

911. A NEW GENUS OF THE TREMATOPHORATE MILIOLIDS (FABULARIIDAE) FROM THE EOCENE SETOGAWA GROUP, SOUTHWEST JAPAN*

KUNITERU MATSUMARU

Department of Geology, Faculty of Education,
Saitama University, Urawa 338

Abstract. This paper deals with the description and illustration of a new genus of the trematophorate miliolids (Fabulariidae), *Neolacazopsis osozawai*, n. gen., n. sp., from the basaltic and calcareous sandstone of the Eocene Setogawa Group, at Ashikubo-Okugumi, Shizuoka City and at Hasama, Okabe-Cho, both of Shizuoka Prefecture, Japan.

Key words. *Neolacazopsis osozawai*, Eocene, Setogawa Group, Shizuoka Prefecture.

Introduction

In 1989, Soichi Osozawa, Institute of Geology and Paleontology, Tohoku University, discovered two new localities of larger foraminifer bearing-limestone at Ashikubo-Okugumi, northwest of Shizuoka City and Hasama, northwest of Okabe-cho, both of Shizuoka Prefecture, and kindly sent the fossil materials to the author for study (Figure 1). Afterwards, the author visited Osozawa's fossil localities with author's working group in order to gather a number of fossil materials and to get the stratigraphical information. At Ashikubo-Okugumi locality, the fossil-bearing limestone samples were taken as a rolling stone of boulder sized limestone conglomerates from the Setogawa Group. Samples at Hasama locality were taken directly from the basaltic and calcareous sandstone exposure of the Setogawa Group. Both samples from the two localities treated in this paper were studied in detail and they were the same limestone, which contains the trematophorate miliolids (Fabulariidae), other

benthic and planktic foraminifers, calcareous algae, bryozoan, molluscs, echinoids and others.

According to the recent stratigraphical and tectonical studies of Osozawa (1988), the area of the two fossil localities is constituted of the Eocene to lower Miocene Setogawa Group, which consists of pelagic, hemipelagic, and terrigenous sediments with volcanic intercalations. The basaltic and calcareous sandstone of the stratigraphic sequence of the Setogawa Group includes fragments of basalt and limestone. On the whole, Osozawa (*op. cit.*) considered the Setogawa Group to be an accretionary complex on the basis of the occurrences of pelagic sediments on land, repeated stratigraphic sequence caused by reverse faulting and asymmetric folding. Sugiyama and Shimokawa (1981) considered the fossil-bearing limestone to be a special lithology of biosparite in the uppermost part of the Takisawa Formation, Setogawa Group. Formerly, Ishii and Makino (1946) found *Discocyclina* from the limestone of the Setogawa Series and regarded to be of the Danian to Upper Eocene. Recently, Ibaraki (1984) regarded the limestones of the Setog-

*Received February 9, 1990; revised manuscript accepted October 27, 1990

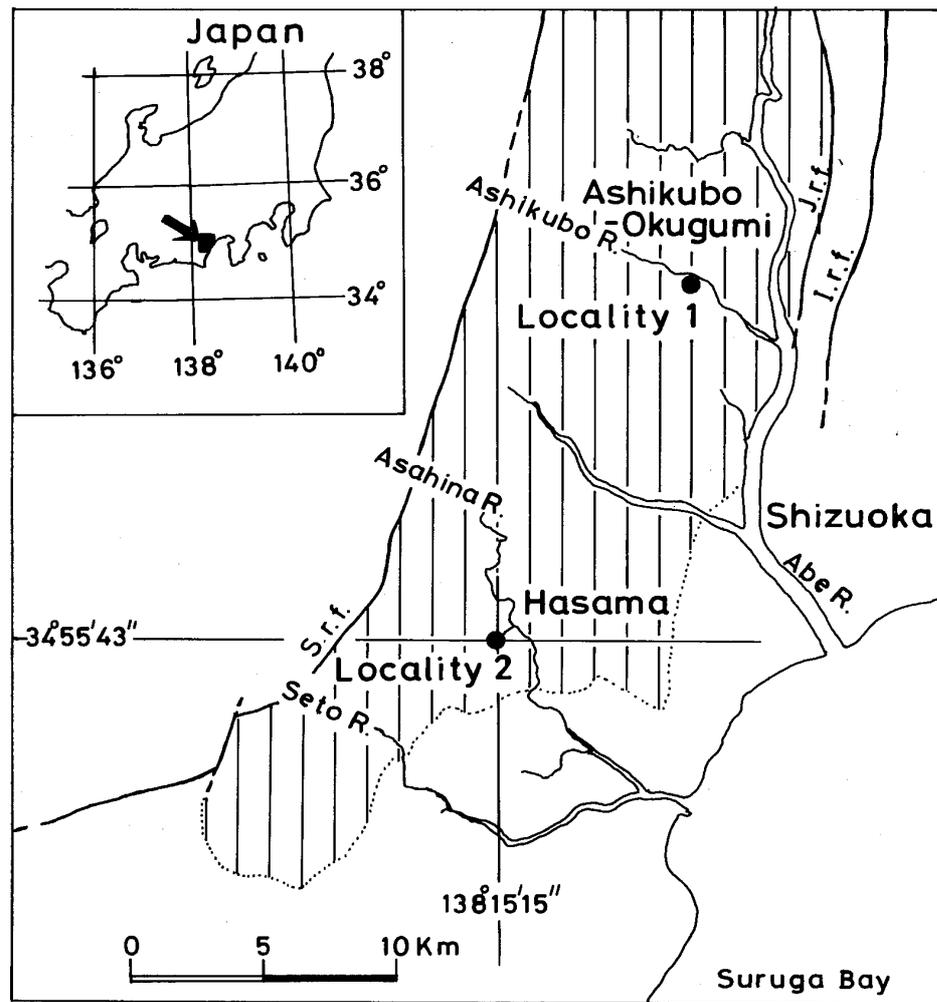


Figure 1. Map showing the fossil locality of the studied area, Shizuoka Prefecture. Vertical lines represent the distribution of the Setogawa Group. S.r.f.: Sasayama reverse fault, J.r.f.: Jyumaiyama reverse fault, I.r.f.: Itoigawa-Shizuoka reverse fault.

awa Group to be assigned to the Middle to Late Eocene (Blow's Zone of P12 to P16) based on planktic foraminifers. As can be seen in Figure 4-1, it is obvious that the age of the fossil-bearing limestone is younger than the Middle Eocene based on the presence of *Triloculina*, ranging from the Middle Eocene to Holocene (Loeblich and Tappan, 1988).

The purpose of this paper is to make the first description and discussion of the new type forms of the trematophorate miliolids in

Japan, and to propose a new genus name *Neolacazopsis* for new type ones, taking *Neolacazopsis osozawai*, n. gen., n. sp., as the type species.

Systematic description

Superfamily Alveolinacea Ehrenberg, 1839

Family Fabulariidae Ehrenberg, 1839

Genus *Neolacazopsis* Matsumaru, n. gen.

Type species.— *Neolacazopsis osozawai*

→ **Figure 2.** *Neolacazopsis osozawai* Matsumaru, n. gen., n. sp. All figures $\times 15$, except $\times 50$ of **2b**; **Locality 2**. **1a-b**, **2a**, lateral views of parts of specimens; **1c**, **2b**, horizontal views, showing the external shape and arrangement of chamberlets; **1d**, Inside of **1a**, showing the arrangement of epidermal chambers and their chamberlets.

911. *A new genus Neolacazopsis from Japan*

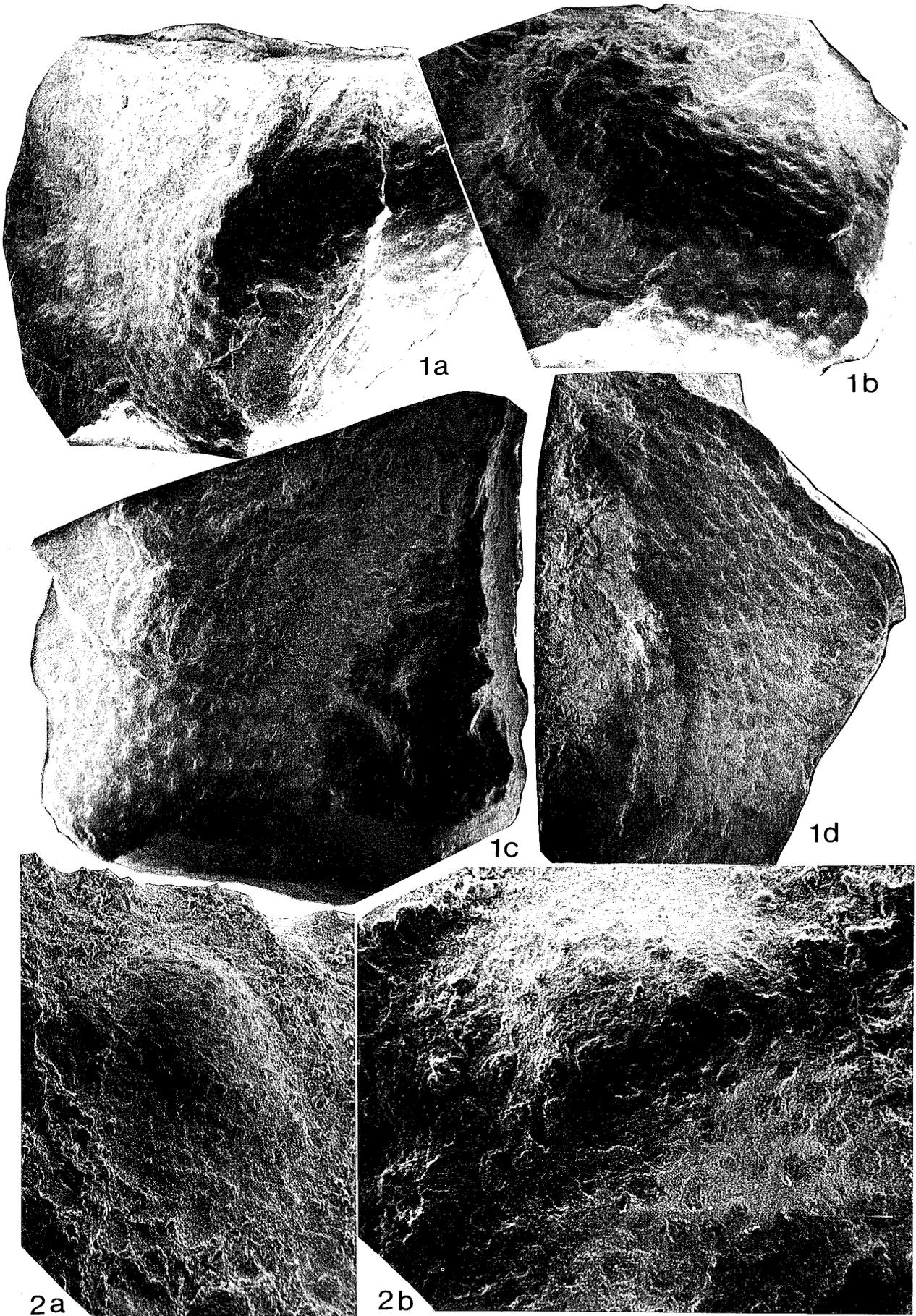
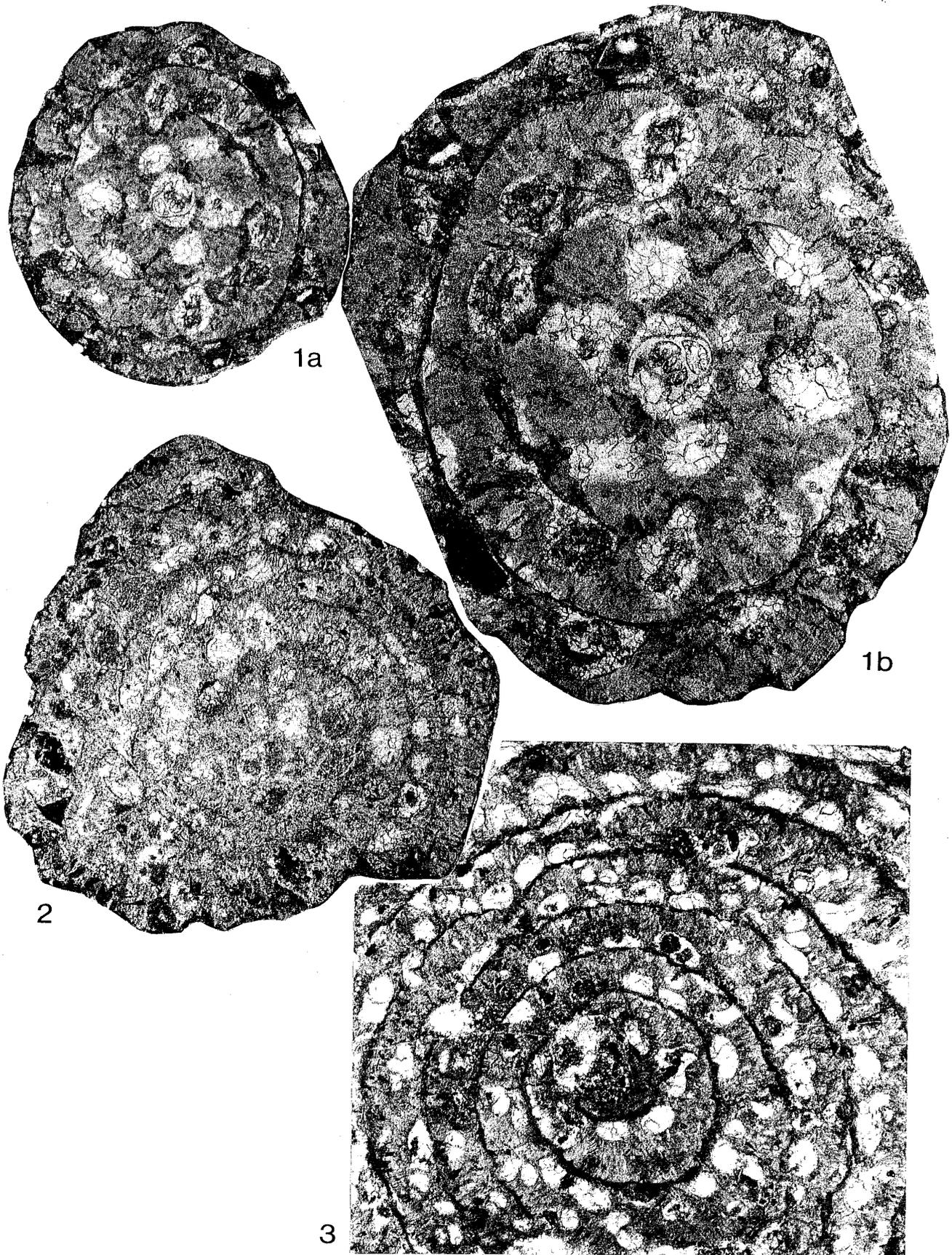




Figure 3. *Neolacazopsis osozawai* Matsumaru, n. gen., n. sp. Equatorial section of a microspheric specimen, holotype, Saitama University, Coll. no. 8804, $\times 10$; Locality 1.

→ **Figure 4.** *Neolacazopsis osozawai* Matsumaru, n. gen., n. sp. All figures $\times 20$, except $\times 40$ of **1b**; Locality 1. **1, 3**, Equatorial sections of both megalospheric specimen (**1**) and microspheric one (**3**); **1b**, Enlarged twice **1a**, showing the large proloculus, which includes *Triloculina* cf. *subvalvularis* Parr, followed by chambers in biloculine arrangement. Paratype, Saitama University, Coll. no. 8805; **2**, Oblique section of a megalospheric specimen.

911. *A new genus Neolacazopsis from Japan*



Matsumaru, n. sp.

Diagnosis.—Test large, elongate ovate in outline; large proloculus followed by chambers in biloculine arrangement in megalospheric form, microspheric test with quinqueloculine at first stage, then triloculine to biloculine, adult of both generations has completely enveloping biloculine chambers added alternately from pole to pole, then followed by enveloping epidermal chambers; biloculine and epidermal chambers subdivided into arcuate to turtle-neck bottle-like form chamberlets by longitudinal and transverse interseptal partitions and pillars among congregations of previous both partitions; wall calcareous, porcellaneous, with thick and finely to coarsely alveolar inner layer, outer layer thin and finely to coarsely perforate, bilamellar; aperture terminal, with a trematophore-like elongate arcuate shape bearing numerous irregular openings separated by anastomosing denticulations or cribrate.

Comparison.—The present genus resembles *Lacazopsis* H. Douvillé 1930, but is distinguished from the latter by having calcareous and porcellaneous wall of test, and trematophore-like aperture. *Lacazopsis* was classified as one of the genus in the Subfamily Fabulariinae Ehrenberg, 1839, of Family Miliolidae Ehrenberg, 1839 by Loeblich and Tappan (1964), but they (1988) rejected *Lacazopsis* as one of the genus taxa erroneously regarded as foraminifers, because of a taxon of an encrusting cheilostome bryozoan. *Neolacazopsis* also resembles *Lacazina* Munier-Chalmas, 1882, but is distinguished from the latter by having an elongate arcuate shape aperture and trematophore, and by having alveolar wall in early stage in microspheric form.

Neolacazopsis osozawai Matsumaru, n. sp.

Figures 2–7

Type material.—Holotype, equatorial section of microspheric specimen, Saitama Uni-

versity Coll. no. 8804 (Figures 3, 4–3). Paratype, equatorial section of megalospheric specimen, Saitama University Coll. no. 8805 (Figures 4–1a–b).

Description.—The microspheric specimens (Figures 3, 4–3, 5, 6, 7) are large elongate ovate test with diameter of 17 to 35 mm, and thickness of 13 to 20 mm. The megalospheric specimens (Figures 4–1–2) are small ovate test with more than 4 mm in diameter and more than 2.2 mm in thickness in some broken specimens. Surface bears widely reticulation, which represents the surface expression of the chamberlet sutures of test walls. The diameter of chamberlet on surface is 100 to 200 μm . The first stage of quinqueloculine chambers in microspheric form has outer diameters of 560 to 580 μm . The second stage of triloculine chambers, which embrace the quinqueloculine, has outer diameters of 750 to 1150 μm . The large megalospheric proloculus is subspherical, with inner diameters of 376 \times 306 μm . The early chambers of both microspheric and megalospheric forms are followed by arcuate to elongate arcuate biloculine chambers added alternately from pole to pole of test, and by elongate arcuate epidermal chambers. The main biloculine chambers in microspheric form in transverse section are with radial diameters of 370 to 380 μm and tangential diameters of 1.2 to 2 mm near the triloculine chambers to radial diameters of 270 to 300 μm and tangential diameter of 8 to 10 mm near the peripheral part of test. Biloculine and epidermal chambers are subdivided into arcuate to turtle-neck bottle-like form chamberlets by longitudinal and transverse interseptal partitions and pillars. Typical chamberlets with dimension of 170 \times 357, 204 \times 408, 238 \times 408, 306 \times 300, 510 \times 272 and 544 \times 272 μm in inner radial and tangential diameters. The wall calcareous and porcellaneous, thick and finely to coarsely alveolar inner layer, outer layer thin and finely to coarsely perforate bilamellar, measuring thickness of 100 to 238 μm near the center to 60 to 100 μm near the periphery. The aper-

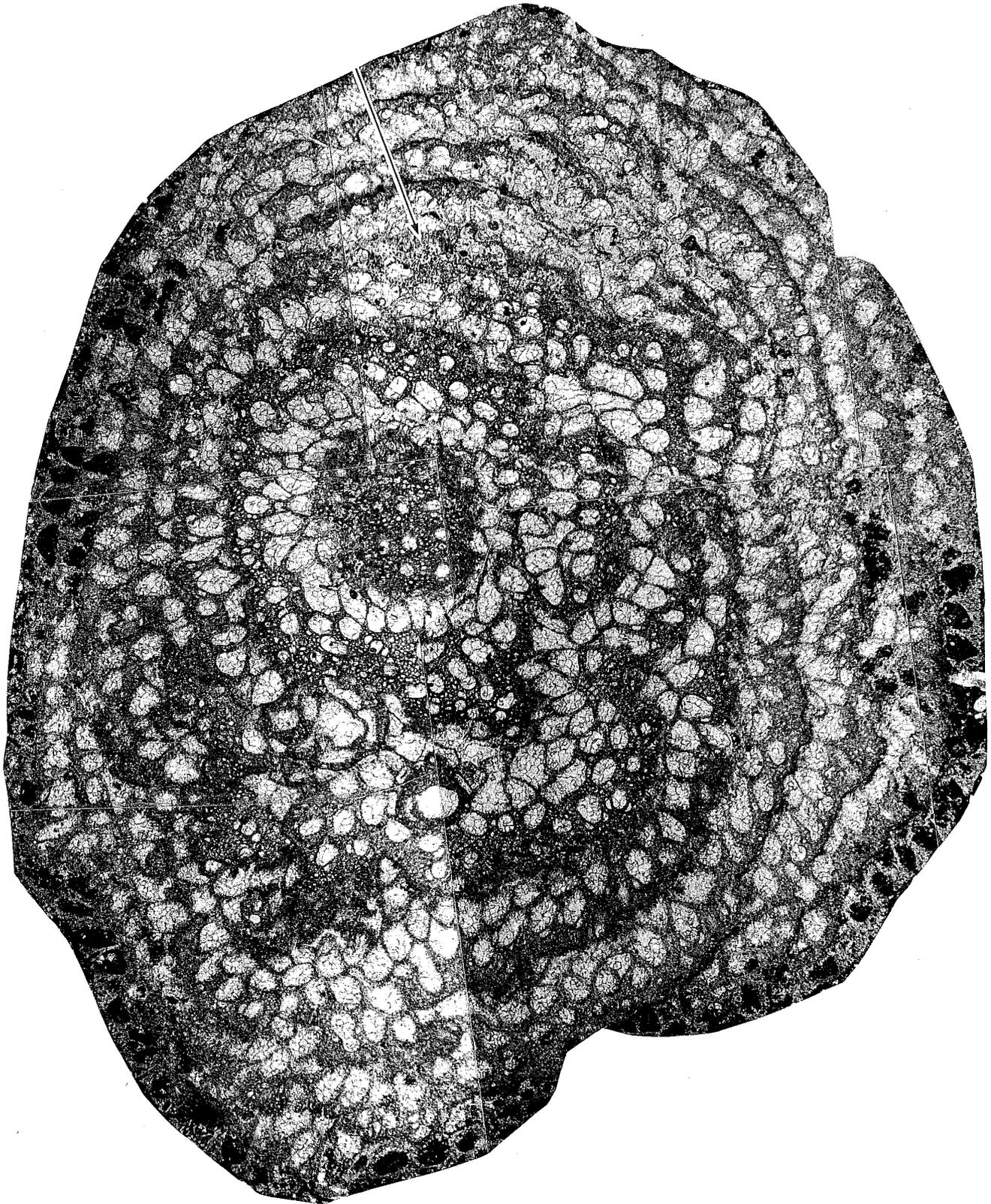


Figure 5. *Neolacazopsis osozawai* Matsumaru, n. gen., n. sp. Tangential section of a microspheric specimen, showing the trematophorate aperture (arrow) and completely enveloping biloculine and epidermal chambers, $\times 15$; Locality 2.



Figure 6. *Neolacazopsis osozawai* Matsumaru, n. gen., n. sp. Transverse section of a microspheric specimen, showing arcuate to turtle-neck bottle-like form chamberlets, $\times 15$; Locality 1.

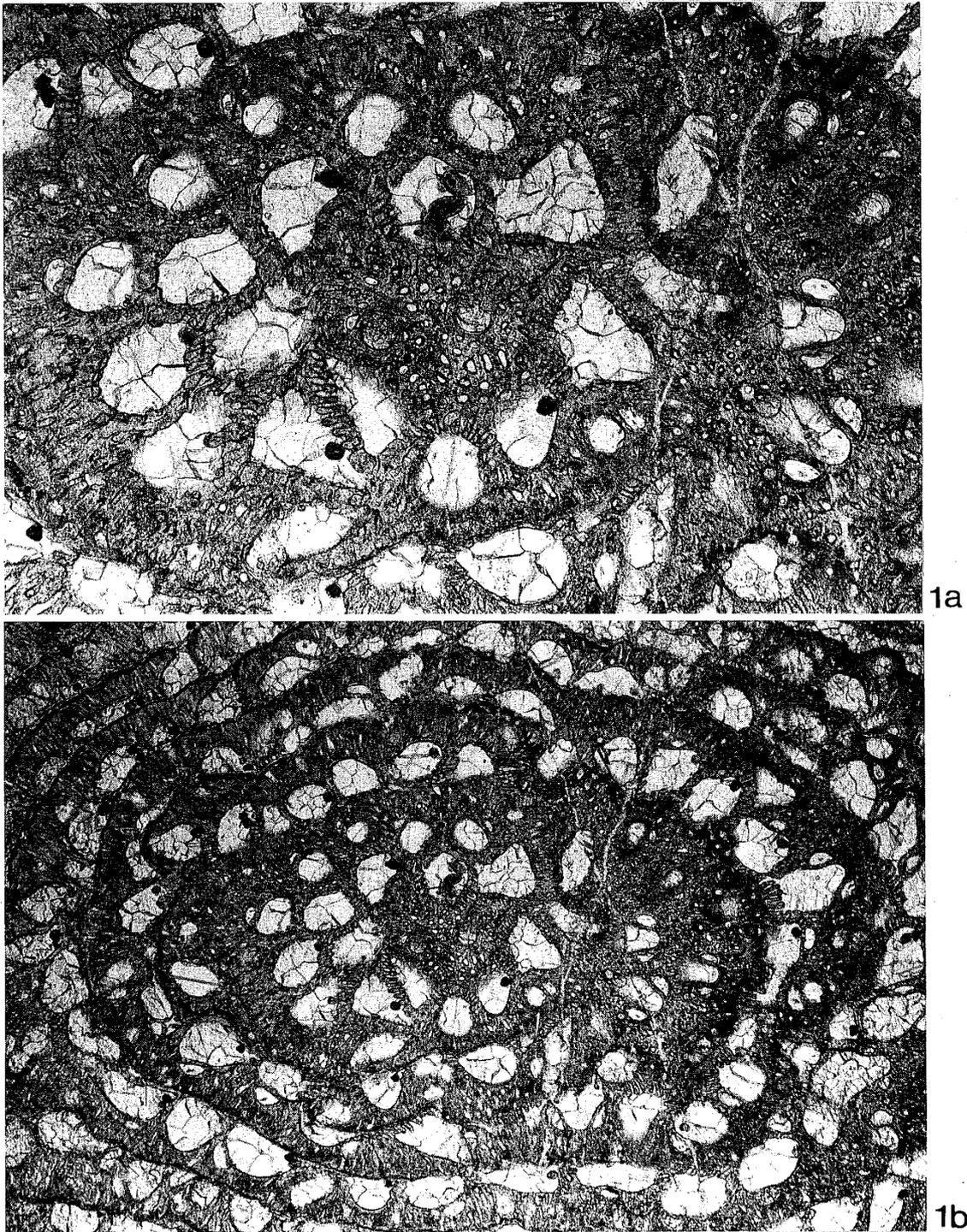


Figure 7. *Neolacazopsis osozawai* Matsumaru, n. gen., n. sp. **1a**, Enlarged of Figure 6 $\times 48$, showing chambers near centre in triloculine arrangement in a microspheric generation, and showing the wall with coarsely alveolar inner layer; **1b**, Enlarged Figure 6 $\times 24$, showing chambers from triloculine to biloculine arrangement, added from pole to pole.

ture at the base of the preceding chamber in tangential section consisting of trematophore with irregular openings (Figure 5).

Locality.—Locality 1 is a tributary river of the Ashikubo River, at the opposite side of Ashikubo-Okugumi, Shizuoka City (35°3'38" N. Lat., 138°19'43" E. Long.) and locality 2 is a tributary river (Kamiiri-sawa) of the Asahina River at the opposite side of Hasama, Okabe-cho, Shida-Gun (34°55'43" N. Lat., 138°15'15" E. Long.), both of Shizuoka Prefecture (Figure 1).

Stratigraphical horizon.—Basaltic and calcareous sandstone, Setogawa Group or Taki-sawa Formation, Setogawa Group.

Geological age.—Middle to Late Eocene.

Remarks.—*Neolacazopsis osozawai*, n. sp. resembles *Lacazopsis termieri* H. Douvillé, 1930 from the Upper Cretaceous (Senonian) in Morocco, northwest Africa, but is distinguished from the latter by having calcareous and porcellaneous wall of test, turtle-neck bottle-like chamberlets, alveolar inner wall and trematophore-like aperture. The present new species differs from *Lacazina compressa* (d'Orbigny) var. *galloprovincialis* Munier-Chalmas and Schlumberger, 1885 from the Senonian, Martigues, France in having turtle-neck bottle-like chamberlets and alveolar inner wall instead of arcuate chamberlets and imperforate inner wall.

Acknowledgment

The appreciation is due to Dr. Soichi Osozawa, Institute of Geology and Paleontology, Faculty of Science, Tohoku University, for his kind offering the fossil materials. Deep appreciations are due to Professor Sumio Sakagami, Department of Geology, Faculty of Science, Chiba University, and Mr. Naotomo Kaneko, Institute of Geology and Paleontology, Faculty of Science, Tohoku

University, for their kind discussion of a Cheilostome bryozoan. Thanks are due to Mr. Hirokazu Asano, Department of Geology, Faculty of Education, Saitama University, for his kind making up of thin sections.

References

- Douvillé, H., 1930: Une Miliolidée géante du Sénonien du Maroc *Lacazopsis termieri*. *Soc. géol. France, Bull., Ser. 4*, vol. 29, nos. 3–5 (1929), p. 245–250, pl. 21.
- Ehrenberg, C. G., 1839: Über die Bildung der Kreidefelsen und des Kreidemergels durch unsichtbare Organismen. *Physik. Abhand. König. Akad. Wissensch. Berlin*, 1838 (1840: separate 1839), p. 59–147.
- Ibaraki, M., 1984: Middle-Late Eocene planktonic foraminiferal faunas from limestones of the Setogawa Group, central Japan. *Trans. Proc. Palaeont. Soc. Japan, N.S.*, no. 135, p. 401–414, pls. 77–79.
- Ishii, M. and Makino, T., 1946: On the *Discocyclina* from the Setogawa Series. *Jour. Geol. Soc. Japan*, vol. 52, no. 610–612, p. 610–612. (in Japanese)
- Loeblich, A. R. and Tappan, H., 1964: Sarcodina, chiefly "Thecamoebians" and Foraminiferida. p. C1–C900. In, Moore, R. C., ed., *Treatise on Invertebrate Paleontology. Protista 2*, vols. 1–2, Univ. Kansas Press and Geol. Soc. America, Colorado.
- , 1988: *Foraminiferal genera and their classification*. 970 p, 847 pls. Van Nostrand Reinhold Co. Inc., New York.
- Munier-Chalmas, E., 1882: Un genre nouveau de foraminifères Sénoniens. *Soc. géol. France, Bull., Ser. 3*, vol. 10 (1881–82), p. 470–471.
- and Schlumberger, C., 1885: Note sur les Miliolidées trématophorées. *Ibid.*, vol. 13 (1884–85), p. 273–323, pls. 13–15.
- Osozawa, S., 1988: Accretionary process of the Tertiary Setogawa and Mikasa Groups, southwest Japan. *Jour. Geol.*, vol. 9, p. 199–208.
- Sugiyama, Y. and Shimokawa, K., 1981: A paleogeographic study of the Paleogene Setogawa Group, Shizuoka Prefecture, central Japan. *Jour. Geol. Soc. Japan*, vol. 87, no. 7, p. 439–456. (in Japanese with English abstract)

911. *A new genus Neolacazopsis from Japan*

673

Ashikubo-Okugumi 足久保奥組, Hasama 羽佐間, Okabe-Cho 岡部町, Setogawa 瀬戸川, Takisawa 滝沢, Kamiiri-Sawa 神入沢, Asahina 朝比奈, Shida-Gun 志太郡.

瀬戸川層群からの Trematophorate miliolids (Fubulariidae 科) の 1 新属: 静岡県静岡市北西の足久保奥組および同県志太郡岡部町羽佐間の神入沢の瀬戸川層群玄武岩質石灰質砂岩から, 始新世中一後期の trematophorate miliolids (Fubulariidae 科) の 1 新属を発見し, 記載した。それは遅沢壮一氏から本研究の機会を得た関係から, *Neolacazopsis osozawai* Matsumaru, n. gen., n. sp. と命名した。この新属新種は *Lacazopsis* 属 (H. Douvillé, 1930) および *Lacazina* 属 (Munier-Chalmas, 1882) に近似し, 詳細に比較検討した。松丸国照
