

## New Species of the Genus *Mycale* from Ieodo Ocean Research Station, Korea

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### ABSTRACT

A new marine sponges, *Mycale (Carmia) ieoensis* n. sp., of the family Mycalidae was collected SCUBA diving in June 2017 from Ieodo Ocean Research Station, Korea. *M. (C.) ieoensis* n. sp. is encrusting to irregular massive type, yellow in life. This new species is similar to *M. nullarosette* Hoshino, 1981 in color and growth form but it differs in spicule size and sigma shape. Spicule size of *M. (C.) ieoensis* n. sp. smaller than that *M. nullarosette*. Also, *M. (C.) ieoensis* n. sp. has two size toxa, but *M. nullarosette* is not. The new species are compared to other *Mycale* species from the Korean region, and similar species from elsewhere.

**Keywords:** new sponge, Mycalidae, *Mycale*, Korea

### INTRODUCTION

The family Mycalidae Lundbeck, 1905 (Demospongiae: Poecilosclerida) is restricted to taxa with the combination of palmate anisochelae and tangential surface skeleton. *Mycale* species occur in all sea regions of the globe, in most habitats and in a considerable depth range from intertidal to abyssal depth. This wide geo-ecological range has led to the description of more than 250 *Mycale* species, currently accepted from a pool of more than 500 nominal species (Van Soest et al., 2014). The genus *Mycale* is subdivided in 11 subgenera (Hajdu, 1999; Van Soest and Hajdu, 2002). Among them, subgenus *Carmia* is confused etosomal skeleton absent, or only a few scattered megascleres lying tangentially. Megascleres are subtylostyle in one category only. Microscleres are plamate anisochelae in one or more size-categories, the larger of which may form rosettes, as well as a variable complement of sigmas, toxa, raphides and microacanthoxeas (Van Soest and Hajdu, 2002). The subgenus *Carmia* is speciose with 35 valid species presently recognized worldwide (Van Soest et al., 2019). One species of the subgenus *Carmia* was already reported from Korean waters (Rho and Yang, 1983).

### MATERIALS AND METHODS

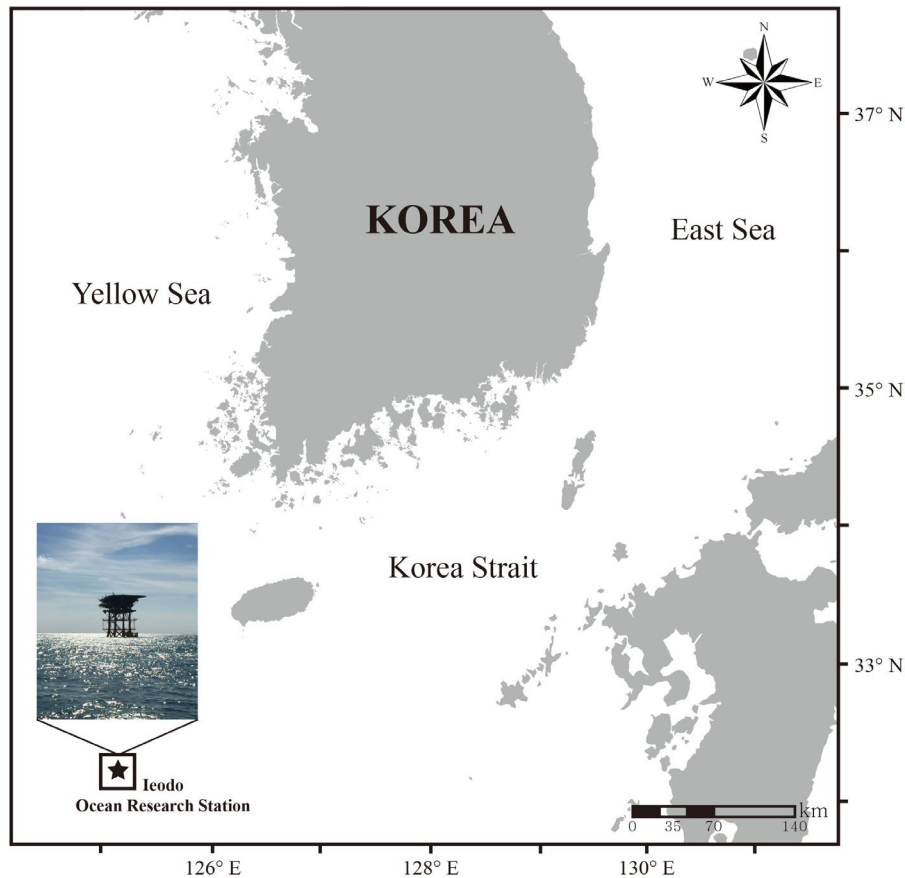
The sponges were collected from Ieodo Ocean Research Station (Fig. 1), Korea by SCUBA diving at 20–25 m deep at June 2017. Specimens were fixed in 95% or 99.9% ethanol. Spicules were observed under light microscope (Axioskop II, Carl Zeiss, Göttingen, Germany). Identification was done on the basis of external features, shape, structure of skeleton, and size and form of spicules. Thin free-hand sections were made with specimens hardened in alcohol using a surgical blade in order to observe the structure of the skeleton. Spicules were prepared by dissolving a piece of sponge in sodium hypochlorite and were examined with scanning electron microscope (Rützler, 1978). The specimens are deposited in National Marine Biodiversity Institute of Korea (MABIK).

### SYSTEMATIC ACCOUNTS

Class Demospongiae Sollas, 1885  
Order Poecilosclerida Topsent, 1928  
Suborder Mycalina Hajdu, van Soest and Hooper, 1994  
Family Mycalidae Lundbeck, 1905  
Genus *Mycale* Gray, 1867  
Subgenus *Carmia* Gray, 1867

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**Fig. 1.** This map is showing the collecting site, Ieodo Ocean Research Station.

**Table 1.** The comparison of characters between *Mycale (Carmia) ieoensis* n. sp. and *M. nullarosette* Hoshino 1981

	Subtylostyle	Spicules ( $\mu\text{m}$ )						Growth form
		Anisochelae		Sigma		Toxa		
		I	II	I	II	I	II	
<i>M. (C.) ieoensis</i> n. sp.	250–350 × 2.5–10	45–50	12.5–15	65–75	12–20	80–100	35–60	Encrusting to irregular massive
<i>M. nullarosette</i>	220–298 × 3–9	33	15–17	19–24	–	–	–	Encrusting to massive

<sup>1\*</sup>*Mycale (Carmia) ieoensis* n. sp. (Fig. 2)

**Material examined.** Korea: Jeju-do, Seogqwipo-si, Daejeong-eup, Ieodo Ocean Research Station, 20–25 m, 30 Jun 2017, SCUBA diving, coll. Lee, SH MABIK IV00155509.

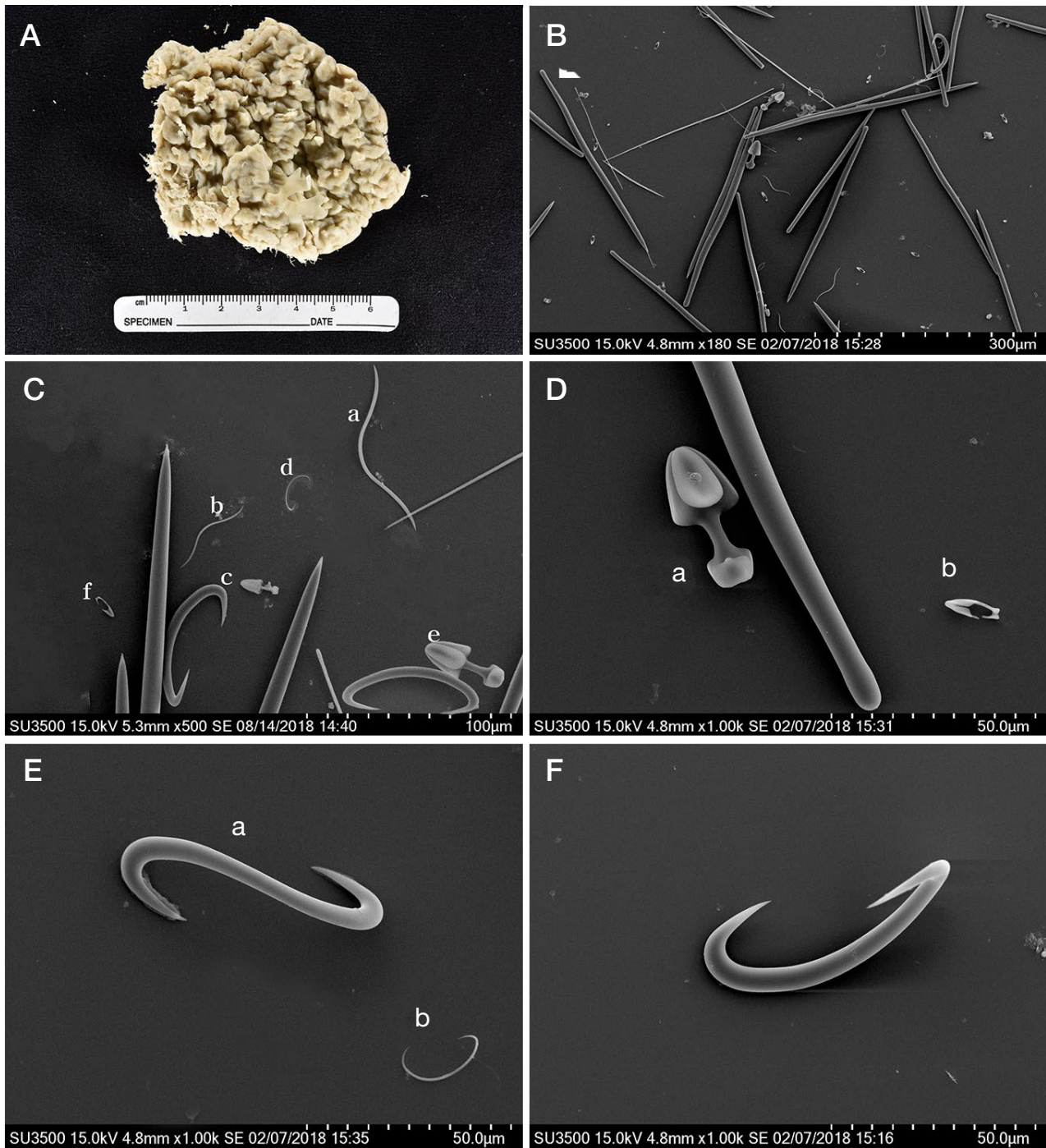
**Description.** This species encrusting to irregular massive, sized up to 7 × 6 cm wide and 1.5 cm thick (Fig. 2A). Oscule and pore invisible. Texture soft, tough and compressible. Colour yellow in life and gradually changed to ivory in alcohol.

Ectosomal skeleton, absent. Spicules (Fig. 2B–F). Megascleres, subtylostyles, 250–350 × 2.5–10  $\mu\text{m}$  in size. Microscleres, anisochelae, sigmas, toxas and microacanthoxeas.

Anisochelae I, robust, with upper frontal alae prominent and curved out-ward, naked shaft relatively short, approximately 45–50  $\mu\text{m}$  in size.

Anisochelae II, size not strongly different from anisochelae I, but frontal alae more incurved, not outward, naked shaft quite short, 12.5–15  $\mu\text{m}$  in size.

Korean name: <sup>1\*</sup> 주름진이어깃해면 (신칭)



**Fig. 2.** A, Entire specimen of *Mycale (Carmia) ieoensis* n. sp.; B, Megascleres and microscleres; C, Microscleres (a, large toxa; b, small toxa; c, large sigma; d, small sigma; e, large anisochelae; f, small anisochelae); D, Anisochelae (a, large; b, small); E, Sigma (a, large; b, small); F, C-type sigma.

Sigma I, robust, elongately curved, 65–75  $\mu\text{m}$  in size.

Sigma II, elongate, but thinner than sigma I, 15–20  $\mu\text{m}$  in size.

Toxa I, thin, widely but sharply curved, 80–100  $\mu\text{m}$  in size.

Toxa II, small, thin, curved, 35–60  $\mu\text{m}$  in size.

**Distribution.** Korea (Jeodo Ocean Research Station).

**Etymology.** Named after the type locality, Jeodo, Jeju-do, Korea.

**Remarks.** This new species is similar to *M. nullarosette* Hoshino, 1981 in color and growth form but it differs in spicule size and sigma shape. Spicule size of *M. (C.) ieensis* n. sp. smaller than that *M. nullarosette* (Table 1). Also, *M. (C.) ieensis* n. sp. has two size toxa, but *M. nullarosette* is not.

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## CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

## ACKNOWLEDGMENTS

This work was supported by a grant (MABIK 2019M00100) of Securement, Discovery and Basic Survey of Marine Biological Resources in 2019 of the National Marine Biodiversity Institute of Korea (MABIK). We also thank members of the Ocean Research Division at Korea Hydrographic and Oceanographic Agency.

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Received July 22, 2019  
Accepted October 1, 2019