

# The first record of *Mesoturrilites* (Ammonoidea) from Hokkaido (Studies of the Cretaceous ammonites from Hokkaido and Sakhalin — LXXXIII)

TATSURO MATSUMOTO and AKITOSHI INOMA

c/o Faculty of Science, Kyushu University, Fukuoka 812-8581, Japan

6-29-19 Daida, Setagaya, Tokyo 155-0033, Japan

Received September 3 1998; Revised manuscript accepted 22 November 1998

**Abstract.** Several small specimens collected years ago by A.I. from a locality in the Soeushinai area of Hokkaido are now identified as *Mesoturrilites boerssumensis* (Schlüter, 1876). The species has been reported from the Lower Cenomanian of western and central Europe and western Asia. Our material is also referred to the Lower Cenomanian on the biostratigraphic evidence. This may be the first record of *Mesoturrilites* in the northern Pacific region.

**Key words:** Cenomanian, geographic distribution, Hokkaido, *Mesoturrilites*, Pacific region, Turrilitidae

## Introduction

A number of species belonging to *Mariella*, *Pseud-helicoceras*, *Ostlingoceras*, *Neostlingoceras*, *Turrilites* and *Hypoturrilites* of the family Turrilitidae [Ammonoidea] show worldwide distribution. Some of them occur fairly commonly in the Upper Albian and Cenomanian strata in Japan, although many of them are waiting for complete descriptions. In this paper a species of *Mesoturrilites* from Hokkaido is described.

## Stratigraphic setting

The area concerned, called "Soeushinai", was geologically mapped by Hashimoto *et al.* (1965) and has been recently reinvestigated by Nishida *et al.* (1996, 1997, 1998a, b). According to these authors, a thick series of strata called the Middle Yezo Subgroup of late Albian through Turonian age, is extensively exposed in this area. The subgroup is subdivided into Members My1 to My8 in a revised scheme of Nishida *et al.* (1996, fig. 10). The specimens described below were contained in a transported nodule obtained by A.I. in 1959. That nodule was collected in the upper reaches of the Sanjussen-zawa, a tributary of the River Uryu. The nodule is interpreted as a derivative from Member My3. This member consists primarily of mudstones which have sometimes fine-grained sands or sandy laminae and contain commonly calcareous nodules. Ammonoids occur fairly abundantly in Member My3 together with inoceramids and other mollusks. Some of them were described by Matsumoto and Inoma (1975, 1991) and Inoma (1980) and also amply listed by Nishida *et al.* (1996, 1997). The fauna forms the Assemblage Zone of *Graysonites adkinsi*, indicating the lower part of the Lower Cenomanian.

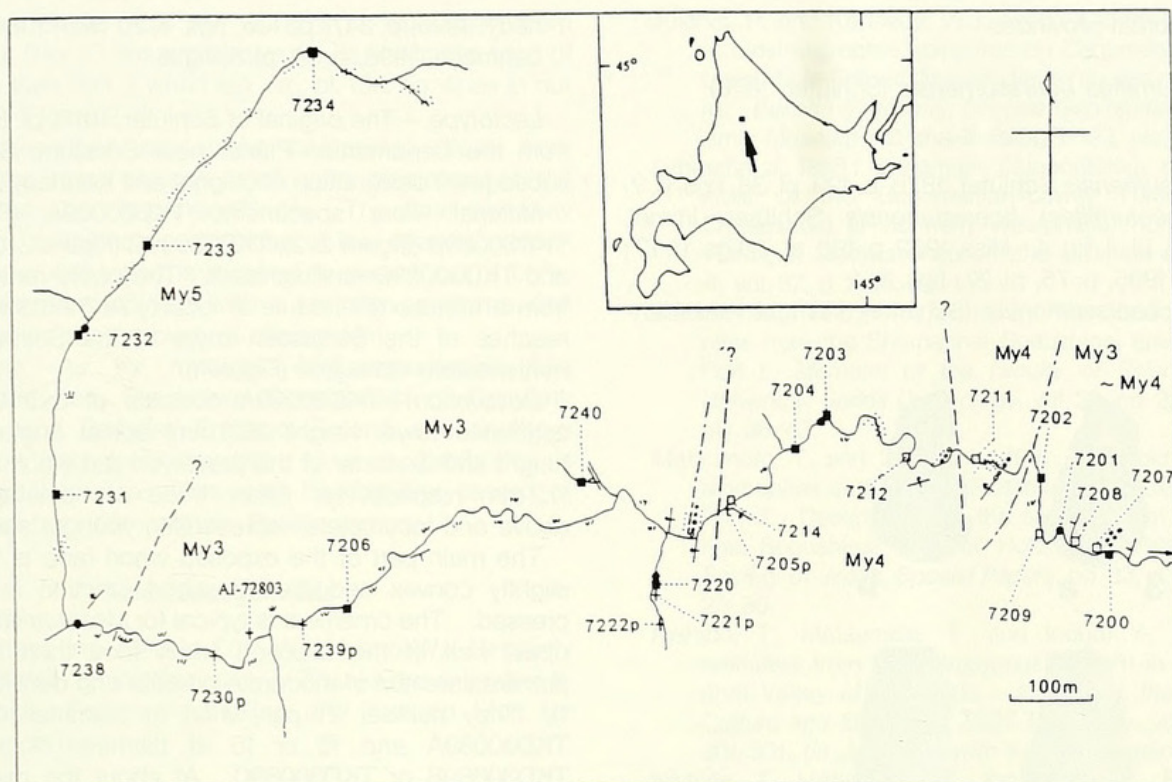
The overlying Member My4 is composed of ill-sorted conglomerates in some parts and predominant sandstones with some mudstones and conglomerates in other parts. It is poor in fossils. The succeeding Member My5 consists mainly of mudstones which contain numerous inoceramids with some associated ammonoids, representing the rest of the Cenomanian.

The Inoma's locality, numbered AI-72803, is concisely indicated in a map by Matsumoto and Inoma (1975, fig. 2) and more precisely in Figure 1. A fossiliferous nodule contains small specimens of *Algericeras proratum* (Coquand) and *Euhystrioceras* cf. *nicaisei* (Coquand) besides those of *Mesoturrilites* described herein. At another locality, R7239p, about 70m NEE of AI-72803, Y. Kawashita and N. Egashira obtained another ammonite which is identified by T.M. with *Gabbiceras yezoense* Shigeta. The three ammonite species indicate an early Cenomanian age and the mudstones around the above localities are referable to Member My3. Incidentally, as a result of Y. Inoue's examination of foraminifera, the strata exposed in the source area of the Sanjussen-zawa, including localities R7238, R7231, R7232, R7233 and R7234, have proved to be Member My5 (middle to upper part of the Cenomanian) (for details see Nishida *et al.*, 1998a). The two members My3 and My5 are probably in fault contact (Figure 1).

## Repository

The specimens described below have numbers with the prefix TKD, which is the abbreviation of "Tokyo Kyoiku Daigaku [Tokyo University of Education]", where A.I. was a student. Since this university was closed, A.I.'s collection of ammonoids from the Soeushinai area under TKD numbers has been temporarily stored in the Department of Geology,





**Figure 1.** Route map along the upper course of the Sanjussen-zawa, cited from Nishida *et al.*, 1998a by permission. Inset is a map of Hokkaido in which the Soeushinai area is indicated by an arrow. Small solid circle: megafossil (in situ), cross: ditto (transported nodule), solid square: microfossil sample, empty square: rock sample, tiny empty circle: conglomerate, dots: sandstone, grass: no outcrop, blank along the route: mudstone, broken line: fault (inferred), chain: boundary of lithostratigraphic units (members). All the locality numbers should have prefix R, except for AI-72803.

Kyushu University in Fukuoka, but they should be eventually returned to the Department of Geosciences, Tsukuba University, Tsukuba, 305-0006 Japan, which is the new guise of the TKD.

### Morphological terms

For the morphological terms used to describe the turrilitid ammonoids, we follow those of Wright and Kennedy (1996). Setting the apex of the turril shell at the top, the terms upper and lower or adapical and adapertural [=adoral] are defined and the rows of tubercles or ribs on the face of each whorl are described in descending order as the first, the second and so on.

### Palaeontological description

Order Ammonoidea Zittel, 1884  
Suborder Ancyloceratina, Wiedmann, 1966  
Family Turrilitidae Gill, 1871  
Genus *Mesoturrilites* Breistroffer, 1953

*Type species.*—*Turrilites aumalensis* Coquand (1862, p. 323, pl. 35, fig. 5), by original designation of Breistroffer (1953, p. 1351).

*Diagnosis.*—Turrilitid ammonoid with four rows of tubercles

or ribs; the upper row made up of ribs or rounded tubercles, the second and the third rows spirally elongated tubercles on semicontinuous, narrow ridges separated by a groove; the fourth row of weak tubercles at the outer edge of the lower whorl surface; faint ribs may be elongated from the fourth row of tubercles toward a narrow umbilicus.

*Remarks.*—The lectotype and paralectotypes of the type species have been photographically illustrated by Wright and Kennedy (1996, text-fig. 146A–G).

At present five species are known in *Mesoturrilites*. The distinction between species is based on the size of the apical angle, mode of ribbing and/or tuberculation, whorl shape etc. Atabekian (1985, p. 75) referred *Turrilites colcanapi* Boule, Lemoine and Thévenin, 1907 to *Mesoturrilites*. However, we agree with Spath (1937, p. 523) and also Wright and Kennedy (1996, p. 323) on their assignment of *T. colcanapi* to *Ostlingoceras*.

The phylogenetic origin of *Mesoturrilites* is uncertain, but it can likely be sought in some form of *Mariella*. A sulcate variety of *Mariella oehlerti* (Pervinquière) may be a candidate, as Pervinquière (1910, p. 55, pl. 5, fig. 17) has already mentioned its affinity to *Mesoturrilites aumalensis*. Wright and Kennedy (1996, p. 346) have suggested *Mariella bicarinata* (Kner) as another allied form.

The type species and some other species of *Mesoturrilites* have been recorded from the Lower Cenomanian of both the



Tethys and Boreal provinces.

***Mesoturrilites boerssumensis* (Schlüter, 1876)**

Figures 2 and 3

*Turrilites boerssumensis* Schlüter, 1876, p. 129, pl. 38, figs. 6, 7.

*Turrilites* (*Mesoturrilites*) *boerssumensis* Schlüter. Immel, 1979, p. 636, pl. 4, fig. 4; Hiss, 1982, p. 190, pl. 7, figs. 11, 12; Atabekian, 1985, p. 75, pl. 27, figs. 3, 4.

*Mesoturrilites boerssumensis* (Schlüter). Wright and Ken-

nedy, 1996, p. 347, pl. 105, figs. 4, 20 (with full synonymy); Lehmann, 1998, p. 36, pl. 5, fig. 5.

**Lectotype.**—The original of Schlüter, 1876, pl. 38, figs. 6, 7, from the Cenomanian Pläner near Börssum, Germany, by subsequent designation of Juignet and Kennedy (1976, p. 67).

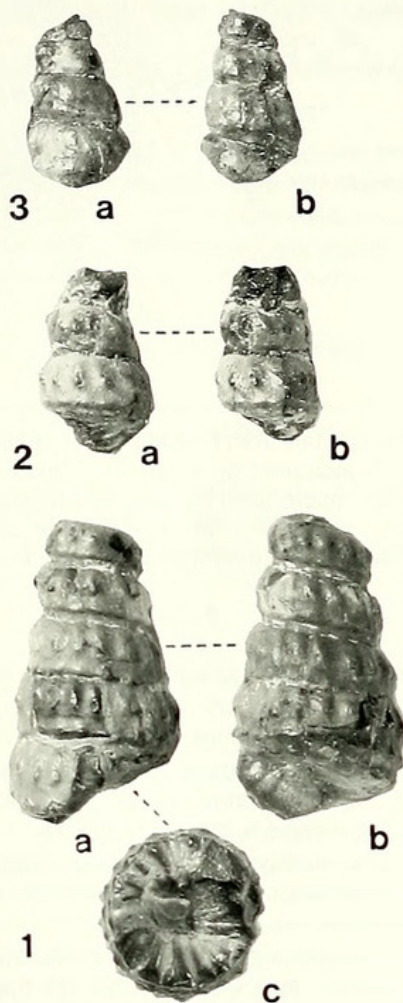
**Material.**—Four specimens, TKD30089A (Figure 2-1), TKD30089B (Figure 2-2), TKD30089C (Figure 2-3; Figure 3) and TKD30089D (unillustrated). They were removed by A.I. from a transported nodule at locality AI-72803 in the upper reaches of the Sanjussen-zawa of the Soeushinai area, northwestern Hokkaido (Figure 1).

**Description.**—TKD30089A consists of four whorls with estimated tower height 23.3 mm, apical angle about 19°, height and diameter of the preserved last whorl 5.4 mm and 11.2 mm respectively. Other three are smaller than the above and incomplete, representing younger stages.

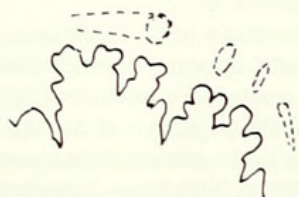
The main part of the exposed whorl face is flattened or slightly convex and the interwhorl junction is feebly impressed. The ornament is typical for *Mesoturrilites*. On the upper half of the exposed whorl face there are slightly prorsiradiate ribs of moderate breadth and density (Figure 2-1). They number 21 per whorl at diameter of 11 mm in TKD30089A and 16 or 15 at diameter 7 or 6 mm in TKD30089B or TKD30089C. At about the middle of the whorl face the ribs terminate at tubercles of the first row. These tubercles are subrounded at the base and pointed at the top, as far as the test is well preserved. The tubercles of the second row are narrowly clavate and rest on a blunt spiral ridge. They correspond in number to the tubercles of the first row but are displaced adaperturally. The space between the first and the second rows of tubercles forms a smooth band and may appear to be slightly concave on the internal mould. The tubercles of the third row are narrowly clavate and aligned along the narrow ridge along the lower seam of the whorl. The narrow interspace between the second and the third rows of clavi is distinctly sulcate. As is shown by TKD30089A, the spiral groove between the second and third rows of semi-continuous ridges is immediately above the interwhorl junction in early growth stages, but later it is covered by the shell layer of the succeeding whorl (Figure 2-1). The tubercles of the fourth row are close to those of the third row, but they are aligned on the outer margin of the lower whorl face. Weak ribs run from them toward a narrow umbilicus, showing slightly rursiradiate curvature (Figure 2-1c).

A septal suture of a young stage is exposed on the whorl face of TKD30089C. As is shown in Figure 3, the saddle E/L is much broader than L/U. The relative disposition of the tubercles with respect to the sutural elements is shown in the same figure.

**Discussion.**—The specimens described above are undoubtedly identified with *Mesoturrilites boerssumensis* (Schlüter, 1876), redefined by Wright and Kennedy (1996, p. 347). In view of the variation of the rib density with growth and between individuals, the 17 ribs to a whorl specified in Schlüter's (1876, p. 636) description may not be incorrect. Hiss (1982, p. 190) counted 20 ribs on an example from Westphalia. Wright and Kennedy (1996, p. 347) estimated



**Figure 2.** *Mesoturrilites boerssumensis* (Schlüter). 1. TKD30089A, two lateral (a, b) and basal (c) views. 2. TKD30089B, two lateral (a, b) views. 3. TKD30089C, two lateral (a, b) views. All  $\times 2$ .



**Figure 3.** *Mesoturrilites boerssumensis* (Schlüter). Suture of TKD30089C, showing relative position of the ribs and tubercles by dotted lines. Approximately  $\times 8$ .



as many as 24–26 ribs per whorl in a specimen from England, but 9 or 10 ribs are shown on its illustrated face of slightly less than half a whorl (*op. cit.*, pl. 105, fig. 4) as in our TKD30089A (Figure 2-1).

Hitherto described specimens, comprising those from Hokkaido, are more or less small, with diameters of the preserved last whorl less than 25 mm. The small size may be, therefore, a diagnostic character of this species. However, further investigation is required to search out a completely preserved specimen with a rostrate peristome and also to examine the problem of dimorphism.

**Occurrence.**—As for material. *M. boerssumensis* has been reported from the Lower Cenomanian of Germany (Westphalia and Bavaria), England, Poland and southern Turkmenistan (see synonymy list). Now its distribution is extended to Hokkaido. This may be the first record of *Mesoturrillites* from the northern Pacific region.

### Acknowledgements

We are much indebted to C.W. Wright and W.J. Kennedy for their kind help during this study. Thanks are extended to Tamio Nishida, Seiichi Toshimitsu and Kazuko Mori for practical support.

### References cited

- Atabekian, A.A., 1985: Turrillids of the late Albian and Cenomanian of the southern part of the USSR. *Academy of Sciences of the USSR, Ministry of Geology of the USSR. Interdepartmental Stratigraphic Committee of the USSR, Transactions*, vol. 14, p. 1–112, pls. 1–34. (in Russian)
- Boule, M., Lemoine, P. and Thévenin, A., 1907: Céphalopode crétacés des environs de Diego-Suarez. *Annales de Paléontologie*, vol. 2, p. 1–56, pls. 1–8.
- Breistroffer, M., 1953: L'évolution des Turrillidés albiens et cénomaniens. *Comptes Rendus Hebdomadaires des Sciences de l'Académie des Sciences*, vol. 237, p. 1349–1351.
- Coquand, H., 1862: Géologie et paléontologie de la région sud de la Province de Constantine. *Mémoires de la Société d'Émulation de la Provence, Marseille*, vol. 2, p. 1–320, 321–341 (supplement), pls. 1–35.
- Hashimoto, W., Nagao, S. and Kanno, S., 1965: Soeushinai. *Explanatory Text of the Geological Map of Japan, scale 1: 50,000*, p. 1–92, quadrangle map. Geological Survey of Hokkaido. (in Japanese with English abstract)
- Hiss, M., 1982: Ammoniten des Cenomans von Südrand der westfälischen Kreide zwischen Unna und Möhnesee. *Paläontologische Zeitschrift*, vol. 56, p. 177–208, pls. 7–9.
- Immel, H., 1979: Cenoman-Ammoniten aus den Losensteiner Schichten der Bayerischen-Alpen. In: Wiedmann, I. ed., *Aspekte der Kreide Europas. International Union of Geological Sciences, Ser. A*, vol. 6, p. 607–644, 4 pls.
- Inoma, A., 1980: Mid-Cretaceous ammonites from the Shumarinai-Soeushinai area, Hokkaido. Part 2. *Professor Saburo Kanno Memorial Volume, Tsukuba*, p. 167–183, pls. 21–22.
- Juignet, P. and Kennedy, W.J., 1976: Faunes d'ammonites et biostratigraphie comparée du Cénomaniens du nord-ouest de la France (Normandie) et du sud de l'Angleterre. *Bulletin trimestriel, Société Géologique Normandie Amis Muséum Havre*, vol. 63, p. 1–193, pls. 1–34.
- Lehmann, J., 1998: Systematic palaeontology of the ammonites of the Cenomanian–Lower Turonian (Upper Cretaceous) of northern Westphalia, north Germany. *Tübingen Geowissenschaftliche Arbeiten (TGA), Reihe A*, vol. 37, p. 1–58, pls. 1–5.
- Matsumoto, T. and Inoma, A., 1975: Mid-Cretaceous ammonites from the Shumarinai-Soeushinai area, Hokkaido. Part 1. *Memoirs of the Faculty of Science, Kyushu University, Series D, Geology*, vol. 23, no. 2, p. 263–293, pls. 38–42.
- Matsumoto, T. and Inoma, A., 1991: The mid-Cretaceous ammonites of the family Kossmaticeratidae from Japan. Part 3. Descriptions of the species from the Shumarinai-Soeushinai area of Hokkaido. *Palaeontological Society of Japan, Special Papers*, no. 33, p. 103–122, pls. 25–30.
- Nishida, T., Matsumoto, T. and Inoue, Y., 1998a: Foraminifera from the Cretaceous System in the Shumarinai Valley of Hokkaido. *Journal of the Faculty of Culture and Education, Saga University*, vol. 3, no. 1, p. 301–331. (in Japanese with English abstract)
- Nishida, T., Matsumoto, T., Kawashita, Y., Egashira, N., Aizawa, J. and Ikuji, Y., 1997: Biostratigraphy of the middle part of the Cretaceous Yezo Group in the Soeushinai area of Hokkaido—with special reference to the transitional part from Lower to Upper Cretaceous: supplement—. *Journal of the Faculty of Culture and Education, Saga University*, vol. 1, no. 1, p. 237–279. (in Japanese with English abstract)
- Nishida, T., Matsumoto, T., Kawashita, Y., Egashira, N. and Aizawa, J., 1998b: Characteristics of the Cretaceous stratigraphy in the Shumarinai Valley of Hokkaido. *Journal of the Faculty of Culture and Education, Saga University*, vol. 1, no. 2, p. 143–181. (in Japanese with English abstract)
- Nishida, T., Matsumoto, T., Yokoi, K., Kawashita, Y., Kyuma, Y., Egashira, N., Aizawa, J., Maiya, S., Ikuji, Y. and Yao, A., 1996: Biostratigraphy of the Cretaceous Middle Yezo Group in the Soeushinai area of Hokkaido—with special reference to the transitional part from Lower to Upper Cretaceous—. *Journal of the Faculty of Education, Saga University*, vol. 44, no. 1, p. 65–149. (in Japanese with English abstract)
- Pervinquière, L., 1910: Sur quelques ammonites du Crétacé algérien. *Mémoires de la Société Géologique de France, Paléontologie* 17, mémoire 42, p. 1–86, pls. 1–7.
- Schlüter, C., 1876: Cephalopoden der oberen deutschen Kreide. *Palaeontographica*, vol. 24, p. 121–264, pls. 36–55.
- Spath, L.F., 1937: A monograph of the Ammonoidea of the Gault, part 12. *Monograph of the Palaeontographical Society*, London, p. 49–540, pls. 57–58.
- Wright, C.W. and Kennedy, W.J. 1996: The Ammonoidea of the Lower Chalk, part 5. *Monograph of the Palaeontographical Society, London*, no. 601, p. 320–403, pls. 95–124.



---

Hokkaido 北海道, Sanjussen-zawa 三十線沢, Shumarinai 朱鞠内, Soeushinai 添牛内, Uryu 雨竜,  
Yezo 蝦夷

---



Matsumoto, Tatsuro and Inoma, Akitoshi. 1999. "The first record of Mesoturrilites (Ammonoidea) from Hokkaido: (Studies of the cretaceous ammonites from Hokkaido and Sakhalin-LXXXIII)." *Paleontological research* 3, 36–40.

**View This Item Online:** <https://www.biodiversitylibrary.org/item/124459>

**Permalink:** <https://www.biodiversitylibrary.org/partpdf/82864>

**Holding Institution**

Smithsonian Libraries and Archives

**Sponsored by**

Biodiversity Heritage Library

**Copyright & Reuse**

Copyright Status: In Copyright. Digitized with the permission of the rights holder

License: <http://creativecommons.org/licenses/by-nc-sa/3.0/>

Rights: <https://www.biodiversitylibrary.org/permissions/>

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.