

## **Two New Marine Sponges of Genus *Clathria* (*Clathria*) (Poecilosclerida: Microcionidae) from Korea**

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### **ABSTRACT**

A study on marine sponges was conducted by SCUBA diving at Ulleungdo Island and Gageodo Island, Korea during the period from July 2000 to October 2001. Two species, *Clathria* (*Clathria*) *gombawuiensis* n. sp. and *Clathria* (*C.*) *gageoensis* n. sp., are new to the fauna of sponges. *Clathria* (*C.*) *gombawuiensis* n. sp. closely relates to *Clathria* (*C.*) *conica* Levi, 1963 based on the type of spicules, but differs in size of spicules and growth form, *Clathria* (*C.*) *conica* has not small toxa. *Clathria* (*C.*) *gageoensis* n. sp. is similar to *Clathria* (*C.*) *hexagonopora* Levi, 1963, but it differs in size of spicules and growth form, also *Clathria* (*C.*) *hexagonopora* has not small toxa.

Key words: Porifera, Microcionidae, *Clathria*, new species, Korea

### **INTRODUCTION**

The genus *Clathria* containing about 350 described species in the world is consist of seven subgenera; *Axosuberites*, *Isociella*, *Microciona*, *Clathria*, *Thalysias*, *Wilsonella* and *Dendrocia*. Sixteen species of *Clathria* were already reported from Korean waters (Rho and Sim, 1972, 1976; Rho and Lee, 1976; Sim, 1982; Rho and Yang, 1983; Sim and Kim, 1988, 2002; Sim and Byeon, 1989; Sim et al., 1992; Sim and Lee, 1998a, b; Kim and Sim, 2000). The genus *Clathria*

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is characterized by auxiliary styles in one or two categories forming various ectosomal structures which are ranging from membranous paratangential to a dense erect palisade of brushes. The subgenus *Clathria* is only a single category of auxiliary style forming a sparse paratangential ectosomal skeleton; choanosome without marked difference between axial and extra-axial region (Hooper and Van Soest, 2002). The samples were collected from Gageodo Island and Ulleungdo Island, Korea during the period from July 2000 to October 2001 by SCUBA diving. They were fixed at once in 99.6% methyl alcohol or 99.9% absolute alcohol. Specimens were observed by light microscopy (Carl Zeiss Axioskop II) and scanning electron microscopy (SEM, HITACHI S-3000N). The identification was performed on the basis of external features, shape, structure of skeleton, and size and form of spicules. The thin free-hand section was made by specimen hardened in alcohol using a surgical blade in order to observe the structure of skeleton. Spicules were prepared by dissolving a piece of sponge in sodium hypochlorite and examined with SEM (Hooper, 1996, Rützler, 1978). The holotypes are deposited in the Natural History Museum, Hannam University (HUNHM) Daejeon, Korea.

## SYSTEMATIC ACCOUNTS

Phylum Porifera Grant, 1836

Class Demospongiae Sollas, 1885

Order Poecilosclerida Topsent, 1928

Suborder \*Microcionina Hajdu, Van Soest and Hooper, 1994

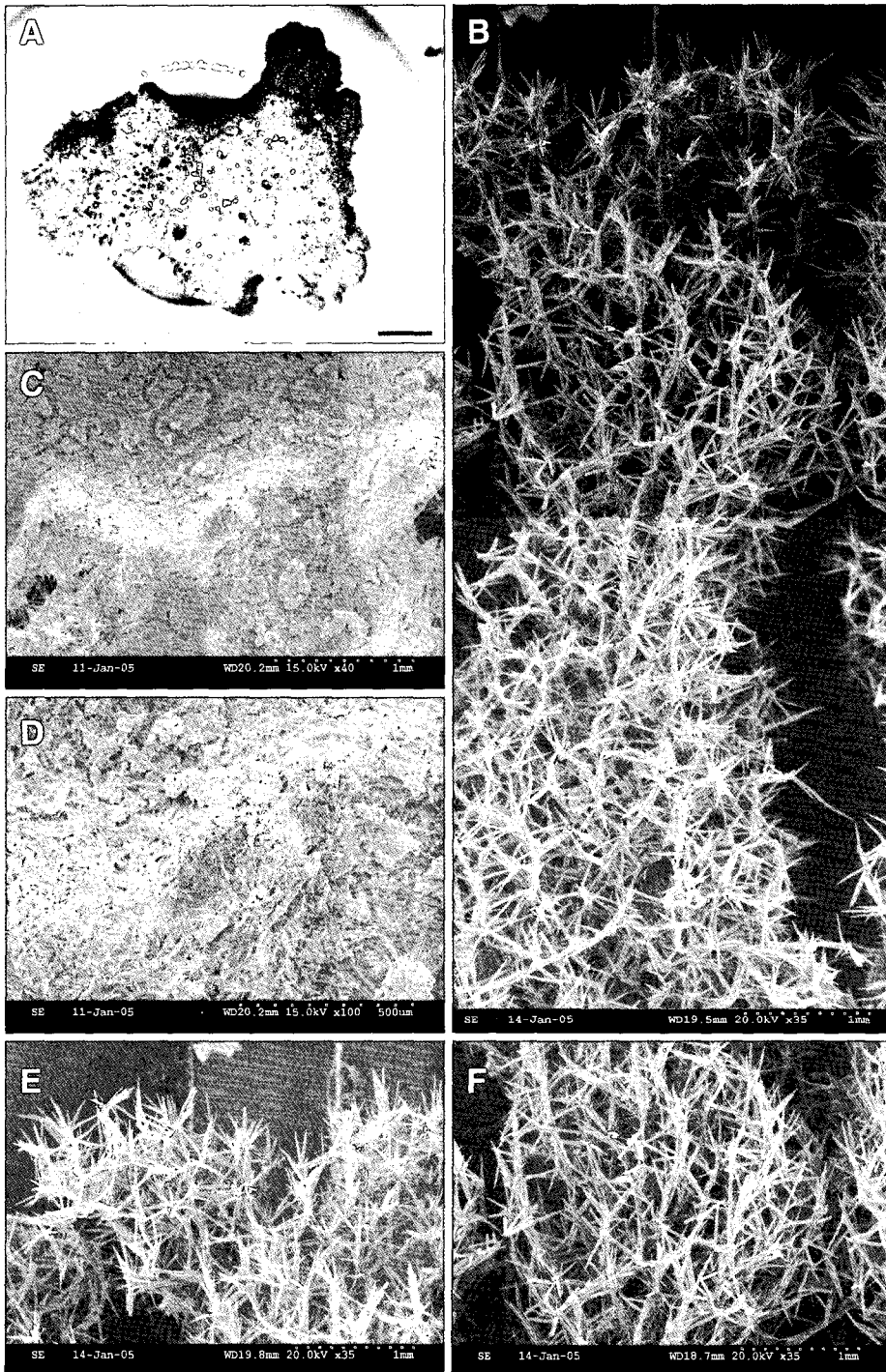
Family Microcionidae Carter, 1875

### \*\**Clathria (Clathria) gombawuiensis* n. sp. (Figs. 1-3)

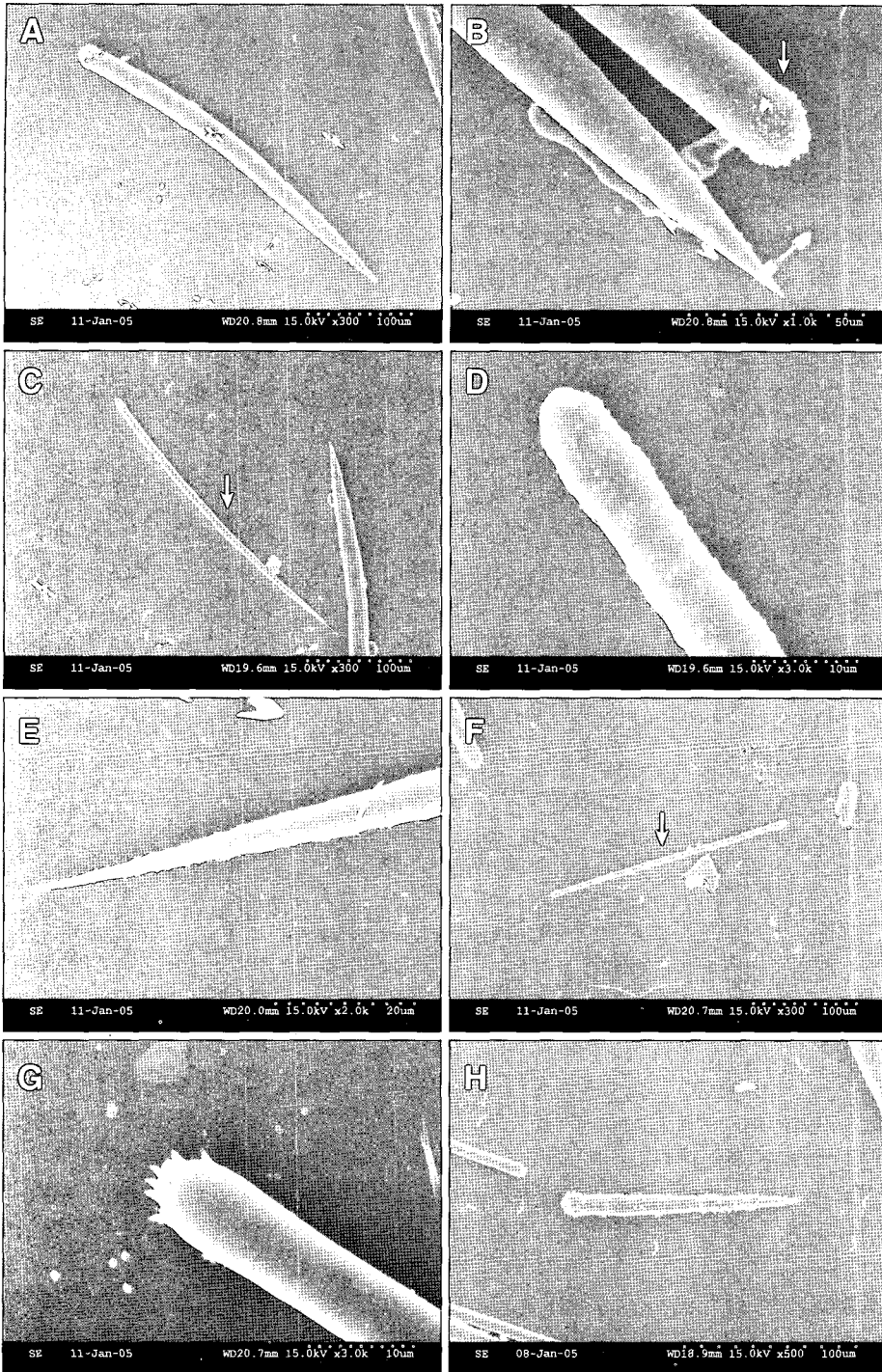
**Type specimen.** Holotype (Por. 54), Gombawuicho (Ulleungdo Island), 23 Oct 2001 (K. J. Lee), by SCUBA diver from 20 m in depth, deposited in the HUNHM. One Paratype (Por 54-1), collected with Holotype, deposited in the Department of Biological Sciences, Hannam University.

**Description.** Holotype thick plate shape, sized up to 150 mm wide, 105 mm height and 7-18 mm thick. Texture flexible, a little tough and split. Oscules most solitary, 0.3-2.58 mm in diameter, scattered on surface. Sometimes, oscules clustered with 2-4 small ones. Color red in life, gradually changed to beige in ethyl alcohol. Flat surface without groove, covered with thick membrane. Habitat loosely attached to rocky substrate. Choanosomal skeleton regularly plumo-reticulated, with well developed spongin fibres forming regular anastomoses of differentiated primary and secondary spongin fibres. Fibres cored by choanosomal principle styles in multispicular ascending tract and unior bispicular transverse connecting tracts. Acanthostyles echinated perpendicular to spongin fibres. Sometimes, formed acute angles. Ectosomal skeleton tangential layer of thick styles, of a single size category. Spicules, megascleres thick and slender styles with spine on head and point part. Subtylotes with spine at both ending part. Echinating acanthostyles weakly spined. Microscleres, palmate isochelae large toxas without spine and small toxas with spine on all of parts.

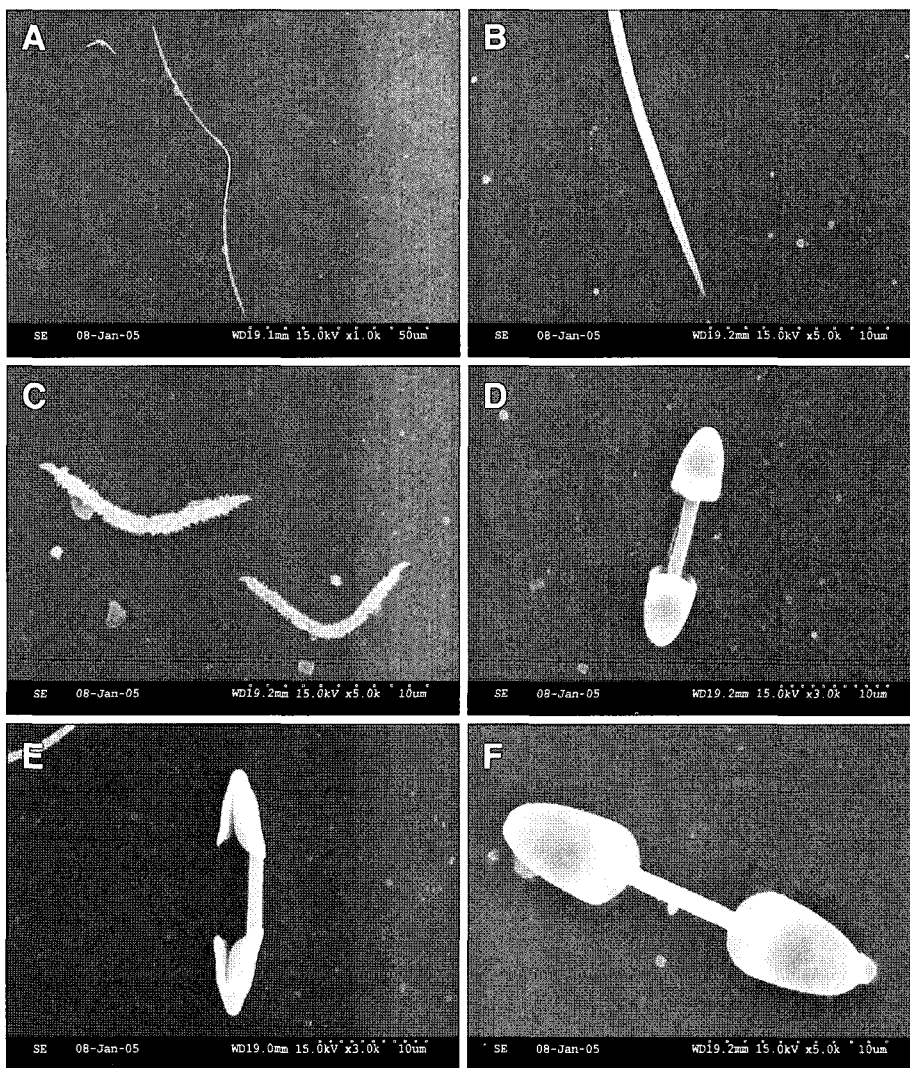
\*유령해면아목. \*\*곰바위유령해면



**Fig. 1.** *Clathria* (*Clathria*) *gombawuiensis* n. sp. A, entire animal; B, whole skeletal structure; C, surface; D, surface magnification; E, ectosomal skeletal structure; F, choanosomal skeletal structure. Scale bar = 20 mm (A).



**Fig. 2.** *Clathria (Clathria) gombawuiensis* n. sp. A, thick style; B, head (arrow) and point (no arrow) of thick style with spine; C, slender style (arrow); D, head of slender style with spine; E, point of slender style with spine; F, subtylote (arrow); G, the end of subtylote with spine; H, acanthostyle.



**Fig. 3.** *Clathria* (*Clathria*) *gombawuiensis* n. sp. A, large toxa; B, point of large toxa; C, small toxas; D, front view of palmate isochela; E, side view of palmate isochela; F, back view of palmate isochela.

Megascleres

thick styles .....	320-400 × 18-25 μm
slender styles .....	290-330 × 8-11 μm
subtylotes .....	200-280 × 8-9 μm
acanthostyles .....	90-170 × 8-11 μm

Microscleres

large toxas .....	130-180 μm
small toxas .....	10-12 μm
palmate isochelae .....	20-25 μm

**Table 1.** The comparison of characters between *Clathria* (*C.*) *gombawuiensis* n. sp. and *Clathria* (*C.*) *conica*. (Unit;  $\mu\text{m}$ )

Character	Species	<i>Clathria</i> ( <i>C.</i> ) <i>gombawuiensis</i> n. sp.	<i>Clathria</i> ( <i>C.</i> ) <i>conica</i> Levi, 1963
	thick styles	320-400 × 18-25	300-700 × 35-55
	slender styles	290-330 × 8-11	190-325 × 5-9
	small acanthostyles	90-170 × 8-11	130-175 × 10-15
spicules	subtylotes	200-280 × 8-9	190-325 × 5-9
	large toxas	130-180	50-150 × 1-3
	small toxas	10-12	-
	isochelae	20-25	9
growth form		thick flatten	massive
Color		orange	-

**Etymology.** This species is named after type locality, Gombawuicho, Ulleungdo Island, Korea.

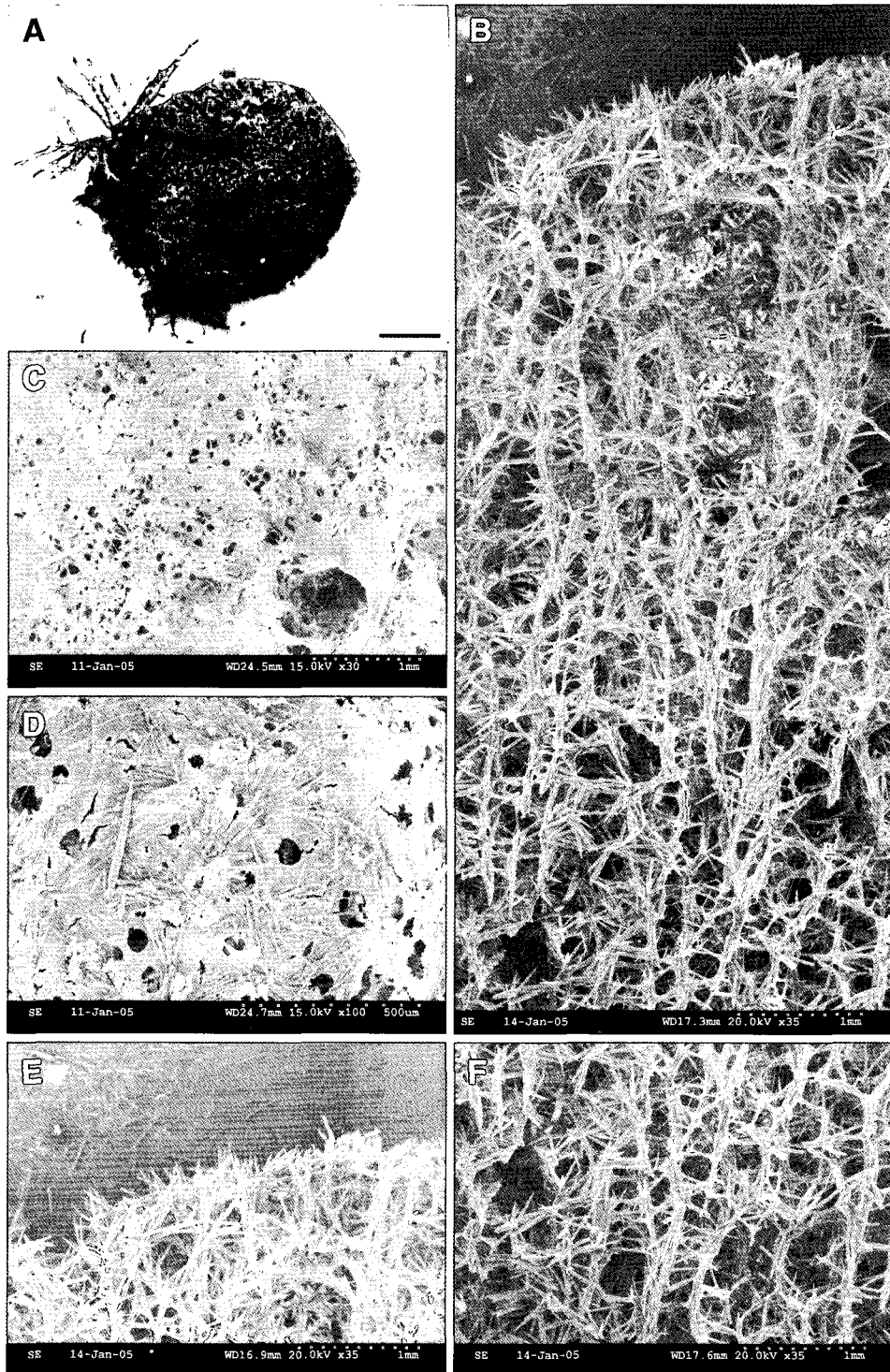
**Remarks.** This new species is similar to *Clathria* (*C.*) *conica* Levi, 1963 based on the types of spicules (Levi, 1963), but the new one is distinguished from growth form and size of thick styles. The growth form is thick flatten in this species, but mass in *Clathria* (*C.*) *conica*. The thick styles of new species are half in the length and thickness of *Clathria* (*C.*) *conica*. Beside *Clathria* (*C.*) *conica* has not small toxa (Table 1).

**\**Clathria* (*Clathria*) *gageoensis* n. sp. (Figs. 4-6)**

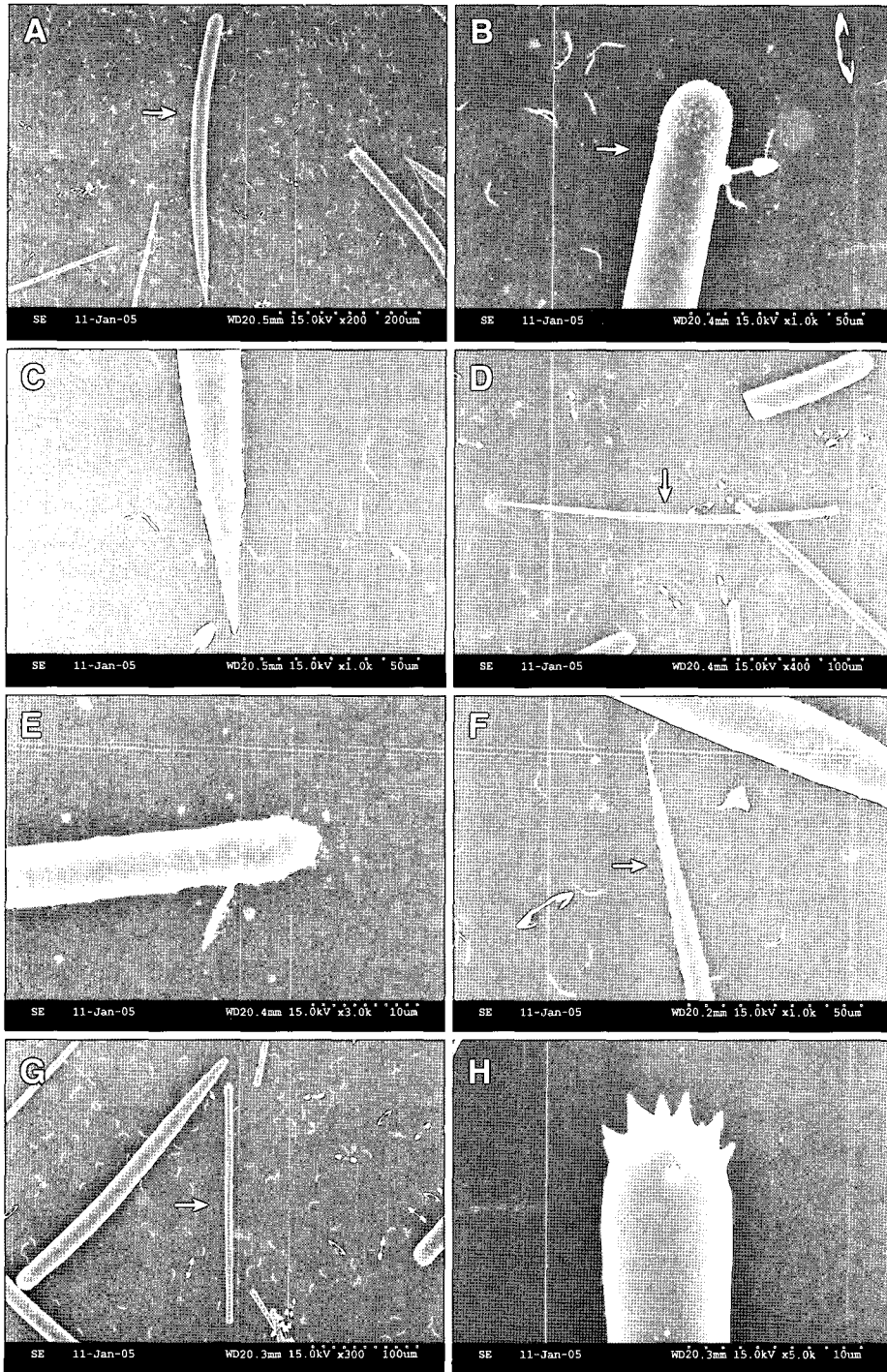
**Type specimen.** Holotype (Por. 55), Binjibak (Gageodo Island), 24 Jul 2000 (K. J. Lee), by SCUBA diver from 20 m in depth, deposited in the HUNHM. One Paratype (Por 55-1), Binjibak (Gageodo Island), 24 Jul 2000 (K. J. Lee), by SCUBA diver from 20 m in depth, deposited in the Department of Biological Sciences, Hannam University.

**Description.** Holotype hemispherical mass shape, sized up to 95.8 mm wide, 77.3 mm height and 55.4 mm thick. Texture tough and a little soft. Oscules 0.6-2.4 mm in diameter, scattered on surface. Color dark red in life, gradually changed to light brown in ethyl alcohol. Surface rough and bumpy surface has many apertures. Membrane covered surface partly. Habitat tightly attached to oyster shells. Ectosomal skeletal structure has not tangential layer of thick styles but thick styles constitute plumose. Choanosomal skeletal structure regularly or irregularly plumo-reticulate, with well developed spongin fibres forming regular or irregular anastomoses of differentiated primary and secondary spongin fibres. Fibres cored by thick styles in multispicular ascending tract and echinated by acanthostyles perpendicular to or at acute angles to spongin fibres. Spicules, megascleres thick and slender styles with spine on head and point part. Subtylote both basally spined, echinating acanthostyles with even spination. Microscleres, palmate isochelae large toxas no spined but small toxas without spines and small toxas with spines on all of parts.



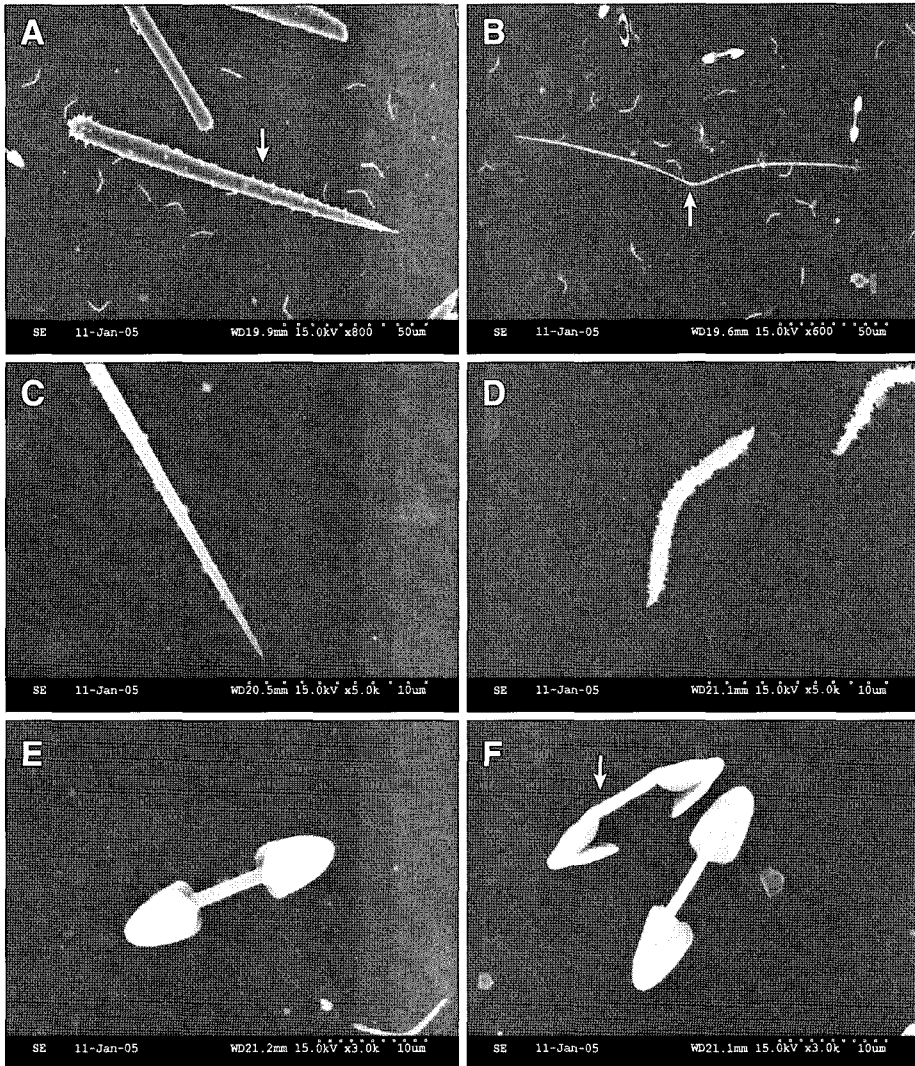


**Fig. 4.** *Clathria* (*Clathria*) *gageoensis* n. sp. A, entire animal; B, whole skeletal structure; C, surface; D, pores; E, ectosomal skeletal structure; F, choanosomal skeletal structure. Scale bar = 50 mm (A).



**Fig. 5.** *Clathria (Clathria) gageoensis* n. sp. A, thick style (arrow); B, head of thick style with spine (arrow); C, point of thick style with spine; D, slender style (arrow); E, head of slender style with spine; F, point of slender style with spine (arrow); G, subtylote (arrow); H, the end of subtylote with spine.





**Fig. 6.** *Clathria* (*Clathria*) *gageoensis* n. sp. A, acanthostyle (arrow); B, large toxa (arrow); C, point of large toxa; D, small toxa; E, front view of palmate isochela; F, side view of palmate isochela (arrow) and back view of palmate isochela.

Megascleres

thick styles	280-390 × 15-26 µm
slender styles	220-310 × 3-9 µm
subtylotes	200-270 × 7-9 µm
acanthostyles	100-270 × 8-11 µm

Microscleres

large toxas	80-200 µm
small toxas	10-15 µm

**Table 2.** The comparison of characters between *Clathria (C.) gageoensis* n. sp. and *Clathria (C.) hexagonopora*. (Unit:  $\mu\text{m}$ )

character	species	<i>Clathria (C.) gageoensis</i> n. sp.	<i>Clathria (C.) hexagonopora</i> Levi, 1963
	thick styles	280-390 $\times$ 15-26	175-325 $\times$ 16-18
	slender styles	220-310 $\times$ 3-9	175-275 $\times$ 7
	small acanthostyles	100-270 $\times$ 7-9	80-85 $\times$ 10
spicules	subtylotes	200-270 $\times$ 7-9	175-275 $\times$ 7
	large toxas	80-200	350
	small toxas	10-15	-
	isochelae	12-25	14-15
	growth form	massive	thick branch
	Color	orange	-

palmate isochelae ..... 12-25  $\mu\text{m}$

**Etymology.** This species is named after type locality, Gageodo Island, Korea.

**Remarks.** This new species is similar to *Clathria (C.) hexagonopora* Levi, 1963 based on its type of spicules (Levi, 1963). but it is different in growth form and size of acanthostyle and large toxa. The growth form is mass in this species, but thick branch in *Clathria (C.) hexagonopora*. The acanthostyle of new species is three times as length as *Clathria (C.) conica*, and large toxa is half of them. Also *Clathria (C.) hexagonopora*. has not small toxa (Table 2).

## ACKNOWLEDGEMENTS

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## 한국 유령해면속 (보통해면강: 다골해면목: 유령해면과)의 2신종

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## 요 약

울릉도와 가거도에서 2001년 10월과 2000년 7월에 SCUBA 다이빙으로 채집된 해면동물을 동정·분류한 결과 유령해면속 (*Clathria*)의 곶바위유령해면 [*Clathria (Clathria) gombawuiensis* n. sp.]과 가거유령해면 [*Clathria (C.) gageoensis* n. sp.]이 신종으로 밝혀졌다. 곶바위유령해면은 *Clathria (C.) conica*와 골편의 구성에 있어서는 유사하지만 골편의 크기와 성장형태에 있어서 많은 차이가 있었으며, *Clathria (C.) conica*는 작은 toxa를 가지지 않는다. 가거유령해면은 *Clathria (C.) hexagonopora*와 유사하지만 골편의 크기와 성장형태가 다르고, *Clathria (C.) hexagonopora*는 작은 toxa를 가지지 않는다.