

Two New Sponge Species of the Genus *Stelletta* (Astrophorida: Ancorinidae) from Korea

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Two new species of the genus *Stelletta* (Astrophorida: Ancorinidae), *S. spinulosa* n. sp. and *S. calyx* n. sp., are described from the waters around Gageodo Island (Sohuksando) and Ulleungdo Island, Korea. *S. spinulosa* n. sp. is similar to *S. crassispicula* (Sollas, 1886) in the feature of entire animal, but differs from it in the shape of orthotriaene and the form and size of oxyasters. *S. calyx* n. sp. resembles to *S. crater* Dendy, 1924 in the shape of sponge, but the new species has four size categories of oxyaster whereas *S. carter* has no oxyaster.

Genus *Stelletta*, with long-shafted triaenes of various type and oxeas as megascleres, differs from other genera in that there are always two distinct categories of euaster as microscleres. Lendenfeld (1903) synonymized *Myristra*, *Pilochorata* and *Anthastra* with *Stelletta*, disregarding the presence of a second category of aster in the latter. Kennedy (2000) also proposed that *Dorypleres*, *Zaplathea* and *Astroplakina* are speculated to be a *Stelletta* lacking triaenes, although further research is needed to confirm this. Seven species were known from Korean waters (Sim, 1981, 1996; Sim and Kim, 1988, 1995; Sim and Lee, 1999). Twelve species were described from Japan by Thiele (1898) and Hoshino (1981). Ten were reported from New Zealand by Bergquist (1968). Over the 50 species reported from Australia by Hooper and Wiedenmayer (1994).

The specimens dealt with in this work collected from Gageodo Island (Sohuksando) and Ulleungdo Island, Korea by SCUBA diving at depth of 25-40 meters. The identification was made mainly on the basis of the external feature, the shape and size of spicules, and the structure of skeleton. To examine the skeletal structure, the thin free-hand section was done with a surgical blade after hardening in alcohol. Spicules were prepared by dissolving a piece of sponge in sodium hydrochloride and examined with SEM (HITACHI S-3000N) at Hannam University. SEM analysis of spicules followed the procedure of Rützler (1978). Holotype specimen is deposited in the Natural History Museum, Hannam University (HUNHM), and Paratype specimens in the Department of Biology, Hannam University, Daejeon, Korea and Natural History Museum, Ewha Womans University, Seoul, Korea.

Results

Phylum Porifera Grant, 1836
Class Demospongiae Sollas, 1885
Subclass Tetractinomorpha Levi, 1956
Order Astrophorida Levi, 1973
Family Ancorinidae Schmidt, 1870

Stelletta spinulosa n. sp.
(Fig. 1A-I)

Type specimens: Holotype (Por. 41), Pinjiammal (Gageodo I., 125° 08' E, 34° 03' N), 24 Jul. 2000, 25 m in depth (SCUBA), K. J. Lee and H. J. Kim, deposited in the Natural History Museum, Hannam University, Daejeon, Korea.

Description: Holotype. Massive, irregularly spherical sponge. Size up to 14.7×10.2×4.3 cm.

Surface. Rough and externally hispid, owing to the projecting brushes of oxeas and triaenes. No pores and with only one large oscula, 15 mm in diameter. Covered with hydroids and bryozoans.

Colour. Dark gray externally and beige internally in life.

Texture. Cortical spicules, densely packed and give sponge hard texture.

Skeleton. Ectosome, about 2 mm thick, easily differentiated from underlying endosome. Most of triaenes distributed in ectosome. Oxeas and microscleres, scattered mainly in endosome. Typical radiate structure. Triaenes and oxeas densely packed and their cladomes arranged at surface of sponge.

Spicules. Megascleres (μm)

Oxeas1450-2125×20-60

Orthotriaenes750-1150×24-57

Microscleres (μm)

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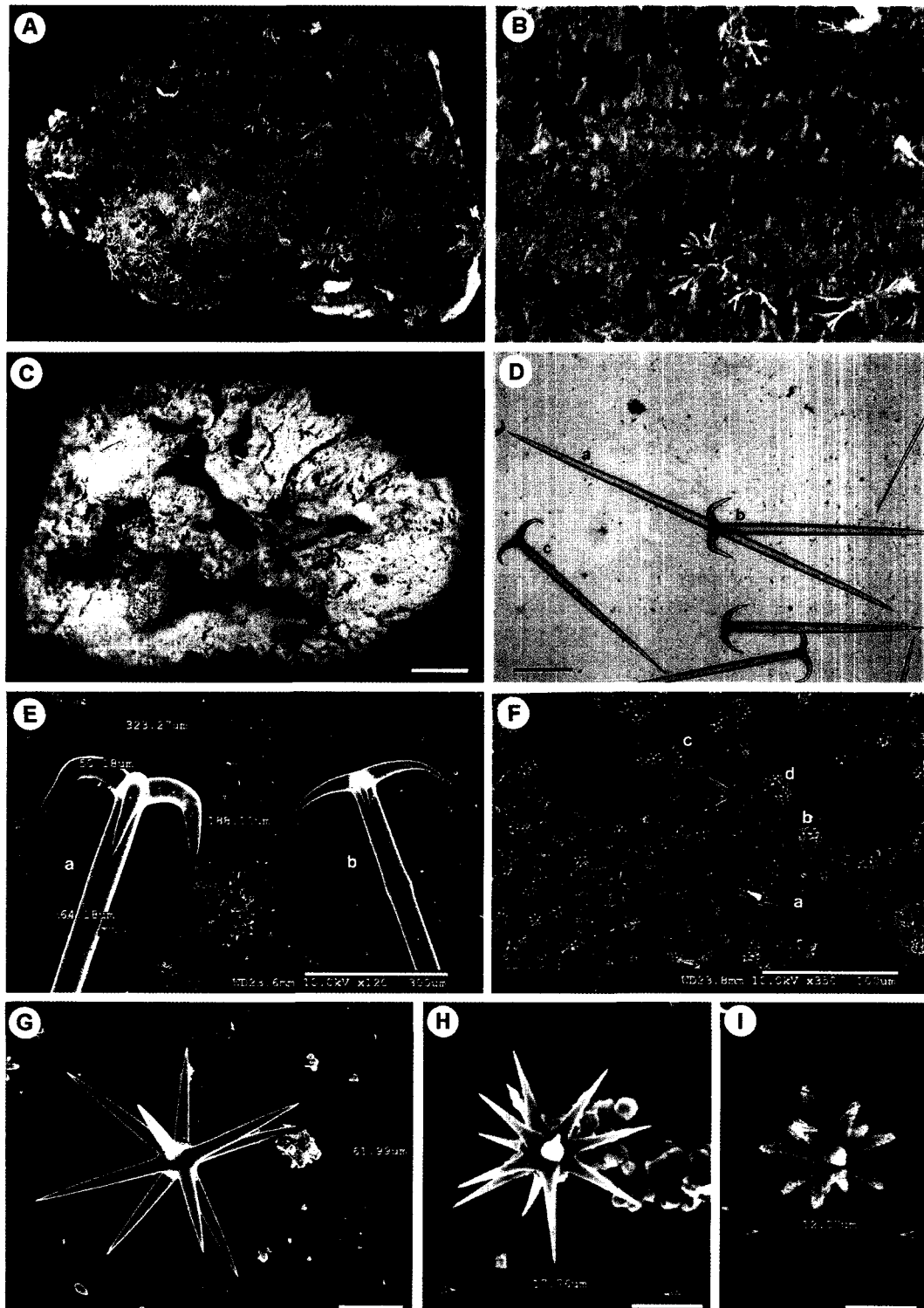


Fig. 1. *Stelletta spinulosa* n. sp. A, top-side view. B, surface of specimen. C, back-side view. D, megascleres; a, oxea, b, long-shaped orthotriaene, c, short-shaped orthotriaene. E, a, head of long-shaped orthotriaene, b, head of short-shaped orthotriaene. F, microscleres; a, large oxyaster, b, medium oxyaster, c, small oxyaster, d, strongylasters. G, large oxyaster. H, small oxyaster. I, strongylaster. Scale bars. 2 cm(A, C), 5 mm(B), 300 μ m(D-E), 100 μ m(F), 15 μ m(G), 10 μ m(H-I).

Oxyasters (large) 40-75
 Oxyasters (medium) 25-35

Oxyasters (small) 15-20
 Strongylasters (with weakly spined) 10-12.5

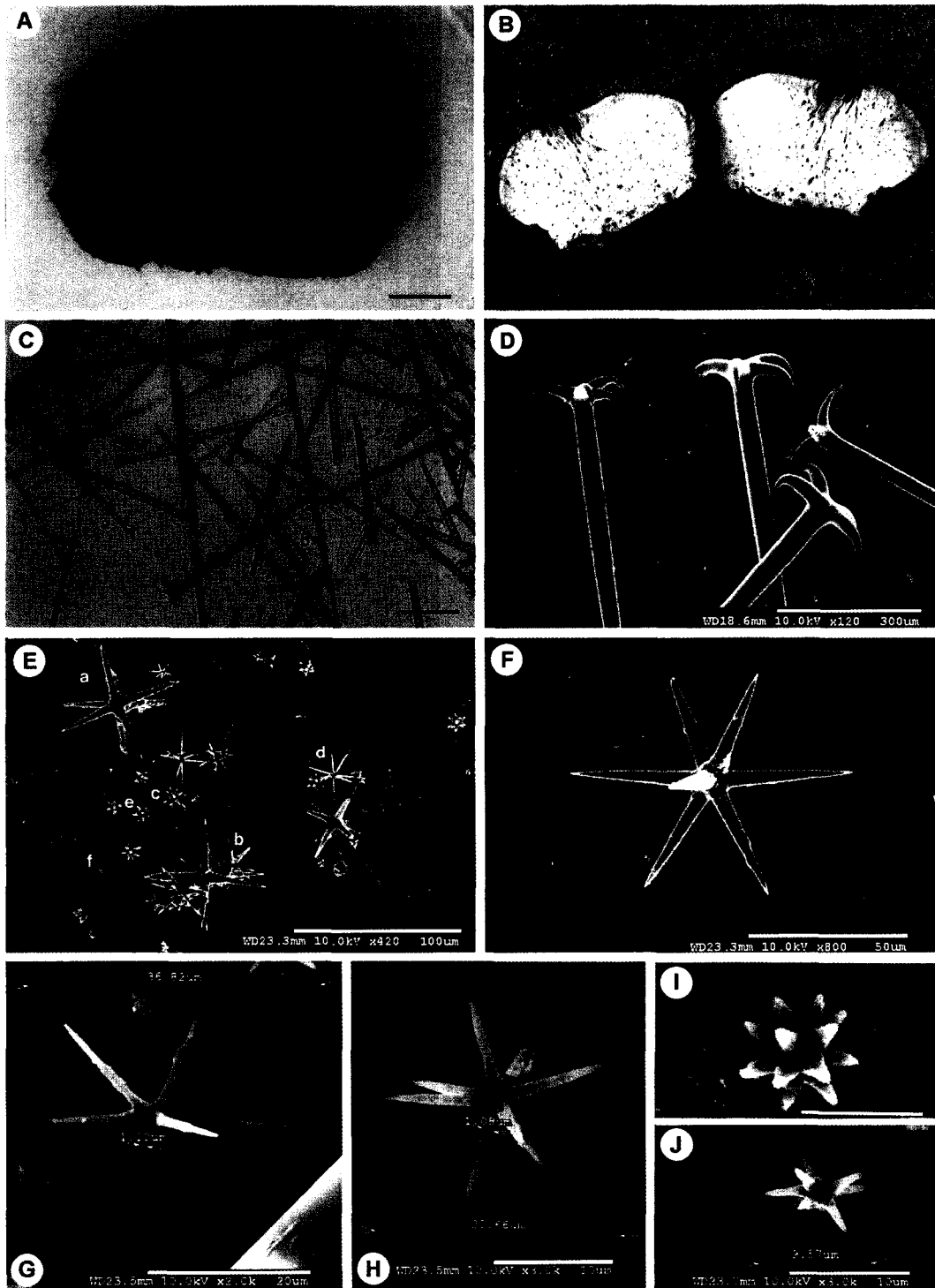


Fig. 2. *Stelletta calyx* n. sp. A, top-side view. B, side-view. C, megascleres; a, stout oxea, b, slender oxea, c, orthotriaene, d, abnormal orthotriaene, e, head of abnormal orthotriaene, f, plagiotriaene. D, head of abnormal orthotriaene. E, microscleres; a, large oxyaster, b, medium oxyaster, c, small oxyaster, d, slender oxyaster. F, large oxyaster. G, slender oxyaster. H, small oxyaster. I, strongylaster. J, thin strongylaster. Scale bars. 5 cm(A-B), 400 μ m(C), 300 μ m(D), 100 μ m(E), 50 μ m(F), 20 μ m(G), 10 μ m(H-J).

Etymology: This specific name, *spinulosa*, is based on the spined surface of the sponge.

Remarks: This new species, *Stelletta spinulosa*, is closely similar to *S. crassispicula* (Sollas, 1886) in the shape and

spicules. But this new species has three size categories of oxyasters and varies in form of the orthotriaenes.

Stelletta calyx n. sp.
(Fig. 2A-J)

Type specimens: Holotype (Por. 42), Neunggul (Ulleungdo I., 130° 55' E, 37° 33' N), 2 Aug. 2001, 20 m in depth (SCUBA), K. J. Lee and H. J. Kim, deposited in the Natural History Museum, Hannam University, Daejeon, Korea. Two Paratypes collected with Holotype, Por. 42-1, deposited in Department of Biology, Hannam University, Daejeon, Korea, and Por. 42-2 in Natural History Museum, Ewha Womans University, Seoul, Korea.

Description: Cup-shaped like crater, massive sponges. Size up to 14.5×11×9 cm.

Surface. Oscules and pores invisible. Conspicuously hispid, with spicules projecting from surface and uneven. Colour. In life, dark gray externally, beige internally.

Texture. very hard and hispid, incompressible.

Skeleton. Ectosome, up to 1.5 mm thick. Oxeas and orthotriaenes, radially arranged towards surface. Most of triaenes distributed in ectosome. Endosome composed principally of large oxeas and microscleres.

Spicules. Megascleres (µm)

Oxeas (stout, large)	2050-3000×50
Oxeas (slender)	800-1520×10-15
Orthotriaenes	1000-1500×50
Plagiotriaenes (rare)	490-700×6-15

Microscleres (µm)

Oxyasters (large)	50-95
Oxyasters (medium)	25-40
Oxyasters (small)	12-20
Oxyasters (thin)	30-40
Strongylasters (with weakly spined)	10-12.5
Strongylasters (thin)	7-10

Etymology: This species name, *calyx*, is based on the cup-shape of the specimen.

Remarks: *Stelletta calyx* n. sp. is similar to *S. crater* Dendy, 1924 in the shape of sponge, but the new species has four size categories of oxyaster whereas *S.*

crater has no oxyaster. Megascleres of *S. calyx* n. sp. are shorter than *S. crater* and possesses abnormal orthotriaenes with four to six clads.

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References

- Bergquist PR (1968) Demospongiae of New Zealand, I Tetractinomorpha and Lithistida. *Mem N Z Oceanogr Inst* 37: 1-105.
- Dendy A (1924) Porifera, part I, non-Antarctic sponges, British Antarctic (Terra Nova) expedition, 1910. *Brit Mus Nat Hist Zool* 7: 269-392.
- Hoshino T (1981) Shallow-water demosponges of western Japan II. *J Sci Hiroshima Univ Ser B Div 1* 29: 207-276.
- Hooper JNA and Wiedenmayer F (1994) Porifera. In: Wells, A. (ed). Zoological Catalogue of Australia. Volume 12. (CSIRO: Melbourne): 1-620.
- Kennedy JA (2000) Resolving the '*Jaspis stellifera*' complex. *Mem Queensl Mus* 45: 1-338.
- Lendenfeld R Von (1903) Porifera. Tetraxonia. In: Schulze, FE (ed), Das Tierreich 19, Friedlander, Berlin, pp 1-168.
- Rützler K (1978) Sponges in coral reef. In: Stoddart DR and Johannes RE (eds), Coral Reefs: Research Methods. *Monogr Oceanogr Neth UNESCO* 5: 299-313.
- Sim CJ (1981) A systematic study on the marine sponges in Korea. *Soongjun Univ Essay and Papers* 11: 83-105.
- Sim CJ (1996) A new sponge species, *Stelletta kundukensis* (Demospongiae: Stellettidae), from Korea. *Korean J Syst Zool* 12: 79-82.
- Sim CJ and Kim MH (1988) A systematic study on the marine sponges in Korea 7. Demospongiae and Hexactinellida. *Korean J Syst Zool* 4: 21-42.
- Sim CJ and Kim YA (1995) A systematic study on the marine sponges in Korea 12. Tetractinomorpha (Porifera: Demospongiae). *Korean J Syst Zool* 11: 147-158.
- Sim CJ and Lee KJ (1999) Taxonomic study on marine sponges of Komundo Island, Korea. *Korean J Syst Zool* 16: 141-146.
- Sollas WJ (1886) Report on the Tetractinellida collected by H.M.S. challenger during the year 1873-1876. *Rep Sci Res Voy Chall Zool* 25: 1-458.
- Thiele J (1898) Studien über pazifische Spongien, I. *Zoologica* 24: 1-72.

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