

## On Some Fossil Echinoids of Japan I

### Brissopsis & Eupatagus

By

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(Received July 31, 1957)

#### Abstract

The two new species, *Brissopsis makiyamai* and *Eupatagus nipponicus* are described. Both genera have not known as fossil in Japan.

Fossil *Brissopsis* is a very important genus in regard of the Tertiary Stratigraphy of Japan.

#### Introductory

Besides the fossil echinoids the writer has described in several former papers, there are some more unknown species in his collection. These species will be reported successively in future. In this paper, the two new species of *Brissopsis* and *Eupatagus* are described.

Both genera, *Brissopsis* and *Eupatagus* belong to the *Brissidae*. They are not known to have existed as fossils in Japan yet, but for a only one species *Brissopsis luzonica* (GRAY) obtained in the Tertiary of Joban. The identification to the recent species *Brissopsis luzonica* is doubtful as will be stated later. This form from Joban is presumably identified as *Brissopsis makiyamai* n. sp. appraised by its occurrences, for the latter is obtained at various localities in Japan, from the Miocene strata.

*Eupatagus nipponicus* n. sp. is known only in the Miocene strata of Toyama Prefecture.

#### Description of Species

Genus *Brissopsis* L. AGASSIZ

#### ***Brissopsis makiyamai* sp. nov.**

Pl. I, Figs. 1-5

1949 *Schizaster* sp. indet., A. MORISHITA, p. 258

The test is moderate or rather small in size and elongate ovoid in outline. The frontal depression is not so deep, but distinct. It is slightly notched at the ambitus

of anterior paired ambulacra. The posterior end is distinctly truncate and concave. The test is low and the greatest height is at the posterior ambitus of test. The oral side is nearly flat. The apical system is subcentral, in other words, slightly eccentric anteriorly.

The ambulacral area is rather narrow and less than a half of length of test. The odd anterior ambulacrum is not petaloid distinctly and in narrow and shallow groove. The paired ambulacra are petaloid, in shallow grooves, and the anterior paired petal of each side forms together a crescentical figure with the posterior paired petal. The anterior paired ones are divergent, subtending an angle of about 90° and curve outwards. The posterior paired petals are nearly equal to anterior paired ones in its length, and they are almost straight, subtending an angle of about 20°. The odd posterior interambulacrum is not elevated, forming a narrow strip.

The peripetalous and subanal fascioles are indistinct. The peristome is semi-lunar shaped and eccentric anteriorly, being nearer from the front than lateral margin of test. The periproct is subcircular in shape and situates at the summit of posterior truncated surface.

Measurements :-

	A	B	C	D
Length of test	25.8 mm.	34.4 mm.	34.0 mm.	28.3 mm.
Width of test	22.2 mm.	26.2 mm.	27.4 mm.	24.6 mm.
Height of test	10.0 mm.	12.6 mm.	16.9 mm.	7.2 mm.
Length of anterior paired petal	6.2 mm.	9.3 mm.	10.2 mm.	9.2 mm.
Width of anterior paired petal	2.2 mm.	2.8 mm.	2.4 mm.	3.4 mm.
Length of posterior paired petal	6.2 mm.	9.4 mm.	?	8.7 mm.
Width of posterior paired petal	2.0 mm.	2.5 mm.	?	3.2 mm.

(deformed)

A: Specimen from Aomori. B: Specimen from Toyama.  
C: Specimen from Yamaguchi. D: Specimen from Wakayama.

Remarks :-

Up to this time the fossil species from the Japanese Miocene strata (Joban) were identified as *Brissopsis luzonica* (GRAY) a unique recent species of Japan (S. NISHIYAMA, 1933, 1954), but this species differs from *Brissopsis luzonica* in its smaller test and narrower petaloidal area. This new species may be the ancestral form of *Brissopsis luzonica*. A specimen from Toyama is the same one as *Schizaster sp. indet.* reported by the author (A. MORISHITA, 1949). At present this species is known only from five localities including that Joban. If some other new localities are added in future, this species will be shown as an index fossil of the Miocene in this country.

Geological Horizons :-

Miogypsina-Operculina Zone (Middle Miocene of Aomori).  
Asagaya Mudstone (Upper Miocene of Toyama).  
Susa Formation (Middle Miocene of Yamaguchi).  
Tanabe Group (Middle Miocene of Wakayama).

## Localities :-

- Otose-mura, Nishi-Tsugaru-gun, Aomori Prefecture. (Holotype, No. JC750008)  
 Kurahara, Minami-Kanda-mura, Nishi-Tonami-gun, Toyama Prefecture. (Paratype, No. JC750009)  
 Koyama, Susa-cho, Abu-gun, Yamaguchi Prefecture. (Paratype, No. JC750010)  
 Inari-cho, Tanabe City, Wakayama Prefecture. (Paratype, No. JC750011)

## Matrices :-

Siltstone (Aomori), Fine Sandstone (Toyama), Medium Sandstone (Yamaguchi),  
 Mudstone (Wakayama).

Genus *Eupatagus* L. AGASSIZ

***Eupatagus nipponicus* sp. nov.**

Pl. I, Figs. 7, 8

1937 *Eupatagus* sp., A. JEANNET u. R. MARTIN, p. 275

1949 *Eupatagus* sp., A. MORISHITA, p. 259

The test is moderate or rather small in size, elongately ovoid in outline, and comparatively low in height. The actinal side is flat, not sunken towards the peristome. The posterior end is more or less truncated. The greatest width is measured at a little posterior part of extremities of anterior paired ambulacra. The apical system is a little anteriorly eccentric and small in size. It rises slightly before the apical system. The paired ambulacra are petaloid, very narrow, slightly sunken, and open distally. The posterior paired petals are nearly equal to the anterior paired ones or somewhat longer than the latter. The anterior paired petals are straight, but the posterior paired ones are slightly curved outwards. The odd anterior ambulacrum is narrow, not sunken, and there is no frontal depression.

The peripetalous and subanal fascioles are indistinct. The peristome is slightly eccentric anteriorly, but far from the frontal margin of test. The periproct is large and on the vertical posterior end.

There is no large primary tubercles in the posterior interambulacrum.

## Measurements :-

Length of test	35.2 mm.
Width of test	31.5 mm.
Height of test	11.2 mm.
Length of anterior paired petal	11.6 mm.
Width of anterior paired petal	3.1 mm.
Length of posterior paired petal	12.2 mm.
Width of posterior paired petal	3.0 mm.

## Remarks :-

This species is very much like *Eupatagus carolinensis* CLARK (W. B. CLARK & M. W. TWITCHELL, 1915, p. 153, pl. 71, figs. 3a-d, 4), in having the higher anterior region than the posterior one, the straight petals and no large tubercles in

the anterior interambulacral areas; but it differs from the latter species in its smaller and more flattened test, and narrower ambulacral petals.

*Eupatagus* sp. of the Javan Miocene described by A. JEANNET and R. MARTIN seems to belong to this new species. The type specimen described here is the same one which was reported as *Eupatagus* sp. by this author. Only one locality is known in Japan.

Geological Horizon :-

Sunagozaka Tuffaceous Member (Middle Miocene).

Locality :-

Yamamoto, Hirose-mura, Nishi-Tonami-gun, Toyama Prefecture.

(Holotype, No. JC750012)

Matrix :-

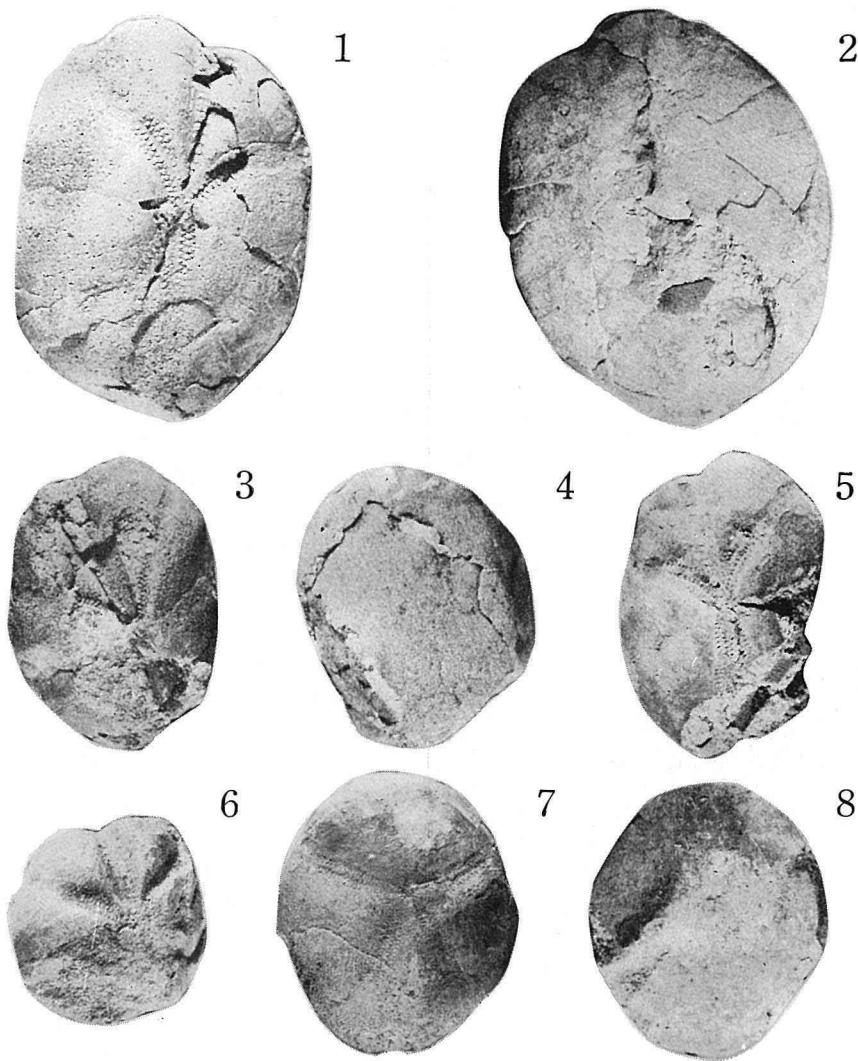
Coarse Sandstone.

#### Acknowledgements

The author wishes to acknowledge his indebtedness to Professor J. MAKIYAMA of this institute for his kind revision, Professor E. TAKAHASHI of Yamaguchi University, Mr. S. NAKAO, Mr. H. ISHIO, Mr. S. ISHIDA and Mr. Y. SHINAGAWA for their kind offers of the precious specimens.

#### References

- AGASSIZ, A. (1881): Report on the Scientific Results of the Voyage H. M. S. Challenger, Zoology, 3, Pt. 9, Report on the Echinoidea.
- CLARK, W. B. & TWITCHELL, M. W. (1915): Mesozoic and Cenozoic Echinodermata of the United States, Monogr., U. S. Geol. Survey, 54.
- ISHIO, H. (1949): Geology of the Environs of Fukumitsu in Toyama Prefecture, The Graduation Thesis of Kyoto University.
- JEANNET, A. u. MARTIN, R. (1937): Ueber Neozoische Echinoidea aus dem Niederländisch-Indischen Archipel, Leidische Geol. Mededeel., 8.
- MORISHITA, A. (1949): Neogene Echinoids from Ishikawa and Toyama Prefectures, Jour. Geol. Soc. Japan, 55.
- MORTENSEN, TH. (1951): A Monograph of the Echinoidea V<sub>2</sub>, Spatangoida 2.
- NISIYAMA, S. (1933): Echinodermata, Iwanami-koza (Manual of Geology and Palaeontology).
- (1954): Echinodermata in Palaeontology, Asakura Book-Store, Japan.
- TAKEYAMA, T. (1930): Tertiary Stratigraphy of the Environs of Tanabe, Kii, Chikyu, 13, 2.



**Explanation of Plate I.**

***Brissopsis makiyamai* sp. nov.**

Fig. 1 Holotype. No. JC750008, Abactinal side. Aomori Pref., Operculina-Miogypsina Zone. ( $\times 2$ )

Fig. 2 Holotype. No. JC750008, Actinal side. ( $\times 2$ )

Fig. 3 Paratype. No. JC750010, Abactinal side. Yamaguchi Pref., Susa Formation. ( $\times 1$ )

Fig. 4 Paratype. No. JC750010, Actinal side. ( $\times 1$ )

Fig. 5 Paratype. No. JC750009, Abactinal side. Toyama Pref., Asagaya Mudstone. ( $\times 1$ )

***Brissopsis* sp.**

Fig. 6 Abactinal side. Yamaguchi Pref., Susa Formation. ( $\times 1$ )

***Eupatagus nipponicus* sp. nov.**

Fig. 7 Holotype. No. JC750012, Abactinal side. Toyama Pref., Sunagozaka Tuffaceous Member. ( $\times 1$ )

Fig. 8 Holotype. No. JC750012, Actinal side. ( $\times 1$ )