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Two New Marine Sponges of Genus *Mycale* (Poecilosclerida: Mycalidae) from Korea

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ABSTRACT

A taxonomic study on the marine sponges was conducted with materials which were collected from Ulleung Island and Chuja Island, Korea by SCUBA diving during the period of July 2000 to May 2005. Among them, two species, *Mycale (Aegogropila) jukdoensis* n. sp. and *Mycale (Mycale) chujaensis* n. sp. are new to science. *M. (A.) jukdoensis* n. sp. seems closely to *M. grandis* based on the shape of spicules, but our new species has two categories of subtylostyles and also larger sigmas and raphides than those of *M. grandis*. And anisochelae I of *M. (A.) jukdoensis* n. sp. is smaller than that of *M. grandis*. *M. (M.) chujaensis* n. sp. is similar to *M. sulgata* in the growth form and size of microscleres. However, the new species has two categories of subtylostyles instead of one type in *M. sulgata*.

Key words: Porifera, Poecilosclerida, Mycalidae, new species, Korea

INTRODUCTION

The family Mycalidae Lundbeck, 1905 (Demosongiae: Poecilosclerida) is restricted to taxa with the combination of plamate anisochelae and tangential surface skeleton. It consists of two genera, *Mycale* and *Phlyctaenopora*. The genus *Mycale* is subdivided in 11 subgenera (Hajdu 1999: Hooper and van Soest, 2002). Among them, subgenus *Mycale* is confused tangential ectosomal

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skeleton with many pore-grooves, and/or three categories of anisochelae, and/or basally-spurred anisochelae-III, and/or raphides in two categories and no toxas (Hadju, 1995; Hooper and van Soest, 2002). Subgenera *Aegogropila* is consisted with intercrossing bundles of megascleres making triangular or polygonal meshes (Hooper and van Soest, 2002).

This taxonomic study on marine sponges is based on specimens which were collected from Ulleung Island and Chuja Island by SCUBA diving at 10-50 m deep during the period of July 2000 to May 2005. All processes in this study were followed the procedures of Kim and Sim (2005) and Rützler (1978). The type specimens were deposited in the Natural History Museum, Hannam University (HUNHM) and Department of Biological Science, Hannam University, Daejeon, Korea.

SYSTEMATIC ACCOUNTS

Class Demospongiae Sollas, 1885
Order Poecilosclerida Topsent, 1928
*Suborder Mycalina Hajdu, van Soest and Hooper, 1994
Family Mycalidae Lundbeck, 1905

***Mycale (Aegogropila) jukdoensis n. sp. (Figs. 1-2)**

Type specimen. Holotype (Por. 57), Jukdo (Ulleung Is.), 19 June 2002, SCUBA, 17 m deep, deposited in HUNHM. Four paratypes (57-1, 57-2, 57-3, 57-4) collected with Holotype, deposited in the Department of Biological Science, Hannam University, Daejeon, Korea.

Description. This species irregular or massive form with mound, sized up to 16 × 7 cm wide and 4 cm thick. Surface smooth with thin membrane. Oscules 0.1-0.2 cm in diameter, scattered on surface. Texture soft and fragile. Colour yellow in life. Ectosomal skeleton isodictyal reticulation of subtylostyles which made net form through arrangement of bundle with 4-7 subtylostyles. Endosomal skeleton thick tracks of subtylostyles, and abundant in matrix. Rosettes with 14-40 large anisochelae appear under surface membrane. Megascleres consisted of two kinds of straight subtylosyles. Microscleres consisted of four kinds of anisochelae (I, II, III, IV), two sigmas and raphide. Shaft anisochelae I: markedly curved in profile view; unguiferated head; narrow lateral alae; bifid frontal alae; height of head, 21% of total length; and foot formed palmate. Robust anisochelae II: width of head, a little larger than length of foot; head formed slightly large angle by curved shaft; tooth of head, slightly invaginated terminally; alae of head, tending to arcuate condition; and forming small space between head and foot. Slender anisochelae III: head, double height of foot; head and foot formed small angle in same size by shaft; and shaft slightly bent at middle part. Basal alae of anisochelae IV, projected like spur.

Spicules. Megascleres

thick subtylostyles ..... 430-525 × 10-12.5 μm
thin subtylostyles ..... 365-435 × 2.5-5 μm

Microscleres

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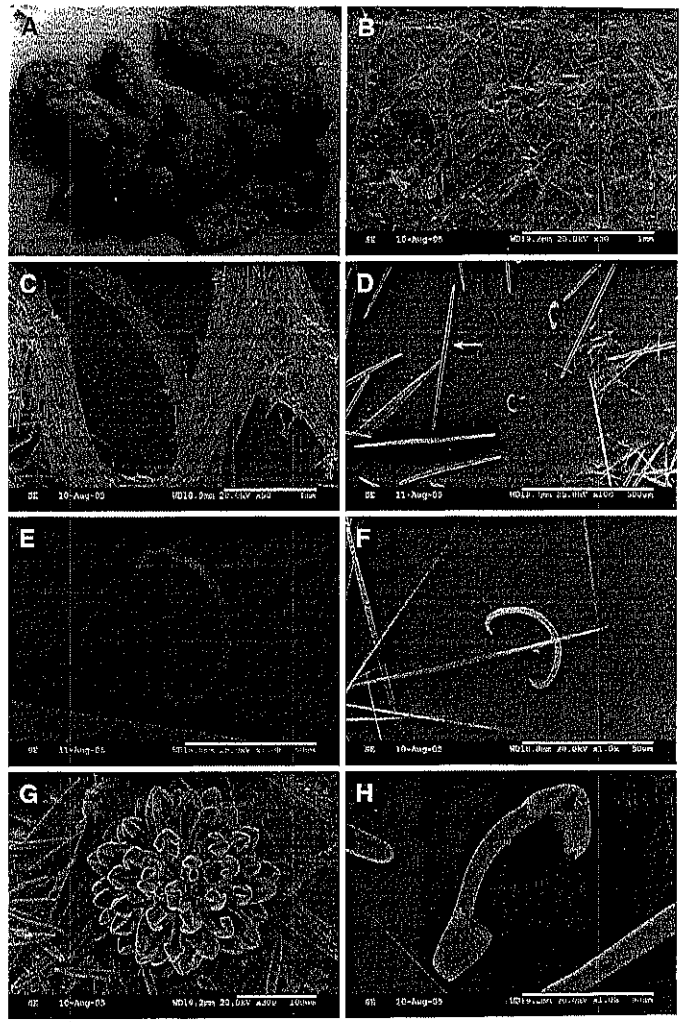

Fig. 1. *Mycale (Aegogropila) jukdoensis* n. sp. A, entire specimen. B, ectosomal skeleton. C, endosomal skeleton. D, megascleres; subtylostyle (arrow). E-H; microscleres; E, large sigma; F, small sigma; G, rosette; H, anisochela I. Scale bars = 50 μm (E, F, H), 100 μm (G), 500 μm (D), 1 mm (B, C), 40 mm (A).

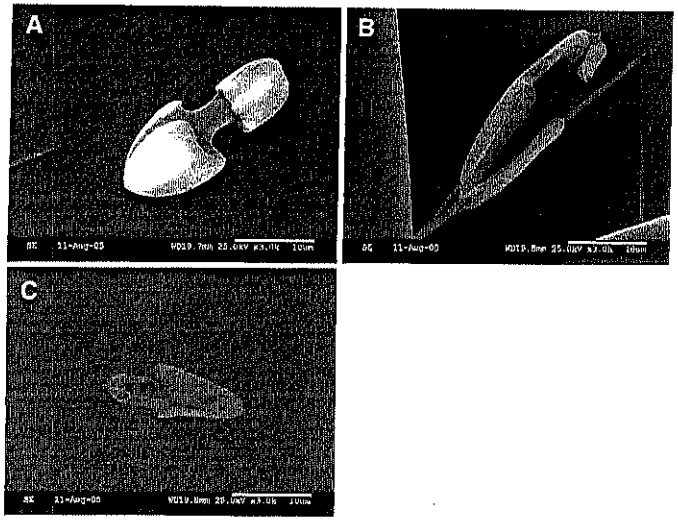

Fig. 2. *Mycale (Acgogropila) jukdoensis* n. sp. A, anisochela II; B, anisochela III; C, anisochela IV. Scale bars = 10 μm.

Table 1. Comparision of characters between *Mycale (Acgogropila) jukdoensis* n. sp. and *M. grandis*.

	Spicules (μm)									
	Subtylostyle	Anisochela				Sigma		Raphide	Growth form	Color
		I	II	III	IV	Large	Small			
M. (A.) jukdoensis n. sp.	Thick 430-525 ×10-12.5	85 - 100	15 - 30	15 - 30	15 - 25	60 - 80	25 - 35	100 - 120	Incrusting Massive	Yellow
	Thin 365-435 ×5									
M. grandis	432-800×10-21	75 - 145	-	-	15 - 32	52 - 57	17 - 19	80 - 100	Massive	Green

anisochelaes I ..... 85-100 μm
anisochelaes II ..... 15-30 μm
anisochelaes III ..... 15-30 μm
anisochelaes IV ..... 15-25 μm
large sigmas ..... 60-80 μm

small sigmas ..... 25-35 μm
raphide ..... 100-120 μm

Etymology. This species is named after its type locality, Jukdo, Ulleung Island, Korea.

Remarks. This new species is very close to *M. grandis* (see Hentschel, 1912) based on the shape of spicules, but this species has two categories (thick and thin) of subtylostyles and also larger sigmas and raphides than *M. grandis*. And anisochelae I is smaller than that of *M. grandis*'s (Table 1).

Mycale (Mycale) chujaensis n. sp. (Fig. 3)

Type specimen. Holotype (Por. 58), Packmiyecksum (Chuja Is.), 21 Aug. 2002, SCUBA, 15 m deep, deposited in HUNHM, Korea. Three paratypes, Por. 58-1, Chupodo, 22 Aug. 2002, SCUBA, 15 m deep. Por. 58-2, Hoenggando, 22 Aug. 2002, SCUBA, 15 m deep. Por. 58-3, Jeolmyeongyeo, 21 Aug. 2002, SCUBA 25 m deep, deposited in the Department of Biological Sciences, Hannam University, Daejeon, Korea.

Description. This species thickly encrusting on rock, sized up to 12×6.5 cm wide and 2 cm thick. Smooth surface has thick membrane with abundant foreign materials. Oscules 0.1-0.2 cm in diameter, scattered on surface. Texture soft, tough and compressible. Colour yellow in life. Ectosomal skeleton consisting of felted mass with intercrossing megascleres irregularly. Endosomal skeleton thick tracks of subtylostyles, abundant in matrix. Rosettes with 30-35 anisochelae I, appear under surface membrane. Anisochelae I: two extremities, head and foot, almost same size in height and diameter; frontal tooth of head formed larger angle by shaft than one of foot; tooth of head, slightly invaginated terminally, made wide space between both alae. Robust anisochelae II: diameter of head, a little more wide larger than length of foot; head formed slightly large angle by curved shaft; tooth of head, slightly invaginated terminally; alae of head, tending to arcuate condition and forming small space between head and foot. Basal alae of anisochelae IV, projected like spur. C-shape sigma and raphide distributed through all sponge.

Spicules. Megascleres
thick subtylostyles ..... 410-630×10-15 μm
thin subtylostyles ..... 350-510×3-5 μm
Microscleres
anisochelaes I ..... 60-75 μm
anisochelaes II ..... 15-30 μm
anisochelaes III ..... 20-30 μm
sigmas ..... 12-17.5 μm
raphide ..... 70-80 μm

Etymology. This species is named after its type locality, Chuja Island, Korea.

Remarks. *M. (M.) chujaensis* n. sp. is similar to *M. sulgata* (see Hentschel, 1911) in the growth form and the size of microscleres. However, this species has two categories (thick and thin) of subtylostyles but, *M. sulgata* has only one type (Table 2).

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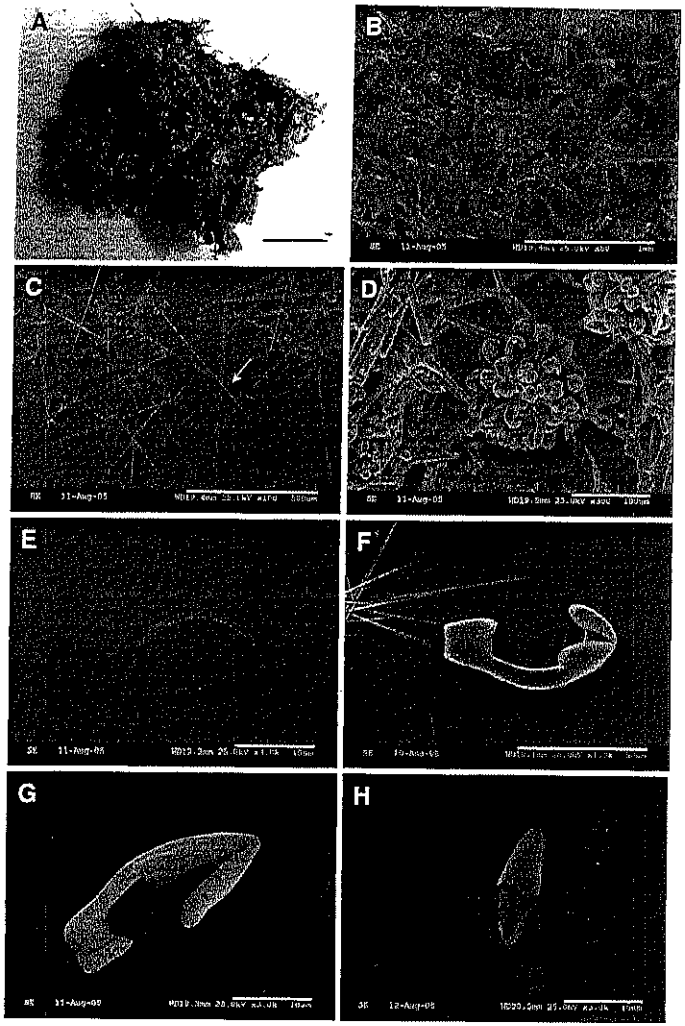

Fig. 3. *Mycale (Mycale) chujaensis* n. sp. A, entire specimen. B, ectosomal skeleton. C, megascleres, subtylostyle (arrow). D, ectosomal rosette. E-H, microscleres: E, small sigma; F, anisochelae I; G, anisochelae II; H, anisochelae III. Scale bars = 10 μm (E, G, H), 50 μm (F), 100 μm (D), 500 μm (C), 1 mm (B), 30 mm (A).

Table 2. Comparision of characters between *Mycale (Mycale) chujaensis* n. sp. and *M. sulgata*

	Spicules (μm)								
	Subtylostyle		Anisochela			Sigma	Raphide	Growth form	Color
			I	II	III				
M. (M.) chujaensis n. sp.	Thick	410-630 × 9-15	60 - 75	15 - 30	20 - 30	12-17.5	70-80	Encrusting	Yellow
	Thin	350-510 × 3-5							
M. sulgata	300-600 × 10-13		56 - 65	19 - 22	-	15-16	75-85	Encrusting	Yellow

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