

# A New Sponge of the Genus *Phorbas* (Poecilosclerida: Hymedesmiidae) from Gageodo Island (So-Huksando), Korea

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**Key Words:** A taxonomic study on marine sponges was conducted with materials collected from Gageodo Island, Korea, from August 1999 to July 2001 by SCUBA diving. Among them, *Phorbas gukhulensis* n. sp. is new to science. *Phorbas gukhulensis* n. sp. is similar to *P. fitictius* Pulitzer-Finali from which it differs in spicule size and growth form.

The genus *Phorbas* Duchassaing and Michelotti, 1864 (Demospongiae, Poecilosclerida, Hymedesmiidae) is a large group of sponges, of which about 70 species have been recorded worldwide (Hooper and Van Soest, 2002). Twelve genera (*Anchinoe* Gray, 1867, *Pronax* Gray, 1867, *Subertelites* Schmidt, 1868, *Plumohalichondrida* Carter 1876, *Clathrissa* Lendenfeld, 1888, *Stylostichon* Topsent, 1892, *Lissopocillon* Ferrer-Hernandez, 1916, *Grayax* Laubenfels, 1936, *Merriamiun* Laubenfels, 1936, *Pronaxella* Burton, 1931, *Bipocillopsis* Kulton, 1964, *Podotuberculum* Bakus, 1966) were synonymized with the genus *Phorbas* by Hooper and Van Soest (2002). The characteristics of this genus are as follows: The sponges are thickly encrusting, massive or ramose; pores grouped in sieve-plates (areolae); ectosomal skeleton with a crust of isochelae and diactinal spicules, which form fans disposed at right angles and tangential to the surface; heavily spined acanthostyles core plumose or plumo-reticulate choanosomal tracts, or these may be replaced by smooth diactinal tornotes; echinating acanthostyles are heavily spined; microscleres are arcuate isochelae and sigmas, both of which may occur or be absent (Hooper and Van Soest, 2002). Only *Phorbas purpurea* and *P. novaezealandiae* were previously reported from Korean waters (Rho and Sim, 1972, 1979).

The identification was made on the basis of external features, shape, structure of skeleton, and size and form of spicules. The thin free-hand section was made with 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 (HITACHI S-3000N)

according to the procedure of Rützler (1978). The type specimens were deposited in the Natural History Museum, Hannam University (HUNHM), Daejeon, Korea.

## Results

Phylum Porifera Grant, 1836  
Class Demospongia Sollas, 1885  
Order Poecilosclerida Topsent, 1928  
Suborder Myxillina, Hajdu et al., 1994  
Family Hymedesmiidae Topsent, 1928

*Phorbas gukhulensis* n. sp.  
(Figs. 1-2)

## Type specimen

Holotype (Por. 46). Gageodo (Gukhuldo), Heuksan-myeon, Sinan-gun, Jeollanam-do, 25 July 2000, SCUBA, 20 m, K. J. Lee and H. J. Kim, deposited in HUNHM, Daejeon, Korea. Paratype. Por. 46-1, collected with holotype, deposited in the Department of Biological Sciences, Hannam University, Daejeon, Korea.

## Description

Holotype, thick mass with mound like 'mountain peak'. Size up to 110×95 mm and 20 mm thick. Paratype, size up to 90×60 mm and 15 mm thick. Surface has many areolated pore fields, of which walls consist of tornote spicules arranged in parallel. Surface covered with transparent dermal membrane over extensive subdermal space. Texture very soft and compressible. Color, dark red in life, gradually changing to ivory in alcohol. Ectosomal skeleton in tangential arrangement of loose tornotes. Crusted isochelae distributed under surface membrane. Choanosomal skeleton, thick columns of

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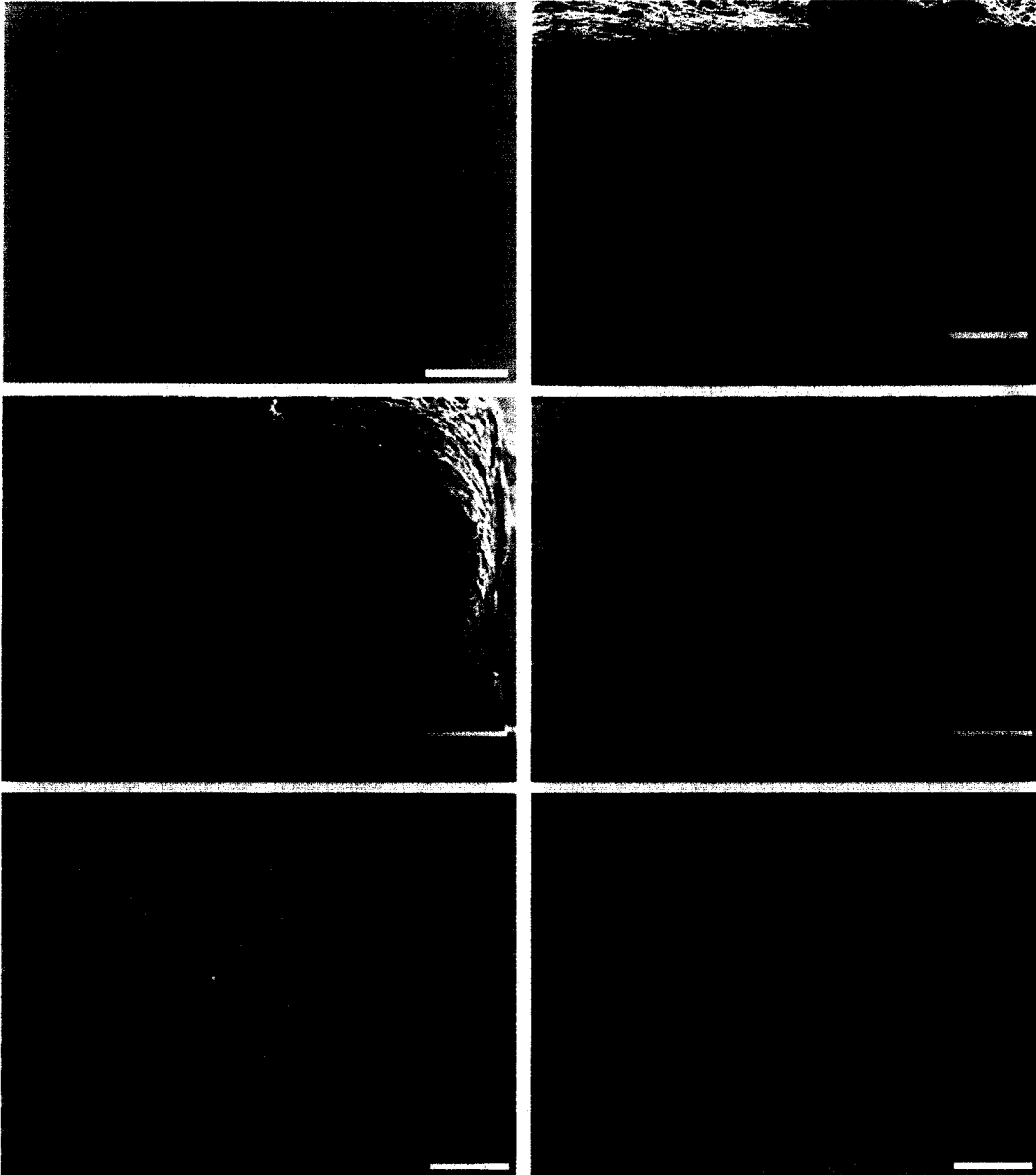


Fig. 1. *Phorbas gukhulensis* n. sp. A, Entire specimen. B, Longitudinal section. C, Oscule. D, Surface. E, Pores grouped in sieve-plates (areolae). F, Choanosomal skeleton. Scale bars=2 cm (A), 300  $\mu$ m (B-C), 30  $\mu$ m (D), 10  $\mu$ m (E), and 200  $\mu$ m (F).

tomotes mixed with acanthostyles and columns echinated by small acanthostyle. Spicules, robust smooth oxeote tomotes, straight with hastate pointed apices. Large acanthostyles spined on head part. Small acanthostyles spined on all of spicules. Robust arcuate isocelae have short alae.

Megascleres	
Tomotes	295-410 $\times$ 5-10 $\mu$ m
Small acanthostyles	145-200 $\times$ 7-10 $\mu$ m
Large acanthostyles	300-420 $\times$ 9-11 $\mu$ m
Microscleres	
Isochelae	25-30 $\mu$ m

#### Ecology

This species is attached to the rocky substratum. Oscules are open at the top of mound like mountain peak.

#### Etymology

*Phorbas gukhulensis* n. sp. is named after its type locality, Gukhuldo, Gageodo, Korea.

#### Remarks

This new species has thicker and longer tomotes and

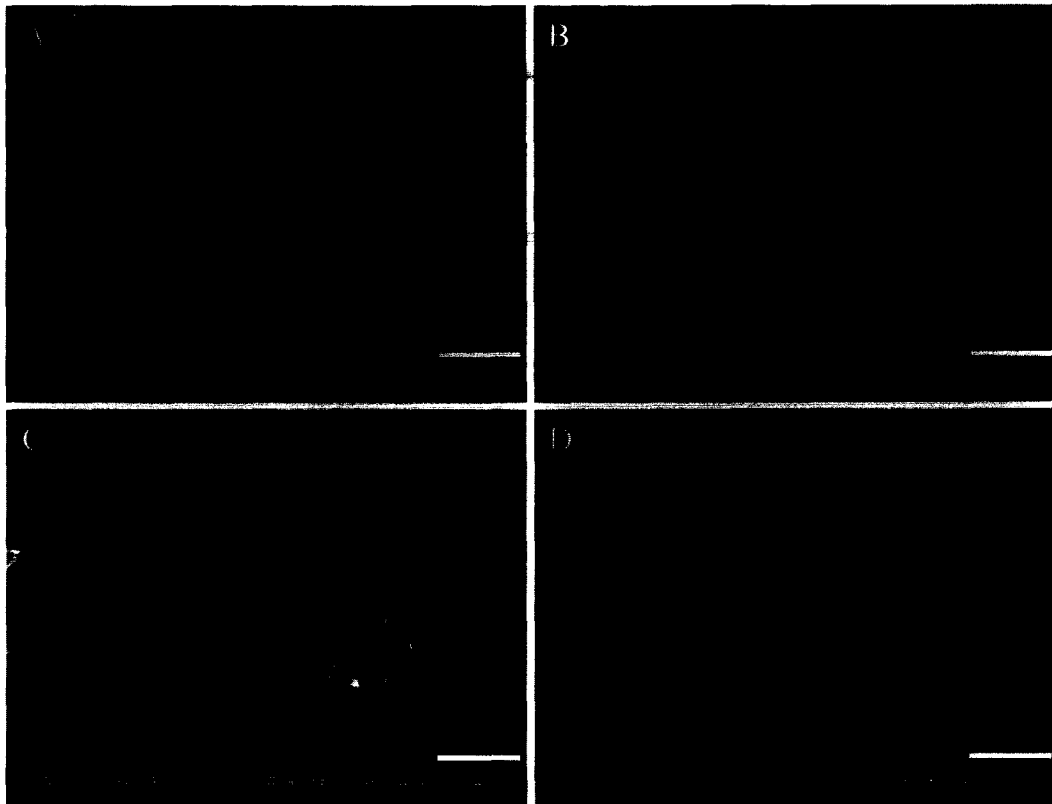


Fig. 2. Skeleton of *Phorbas gukhulensis* n. sp.. A, Spicules (megascleres); a, tomote; b, large acanthostyle; c, small acanthostyle. B, Megascleres, small acanthostyle. C, Microscleres, isochela. D, Head of isochela. Scale bars=80  $\mu$ m (A), 25  $\mu$ m (B), 8  $\mu$ m (C), and 4  $\mu$ m (D).

small acanthostyles than *P. fictitius* Pulitzer-Finali, 1977 from the Bay of Naples. Morphologically, the growth form of this specimen is a thick mass, but the sponge from Naples is incrusting (Table 1).

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Table 1. Differences between *Phorbas gukhulensis* n. sp. and *P. fictitius*

Species	Growth form	Tomote ( $\mu$ m)	Large acanthostyle ( $\mu$ m)	Small acanthostyle ( $\mu$ m)	Isochela ( $\mu$ m)
<i>P. gukhulensis</i> n. sp.	Thick mass	295-410 $\times$ 5-10	300-420 $\times$ 9-11	145-200 $\times$ 7-10	25-30
<i>P. fictitius</i>	Incrusting	250-350 $\times$ 3-4	300-420 $\times$ 7-8	105-150 $\times$ 5	24-30