, 25 July 1995, 7 inds.; 7 Feb. 1996, 1 ind.; Deokdong, 6 July 1996, 18 inds.; Daepo, 7 July 1996, 3 inds.; Ssanggeun, 8 July 1996, 7 inds.; Daepo, 9 July 1996, 2 inds.; Susan, 29 Jan. 1997, 1 ind.; Heungnam, 30 Jan. 1997, 1 ind.; Yanghwa, 4 July 1997, 2 inds.

Previous records. Bijindo (Rho and Kim, 1966; Kim *et al.*, 1979; Shin, 1992b) Jangseungpo (Rho and Shin, 1980), Yundoldo (Rho and Shin, 1980), Gujora (Rho and Shin, 1980), Haegeumgang (Rho and Shin, 1980), Gugdo (Kim *et al.*, 1979; Rho and Shin, 1980)

Family Echiniasteridae Verrill, 1867 애기불가사리 과

Genus *Henricia* Gray, 1840 애기불가사리 속

***7. *Henricia leviuscula* (Stimpson, 1857) 미끈애기불가사리**

Materials examined. Daepo, 8 July 1996, 1 ind.; Heungnam, 18 Jan. 1998, 1 ind.

8. *Henricia nipponica* Uchida, 1928 애기불가사리

Materials examined. Isudo, 25 July 1995, 2 inds.

Previous records. Yundoldo (Rho and Shin, 1980), Haegeumgang (Kim *et al.*, 1979; Rho and

Shin, 1980)

9. *Henricia ohshimai* Hayashi, 1935 오오지마애기불가사리

Previous records. Hongdo (Kim *et al.*, 1979).

10. *Henricia pachyderma* Hayashi, 1940 육질애기불가사리

Materials examined. Daepo, 8 July 1996, 2 inds.

Previous records. Gujora (Rho and Shin, 1980)

Genus *Poraniopsis* Perrier, 1888 부푼불가사리 속

***11. *Poraniopsis inflata* (Fisher, 1911)** 부푼불가사리

Materials examined. Yeocha, 9 July 1996, 1 ind.

Family Solasteridae Forbes, 1839 햇님불가사리 과

Genus *Solaster* Forbes, 1839 햇님불가사리 속

***12. *Solaster dawsoni* Verrill, 1911** 도우손햇님불가사리

Materials examined. Daepo, 9 July 1996, 3 inds.; Maemuldo, 9 July 1996, 1 ind.

***13. *Solaster uchidai* Hayashi, 1939** 우치다햇님불가사리

Materials examined. Maemuldo, 8 July 1996, 2 inds.

Genus *Crossaster* Miller et Troschel, 1840 주름불가사리 속

14. *Crossaster papposus* (Linné, 1758) 주름불가사리

Materials examined. Oepo, 8 July 1996, 1 ind.; Maemuldo, 8 July 1996, 1 ind.; Daepo, 9 July 1996, 4 inds.

Previous records. Hongdo (Rho and Shin, 1980)

Order Forcipulata Perrier, 1884 차극 목

Family Asteriidae Gray, 1840 불가사리 과

Genus *Coscinasterias* Verrill, 1867 체판불가사리 속

15. *Coscinasterias acutispina* (Stimpson, 1857) 체판불가사리

Previous records. Bijindo (Rho and Kim, 1966), Jangseungpo (Rho and Kim, 1966).

Genus *Distolasterias* Perrier, 1896 디스톨불가사리 속

***16. *Distolasterias nipon* (Döderlein, 1902)** 일본불가사리

Materials examined. Daepo, 9 July 1996, 1 ind.; Heungnam, 30 Jan. 1997, 1 ind.

Genus *Aphelasterias* Fisher, 1923 아펠불가사리 속

***17. *Aphelasterias japonica* (Bell, 1881)** 아펠불가사리

Materials examined. Ssanggeun, 8 July 1996, 1 ind.; Geojedo, 8 July 1996, 4 inds.; Daepo, 9 July 1996, 3 inds.; Daepo (Kulpido), 9 July 1996, 5 inds.; Susan, 29 Jan. 1997, 1 ind.

Genus *Asterias* (Linné, 1758) 불가사리 속

18. *Asterias amurensis* Lütken, 1871 아므르불가사리

Materials examined. Isudo, 7 Feb. 1996, 1 ind.; Deokdong, 6 July 1996, 22 inds.; Maemuldo, 8 July 1996, 1 ind.; Daepo, 9 July 1996, 4 inds.; Isudo, 25 July 1995, 2 inds.; Ssanggeun, 8 July 1996, 1 ind.; Susan, 29 Jan. 1997, 1 ind.

Previous records. Bijindo (Rho and Kim, 1966; Kim *et al.*, 1979), Jangseungpo (Rho and Shin, 1980), Gujora (Kim *et al.*, 1979)

Subclass Ophiuroidea Gray, 1840 거미불가사리 아강
 Order Phrynophiurida Matsumoto, 1915 혁사미 목
 Suborder Euryalina Lamarck, 1816 지완사미 아목
 Family Gorgonocephalidae Ljungman, 1867 삼천발이 과
 Genus *Astrocladus* Berrill, 1899 가지거미불가사리 속

19. *Astrocladus coniferus dofleini* Döderlein, 1910 도플라인혹가자거미불가사리

Materials examined. Maemuldo, 8 July 1996, 1 ind.; Hongdo, 9 July 1996, 1 ind.; Daepo, 9 July 1996, 2 inds.; Bijindo, 9 July 1996, 1 ind.

Previous records. Bijindo (Kim *et al.*, 1979)

***20. *Astrocladus ludwigi* (Döderlein, 1896)** 루드윅가지거미불가사리

Materials examined. Hongdo, 9 July 1996, 1 ind.

Order Myophiurida Matsumoto, 1912 폐사미 목
 Suborder Gnathophiurina Matsumoto, 1915 악사미 아목
 Family Ophiactidae Matsumoto, 1915 뱀이거미불가사리 과
 Genus *Ophiactis* Lütken, 1856 뱀이거미불가사리 속

21. *Ophiactis affinis* Duncan, 1879 유사뱀이거미불가사리

Materials examined. Daepo, 9 July 1996, 1 inds.

Previous records. Jangseungpo (Shin, 1992a)

22. *Ophiactis macrolepidota* Marktanner-Turnerestscher, 1887 예쁜뱀이거미불가사리

Previous records. Haegeumgang (Shin, 1992a)

Genus *Ophiopholis* Müller et Troschel, 1842 빨거미불가사리 속

***23. *Ophiopholis mirabilis* (Duncan, 1879)** 빨거미불가사리

Materials examined. Maemuldo, 8 July 1996, 58 inds.; Gugdo, 8 July 1996, 1 ind.; Daepo, 9 July 1996, 27 inds.; Daepo (Kulpido), 9 July 1996, 1 ind.

***24. *Ophiopholis japonica* Lyman, 1879** 왜빨거미불가사리

Materials examined. Daepo, 9 July 1996, 9 inds.

Family Ophiotrichidae Ljungman, 1866 가시거미불가사리 과
 Genus *Ophiotrix* Müller and Troschel, 1840 가시거미불가사리 속

25. *Ophiotrix exigua* (Lyman, 1874) 짧은가시거미불가사리

Materials examined. Deokdong, 6 July 1996, 1 ind.; Ssanggeun, 8 July 1996, 5 inds.; Daepo, 9 July 1996, 9 inds.; Maemuldo, 9 July 1996, 22 inds.; Heungnam, 30 Jan. 1997, 7 inds.; 3 July 1997, 4 inds.; Yanghwa, 4 July 1997, 1 ind.; Sagog, 4 Jan. 1998, 3 inds.

Previous records. Bijindo (Kim *et al.*, 1979; Shin, 1992a), Haegeumgang (Kim *et al.*, 1979), Gujora (Rho and Shin, 1980), Hongdo (Kim *et al.*, 1979).

Suborder Chilophiurina Matsumoto, 1915 순사미 아목
 Family Ophiodermatidae Ljungman, 1867 가죽거미불가사리 과
 Genus *Ophiarachnella* Ljungman, 1872 뱀거미불가사리 속

26. *Ophiarachnella gorgonia* Müller et Troschel, 1842 뱀거미불가사리

Materials examined. Susan, 29 Jan. 1979, 3 inds.

Previous records. Gujora (Rho, 1979)

Family Ophionereididae Lutken, 1859 딱지거미불가사리 과

Genus *Ophionereis* Lütken, 1859 딱지거미불가사리 속

27. *Ophionereis eurybrachioplax* H.L. Clark, 1911 둥근딱지거미불가사리

Materials examined. Maemuldo, 8 July 1996, 50 inds.; Gugdo, 8 July 1996, 6. inds.; Yeocha, 9 July 1996, 1 ind.; Daepo, 9 July 1996, 9 inds.

Previous records. Bijindo (Shin, 1992a)

Family Ophiuridae Lyman, 1865 빗살거미불가사리 과

Genus *Ophioplocus* Lyman, 1861 곱슬거미불가사리 속

28. *Ophioplocus japonicus* H.L. Clark, 1911 왜곱슬거미불가사리

Materials examined. Isudo, 25 July 1995, 1 ind.; Yanghwa, 4 July 1997, 4 inds.; Ssanggeun, 8 July 1996, 1 ind.; Yeucha, 9 July 1996, 2 inds.; Susan, 29 Jan. 1997, 1 ind.; Heungnam, 30 Jan. 1997, 1 ind.

Previous records. Bijindo (Kim *et al.*, 1979), Yundoldo (Rho, 1979), Gujora (Rho, 1979), Hongdo (Kim *et al.*, 1979).

Genus *Ophiura* Lamarck, 1816 빗살거미불가사리 속

***29. *Ophiura kinberi* (Ljungman, 1866)** 빗살거미불가사리

Materials examined. Deokdong, 9 July 1996, 12 inds.; Heungnam, 30 Jan. 1996, 1 ind.

***30. *Ophiura sarsii* Lütken, 1854** 살시빗살거미불가사리

Materials examined. Daepo, 9 July 1996, 17 inds.

***31. *Ophiura leptoctenia* H.L. Clark, 1911** 가는빗살거미불가사리

Materials examined. Daepo, 9 July 1996, 4 inds.

Class Echinoidea Leske, 1778 성게 강

Subclass Regularia Latreille, 1825 정형 아강

Order Cidaroida Claus, 1880 관극성게 목

Family Cidaridae Gray, 1825 관극성게 과

Genus *Prionocidaris* A. Agassiz, 1863 톱니관극성게 속

****32. *Prionocidaris baculosa* (Lamarck, 1816)** 톱니관극성게 (**Fig. 2**)

Cidarites baculosa Lamarck, 1816, p. 55.

Cidarites annulifera Lamarck, 1816, p. 57.

Cidaris baculosa: A. Agassiz, 1863, p. 17; Mortensen, 1903, p. 19.

Leiocidaris baculosa Döderlein, 1887, p. 23, pl. 9, figs. 10a-g.

Leiocidaris annulifera Döderlein, 1887, p. 24, pl. 9, figs. 10h-i.

Cidaris (Leiocidaris) annulifera: Yoshiwara, 1898, p. 147; Tokunaga, 1904, pl. 1, fig. 11, pl. 2, fig. 1.

Cidaris annulifera: Mortensen, 1903, p. 19.

Cidarites cidaris Döderlein, 1906. p. 96.

Phyllacanthus baculosa: Clark, 1907, p. 189; 1908, p. 301.

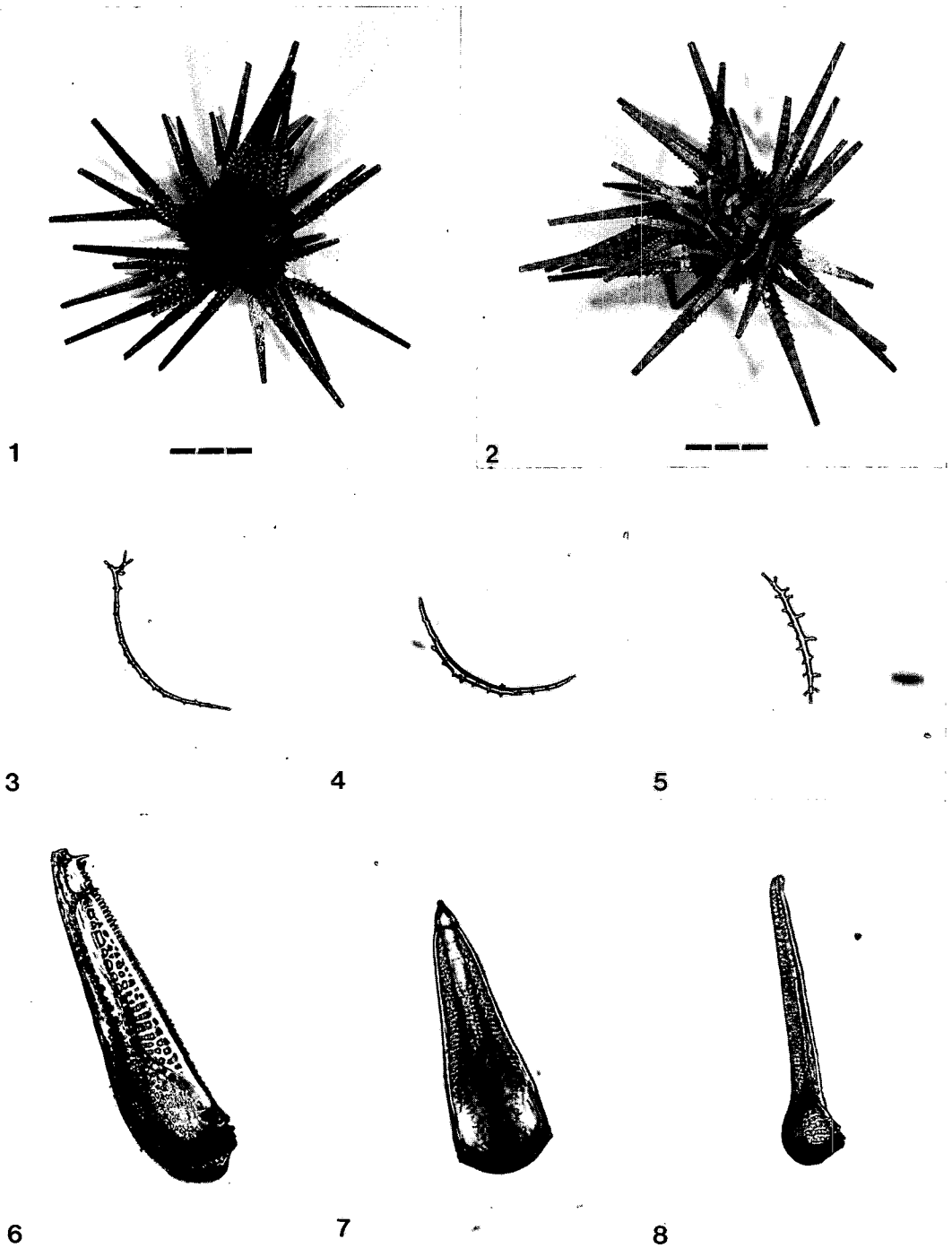


Fig. 2. *Prionocidaris baculosa* (Lamarck, 1816): 1, dorsal view; 2, ventral view; 3, 4, 5, spicules of podia; 6, 7, globiferous pedicellaria; 8, tridentate pedicellaria. Scale = 1 cm.

Prionocidaris baculosa var. *annulifera*: Mortensen, 1928, p. 443; Utinomi, 1965, p. 67, fig. 203; Nishiyama, 1968, p. 323; Shigei, 1970, p. 2, pls. 1, fig. 1, pl. 2, fig. 12; Shigei, 1973a, p. 4;

1973b, p. 35; Yamashita, 1979, p. 57.

Prionocidaris baculosa: A.M. Clark and Rowe, 1971, p. 140, pl. 23, fig. 1; Shigei, 1986, p. 26, pl. 6, figs. 3, 4; pl. 52, figs. 1, 2; pl. 53, figs. 1-3.

Materials examined. Hongdo, 19 May 1998, 1 inds.

Description. The test moderately low, slightly concave at apical system and convex at peristome. Apical system rather small, flat, polygonal in outline and covered with slightly pointed miliary spines. Ocular plates broadly insert. Both genitals and oculars closely set with very small tubercles and the tubercles along the inner edge of genitals elongate and conical. Genital pores small and rather close to the edge. Peristome as large as apical system and covered with miliary spines.

Ambulacral pores contact each other. Ambulacral tubercles prominent and arranged in a vertical series and each ambulacral plate carries two more smaller tubercles inside. Interambulacral tubercles noncrenulated except the upper one or two tubercles and scrobicular circles conspicuous. Interambulacral plates covered with smaller tubercles.

Primary spines long, twice as long as horizontal diameter, nearly cylindrical and tapering towards the point. Shaft of spine flattened slightly on the outer sides, regularly provided with pairs of lateral thorns on the basal half part and also with thorns on the aboral side. Surface of shaft closely set with fine thorns arranged in a longitudinal series. Collar is long and prominent. Oral primary spines flattened and serrated. Scrobicular spines long, slender and flattened. Marginal ambulacral spines much smaller, slender, and slightly flattened. Miliary spines flattened and slightly pointed.

Globiferous pedicellariae have not an end tooth. Tridentate pedicellariae have slender valves joining only at the point.

Test, horizontal diameter	.....	3.4 cm
height	.....58.5% h.d.	.....2.0 cm
Apical system	.....41.2% h.d.	.....1.4 cm
Peristome	.....41.2% h.d.	.....1.4 cm
Longest spine	.....	.....6.8 cm

Diagnosis. Peculiar color of primary spines usually conspicuously banded with red and white. The red spots on the collar very prominent and arranged in longitudinal series. Ambulacral spines uniformly brownish.

Distribution. Korea (South Sea), Japan, Indo-West Pacific.

Order Echinoida Claus, 1876 성계 목

Suborder Temnopleurina Mortensen, 1942 분지성계 아목

Family Temnopleuridae A. Agassiz, 1872 분지성계 과

Genus *Temnopleurus* L. Agassiz, 1841 분지성계 속

33. *Temnopleurus toreumaticus* (Leske, 1778) 분지성계

Previous records. Bijindo (Kim *et al.*, 1979)

34. *Temnopleurus harwickii* (Gray, 1855) 하드워분지성계

Materials examined. Deokdong, 6 July 1996, 2 inds.; Maemuldo, 8 July 1996, 1 ind.

Previous records. Yundoldo (Rho and Shin, 1981)

Genus *Temnotrema* A. Agassiz, 1863 작은성계 속

***35. *Temnotrema rubrum* (D derlein, 1885) 빨강작은성계**

Materials examined. Daepo, 9 July 1996, 1 ind.

Genus *Mespilia* L. Agassiz and Desor, 1846 비파분지성계 속

***36. *Mespilia globulus* (Linnaeus, 1758) 고높은분지성계**

Materials examined. Heungnam, 3 July 1996, 1 ind.

Family Toxopneustidae Troschel, 1872 주발성계 과

Genus *Pseudocentrotus* Mortensen, 1903 분홍성계 속

37. *Pseudocentrotus depressus* (A. Agassiz, 1863) 분홍성계

Materials examined. Isudo, 7 Feb. 1996, 1 ind.

Previous records. Bijindo (Rho and Kim, 1966) Jangseungpo (Rho and Kim, 1966) Haegeumgang (Kim *et al.*, 1979; Rho and Shin, 1981), Gujora (Rho and Shin, 1981), Yundoldo (Rho and Shin, 1981).

Suborder Echinina Claus, 1876 성계 아목

Family Strongylocentrotidae Gregory, 1900 둥근성계 과

Genus *Strongylocentrotus* Brandt, 1835 둥근성계 속

38. *Strongylocentrotus nudus* (A. Agassiz, 1863) 둥근성계

Materials examined. Isudo, 25 July 1995, 1 ind.; Isudo, 7 Feb. 1996, 1 ind.; Deokdong, 6 July 1996, 2 inds.; Oepo, 7 July 1996, 1 ind.; Daepo, 9 July 1996, 33 inds; Susan, 29 Jan. 1979, 2 inds.; Heungnam, 30 Jan. 1997, 1 ind.; 13 Jan. 1998, 2 inds.

Previous records. Gujora (Rho and Shin, 1981), Yundoldo (Rho and Shin, 1981), Haegeumgang (Rho and Shin, 1981)

Genus *Hemicentrotus* Mortenen, 1942 말뚱성계 속

39 *Hemicentrotus pulcherrimus* (A. Agassiz, 1863) 말뚱성계

Materials examined. Isudo, 25 July 1995, 5 inds.; Oepo, 7 July 1996, 1 ind.; Isudo, 7 Feb. 1996, 1 ind.; Susan, 29 Jan. 1997, 9 inds.; Heungnam, 30 Jan. 1997, 12 ids; 13 Jan. 1998, 3 inds.

Previous records. Bijindo (Rho and Kim, 1966; Kim *et al.*, 1979), Haegeumgang (Kim *et al.*, 1979).

Family Echinometridae Gray, 1855 만두성계 과

Genus *Anthocardaris* Lütken, 1864 보라성계 속

40. *Anthocardaris crassispina* Lütken, 1864 보라성계

Previous records. Bijindo (Rho and Kim, 1966; Kim *et al.*, 1979), Haegeumgang (Kim *et al.*, 1979; Rho and Shin, 1981), Gujora (Rho and Shin, 1981)

Subclass Irregularia Latreille, 1825 부정형 아강

Order Clypeasteroida A. Agassiz, 1873 연잎성계 목

Suborder Laganina Mortenen, 1948 레가나 아목

Family Laganidae Deor, 1857 레가나 과

Genus *Peronella* Gray, 1855 브로지연잎성계 속

41. *Peronella japonica* Mortenen, 1948 브로지연잎성계

Previous records. Geojedo (Rho, 1971), Gujora (Rho and Shin, 1981).

Distribution. Korea (Korea Strait), Japan.

Order Spatangoida L. Agassiz 1840 엽통성게 목
 Suborder Spatangina Claus, 1876 엽통성게 아목
 Family Schizasteridae Lambert, 1905 균열엽통성게 과
 Genus *Schizaster* L. Agassiz, 1836 균열엽통성게 속

42. *Schizaster lacunosus* (Linnaeus, 1758) 엽통성게

Previous records. Yundoldo (Rho and Shin, 1981)

Family Brissidae Gray, 1855 큰엽통성게 과
 Genus *Brissus* Gray, 1825 큰엽통성게 속

***43. *Brissus agassizi* (Döderlein, 1885) 큰엽통성게**

Materials examined. Susan, 29 Jan. 1979, 1 ind.

Class Holothuroidea de Blainville, 1834 해삼 강
 Order Dendrochirotida Grube, 1840 수수 목
 Family Sclerodactylidae Panning, 1949 환꼬리해삼 과
 Genus *Sclerodactyla* Ayers, 1851 환꼬리해삼 속

***44. *Sclerodactyla multipes* (Théel, 1886) 다족환꼬리해삼**

Materials examined. Daepo, 9 July 1996, 1 inds.

Family Cucumariidae Ludwig, 1894 광삼 과
 Genus *Cucumaria* de Blainville, 1830 광삼 속

***45. *Cucumaria chronhjelmi* Théel, 1886 오각광삼**

Materials examined. Maemuldo, 8 July 1996, 1 inds.

Genus *Pentacta* Gouldfuss, 1820 오각해삼 속

***46. *Pentacta doliolum* (Pallas, 1766) 오각해삼**

Materials examined. Daepo, 9 July 1996, 1 inds.

Order Aspidochirotida Glube, 1840 순수 목
 Family Stichopodidae Haeckel, 1896 돌기해삼
 Genus *Stichopus* Brandt, 1835 돌기해삼 과

47. *Stichopus japonicus* Selenka, 1867 돌기해삼

Previous records. Isudo (Rho and Won, 1995).

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REFERENCES

- Agassiz, A., 1863, List of the echinoderms sent to different institutions in exchange for other specimens, with annotations. *Bull. Mus. Comp. Zool.*, **1**: 17-18.
- Clark, A.M. and F.W.E. Rowe, 1971. Monograph of shallow-water Indo-West Pacific echinoderms. *Brit. Mus. Publ. (Nat. Hist.)*, **690**: 1-238.
- Clark, H.L., 1907. The Cidaridae. *Bull. Mus. Comp. Zool.*, **51**(7): 1-66, pls. 1-11.
- Clark, H.L., 1928. Some Japanese and E. Indian Echinoderms. *Bull. Mus. Comp. Zool.*, **51**(11): 279-311.
- D derlein, L., 1887. *Die Japanischen Seeigel: Theil I, Die Familien Cidaridae und Saleniidae.* iv+59 pp., 11 pls., Stuttgart.
- Döderlein, L., 1906. Die polyporen Echiniden von Japan. *Zool. Anz.*, **30**(16): 515-521
- Kim, H.S., B.J. Rho, S.Y. Hong, I.H. Kim, S. Shin and C.H. Han, 1979. The marine invertebrate fauna in the southern part of Goeje Island and it's adjacent five islands. *Rep. KACN*, (14): 102-126, 2pls.
- Lamarck, J.B., 1816. *Histoire naturelle des Animaux sansvertèbres*, **3**: 586 pp., Paris.
- Mortensen, Th., 1903. The Danish Ingolf-Expedition. 4 (Echinoidea, Part 1): 1- 198, 12 text-figs., pls, 21-25.
- Mortensen, Th., 1928. A Monograph of the Echinoidea 1. Cidaroida. *Copenhagen. London.* pp. 1-3, 1-551, 88 pls., 173 figs.
- Nisiyama, S., 1968. The Echinoid Fauna from Japan and Adjacent Regions Part II. *Palaeont. Soc. Japan, Spec. Pap.*, **13**: i-ii, 1-491, pls. 19-30
- Rho, B.J., 1971. A Taxonomic Study on the Echinoderms from Korea 2. Asteroidea and Echinoidea. *J. Kor. Res. Inst. Liv., Ewha Womans Univ.*, **7**: 67-87, 9pls.
- Rho, B.J., 1979. A Study on the classification and the distribution of the Echinoderms in Korea. *J. Kor. Res. Inst. Liv., Ewha Womans Univ.*, **23**: 33-66,
- Rho, B.J. and H.S. Kim, 1966. Studies on the Echinodermata (Echinoidea, Asteroidea and Ophiuroidea) from Korea. *Collect. Thes. Writ. Commen. Dr. Emma Kim's Forty Years Teac. Ewha Womans Univ., Seoul, Korea*, pp. 273-293, 9pls.
- Rho, B.J. and S. Shin, 1980. A systematic study on the echinoderms in Korea 4. Asteroids. *J. Kor. Res. Inst. Liv., Ewha Womans Univ.*, **26**: 65-104, 12 pls.
- Rho, B.J. and S. Shin, 1981. A systematic study on the echinoderms in Korea 5. Echinoids. *J. Kor. Res. Inst. Bet. Liv., Ewha Womans Univ.*, **28**: 1-33, 11pls.
- Rho, B.J. and J.H. Won, 1995. A Systematic study on the Aspidochirotea and Apodacea (Echinodermata: Holothuroidea) in Korea. *Korean J. Syst. Zool.*, **11**(3): 343-358.
- Shigei, M., 1970. Echinoids of the Bonin Islands. *J. Fac. Sci., Univ. Tokyo, Sec. IV*, **12**: 1-22.
- Shigei, M., 1973a. A Check List of Echinoids found in Sagami Bay with Brief Notes on Each Species. *J. Fac. Sci., Univ. Tokyo, Sec.*, **13**: 1-33.
- Shigei, M., 1973b. A check List of Echinoids of Suruga Bay Part 1. Littoral Species. *J. Fac. Sci., Univ. Tokyo, Sec.*, **13**: 35-38.
- Shigei, M., 1986. *The Sea Urchins of Sagami Bay, Collected by His Majesty the Emperor of Japan.* Maruzen Co Ltd., Japan, 173pp.
- Shin, S. 1992a. A Systematic study on the Ophiuroidea in Korea. 1. Species from the Sea of Japan and the

- Korea Strait Korean J. Syst. Zool., **8**(1): 107-132, 3 pls.
- Shin, S. 1992b. A Systematic study on the Asteroidea in Korea 1. Species from the South Sea. Korean J. Syst. Zool., **8**(2): 243-258.
- Shin, S. and B.J. Rho, 1996. Illustrated encyclopedia of fauna and flora of Korea, Vol. 36 Echinodermata. Ministry of Education, pp. 1-780.
- Tokunaga, S., 1904. Japanese Echini (Plates). Zool. Mag., **16**: pls. 1-2.
- Utinomi, H., 1954. A Check List of Echinoids found in Kii Region. Publ. Seto Mar. Biol. Lab., **3**(3): 339-358.
- Utinomi, H., 1965. Echinoidea. In, New illustrated encyclopedia of the fauna of Japan, **3**: 64-81, text-figs. 196-257, Hokuryu-kan, Tkyo (in Japanese).
- Utinomi, H., 1973. Echinoids. In, Aquatic plants and animals (Picture encyclopedia 6), p. 185-239, pls. 120-125, Gakushu-kenkyusha, Tokyo (in Japanese).
- Yamashita, H., 1979. Studies on the Benthic Organisms Collected from the East China Sea and the Yellow Sea VIII. Distribution of Echinoderms: Crinoidea, Ophiuroidea, Asteroidea, Echinoidea, Holothuroidea and Ascidiacea. Bull. Seikai Reg. Fish. Res. Lab., (53): 51-86.
- Yoshiwra, S., 1898. Preliminary notice of new Japanese Echinoids. Annot. Zool. Japan, **2**(2): 57-61.

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거제도 해역의 극피동물

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요 약

경상남도 남해안에 있는 거제도 해안의 20지역에서 1995년 2월부터 1998년 5월 까지 채집되어 동정된 극피동물은 3강 11목 25과 37속 47종으로서 불가사리류가 3목 8과 14속 18종, 거미불가사리류가 2목 6과 8속 13종, 성게류가 4목 8과 11속 12종, 해삼류가 2목 3과 4속 4종이었다. 이중 *Prionocidaris baculosa* 툽니관극 성게는 한국 미기록종으로 밝혀졌으며, 불가사리류 9종, 거미불가사리류 6종, 성게류 4종, 3종의 해삼류 등 22종은 거제도에서 처음 기록되는 종이다.