

A Newly Recorded Sea Star of Genus *Aleutihenricia* (Asteroidea: Spinulosida: Echinasteridae) from the East Sea, Korea

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ABSTRACT

An asteroid specimen was collected by using a fishing net from the waters near Daejin harbor, in the East Sea of Korea on 3 Mar 2017. Based on morphological characteristics, the specimen was identified as *Aleutihenricia beringiana* (Djakonov, 1950), belonging to the family Echinasteridae, of the order Spinulosida. The genus *Aleutihenricia* was first described by Clark and Jewett, 2010. This species can be distinguished from other *Aleutihenricia* species by having a roundish protruding shape of abactinal and actinal plates, the number of abactinal spines bearing three to eight spinelets, and the number of adambulacral spines comprising six to eight spinelets. This is the first report of the genus *Aleutihenricia* and *A. beringiana* in Korea.

Keywords: *Aleutihenricia*, Spinulosida, East Sea, Korea, morphological characteristics

INTRODUCTION

The family Echinasteridae, of the order Spinulosida, contains eight genera, of which the genus *Aleutihenricia* (Clark & Jewett, 2010), is composed of four species: including *A. beringiana* (Djakonov, 1950), *A. derjungini* (Djakonov, 1950), *A. federi* Clark & Jewett, 2010, and *A. reticulata* (Hayashi, 1940). Echinasteridae has been progressively restricted since its early days, resulting in only a few genera left in this family (Clark and Downey, 1992). The genus *Aleutihenricia* is a unique group of *Henricia*-like Echinasteridae, which was first introduced by Clark and Jewett (2010) from the Aleutian Island archipelago. Echinasterids generally feed on sponges, hydroids, ectoprocts (Brun, 1976), suspended particulate matter, detritus-rich sand, and algae (Rasmussen, 1965). Species that belong to the genus *Aleutihenricia* can be distinguished based on their coloration, number of abactinal spines, and number of adambulacral spines. *Aleutihenricia beringiana* species possessed a close similarity to *A. federi*, but differed mainly in the number of adambulacral spines and the color of the body. The key taxonomic differences between the genus *Aleutihenricia* and other genera are that marginal plates are lacking or indistinguishable from

the abactinal plates, and not arranged in a discernible linear series (Clark and Jewett, 2010).

On 3 Mar 2017, an asteroid specimen was collected by using a fishing net from the waters near Daejin harbor, in the East Sea of Korea. The collected specimen was preserved in 95% ethanol, and the morphological characteristics, such as the size of the disk, upper and proximal portions of the arms, number of abactinal spines, shape of the abactinal and actinal skeletons, and number of adambulacral spines, were examined. The morphological features of the specimen were photographed by using a scanning electron microscope (JSM-6510; JEOL Ltd., Tokyo, Japan), stereomicroscope (Nikon SMZ1000; Nikon Co., Tokyo, Japan), and digital camera (Nikon D7000). The abbreviations of the measurements were those used by Shin and Ubagan (2015a, 2015b). With the newly recorded genus *Aleutihenricia* in Korea, in total, two genera have been reported in Korea. A key for Korean Echinasterid genera was provided.

SYSTEMATIC ACCOUNTS

Class Asteroidea de Blainville, 1830

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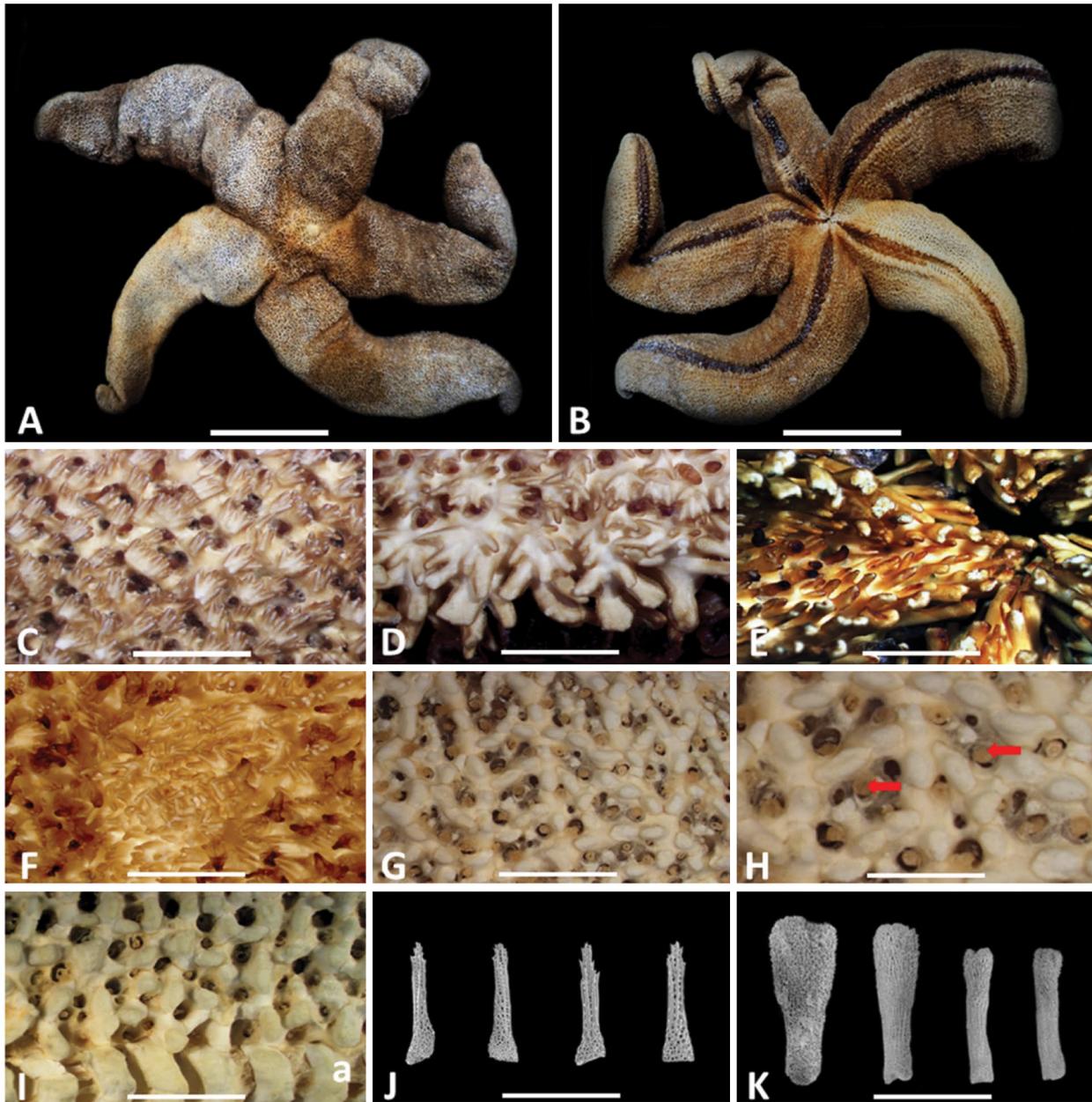


Fig. 1. *Aleutihenricia beringiana*. A, Abactinal side; B, Actinal side; C, Abactinal paxillae; D, Adambulacral spines; E, Oral part; F, Madreporite; G, Abactinal skeleton; H, Papula (arrows); I, Actinal skeleton: adambulacral plates (a); J, Abactinal spines; K, Adambulacral spines. Scale bars: A, B=3 cm, C-I=1 mm, J=100 μ m, K=50 μ m.

Order Spinulosida Perrier, 1884
 Family Echinasteridae Verrill, 1870

Key to the genera of the family Echinasteridae in Korea

1. Marginal and ventrolateral plates well defined, arranged in three regular series, distinguishable from the abactinal

plates *Henricia*
 – Marginal and ventrolateral plates lacking, not arranged in regular series, indistinguishable from the abactinal plates *Aleutihenricia*

¹***Genus *Aleutihenricia* Clark & Jewett, 2010**
 Genus *Aleutihenricia* Clark & Jewett, 2010: 7; Mah, 2019:

Korean name: ¹*알루산애기불가사리속 (신칭)

509256.

Type of species: *Henricia beringiana* Djakonov, 1950

¹Aleutihenricia beringiana* (Djakonov, 1950)**

Henricia beringiana Djakonov, 1950: 87, figs. 58–59.

Aleutihenricia beringiana Djakonov, 1950; Clark & Jewett, 2010: 9, fig. 12; Mah, 2019: 597761.

Material examined. One specimen, Daejin harbor, Korea, 3 Mar 2017, fishing net.

Description. Disc large; arms five, inflated, relatively long, broad arm base, gradually tapering to curly tips $R/r = 4.5$ (Fig. 1A, B). Abactinal paxillae clustered, containing three to eight slender spinelets, slightly covered with integument (Fig. 1C). Papular areas wide, containing one to six papulae in an area, some small ossicles present inside of some papular areas (Fig. 1H). Abactinal skeleton open meshed, reticulated, composed of small, roundish protruding plates (Fig. 1G). Madreporite elongated in form, situated near the center of disc, bearing spines same as abactinal spines (Fig. 1F). Actinal skeleton possessed similar shape but a little larger than abactinal protruding plates, actinal papular areas with one to three papulae present, no regular marginal and ventrolateral series (Fig. 1I). Adambulacral armature composed of six to eight spinelets; the inner three or four being bigger, spatulate form, longer than the outer spines, arranged in a transverse or in a zigzag row (Fig. 1D). Oral plate bearing two slender, blunt spines (Fig. 1E). Furrow spine single.

Size. $R = 180$ mm, $r = 40$ mm, $R/r = 4.5$.

Habitat. Hard substrates (rocks).

Distribution. Korea (Daejin); Russia (Avacha Bay, Bering Strait, Commander Islands, Olyutorskii Bay); Alaska (Aleutian Islands, west of Attu Island, off Semisopochnoi Island).

Deposition. The collected specimen was deposited in the Marine Echinoderm Resource Bank of Korea (MERBK), Sahmyook University, Seoul, Korea.

Remarks. *Aleutihenricia beringiana* was first described by Djakonov, 1950 as *H. beringiana* from Avacha Bay, Bering Strait, Bering Sea, and Commander Islands; later, this species was moved to genus *Aleutihenricia* (Clark and Jewett, 2010). The *Henricia*-like Echinasteridae *A. beringiana* has no regular series in marginal and ventrolateral plates, which are distinct characteristics of this species and can easily separate them to the genus *Henricia*. Both the abactinal and actinal skeletons of *A. beringiana* were composed of protruding plates, but the actinal papular area has fewer papulae than the abactinal papular area. *Aleutihenricia beringiana* possesses similar characteristics to *A. federii* with broad, inflated arms, a broad disc, and curly arm tips, but differs

mainly through (1) fewer abactinal spines, three to eight in *A. beringiana* and eight to 15 in *A. federii*; (2) less number of adambulacral spines, six to eight in *A. beringiana* and nine to 12 in *A. federii*.

We also compared our specimen *A. beringiana* to another member of the group *A. reticulata* Hayashi, 1940. As a result, two major differences of morphological characters were observed such as (1) *A. beringiana* has a considerable size, in which grows R up to 180 mm, while *A. reticulata* R up to 67 mm, (2) abactinal plates of *A. beringiana* composed of protruding plates, while *A. reticulata* composed of slender, elongated rod-like plates. This is the first report of genus *Aleutihenricia* and *A. beringiana* in Korea.

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