

Neogene echinoid fossils of the northern part of  
Ibaraki Prefecture, northeastern Kanto, Japan

Abstract

Neogene echinoid fossils occurred from the northern part of Ibaraki Prefecture are identified, as a whole, as 39 species of 11 families and 15 genera. They are as followings; *Shizasteridae* gen. et sp. indet., *Brissopsis kajiiwarai* n. sp., *Brissopsis daigoensis* n. sp. and *Brissopsis* sp. from the early middle Miocene; *Pourtalesia kusachii* n. sp., *Aceste* sp. and *Schizasteridae* gen. et sp. indet. from the middle Miocene; *Nikaidoster tokaiensis* n. gen. et n. sp., *Nodaster watanabei* n. gen. et n. sp., *Lutetiaster ogasawarai* n. sp., *Anthocidaris* sp., *Temnotrema rubrum*, *Echinocyamus crispus*, *Scaphechinus* cf. *mirabilis*, *Palaeopneustes psoidoperidus*, *Linthia nipponica*, *Linthia tokunagai*, *Linthia* sp., *Brisaster owstoni*, *Brissopatagus* sp., *Anametalia* sp. and *Schizasteridae* gen. et sp. indet. from the Pliocene. Among these taxa, 5 genera and 6 species are newly proposed herein.

As a taxonomical result, *Pourtalesia*, *Aceste* and *Anametalia* species that are representatives of the deep-sea echinoids were first confirmed in fossil record in the world. All of the Japanese early middle Miocene *Linthia* species were assigned as a synonym of genus *Brissopsis*. Therefore, *Linthia*

species of the early middle Miocene was judged to not exist at present. *Anthocidaris* sp, *Echinocyamus crispus*, *Brissopatagus* sp. and *Brisaster owstoni* were first confirmed from the Japanese Pliocene. In addition, fossil record of *Lutetiaster* species previously only found in upper Eocene of France and Somalia was first confirmed from the Japanese Pliocene.

Hence, recent echinoid fauna which inhabiting the Japanese sea area can be considered it originated in Miocene, and is completed after Pliocene.

On the other hand, re-examination of Neogene stratigraphy of the northern part of Ibaraki Prefecture was done in 13 local areas. As a result, the Shinkawa Formation, Hitachinaka Formation and Hetano Tuff Member of the Hitachinaka Formation were newly proposed in middle Miocene, and also the Muramatsu Formation and Momiya Conglomerate Member of the basal conglomerate of Kume Formation were newly recognized in Pliocene.

Paleoenvironmental changes of the studied area during the Neogene are also reconstructed mainly based on stratigraphical and echinoids fossil studies.

**Key words:** Echinoid fossil, taxonomy, paleoenvironment, faunal change, originate, Miocene, Pliocene.

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