

Original Article

# Discovery of a rare bivalve species from the Late Cretaceous (Maastrichtian) *Kamuysaurus*-locality of the Hakobuchi Formation, Hobetsu area, Hokkaido, Japan

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**Abstract.** Two specimens of Late Cretaceous bivalve *Tenea japonica* Ichikawa and Maeda (1963) were collected from the *Kamuysaurus*-locality in the Hakobuchi Formation, Hobetsu area, Japan. This species is the first report from Hokkaido, and the northernmost record of the species. This species occurs rarely from the Upper Cretaceous deposits in Hokkaido and is an autochthonous or semi-autochthonous occurrence from just below the *Kamuysaurus*-bearing bed.

**Key words:** articulated, first record, Late Cretaceous, northernmost, *Tenea japonica*

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## Introduction

Late Cretaceous bivalve faunas were well studied in each area of Japan since the 1890s (e.g., Yokoyama, 1890; Nagao and Otatume, 1938; Ichikawa and Maeda, 1963; Tashiro, 1976; Komatsu *et al.*, 2008, etc.). These faunas were widely known because Hayami (1975) reviewed Mesozoic bivalve fauna from Japan.

In Hokkaido, studies of inoceramids were well developed, however, other bivalves were not. Most studies were carried out before the 1930s (e.g., Yehara, 1915; Yabe and Nagao, 1928; Nagao, 1932, 1938; Nagao and Otatume, 1938). Few works have been performed after the 1970s (e.g., Tashiro, 1978, 1994, 1995; Ando and Kodama, 1998; Tsujino and Maeda, 2007; Nishimura and Komatsu, 2022). In contrast, there has been a high activity in the study of ammonoid and inoceramids (e.g., Matsumoto, 1977; Tanabe, 1977, 2022; Noda and Matsumoto, 1988; Maeda, 1987, 1993; Shigeta, 1989, 1993, 2023; Okamoto, 1988a–c, 1989; Toshimitsu and Hirano, 2000; Tanabe *et al.*, 2003; Tsujino *et al.*, 2003; Takahashi, 2005; Nishimura *et al.*, 2006, 2010; Aiba *et al.*, 2016; Muramiya and Shigeta, 2021; Yoshinaga *et al.*, 2024; Nishimura and Maeda, 2025). Probably, this causes most fossils

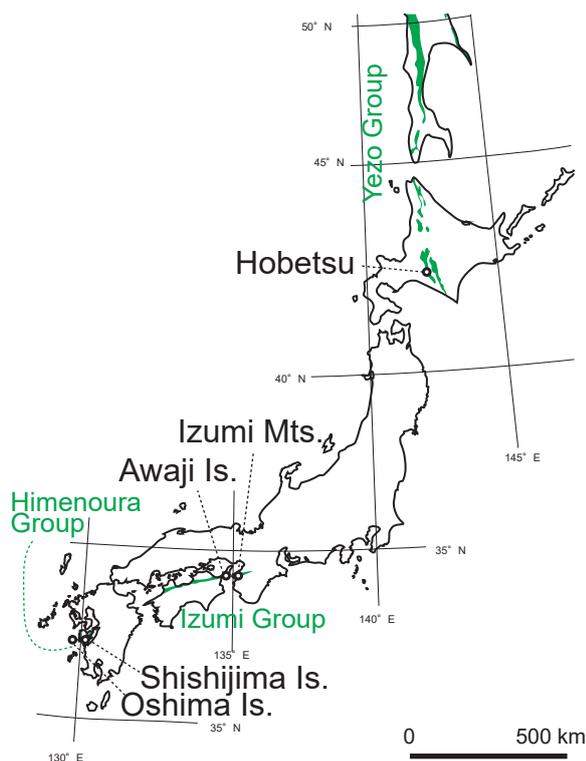
occur in calcareous nodules. In particular, it is difficult to observe the hinge part of the bivalves, because preparation them contained in a calcareous nodule.

In 2013–2014, a middle-sized dinosaur, *Kamuysaurus japonicus* Kobayashi *et al.*, (2019) was excavated by the Hobetsu Museum and Hokkaido University in the Hobetsu area, Hokkaido. Many co-occurring bivalves were also collected from *Kamuysaurus* (HMG-1219)-locality of the Upper Cretaceous Hakobuchi Formation, Hobetsu area, Hokkaido (Figure 1). Most specimens of these fossils do not contain the calcareous nodule, which is contained in the host rock of the sandy mudstone, and is easy to prepare.

In the study, I describe a species of bivalve fossils found from the locality.

## Notes on stratigraphy

The Hakobuchi Formation is the uppermost unit of the Yezo Group, which is a part of Cretaceous to Paleocene forearc basin deposits that crop out in Hokkaido, Japan. The *Kamuysaurus* and associated fossils were discovered from an outcrop of the middle part of IVb rock unit, consisting mainly of sandy



**Figure 1.** Index map showing the distribution of *Tenea japonica* Ichikawa and Maeda, 1963.

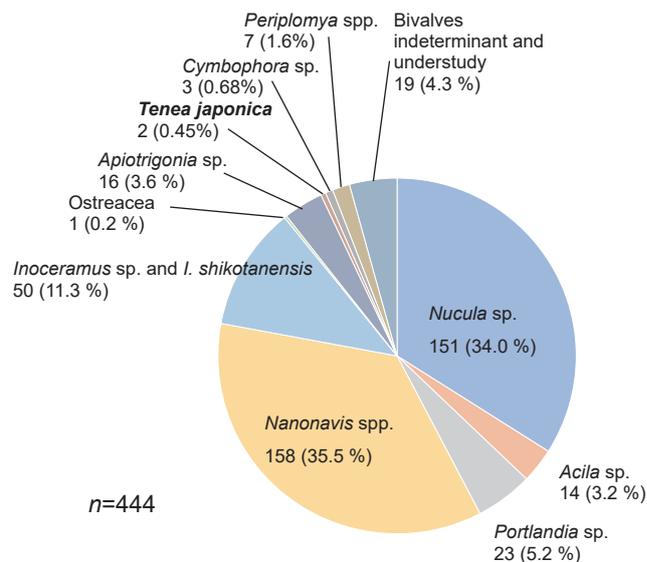
mudstone, along the Shirafunezawa Creek in the northern Hobetsu area, Hokkaido, Japan (Kobayashi *et al.*, 2019). This rock unit is correlated to the lowest Maastrichtian in age and outer shelf deposits (Kobayashi *et al.*, 2019; Legrand *et al.*, 2024).

#### Modes of occurrence of bivalve fossils in the *Kamuysaurus*-locality

Many bivalves and gastropods were collected mainly in the 2013 and 2014 excavations of *Kamuysaurus*. Figure 2 shows the co-occurring bivalves from the excavation of *Kamuysaurus* in 2014 from the outcrop of the *Kamuysaurus*-locality (Kobayashi *et al.*, 2019), which is 20 m thick of sandy mudstone. A total of 444 bivalve specimens occurred in the 2014 excavation. Species of bivalves, such as *Nucula*, *Portlandia*, *Nanonavis*, *Inoceramus*, and *Apiotrigonia*, show a rich occurrence. Only two specimens of *Tenea japonica* occurred from the excavation of 2014.

#### Paleontological description

*Institution abbreviation.*—OCU, Department of



**Figure 2.** Pie chart of the bivalves from the *Kamuysaurus*-locality collected in the 2014 excavation.

Geosciences, Osaka Metropolitan University (previous Osaka City University). HMG, Hobetsu Museum, Mukawa Town, Hokkaido.

Family Veneridae, Rafinesque, 1815

Genus *Tenea* Conrad, 1870

*Tenea japonica* Ichikawa and Maeda, 1963

#### Figure 3

1963, *Tenea japonica* Ichikawa and Maeda, p.131–133, pl. 9, figs. 1, 2a–b, 3, 4

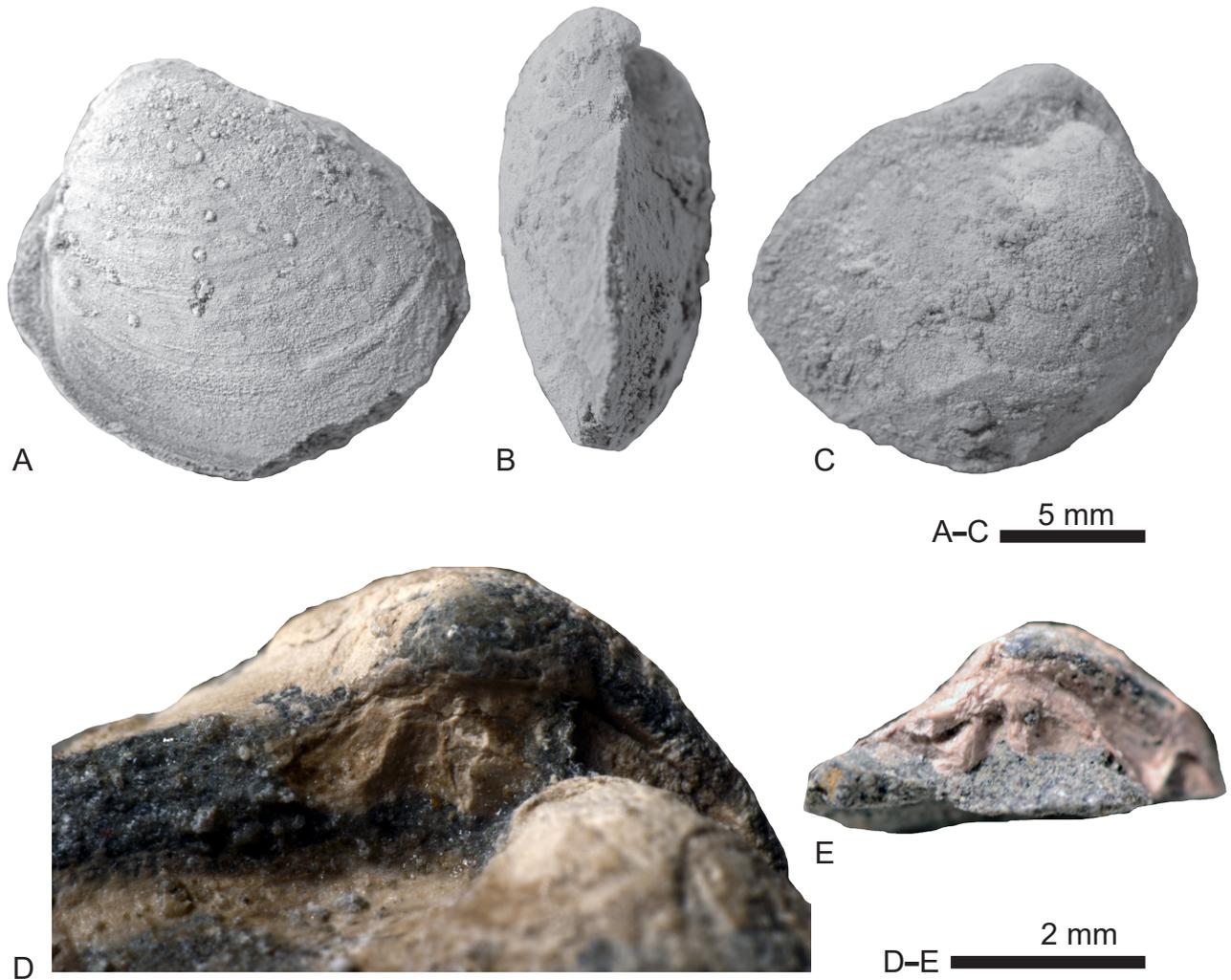
1976, *Tenea japonica* Ichikawa and Maeda, Tashiro, p. 69, pl. 11, figs. 5, 6.

1986, *Tenea japonica* Ichikawa and Maeda, Ichihara *et al.*, table 9.

*Types.*—OCU MM 331, from loc. 51a west of Hansanji, Seidan-cho, Awaji Island, Shichi shale of the Izumi Group.

*Material.*—HMG-2642, 2643

*Description.*— A specimen with both valves was preserved (HMG-2642), and a specimen with the preserved hinge part of the left valve (HMG-2643). Most parts of the right valve are well preserved. Suborbicular, slightly longer than high or nearly as



**Figure 3.** *Tenea japonica* Ichikawa and Maeda, 1963 from the *Kamuysaurus*-locality, Hobetsu area, Hokkaido. A–D. HMG-2642. A. Left valve, B. Posterior view, C. Right valve. D. Teeth of left valve. Without whitening. E. HMG-2643, teeth of left valve. Without whitening.

long as high. Shell length is 15 mm long. A little inequilateral, moderately and evenly inflated, the maximum inflation is a little above the mid-height in position. Umbo subcentral, small, distinctly prosogyrous, and incurved. Valve margin regularly rounded except for the postero-ventral margin. The surface of the shell is smooth with a faint growth line.

The hinge of the left valve is observed. 2a and 2b probably united at the apex, which does not attain the dorsal margin of the hinge. 4a is not preserved.

*Remarks.*— HMG-2642 and 2643 occur from just below the *Kamuysaurus*-bearing bed.

*Occurrence.*—Campanian and Maastrichtian strata of

the Izumi Group in Awaji Island and Izumi Mountains, and of the Himenoura Group in Shishijima and Oshima islands.

### Discussion

*Tenea japonica*, which occurs from the *Kamuysaurus*-locality of the Hakobuchi Formation of the Hobetsu area, that lives there because of both valves being preserved. It is difficult to distinguish the autochthonous or semi-autochthonous occurrence, because the fossil orientation of two specimens of *Tenea* is not registered.

*Tenea japonica*, which are reported in this study shows a rare occurrence. In the *Kamuysaurus*-locality,

only two specimens of *Tenea japonica* occur, that is 0.45 % of the total 444 specimens of bivalves that were excavated in 2014 (Figure 2). In the Hakobuchi Formation of the Hobetsu area, rich bivalve fossils occur from the lower middle Campanian *Sphenoceras orientalis* Zone, the lowest Maastrichtian *Pachydiscus japonicus* Zone, and the lower Maastrichtian *Gaudryceras izumiense* Zone. A part of these bivalve fossils was reported only in Nagao and Otatume (1938) except for inoceramids. *Tenea japonica* of HMG-2642 and 2643 are the only specimens among these bivalves from the Campanian–Maastrichtian Hakobuchi Formation of the Hobetsu area.

*Tenea japonica* is first discovered in Hokkaido, northern Japan in the present paper. This species was found in the Shishijima and Oshima islands, Himenoura Group, and the Awaji Island and Izumi Mountains, Izumi Group, Southwest Japan (Figure 1). The discovery of the specimen is the northernmost record and a significant finding revealing the paleoecology of the species.

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西村智弘, 2026, 北海道穂別地域の函淵層産後期白亜紀恐竜カムイサウルスと共産した産出が稀な二枚貝化石. むかわ町穂別博物館研究報告, **41**, 9-14.

(要 旨)

北海道穂別地域函淵層のカムイサウルス骨化石層直下から後期白亜紀二枚貝 *Tenea japonica* Ichikawa and Maeda, 1963 を2個体発見した。これは北海道で初めての産出報告で、本種の最北端の記録となる。北海道からの本種の産出は極めて稀であり、カムイサウルス骨化石の直下から現地性もしくは準現地性で産出した。