

On the genus *Asterocyclina* from the Kurusuno Formation, Tosa Shimizu City, Kochi Prefecture, Shikoku, Japan

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Recently Professor Jiro KATTO and Associate Professor Asahiko TAIRA, both of the Department of Geology, Kochi University, collected a larger foraminifera bearing limestone from the Eocene Kurusuno Formation (KATTO *et al.*, 1979; TAIRA, KATTO, TASHIRO and OKAMURA, 1980 this volume) in the northern environs of Tosa Shimizu City, Kochi Prefecture. The larger foraminifera determined by the writer from the Shimizu Formation at Zaimisaki Cape are as follows:

Asterocyclina cf. *stella* (GÜMBEL)

Aceroulina inhaerens SCHLUTZE

Amphistegina radiata (FICHEL and MOLL)

This fauna contains the Middle to Upper Eocene elements such as *Asterocyclina stella* (GÜMBEL) of the Lutetian inferior to Bartonien according to NEUMANN (1958). As MATSUMARU (1980) has already described, this species found from the Kurusuno Formation resembles *Orthophragmina* (*Asterodiscus*) sp. (YABE and HANZAWA, 1925) from the basal part of the Kyoragi Shale (= Akashimisaki Formation of HATAE, 1960) in Kyushu and *Discocyclina* sp. from the Nimyo Formation of Kuma Group in Shikoku (HANZAWA, 1959). At present, the writer considers that if *Nummulites hongoensis* HANZAWA in association with *Asterocyclina* sp. from the Akashimisaki Formation is identical with *Nummulites striatus* (BRUGUIÈRE) (= *N. saipanensis* COLE) from the Upper Tertiary a to Tertiary b, as both species show close resemblance

in general aspects, the geological age of the Akashimisaki Formation should not be accepted as Ypresian (YABE and HANZAWA, 1925), but at least as Lutetian. Lately TASHIRO *et al.* (1980) reported the *Discoaster sublodoensis* Zone based on the Middle Eocene calcareous nannofossils from the basal part of the Akasaki Formation (= Akashimisaki Formation of HATAE, 1960). Therefore, it seems obvious that the larger foraminifera bearing Paleogene Series from Kyushu and Shikoku have been deposited during the Middle Eocene (Lutetian) time.

The purpose of this paper is to make a description of *Asterocyclina* cf. *stella*. Taking this opportunity the writer wishes to express his appreciation to Professor Jiro KATTO and Associate Professor Asahiko TAIRA for their limestone materials which were used in this study. Thanks are also due to Mr. Bernardo M. BARCELONA, Bureau of Mines, Philippines, for his kind reading of the manuscript.

Description of Species

Family Discocyclinidae GALLOWAY, 1928

Genus *Asterocyclina* GÜMBEL, 1970

Asterocyclina cf. *stella* (GÜMBEL)

Plate 25, figs. 1-14.

Asterocyclina stella (GÜMBEL)-NEUMANN, 1958,
p. 112-114, pl. 28, figs. 1-6; text-fig. 36.

Description: - The test is lenticular or inflated, 1.6 to 3.1 mm, occasionally up to 3.6 mm, in diameter; 0.9 to 1.6 mm in thickness and 1.9 to 3.0 is the ratio of the diameter to the thickness. There are 4 to 6 distinct rays which merge into the central umbonate area. Pillars occur on the

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central inflated portion of test and are 68 to 146 microns, and occasionally up to 180 microns in diameter. Three specimens were cut in the equatorial sections and the following are the measured diameters: embryonic chambers have a spherical to subspherical protoconch of 136×116 microns, 170×136 microns and 170×170 microns and a kidney-shaped deuteroconch of 218×170 microns, 272×170 microns and 204×170 microns. There appear to be two primary auxiliary chambers, and a few accessory auxiliary chambers and nepionic chambers on the outer edge of deuteroconch in the equatorial sections. The equatorial chambers in rays near periphery are 65 to 70 microns in radial diameter and 34 to 50 microns in tangential diameter, and those in interrays near periphery being 40 to 50 microns in radial diameter and 22 to 34 microns in tangential diameter. The lateral chambers are arranged in regular tiers and low slitlike between roofs and floors. The number of lateral chambers varies 14 to 20 layers over the embryonic chambers.

Remarks : - The general test shape, the small embryonic chambers, the regular arranged slitlike lateral chambers, and the distribution and development of pillars are similar to the *Asterodiscus* (= *Asterocyclina*) *stella* GÜMBEL found on the western Aquitaine Bassin, France, though they differ more or less in measurement of the embryonic chambers. Therefore this species is referred to as *Asterocyclina* cf. *stella* (GÜMBEL).

Asterocyclina cf. *stella* (GÜMBEL) from Zaimisaki Cape, Tosa Shimizu City, Kochi Prefecture is comparable with specimens of figs. 12, 13, 15, 16 and 21 which have already been identified as *Asterocyclina stellata* (= *A. stellatus*) (D' ARCHIAC) from Tanay Region, Philippines according to HASHIMOTO *et al.* (1979). They are similar in general aspect, especially on the distribution and development of pillars, and should, therefore, be referred to as *Asterocyclina* cf. *stella* (GÜMBEL) and not *Asterocyclina stellata* (D' ARCHIAC) and *Asterocyclina* cf. *stella* (GÜMBEL) from Tanay Region, Philippines, occur in the Masungit Limes-

tone of the Maybangan Formation carrying the MSG4 (=MGT 4) fauna, whose fauna suggests Early Lutetian.

Geologic age : - As the MSG 4 fauna suggests the Early Lutetian, the age of *Asterocyclina* cf. *stella* from the Kurusuno Formation is also of the same age.

Stratigraphic horizon : - Kurusuno Formation.

Locality : - Zaimisaki Cape (latitude $32^{\circ} 52'$ north longitude $133^{\circ} 01'$ east), Tosa Shimizu City, Kochi Prefecture (KATTO *et al.*, 1979, figs. 3-4).

References

- KATTO, J., MATSUMARU, K., OKADA, H. and TAIRA, A., 1979: Discovery of Eocene fossils from the Muroto Group and their equivalent formation, and its significance. *Geol. News*, (294), *Geol. Surv. Japan*, 41-43. (in Japanese)
- HANZAWA, S., 1959: The foraminiferal species *Fabiania* (Oppenheim), in Japan. *Cushman Found. Foram. Res. Contr.*, 10, 119-122.
- HASHIMOTO, W., KITAMURA, N., BALCE, G. R., MATSUMARU, K., KURIHARA, K. and ALIATE, E. Z., 1979: Larger foraminifera from the Philippines, Part 10. Stratigraphic and faunal break between the Maybangan and Kinabuan Formations in the Tanay Region, Rizal, Philippines. *Geol. Palaeont. Southeast Asia*, 20, 143-157.
- HATAE, N., 1960: On the *Nummulites* zone of the Islands of Amakusa, Kyushu, Japan. *Sci. Rept., Tohoku Univ.*, 2nd ser. (Geol.), Spec. Vol. 4, 411-423. (in Japanese with English Abstract)
- MATSUMARU, K., 1980: Cenozoic larger foraminiferal assemblages of Japan, Part. 1. A comparison with Southeast Asia. *Geol. Palaeont. Southeast Asia*, 21, 211-221.
- NEUMANN, M., 1958: Revision des Orbitoides du Cretace et du Eocene en Aquitaine occidentale. *Soc. Geol. France Mem.*, N. S., 37 (83), 1-174.
- TASHIRO, M., OKADA, H., TAIRA, A. and OTSUKA, M., 1980: Middle Eocene calcareous nannofossils from the basal part of the Tertiary strata in Amakusa-Shimojima, Kyushu. *Jour. Geol. Soc. Japan*, 86(2), 139-141. (in Japanese)
- YABE, H. and HANZAWA, S., 1925: Nummulitic rocks of the Islands of Amakusa (Kyusyu), Japan. *Sci. Rept., Tohoku Imp. Univ.*, 3(7), 73-82.

PLATE 25

Explanation of Plate 25

All figures $\times 10$

Asterocyclina cf. *stella* (GÜMBEL)

Locality : Zaimisaki Cape, Tosa Shimizu City, Kochi Prefecture.

Figs. 1, 4 (right), 9, 12. Vertical sections.

Figs. 2-4 (left), 5-7 (right and left), 8, 10-11, 13-14. Oblique sections.

Figs. 7 (centre), 10 (centre), 13 (centre). Tangential sections.

Fig. 14 (left). Equatorial section.

