

A Newly Recorded Sea Urchin (Echinoidea: Spatangoida: Spatangidae) from Geomundo Island, Korea

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ABSTRACT

A sea urchin was collected from Geomundo Island of Jeollanam-do, Korea on July 3, 2009. This specimen was classified as *Spatangus luetkeni* A. Agassiz 1872 belonging to the family Spatangidae of order Spatangoida based on the morphological characteristics. This genus and species are newly recorded in Korea. It is distinct morphological characters that test is thick and strong, six to eight primary tubercles are in 1 and 4 interambulacra, sternum is equipped with little keel, and color in alcohol is dark violet. This species inhabits tropical waters and usually distributes over the West Pacific from southern Japan to New Zealand.

Keywords: *Spatangus luetkeni*, sea urchin, morphology, Geomundo Island, Korea

INTRODUCTION

Sea urchins which are obviously bilaterally symmetrical, have an anterior mouth and are informally termed “heart urchins” are organized into the order Spatangoida representing one of the most easily recognizable groups within the class Echinoidea (Smith, 2004). This order is the most diverse one of all the extant orders of sea urchin (Stockley et al., 2005). They are found in all the major oceans of the world, and vary in their geographical distribution from highly localized to highly cosmopolitan. Family Spatangidae of order Spatangoida comprises 15 species within two genera in the world (Kroh and Mooi, 2013). In this study the genus *Spatangus* and *S. luetkeni* are newly reported in Korea, and the key to the families of suborder Brissidina is prepared. To date, six species of order Spatangoida including this species have been recorded in Korea (Shin and Rho, 1996; Shin, 2012).

The specimen was collected from Geomundo Island on July 3, 2009 and was preserved in 95% ethyl alcohol. The important morphological characters were photographed by a digital camera (Nikon D7000; Nikon Co., Tokyo, Japan), light- and stereo-microscopes (Nikon Eclipse 80i; Nikon SMZ1000). Identification of this specimen was referred to HL Clark (1917), Mortensen (1951) and Shin (2012). Specimen was deposited in the Marine Echinoderm Resource

Bank of Korea (MERBK), Sahmyook University, Seoul, Korea.

SYSTEMATIC ACCOUNTS

Class Echinoidea Leske, 1778

Subclass Euechinoidea Bronn, 1860

Order Spatangoida L. Agassiz, 1840

Suborder Brissidina Stockley, Smith, Littlewood, Lessios & MacKenzie-Dodds, 2005

Key to the families of suborder Brissidina in Korea

1. Internal fasciole present Loveniidae
– Internal fasciole absent 2
2. Peripetalous fasciole present Brissidae
– Peripetalous fasciole absent 3
3. Sternal system completely covered with tubercles
..... Spatangidae
– Sternal system not completely covered with tubercles
..... Maretiidae

Family Spatangidae Gray, 1825

Test heart shaped, oval outline. Apical system ethmolytic. Subanal fasciole present, but no other fascioles. Petals well

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developed. Ventral part of poriferous zones usually rudimentary.

Type genus: *Spatangus* Gray, 1825.

Genera 3 (1 in Korea).

¹***Genus *Spatangus* Gray, 1825**

Spatangus OF Müller, 1776: 236.

Spatangus Gray, 1825: 527; L Agassiz and Desor, 1847: 6; HL Clark, 1917: 233; 1925: 224; Mortensen, 1951: 7; Nisiyama, 1968: 199; Rowe and Gates, 1995: 244; Kroh and Mooi, 2013: 123430.

Prospatangus Lambert, 1902: 55; 1915: 192; Lambert and Thiery, 1924: 459.

Test rigid, broad oval outline, with a fairly deep frontal ambulacral groove. Paired ambulacra form very distinct petals, nearly closed distally, not sunken. Apical system subcentral, with four genital pores, ethmolytic. Labrum prominent. Sternum generally narrow. Periproct on truncated posterior end.

Type species: *Spatangus purpureus* O.F. Müller, 1776.

Species 14 (1 in Korea).

²****Spatangus luetkeni* A. Agassiz, 1872 (Fig. 1)**

Spatangus luetkeni A Agassiz, 1872: 57; 1873: 564; HL Clark, 1917: 238, Pl. 146, fig. 17, pl. 157, figs. 5, 6; Mortensen, 1951: 18; Rowe and Gates, 1995: 245; Kroh and Mooi, 2013: 513548.

Material examined. 1 specimen by Hyun Sik Lim, Geomundo Island, 3 July 2009.

Description. Test medium-sized, thick, strong, oval outline, regularly indented anterior, with a fairly deep broad frontal ambulacral groove, with dorsal side regularly arched both transversely and longitudinally, ventral side flat, truncated at posterior end. Apical system with four genital pores, subcentral, lying anterior, vertex slightly posterior. Madreporite extending beyond posterior ocular plates. Lateral petals moderately broad petaloid, comparatively short, occupying less than two thirds of length to test margin. Peristome lying anterior, usually distinctly sunken, with fairly conspicuous phylloides, labrum prominent, generally tuberculated. Sternum generally narrow, with irregularly arranged large primary tubercles carrying slightly bent large spines with broadly rounded spoon-like ends. Small tubercles covering ventral surface including anterior groove, uniform size, carrying minute slender curved spines. Apical portion of 1 and 4 lateral interambulacra bearing six to eight irregularly arranged primary tubercles carrying large spines. On outer slopes of

anterior groove, adjoining ambulacral zones, irregular vertical lines of large primary tubercles carrying large spines present. Periproct on truncated posterior end large, broad ovoid. Dorsal plastron elongated. Subanal plastron heart-shaped, about one and a half times as broad as long and not exceeding in width of widest part of dorsal plastron. Subanal fasciole present, but no other fascioles. Only tridentate pedicellariae abundant, triphyllous pedicellariae a few, without globiferous and ophiocephalous pedicellariae.

Size. Test length 72 mm

Test width 64 mm

Test height 55.6% Test length 40 mm

Color. Test is dark violet and spines are olive in alcohol.

Distribution. Korea (Geomundo Island), Japan, China, Taiwan, New Zealand, Australia (Tasmania).

Remarks. This species is peculiar by clearly showing the arrangement of skeletal plates on the dorsal side and the distributed pattern of large spines and by having abundant tridentate and a few triphyllous pedicellariae, but no globiferous and ophiocephalous pedicellariae which were mentioned by Agassiz (1872), HL Clark (1917), and Mortensen (1951). It is distinct morphological characters that test is thick and strong, six to eight primary tubercles are in 1 and 4 interambulacra, sternum is equipped with little keel, and color in alcohol is dark violet. Two different forms of tridentate pedicellariae having short and broad or long and slender stalks were observed in this specimen.

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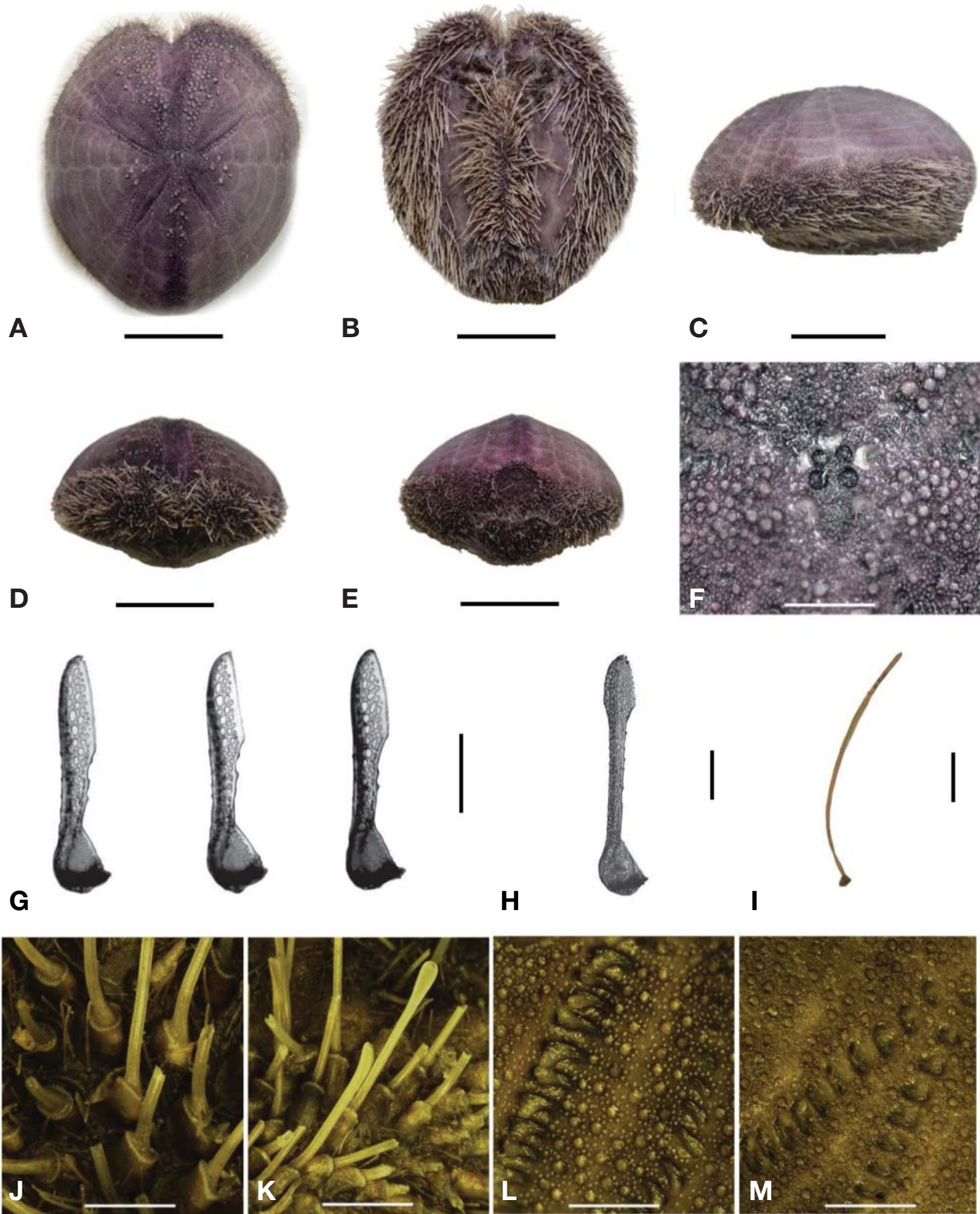


Fig. 1. *Spatangus luetkeni*. A, Dorsal side; B, Ventral side; C, Lateral side; D, Anterior view; E, Posterior view; F, Apical system; G, H, Valves of tridentate pedicellaria; I, Supporting rod of penicillate podia of phyllode; J, Basal parts of large spines; K, Large spines; L, Branchial podia of petaloid; M, Petaloid removed branchial podia. Scale bars: A–E=3 cm, F, J–M=5 mm, G, H=250 μ m, I=30 μ m.

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