

## **Two New Species of the Genus *Sarcotragus* (Demospongiae, Dictyoceratida, Irciniidae) in Korea**

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### **ABSTRACT**

Sponges of the genus *Sarcotragus* are very poorly known in the world. Two new species of *Sarcotragus*, *S. maraensis* n. sp. and *S. gapaensis* n. sp., are described from Korea.

Key words: Dictyoceratida, Irciniidae, *Sarcotragus*, New species, Korea.

### **INTRODUCTION**

The genera *Ircinia*, *Psammocinia*, and *Sarcotragus* in the family Irciniidae, once classified as Thorectidae, are distinguished by the presence of fine collagenous filaments within the sponge matrix and the presence of the furanosesterpene variabilin. Both of these features are unique to the Irciniidae (Bergquist and Wells, 1983). The genus *Sarcotragus* has the fasciculate primary fibres that lack or almost lack foreign inclusions. The secondary fibres are clear of debris. Knobbed collagen filaments permeate the matrix, but these are always very fine (Bergquist, 1980; Hooper, 1994). The surface is conulose, and its texture is tough. By 1980 there were only three described species of the genus *Sarcotragus* worldwide, *S. arbuscula* (Lendenfeld, 1889), *S. spinulosa* (Schmidt, 1862) and *S. muscarum* (Schmidt, 1864) (Bergquist, 1980).

Seven species (five new species) of Korean Dictyoceratid sponges have reported by Sim (1985, 1998) and Sim and Lee (1998). The genus *Sarcotragus* Schmidt, 1862 is little known.

In this study, the specimens from Marado and Gapado (adjacent waters of Chejudo Island) were collected by scuba diving. Methods used in the light microscopy are described by Cook and Bergquist (1998). Scanning electron microscope (SEM, Akashi ISI-SS40 at the Department of Bio-

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logy, Hannam University) preparations were made after drying skeleton. As a result, two new species belonging to the genus *Sarcotragus* are described from Korea, *S. maraensis* and *S. gapaensis*.

Type specimens are deposited in the Natural History Museum, Hannam University, Taejon, Korea.

## DESCRIPTION

Order Dictyoceratida Minchin, 1900 망각해면목

Family Irciniidae Gray, 1867 가늌실해면과

Genus *Sarcotragus* Schmidt, 1862 육질실해면속

### 1. *Sarcotragus maraensis* n. sp. 마라육질실해면 (신칭) (Fig. 1A-H)

**Type specimen.** Holotype (Por. 32, NHM, Hannam Univ.), Marado (Chejudo Island), on 25 Oct. 1991, SCUBA, 20 m depth. Paratype (Por. 32-1, Dept. of Biology, Hannam Univ.), collected with holotype.

**Description.** Specimen globular or hemispherical, 16 cm × 10 cm × 12.7 cm high. Habitat on rocky substrate. Oscules, 2-15 mm in diameter, irregularly scattered on surface, and sometimes has thin filamentous membrane. Texture very soft, and loosely arranged. Endosome and ectosome have little matrix, and easily separated from body. Endosome has large canals pass through the sponge. Color in life ivory and purple, in spirit ivory.

Surface: Filamentous membrane not cored with detritus. Sharp conules, 2-8 mm high, 2-10 mm apart, well developed and divided into two or three branches at terminal.

Skeleton: Primary fibres very complexly fasciculated, and secondary fibres arranged plate form (Fig. 1D-G). Sometimes these fibres very difficult to distinguish. Primary fibres lack foreign inclusions. Secondary fibres clear of debris. Filaments, 2-6 μm, very loosely arranged and emerge from holes in the fibre, and they have terminal knobs, 10-15 μm (Fig. 1H).

**Remarks.** *Sarcotragus muscarum* Schmidt is similar to the new species but its filaments are very fine (1-2 μm thick). *S. spinosula* Schmidt also has very thin filaments, 1-2 μm thick, and small terminal knobs, 3 μm in diameter. *S. arbuscula* Lendefeld is massive with digitate processs, on the summits of which the oscula are situated. our specimen is globular massive.

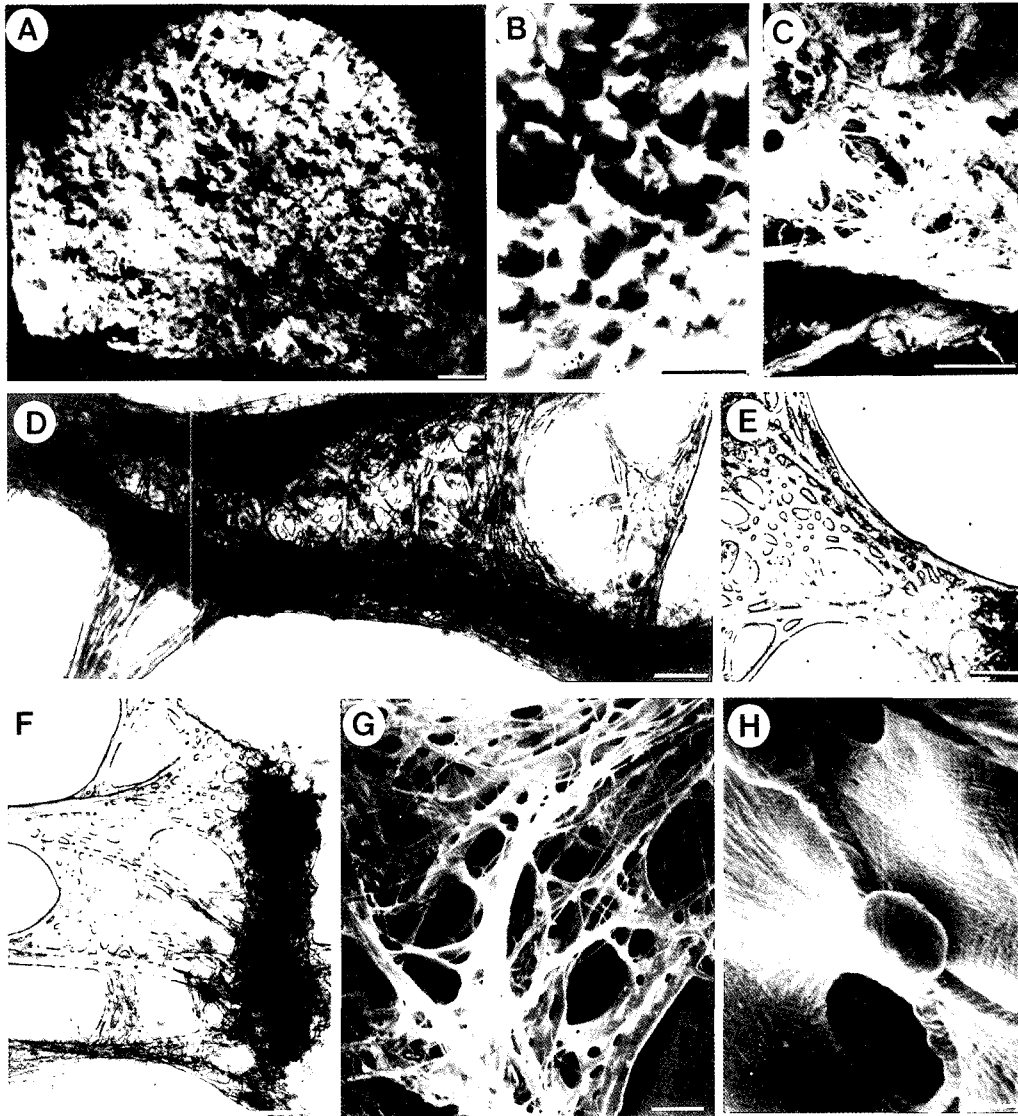
**Etymology.** This species is named after its type locality.

### 2. *Sarcotragus gapaensis* n. sp. 가파육질실해면 (신칭) (Fig. 2A-J)

**Type specimen.** Holotype (Por. 33, NHM, Hannam Univ.), Gapado (Chejudo Island), on 21 Aug. 1998, SCUBA, 20 m depth. Paratype (Por. 33-1, Dept of Biology, Hannam Univ.) collected with holotype.

**Description.** Subspherical massive sponge, 11 cm × 4.6 cm × 5.3 cm high. Habitat on rocky substrate. Oscules, 2-4 mm in diameter, irregularly scattered on surface. Thoracican lived in each oscule. Texture elastic, tough and difficult to tear apart. Surface color in life black or dark brown, endosome ivory.

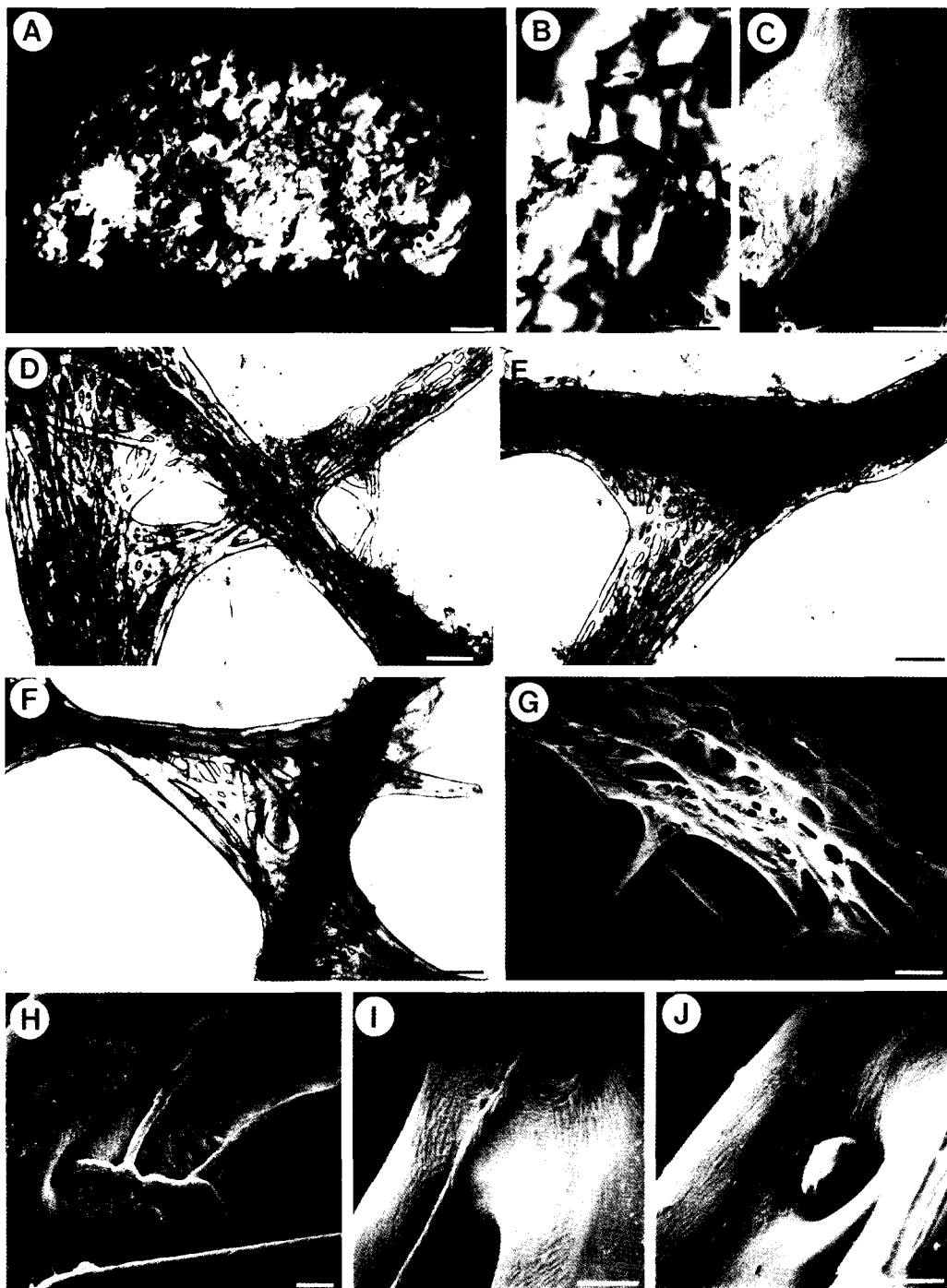
Surface: Conulose surface very rough. Conules, 2-5 mm height and 2-6 mm apart, well developed and sharply ended. Some continuous conules joined together, forming irregular ridges.



**Fig. 1.** *Sarcotragus maraensis* n. sp. A, Side view, specimen preserved in alcohol; B, Surface of specimen (conules), not armored; C, Endosome of specimen (SEM, transigional section); D-F, Skeletal structure; G, Fasciculate structure of fibre (SEM); H, Filament emerge from the hole of the fibre (SEM). Scale bars: A-B, 1 cm; C, 400  $\mu$ m; D-F, 200  $\mu$ m; G, 120  $\mu$ m; H, 10  $\mu$ m.

Skeleton: Primary fibres, 280–530  $\mu$ m in diameter, fasciculated and uncored. Secondary fibres, 60–330  $\mu$ m in diameter, slightly fasciculated and uncored (Fig. 2D–G). Endosome skeleton thick, simple and dark brown color (Fig. 2F). Filaments, 2.5–5  $\mu$ m thick, very tightly arranged and emerge from holes in fibre and have terminal knobs, 12–15  $\mu$ m in diameter (Fig. 2H–J).

**Remarks.** This species differs from all other described species of *Sarcotragus* in its appearance, skeletal arrangement and filament size. Fasciculate primary fibres are slightly twisted.



**Fig. 2.** *Sarcotragus gapaensis* n. sp. A, Side view, specimen preserved in alcohol; B, Surface of specimen (conules), not armored; C, Endosome of specimen (SEM, transigional section); D-F, Skeletal structure; G, Fasciculate structure of fibre (SEM); H-J, Filament emerge from the hole of the fibre (SEM). Scale bars: A-B, 1 cm; C, 400  $\mu$ m; D-F, 200  $\mu$ m; G, 120  $\mu$ m; H-J, 10  $\mu$ m.

**Etymology.** This species is named after its type locality.

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## REFERENCES

- Bergquist, P. R., 1980. A revision of the supraspecific classification of the orders Dictyoceratida, Dendroceratida and Verongida (Class Demospongiae). *N. Z. J. Zool.*, **7**: 443-503.
- Bergquist, P. R. and R. J. Wells, 1983. Chemotaxonomy of the Porifera: The development and current status of the field. *Mar. Nat. Prod.*, pp. 1-50.
- Cook, S. C. De and P. R. Bergquist, 1998. Revision of the genus *Psammocinia* (Porifera: Demospongiae: Dictyoceratida), with six new species from New Zealand. *N. Z. J. Mar. Fresh. Res.*, **32**: 399-426.
- Lendenfeld, R. von, 1889. A monograph of the horny sponges. Royal Society London, **2**: 468-936.
- Hooper, J. N. A., 1994. Guide to sponge collection and identification. *Mom. Queensland Mus.*, pp. 1-109.
- Sim, C. J., 1985. A systematic study on the marine sponges from the south sea and the yellow sea of Korea. *Korean J. Syst. Zool.*, **(1-2)**: 1-11.
- Sim, C. J., 1998. Three new horny sponges of the genus *Psammocinia* (Dictyoceratida: Irciniidae) from Korea. *Korean J. Syst. Zool.*, **14**(1): 35-42.
- Sim, C. J. and K. J. Lee, 1998. New species of two *Psammocinia* horny sponges (Dictyoceratida: Irciniidae) from Korea. *Korean J. Syst. Zool.*, **14**(4): 335-340.

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한국 육질실해면속 (보통해면강, 망각해면목, 가는실해면과)의 2신종

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요 약

육질실해면속 (*Sarcotragus*)은 세계적으로 아직 많이 보고되지 않은 속으로 한국에서 2 신종, 마라육질실해면 (*S. maraensis* n. sp.)과 가파육질실해면 (*S. gapaensis* n. sp.)이 밝혀져 보고하고자 한다.