

A second new species of *Nebularia* (Gastropoda, Mollusca) from the Miocene Katsuta Group in Okayama Prefecture, Southwestern Japan

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Abstract

Nebularia matsudai, a Miocene gastropod is newly described from the Yoshino Formation of the Katsuta Group at Niida, Tsuyama City, Okayama Prefecture.

Key words: *Nebularia matsudai*, Miocene, *Nebularia*, Yoshino Formation, Katsuta Group.

Introduction

Nebularian species are rare in the Miocene of the Chugoku district. *Nebularia nishimotoi* Taguchi and Kawase, 2004, a first Miocene species of *Nebularia* described in this district, was obtained from the Yoshino Formation of the Katsuta Group at Niida, Tsuyama City, Okayama Prefecture. A new species of *Nebularia* has been found at the same locality. This new species is described in this paper.

Systematics

Family Mitridae Swainson, 1831
Subfamily Mitrinae Swainson, 1831
Genus *Nebularia* Swainson, 1840
(=*Chrysame* H. & A. Adams, 1853)

Type species: *Mitra (Nebularia) contracta* Swainson, 1820

Nabularia matsudai Taguchi and Suzuki, new species

(Pl. 1, figs. 1a-2c)

Synonymy: *Chrysame* sp. Taguchi, 2002, pl. 8, fig. 14.

Diagnosis: Fusiform in shape with strong spiral cords. Siphonal canal moderately opened, nearly straight.

Description: Shell small in size, fusiform, moderately thick. Whorls about 6 including two nuclear whorls. Apical angle about 60°. Spiral cords 4 in number in penultimate whorl, irregularly spaced; first spiral appears on at second nuclear whorl and becomes subsutural band immediately above suture; second spiral appears to be the second nuclear whorl and makes a shoulder on each whorl; the other cords starting at third whorl. Weak spiral thread intercalated between spiral cords. Incremental lines make blunt axial costae on penultimate and body whorls. Body whorl sculptured with 30 spiral cords. Aperture elongate oval in shape, occupying about 7/10 of shell height. Periphery elliptical

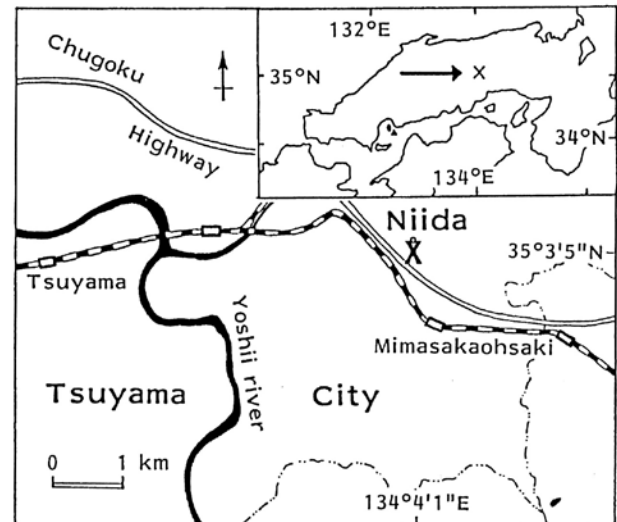
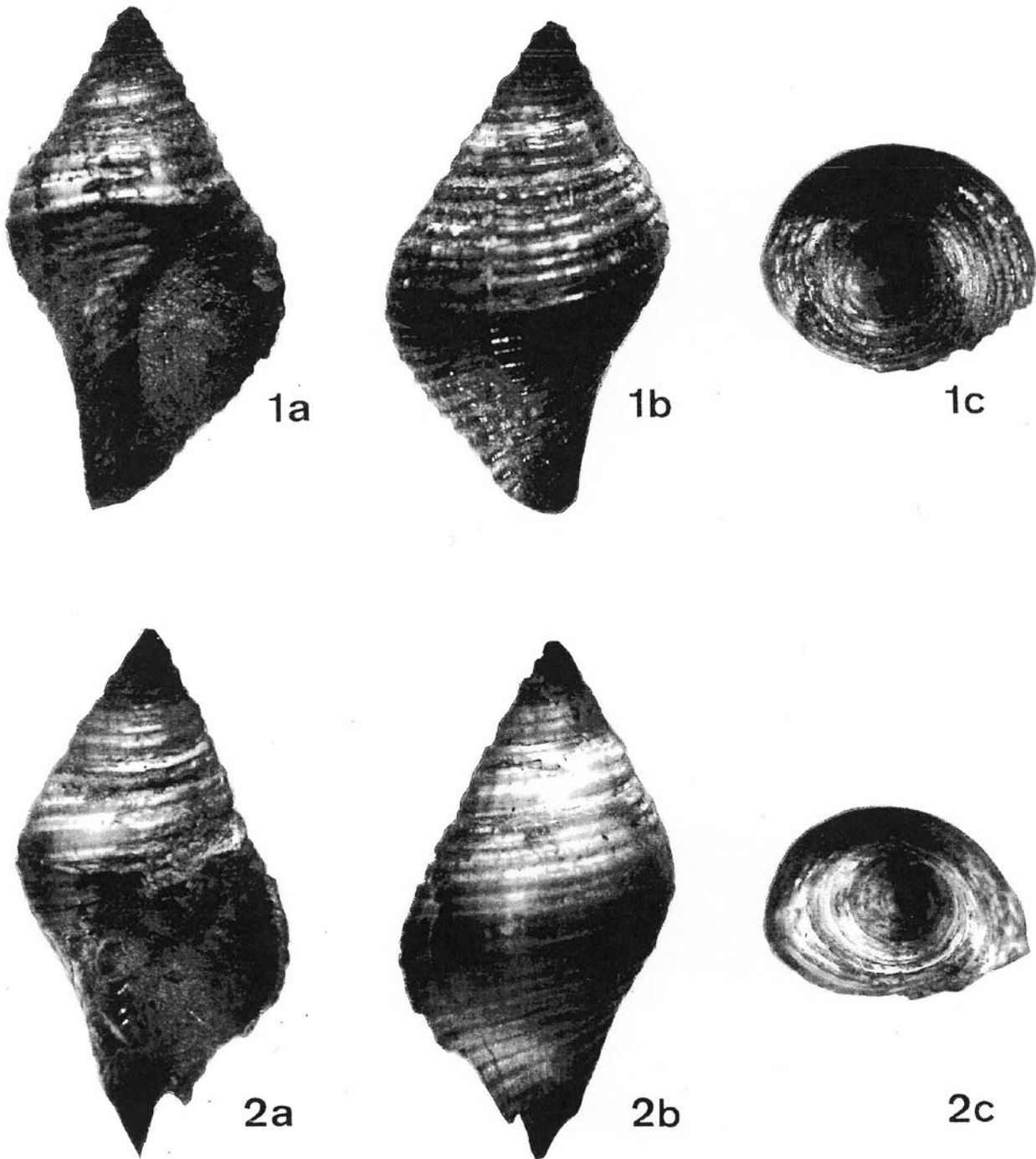


Fig. 1. Location of the type locality of *Nebularia matsudai* n. sp.

in shape. Outer lip broken, but seems to be moderately thick. Inner lip covered with narrow, smooth calus deposit and seems to be ornamented with 5 to 6 columellar folds. Siphonal canal moderately opened, more or less short, nearly straight. Umbilicus closed.

Measurements	Number of whorls	Shell height (in mm)	Maximum of diameter (in mm)
Holotype (MFM20107)	5.5	15.6	9.1
Paratype (MFM20108)	6	17.4	8.8
	Apical angle	Height of aperture (in mm)	Height of aperture / Shell height
	60°	10.6	0.68
	62°	11.2	0.64



Figs. 1 a–c. *Nebularia matsudai* n. sp. holotype, MFM20107; Miocene Yoshino Formation of the Katsuta Group at Niida, Tsuyama City, Okayama Prefecture $\times 3.73$.

Figs. 2 a–c. *Nebularia matsudai* n. sp. paratype, MFM20108; Miocene Yoshino Formation of the Katsuta Group at Niida, Tsuyama City, Okayama Prefecture $\times 3.73$.

Material: Holotype (MFM20107), paratype (MFM20108).

Comparisons: This new species closely resembles *Mitra* (*Nebularia*) *tabanula* Lamarck, 1811, distributed in Okinawa Island and southwards, but is distinguished by its greater number of spiral cords, more rounded shoulder, and thinner outer lip. This species is also similar to *Mitra* (*Nebularia*) *cucumeria* Lamarck, 1811, which lives in the sea off Amami Island and southwards, but differs in having a more slender shell, thin outer lip, and a smaller apical angle.

With respect to the fossil species, this species is allied to *Mitra* *ishidae* Masuda, 1967, from the Miocene of Noto Peninsula. However, the new species differs from *Mitra* *ishidae* in having a smaller number of whorls and a larger apical angle. *Nebularia* *nishimotoi* Taguchi and Kawase, 2004, from the Miocene Katsuta Group occurs at the same stratigraphic position and locality as the new species, but differs in its larger shell, a smaller apical angle, and a larger number of spirals.

Etymology: This new species is named in honor of Mr. Tsuguo Matsuda, principal of Yakage Junior High School, who gave us every encouragement during the course of this study.

Type locality: Niida, Tsuyama City, Okayama Prefecture. The Yoshino Formation of the Katsuta Group (Fig. 1).

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