Asterocyclina (Larger Foraminifera) from Haha-jima
(Hillsborough Island), Ogasawara (Bonin) Islands

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During a short visit to Haha-jima in February, 1975, the junior author collected several foraminiferous rock samples from the middle part of the stratified sandstone (ca. 5 meters in thickness) exposed at the sea cliff of Okimura (142° 09.4'E, 26° 38.14'N, Figure 1). Rock samples are light gray-coloured, tuffaceous, fine-grained, and contain numerous specimens of larger Foraminifera in association with abundant planktonic Foraminifera such as *Orbulinoides beckmanni* (SAITO), *Hantkenina dumblei* WEINZIERL & APPLIN, *Globorotalia spinulosa* CUSHMAN, *Truncorotaloides topilensis*

(CUSHMAN), and others. Consequently, no doubt this sandstone corresponds to the *Globigerina* tuff and/or the well stratified tuffaceous fine-grained sandstone described by some previous authors (HANZAWA, 1947; SAITO, 1962; IWASAKI & AOSHIMA, 1970).

After disintegration of samples, which weight 100 grams altogether, using GLAUBER's salt, about two hundred matrix-free specimens of larger Foraminifera were extracted from the residue on the screen with about 150 microns opening.

Most of them represented the genus *Asterocyclina* and the other few the genus *Discocyclina*. Although the embryonic apparatus of the latter have been destroyed by replacement with calcite in all specimens, the former were fairly well preserved both externally and internally. The specimens of the former genus were diversified externally, but it was possible to divide them into some groups. Representative specimens of each group were sectioned and studied.

On the basis of internal structures, the following three species of the genus *Asterocyclina* were recognized (Figs. 2 & 3).

<i>Asterocyclina matanzensis</i> COLE	abundant
<i>A. penuria</i> COLE	common
<i>A. cf. elongaticamera</i> COLE	rare

Besides these species, a few new forms are present so far as have been ascertained.

The former two have been recorded by many authors from various localities of the Western Pacific region and regarded as indexes of Tertiary b (Tb) in the Indo-Pacific region (corresponding to Priabonian, late Eocene). It should be mentioned that the present report is the first record of *Asterocyclina* accompanied

Fig. 1. Map showing the southern half of Haha-jima and the location of the foraminiferal samples.

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Fig. 2. *Asterocyclina matanzensis* COLE

(1) : Equatorial section, (2) : Vertical section.

Fig. 3. *Asterocyclina penuria* COLE

(1) : Equatorial section, (2) : Vertical section.

with middle Eocene planktonic Foraminifera, *Orbulinoides beckmanni* SAITO and *Hantkenina dumblei* WEINZIERL & APPLIN.

The detailed paleontological description of all species obtained from the above described locality will be documented and discussed

Table 1. Measurements of equatorial sections of representative specimens.

(1) <i>Asterocyclina matanzensis</i> , (2) <i>A. penuria</i>		
	(1)	(2)
Diameter (mm)	1.650	2.760
Thickness (mm)	0.375	0.950
Diameter of umbo (mm)	—	1.250
Embryonic chambers (μ) :		
Diameter of initial chamber	39—50	270—450
Diameter of second chamber	30—93	240—510
Distance across both chambers	78	480
Thickness of outer wall	6	10
Equatorial chambers (μ) :		
Radial diameter	24—36	60—90
Tangential diameter	24	30—45

Table 2. Measurements of vertical sections of representative specimens.

(1) <i>Asterocyclina matanzensis</i> , (2) <i>A. penuria</i>		
	(1)	(2)
Diameter (mm)	1.750	2.520
Thickness (mm)	0.500	1.170
Diameter of umbo (mm)	—	1.800
Thickness of flange (μ) :		
near umbo	—	330
at periphery	—	120
Embryonic chambers (μ) :		
Length	90	360
Height	45	135
Thickness of outer wall	6	18
Equatorial layer* (μ) :		
Height at center	24	40
Height at periphery	40	40
Lateral chambers :		
Number	12	17
Length (μ)	30—60	30—90
Height (μ)	15	10—20
Thickness of floors and roofs (μ)	5	15—20
Surface diameter of pillars (μ)	30—45	45—75

* Includes thickness of floor and roof.

thoroughly in another paper in the near future.

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