SCIENCE REPORT OF THE YOKOSUKA CITY MUSEUM, NO. 26, pp. 13-20, pl. 5
October, 1979

Two ornate ammonites from the Urakawa Cretaceous area, Hokkaido

(Studies of the Cretaceous ammonites from Hokkaido and Saghalien—XXXVIII)

Tatsuro MATSUMOTO* and Yasumitsu KANIE**

(With 3 text-figures and 1 plate)

北海道浦河地域白亜系産の装飾性アンモナイト2種

松本達郎*・蟹江康光**

浦河統の名の由来した北海道浦河地方は，古くから白亜紀アンモナイトの産出で有名であるが，国際対比に有効な部類であるアカントセラス超科・その他の装飾性アンモナイトの産出が，他地域に比べてきわめて乏しかった。この程，当地域の大絵笛で，浦河統上部階（K 5b）に当たる部分から，そういう部類のアンモナイト種を採集したので，産地記録を詳述し，古生物学的記載を行なった。2種中のその1は *Texanites* (*Plesiotexanites*) *yezoensis* MATSUMOTO に同定され，その2は断片的ではあるが，*Praemuniericeras* (?) n. sp. として記載した。ともにサントニアン階を示す。浦河地方白亜系は，最近微化石とマクロ化石の対比の見地からも重要視されているので，示準化石級のこの種のアンモナイトの産出は有意義であり，今後も探求していきたい。

Introduction

The Urakawa area is celebrated for the abundant occurrence of the Upper Cretaceous marine fossils. Since the description by YOKOYAMA (1890), many geologists visited there and we ourselves, though independently for the most time, did field works at a number of times. Although the results were published previously (e.g. MATSUMOTO, 1942; KANIE, 1966), there remains much to be done. One of us (Y. K.) is now doing a cooperative work with micro-palaeontologists to establish there more clearly the scheme of biostratigraphic classification.

This area is the nominal type area of the Urakawan. The Urakawan Series was comprehensively proposed by YABE (1927), without designating the type sequence. It was biostratigraphically redefined by MATSUMOTO (1943), whose scheme depended on syntypic sequences of several areas as indicated in table 5 of that paper. One of us (T. M.) is going to give a clearer redefinition of the stages and substages, denominating them simply K1, K2, K3, K4, K5, K6 and their

* 西南学院大学・九州大学 c/o Department of Geology, Kyushu University 33, Fukuoka, 812 Japan.
** 横須賀市博物館 Yokosuka City Museum, Yokosuka, 238 Japan.
Manuscript received June 29, 1979. Contribution from the Yokosuka City Museum, No. 279.

subdivisions K1a, K1b, etc., with designation of the typical sequences in representative areas (i.e. the best one and other subsidiary ones—that may correspond with the lectotype and paralectotypes in concept), and also with indication of the characteristic species of ammonoids, inoceramids and some other mega-fossils (MATSUMOTO, 1980 in press). In that definition, the Urakawan is marked as K5 and is best represented by the sequences along the River Ikushumbets and its tributaries in the Mikasa district. The Urakawa district is taken as one of the areas where subsidiary sequences of K5 (and also K6) are observable. This procedure was taken, because the species of a shorter stratigraphical range were known to occur more frequently in the Ikushumbets area than in other areas.

In fact, most of the common ammonite species from the Upper Cretaceous of the Urakawa area are long ranging. They belong to the Phylloceratidae, Tetragonitidae, Gaudryceratidae, Nostoceratidae, Diplomoceratidae, Desmoceratidae, Kossmaticeratidae and Pachydiscidae. No example of the Collignoniceratidae has been found there. This was too bad especially for international correlation.

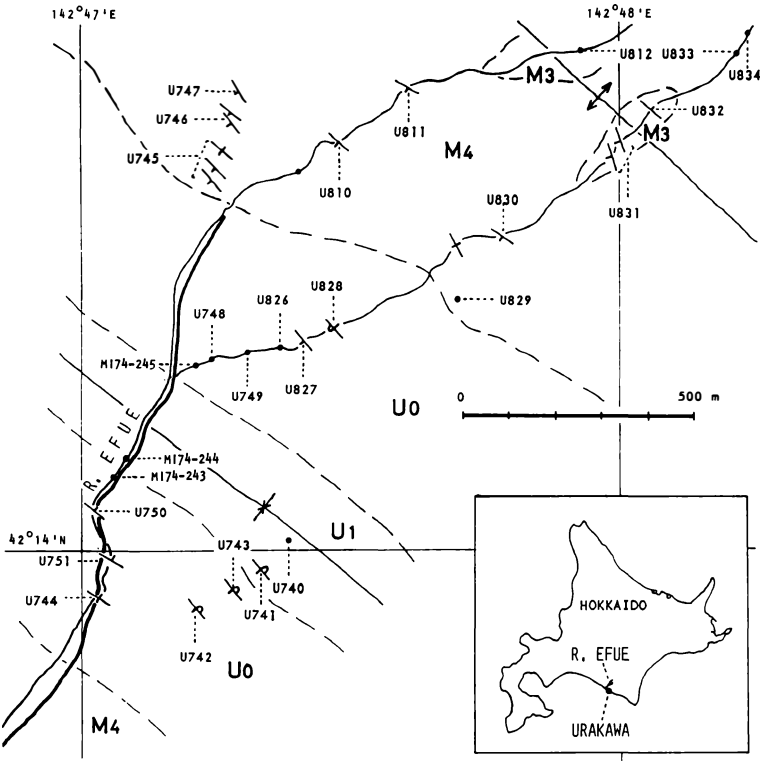
Recently, however, one of us (Y. K.), with assistance of Mr. T. HORII, has obtained two ammonites of ornate groups from the equivalent of K5 in the Urakawa area. They have been palaeontologically investigated by the other of us (T. M.). This paper is to report the result of our study.

Geological setting

Despite the famous name of Urakawa for the occurrence of fossils, the geologic structure of the Urakawa area is fairly complex. The Cretaceous strata are considerably folded, thrust and faulted, and, furthermore, displaced by transverse faults. They outcrop mainly along several streams and on the coast, and the exposures are often interrupted by vegetation and other coverings. We have to compile the observed sequences along a number of routes into a summarized scheme. As a revised work is in progress, a short stratigraphic note is given for the sequences in a small area around the localities of ammonites under consideration.

The ornate ammonites described below were collected at localities U 741 p and U 740 p in a small tributary of the River Efue by Y. KANIE and T. HORII. They were preserved in calcareous nodules washed out into the stream. As the valley is small, they must have been derived from the original country rocks (claystones) which were exposed close to the respectively numbered localities. The area shown in text-fig. 1 is made up of the upper part of the Middle Yezo Group (M_3 and M_4) and the lower part of the Upper Yezo Group (U_0 and U_1), which altogether form a syncline, with its axis not far from loc. U740, and an anticline to the northeast about 1100 m distant from that syncline.

The stratigraphic sequence investigated by one of us (Y. K.) in this local



Text-fig. 1. Route map of the Efue (Oefue) area around the ammonite localities, based on Y. KANIE's field work. See text for the stratigraphic units, M_3, M_4, U_0 and U_1. Inset at the lower right corner the outline map of Hokkaido, indicating the location of Urakawa.

area is as follows in ascending order (Text-fig. 2), with indication of characteristic fossils:

Unit M_3 (upper part): fine-grained sandstone, 120 m in thickness.

Unit M_4: siltsone in the lower part, followed by alternating mudstone and sandstone in the upper part, 340 m; *Anagudryceras limatum* (YABE) at loc. U745; foraminifera of a Turonian assemblage (MAIYA, personal comm.)

Unit U_0: claystone, with some sandstone on the southern wing, 320 m, and about 300 m on the northern wing; *Inoceramus* (*Inoceramus*) *uwajimensis* YEHARA at locs. U750, U828, etc. and foraminifera of a Coniacian assemblage (MAIYA, personal comm.)

Unit U_1: claystone, 60 m (exposed part); *Inoceramus* (*Platyceramus*) cf. *amakusensis* NAGAO and MATSUMOTO (loc. U740p1), *I.* (*P.* ?) cf. *japonicus* NAGAO and MATSUMOTO (U740p2), *I.* (*Sphenoceramus*) *naumanni* YOKOYAMA (U740p2), *Damesites semicostatus* MATSUMOTO (U740p4), *Kitchinites* (*Neopuzosia*) sp. (U740p2), *Eupachydiscus* sp. (U740p2) and foraminifera of a Santonian assemblage (MAIYA, personal comm.)

As the exposures are discontinuous, the boundary of U_0 and U_1 in text-fig. 1 is provisional. In the typical sequence on the route of the upper reaches of the River Chinomi, about 7 km east of the Efue, Units U_0 and U_1 are better exposed and a layer of laminated tuffaceous sandstone marks the base of U_1. This key bed does not seem to be extended to the Efue valley. Anyhow, on the evidence of fossils, especially of inoceramid species and foraminifera investigated by MAIYA (details omitted here; see MAIYA and TAKAYANAGI, 1977 for the general account), U_0 is K5a (Coniacian) and U_1 is K5b (Santonian). In the Ikushumbets and other well studied areas, K5b is subdivisible into two parts, K5b1: Zone of *I.* (*P.*) *amakusensis* and K5b2: Zone of *I.* (*P.* ?) *japonicus*. As the specimens comparable with these two zonal species are obtained as washed out nodules at loc. U740p1, p2, substage K5b1 and also a part of K5b2 can be expected in U_1 of this Efue sequence. This should be, of course, confirmed by the fossils occurring in situ from the successive strata.

Palaeontological description

Family Collignoniceratidae

Subfamily Texanitinae

Genus *Texanites* SPATH, 1932

Remarks.—See MATSUMOTO, 1970 (pp. 266–280) for the definition, classification and affinities of this genus.

Texanites (*Plesiotexanites*) *yezoensis* MATSUMOTO

Pl. 5, fig. 1; Text-fig. 3

1970. *Texanites* (*Plesiotexanites*) *yezoensis* MATSUMOTO, *Mem. Fac. Sci., Kyushu Univ.*, [D], **20**, (2), p. 294, pl. 44, fig. 2.

Material.—YCM.Ur 741001, from U741p, Efue (Oefue).

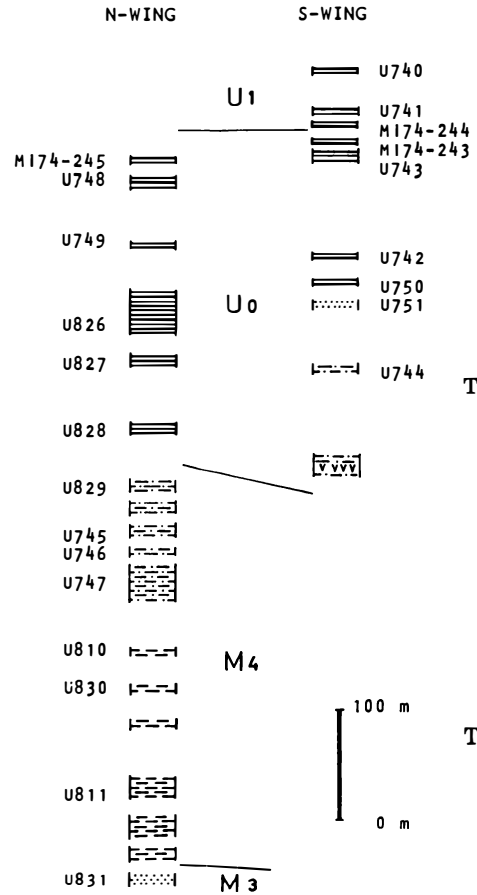
Description.—The specimen is incomplete and in part eroded but shows some diagnostic features.

The preserved last whorl, if restored, would be slightly more than 170 mm in diameter, but as only a posterior fraction of the body-chamber is preserved, the entire shell would have been still larger. The shell is evolute and the whorl enlarges rather slowly; the umbilicus is fairly large, although its proportion to the shell diameter is hardly estimated on the incompletely preserved outer whorl. Approximate measurements (in mm) on the next inner whorl are as follows:

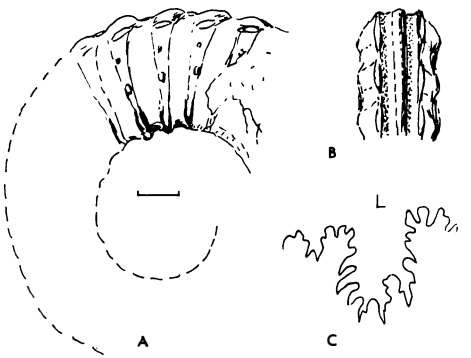
Diam.=90.0, Umb.=36.0 (.40) Height=32.0, Breadth=*Ca.* 26, B./H.=.72

The whorl is higher than broad and subrectangular in section. The subtrapezoidal shape of the outer whorl may owe to secondary deformation.

The ribs are simple, slightly prorsiradiate, fairly strong and coarse, separated by a concave interspaces which are somewhat broader than the ribs. They are



Text-fig. 2. Stratigraphic sequences of the Upper Cretaceous in the Efue (Oefue) area mapped in text-fig. 1.
Ruled: claystone, broken lines: siltstone; dotted: sandstone, chain: alternating standstones and shale, v: tuff.



Text-fig. 3. Diagrammatic sketch of a part of the inner whorl of YCM.Ur 741001, *Texanites yezoensis* MATSUMOTO. Lateral (A) and ventral (B) views (bar indicates 10 mm) and a part of the suture (C).
(T. M. *delin.*)

club-shaped, provided with tubercles in five rows; the umbilical tubercle is bullate, the inner lateral pointed or shortly bullate, the outer lateral smaller and less prominent than the inner lateral, and the two ventrolateral ones clavate, of which the outer one is more remarkably so. The distance between the umbilical and the inner lateral tubercles is somewhat longer than that between each two of others.

The suture has a broad lateral lobe (L) of roughly subrectangular outline and massive bifid saddle between E and L, narrower saddle between L and smaller U2.

Discussion.—All the observable characters agree well with the diagnosis of *T.* (*Plesiotexanites*) *yezoensis* MATSUMOTO, which was established on the holotype from K5b of the Ikushumbets area and on several paratypes from K5 of the Ikushumbets and the Yubari areas. Therefore the specimen from Efue is identified with *T.* (*P.*) *yezoensis*, although the trituberculate early stage is not confirmed on account of the poor preservation of the inner whorl.

Family Muniericeratidae

Genus Praemuniericeras COLLIGNON, 1966

Type-species.—*P. proprium* COLLIGNON, 1966.

Diagnosis.—See COLLIGNON, 1966, p. 13.

Praemuniericeras (?) n. sp.

Pl. 5, fig. 2

Material.—YCM.Ur 740010, from loc. U740p3, Efue (Oefue).

Description.—This is a fragmentary body-whorl of about 120°. It is higher than broad and fastigate in section, although there is an effect of secondary compression. The apparent whorl-height is 48 mm. The umbilicus seems to be narrow. The flank is rather flat, gently inflated at the middle and convergent towards the venter. It has numerous short ribs on the outer half. They are curved forward on the ventrolateral part and sometimes bifurcated. They end on the venter with an indistinct tubercle or elevation.

Periodically a few ribs are extended inward towards the umbilical margin. Some of them have bullate tubercle at the middle of the flank but no tubercle is perceptible at the umbilical end of the long ribs. The rib may sometimes branch at the lateral tubercle. A shallow and wide depression runs along the periodic long rib, but it is almost imperceptible on the inner half.

The venter is unfortunately incompletely preserved, but partly preserved clavi at the mid-venter seem to be separated by a smooth zone from the clavi at the end of the ribs.

Discussion.—This specimen represents a species of some genus which belongs to the family Muniericeratidae, although it is deficient for precise identification.

In the attenuated ornamentation and the high whorled shape, this species is similar to *Praemuniericeras tsarahotanense* COLLIGNON (1966, p. 45, pl. 473, fig. 1928), from the Middle Santonian (Zone of *Texanites hourcqui*) of Madagascar. That species has, on the late part of its body-whorl, umbilical tubercles and their ribs end at a broader elevation.

Our specimen somewhat resembles the holotype of *Praemuniericeras primum* COLLIGNON (1966, p. 31, pl. 460, fig. 1881), from the Lower Santonian (Zone of *Taxanites oliveti*) of Madagascar. Although the ornamentation is rather weak in that species, it has more numerous longer ribs which arise from a blunt umbilical tubercle. COLLIGNON's figure seems to show a lateral tubercle like that of ours on at least one of the long ribs, although this was not mentioned in his text.

The presence of reminiscent constrictions suggests an affinity with the ancestral genus *Tragodesmoceras* SPATH, 1922.

To sum up, our specimen probably represent a new species of *Praemuniericeras* (?), but we need better preserved material to establish the new species.

Concluding remarks

The two ammonites of ornate groups, probably derived from Unit U_1 at U741p and U740p3 of Efue (Oefue) in the Urakawa district, are identified with (1) *Texanites* (*Plesiotexanites*) *yezoensis* MATSUMOTO and (2) *Praemuniericeras* (?) n. sp., respectively.

T. (*P.*) *yezoensis* has hitherto been known to occur in the Upper Urakawa (K5b) of the Ikushumbets valley of the Mikasa district and also that of the Yubari district. This confirms the Santonian age of Unit U_1.

Numerous species of *Praemuniericeras* have been known from the Middle Santonian and a few of the same genus from the Lower Santonian of Madagascar, whereas species of *Muniericeras* occur in the Upper Santonian (Zone of *Pseudoschloenbachia umbulazi*) of Madagascar, as clearly shown by COLLIGNON (1966). Our specimen, though poorly preserved, is somewhat allied to *Praemuniericeras primum* COLLIGNON, from the Lower Santonian, and to *P. tsarahotanense* COLLIGNON, from the Middle Santonian. Anyhow, it would be a Santonian species.

The Urakawa area is one of the important fields where Cretaceous microbiostratigraphy can be coordinated with macro-biostratigraphy, as suggested by MAIYA and TAKAYANAGI (1977). The present discovery of ornate ammonites encourages us for further collecting and also to improve this cooperative work.

Acknowledgements

We are much indepted to Dr. S. MAIYA for valuable information about microfossils. Thanks are extended to Mr. T. HORII and Dr. K. TANABE for kind helps in the field and the laboratory. This work is a part of the results of the cooperative study (No. 334043) (leader: Professor Y. TAKAYANAGI), which was undertaken with a grant in aid of the Ministry of Education, Science and Culture (Monbusho), Japan. It is also a contribution to the Working Group of the Coniacian-Maastrichtian Stages (leader: Prof. F. SCHMID) of the IUGS Subcommission on Cretaceous Stratigraphy (Chairman: Prof. Tove BIRKELUND).

References cited

COLLIGNON, M. 1966. *Atlas des Fossiles Caracteristiques de Madagascar* (Ammonites), 14 (Santonien): 1–134, pls. 455–513, Serv. Géol. Rep. Malagache, Tananarive.

KANIE, Y. 1966. The Cretaceous deposits in the Urakawa district, Hokkaido (in Japanese with English abstract). *Jour. Geol. Soc. Japan*, **72**(7): 315–328.

MAIYA, S. and TAKAYANAGI, Y. 1977. Cretaceous foraminiferal biostratigraphy of Hokkaido. *Palaeont. Soc. Japan Spec. Pap.*, **21**: 41–51.

MATSUMOTO, T. 1942–43. Fundamentals in the Cretaceous stratigraphy of Japan. Part I. *Mem. Fac. Sci., Kyushu Univ.*, [D], **1**(3): 129–210, pls. 5–20 (1942); Parts II & III. *Ibid.*, **2**(1): 97–237 (1943).

——— 1970. A monograph of the Collignoniceratidae from Hokkaido. Part IV. *Ibid.*, **20**(2): 225–304, pls. 30–47.

——— 1980 (in press). Biostratigraphic subdivision of the Cretaceous System in the Japanese-East Asian province. — Definition and inter-regional correlation. *In* KAUFFMAN, E. G. and HATTIN, D. E. ed. *The North Temperate Cretaceous*. Dowden, Hutchinson & Ross, Inc.

MATSUMOTO, T. and HARAGUCHI, Y. 1978. A new texanitine ammonite from Hokkaido. *Trans. Proc. Palaeont. Soc. Japan,* N. S., (110) : 305–318, pl. 42.

SPATH, L. F. 1922. On the Senonian ammonite fauna of Pondoland. *Trans. Roy. Soc. South Africa,* **10**(3) : 113–147, pls. 5–9.

YABE, H. 1927. Cretaceous stratigraphy of the Japanese Islands. *Sci. Rept. Tohoku Imp. Univ.,* [2], **11**(1) : 27–100, pls. 3–9.

YOKOYAMA, M. 1890. Versteinerung aus der japanische Kreide. *Palaeontographica,* **36**: 159–202, pls. 18–25.

Explanation of plate 5

Fig. 1. *Texanites yezoensis* MATSUMOTO .....Page 16
Lateral view of YCM.Ur 741001, from loc. U741p, Efue (Oefue) of the Urakawa district, ×1.

Fig. 2. *Praemuniericeras* (?) n. sp. .....Page 18
Lateral view of YCM.Ur. 740010, from loc. 740p3, Efue (Oefue) of the Urakawa district, ×1.

Y. KANIE photos, with whitening.

Chinomi (乳呑), Efue (絵笛), Ikushumbets (幾春別), Mikasa (三笠), Oefue (大絵笛), Urakawa (浦河), Yubari (夕張)


1
2