A NEW TERTIARY SPECIES OF ECHINARACHNIUS FROM HOKKAIDO

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(With 1 Textfigure)

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Recently S. NISHIYAMA and W. HASHIMOTO described a new fossil sand-dollar species, *Echinarachnius subtumidus*, which was found in the Miocene Tôgeshita formation exposed around Rumoe City, Hokkaidô.[1] Although the material is only a single specimen, it seems to be excellently preserved so that the authors could make observations on its details. On account of several distinctive features the authors gave a new specific name to it.

The junior writer of this paper, while engaged in the field works in the Rumoe region sometime ago, happened to visit the locality where *E. subtumidus* occurred. A small number (about a score of specimens) of fossil sand-dollars were collected by him at the very place where HASHIMOTO obtained his specimen. The specimens are not all in a good state of preservation, however. Many of them are deformed, more or less, and a few fractured also. The specimens, as a whole, are very much like *E. subtumidus*: they have many features in common. Taking up a well preserved and intact specimen as the representative of the lot, however, we find that there are a few points of demarkation between it and *E. subtumidus*. After a deliberate consideration we are decided to regard our species different from the latter, and to propose a new name, *Echinarachnius rumoensis*.

Before discussing the affinities and distinctions the new species is described as follows.

Test rather small, irregularly rounded oval, slightly longer than wide, with broad and shallow ambital notches which are particularly expressive in I and V: about 41 mm long, 39 mm wide and 5.5 mm high, the greatest width being at a little back of center of test. Abactinal

surface moderately raised gently from thick margin to the highest point which is slightly excentric anteriorly immediately in front of apical system which also is a little ahead of center. Apical system rather large, 4.2 mm long and 4 mm wide, with 4 genital pores and 5 minute ocular pores. Petals nearly equal, broad, slightly elevated: broadly open distally. Odd ambulacrum 13 mm long and 7 mm wide with poriferous areas, having about 44 pore-pairs, 1 mm wide, interporiferous area 4 mm wide. Antero-lateral ambulacra 13 mm and 6.5 mm in length and width, respectively, and poriferous areas with about 48 pore-pairs 1 mm, interporiferous area 4mm wide. Postero-lateral ambulacra about 12.5 mm long and 6 mm wide, and poriferous areas with about 47 pore-pairs about 1 mm, interporiferous area 4 mm wide. Poriferous areas of each ambulacrum tend to diverge rather than converge at distal extremities, this tendency being well recognized in II and IV and in a less degree in III also. Periproct supramarginal, quite large, but real form and size are not known as its margin is broken; possibly circular or slightly elliptical in outline. Interambulacral plates on abactinal surface large, 9 or 10 in number in each column.

Actinal surface slightly concave orally. Peristome central, apparently sub-elliptical in outline in the type specimen, 3.3 mm long and 3 mm wide; elongately sub-pentaganal in some other specimens. Coronal

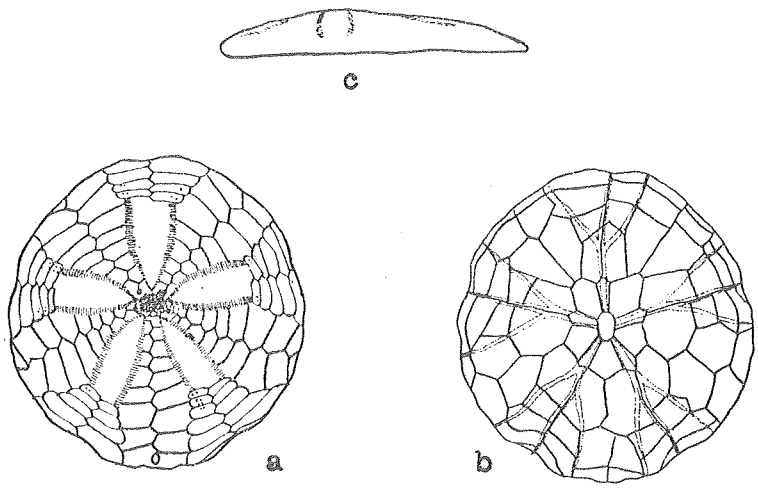

Fig. 1. *Echinarachnius rumoensis* nov. sp. × 1
a. abactinal, b. actinal, c. lateral views
(Sketched by Shibata)

plates on oral surface large and numerous, each ambulacrum with 5 to 6 plates: primordial ambulacral plates small, narrow, lancet-shaped; secondary ambulacral plates large: primordial interambulacral plates rather small, pentagonal in outline, largest about 6 mm long and wide, continuous in (2) and (3) and discontinuous in others. Actinal ambulacral furrows distinct, trifurcate at distal end of primordial ambulacral plates or almost in the center of the second. Marginal triangular areas of ambulacral zones limited by two lateral branches of ambulacral furrows slightly depressed, alternating in position with interambulacral depression on abactinal surface.

Remarks. Comparing what we have observed with the description of *E. subtumidus* by NISHIYAMA and HASHIMOTO we realize that the two forms almost coincide in essential features: yet there are a few points of difference we can not neglect altogether.

We need not perhaps be concerned with the difference of the outline of the tests of the two specimens under consideration, because it seems there is a range of variation recognized among the specimens at hand. But if we take the representative specimen alone into consideratian, and compare it with *E. subtumidus* as it is described and figured by the authors the following differences among others become apparent.

	E. subtumidus	*E. rumoensis*
1. Test {Length /Width	0.97	1.05
1. Test {Height/Length	0.18	0.13
2. Petaloid area/Radius	0.7	0.8
3. Poriferous zones distally	convergent	divergent
4. Highest point of test	post-central	antero-central
5. Trifurcation at····· {distal end of 3rd ambulacral plates	{distal end of primordial, or in 2nd amb. plates

On examining the other specimens in our collection that are mostly deformed more or less, we feel it plausible to admit ranges of variation in points 1 and 2 in the above table. But the other features appear to be quite constant. In a specimen, or two, of which the actinal surface is unfortunately more or less obscured by fossilization, the trifurcation of the actinal ambulacral furrows may take place somewhat closer to the margin of the test than in *E. subtumidus*.

As to the arrangement of the interamulacral plates on the actinal

surface, they are continuous in (2) and (3), and discontinuous in all the others in both the species under consideration. But in some other individuals of *E. rumoensis* it is different. In one of the specimens they are discontinuous in (1), (3), (4) and (5). There is another specimen in which plates are continuous in (2) and (3), discontinuous in (5), and intermediate[2] in (1) and (4). It seems therefore that in this species also the arrangement of the actinal surface is inconstant and variable as was observed by HAYASAKA and MORISHITA sometime ago in the study of *E.* (*Scaphechinus*) *mirabilis* from the youngest Pliocene formation of Taiwan.[3]

As the species *E. subtumidus* is represented by only one specimen which was found where almost a score of individuals of *E. rumoensis* were subsequently obtained, we can not but hesitate to regard the establishment of the two different species valid. Possibly, the specimen named *E. subtumidus* might be a particular individual of a group of sand-dollars which is rather commonly found in the Miocene Tôgeshita formation of Hokkaidô. In that case *E. rumoensis* should be the synonym of *E. subtumidus*. The material at hand, however, is not sufficient to decide the matter. On the other hand, the mode of occurrence of the actinal ambulacral furrows as well as points 3 and 4 appear to be features quite constant in the majority of specimens.

Thus, we like, at least for the time being, to specifically distinguish our specimens from *E. subtumidus* NISIYAMA and HASHIMOTO.

Locality and Geological Horizon.—Collected in the Tôgeshita formation exposed along the wall of the road-cut in the back of the Primary School about 1 km west of the Tôgeshita railroad station, Rumoe City, Hokkaidô. The Tôgeshita formation is regarded Miocene in age.

References

1. Syôzô NISHIYAMA and Wataru HASHIMOTO: A New *Echinarachnius* from the Tertiary of Hokkaido; Short Papers, IGPS, no. 2, pp. 39-42, 2 textfigures., December 15, 1950.
2. Sôzô NISHIYAMA: On the Japanese Species of *Echinarachnius*; Jubilee Publication in the Commemoration of Prof. H. YABE's 60th Birthday, p. 811, fig. 3, 1940.
3. Ichirô HAYASAKA and Akira MORISHITA: Notes on some Fossil Echinoids of Taiwan, II; Acta Geologica Taiwanica, vol. 1, pp. 95-96, October, 1947.