

Note on a Species of *Romaniceras* from the Cretaceous of Hokkaido

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Abstract An ammonite specimen which can be identified with *Romaniceras kallesi* (ZÁZVORKA), known from the Middle Turonian of Europe, was obtained from the Middle Turonian of the Obira area of northwestern Hokkaido. It is described and illustrated in this paper, as it is the first record of *R. kallesi* from the northwestern Pacific region. The Obira specimen is somewhat larger than the hitherto described specimens from Europe. Some of the umbilical tubercles are nodose and strong on its body-chamber, and the suture is best shown in this specimen.

We have noticed that the holotype of *Romaniceras pseudodeverianum* (JIMBO, 1894) somewhat resembles this specimen and also an example of *R. kallesi* from Spain described by WIEDMANN (1960). We suggest that the two species are closely allied to each other or that *R. kallesi* (ZÁZVORKA, 1958) could be a synonym of *R. pseudodeverianum* (JIMBO, 1894). This should be determined through a future study of the variation of this (or these) species.

Introduction

On the occasion of a field work in 1980 one of us (S.U.) obtained an acanthoceratid ammonite from the Turonian of the Obira area, northwestern Hokkaido. After his preliminary study it was sent to the other of us (T.M.) for further study. It can be identified with *Romaniceras kallesi* (ZÁZVORKA, 1958) but also shows a close affinity to *Romaniceras pseudodeverianum* (JIMBO, 1894). In this paper the obtained specimen is described and the relationship between the two nominal species is discussed.

Palaeontological Description

Family Acanthoceratidae de GROSSOUVRE, 1894

Subfamily Euomphaloceratinae COOPER, 1978

Genus *Romaniceras* SPATH, 1923

Studies of the Cretaceous Ammonites from Hokkaido-XLVII. The serial number follows XLVI—MATSUMOTO, T., 1984: A new tetragonitid ammonite from Hokkaido (*Proc. Japan Acad.*, 60B: 33–35) and XLV—MATSUMOTO, T., 1894: A gigantic ammonite from northern Hokkaido (*Rept. Geol. Surv. Hokkaido*, (55): 21–28, pls. 1–2), although the numbering was not indicated in these two papers.

Type species: Ammonites deverianus d'ORBIGNY, 1841 by the original designation of SPATH, 1923.

Remarks: This genus has been treated comprehensively by KENNEDY *et al.* (1980), who have affiliated with it not only *Romaniceras* (s.s.), but also *Yubariceras* MATSUMOTO, SAITO et FUKADA, 1957, *Obiraceras* MATSUMOTO, 1975 and probably also *Shuparoceras* MATSUMOTO, 1975 as its subgenera. On the other hand, MATSUMOTO and OBATA (1981) have suggested that *Yubariceras* may be an independent genus derived from *Euomphaloceras* SPATH, 1923 by way of *Neomphaloceras* MATSUMOTO et OBATA, 1981, while *Romaniceras* has been regarded by KENNEDY *et al.* (1980) as a descendant of *Euomphaloceras* by way of *Kamerunoceras* REYMENT, 1954 (see KENNEDY and WRIGHT, 1979). This is not the place to discuss this problem further, but in this paper *Romaniceras* is provisionally taken in a strict sense, that is the subgenus *R.* (*Romaniceras*) defined by KENNEDY *et al.* (1980).

***Romaniceras kallei* (ZÁZVORKA, 1958)**

Pl. 1, Figs. 1, 2; Text-fig. 1

1958. *Acanthoceras kallei* ZÁZVORKA, *Cas. národ. Mus.* vol. 127, no. 1, p. 39, pl. 1, figs. 1–2.

1980. *Romaniceras (Romaniceras) kallei* (ZÁZVORKA, 1958); KENNEDY, WRIGHT and HANCOCK, *Palaeontology*, vol. 23, p. 342, pl. 44, figs. 1–3; pl. 45, figs. 2–7; pl. 46, figs. 1–4; text-fig. 6.

1982. *Romaniceras kallei* (ZÁZVORKA); ROBASZYNSKI *et al.*, *Bull. Centres Rech. Explor. Prod. Elf-Aquitaine*, vol. 6, pl. 6, fig. 1.

Holotype: The original of ZÁZVORKA, 1958, pl. 1, fig. 1 (=KENNEDY *et al.*, 1980, text-fig. 6), from the Turonian Spongolith facies of the White Mountain near Prague, Czechoslovakia.

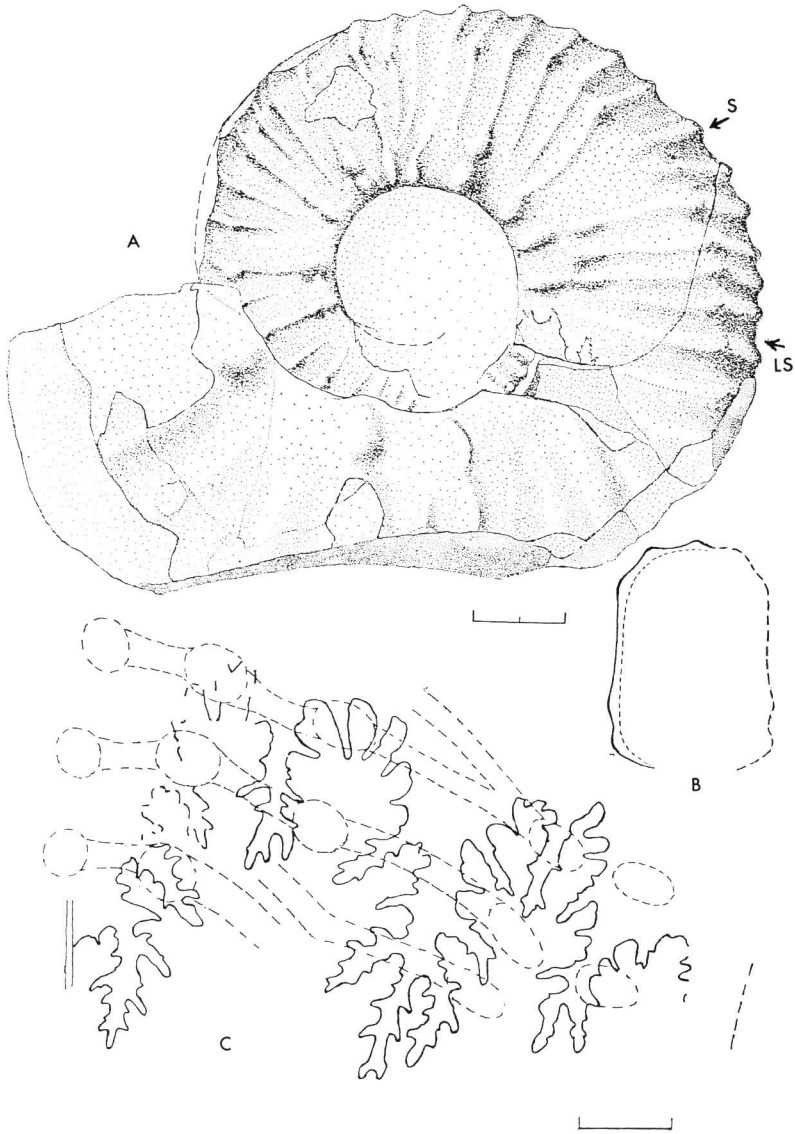
Material: A single specimen numbered RO-997a 19800921 in the Collection of S. UCHIDA, now donated to National Science Museum, NSN PM 9585.

Description: This is an internal mould which shows the last whorl of the phragmocone fairly well on its left side but only partly on its right side, and also a fraction of the body chamber. Inner whorls are unpreserved (probably dissolved).

The shell is of moderate size, about 130 mm in diameter at the end of the phragmocone, and presumed to be about 160 mm if the body-chamber is assumed to occupy a half whorl. The expansion rate is moderate, showing 1.51 in the increase of whorl-height for a half of the last septate whorl. The involution is slight, about 20 percent of the inner whorl being overlapped by the outer one. The umbilicus is of moderate width, about 30 to 32 percent of the shell diameter.

The whorl is somewhat higher than broad, with B/H about 0.82–0.84, subrectangular in section, with nearly vertical or slightly overhanging umbilical walls, subangular umbilical shoulders, subparallel and nearly flat or slightly convex flanks, sloping ventrolateral shoulders and a less convex venter.

The last full whorl of the phragmocone is ornamented with numerous (40–42), rather narrow ribs, which are separated by wider interspaces. Some of the ribs are nearly recticadate but others are slightly flexuous, showing a forward inclination on



Text-fig. 1. Diagrammatic sketch of *Romaniceras kalesi* (ZÁZVORKA) from the Obira area. NSM-PM 9585.

A: Lateral view, in which LS is the position of the last suture and S is that of the illustrated suture. B: Whorl section, in which a broken line is a reconstructed outline. C: External suture. Scale bar for A and B: 20 mm for C: 10 mm. (S. UCHIDA *delin.*)

the inner part of the flank and also between the inner and outer ventrolateral tubercles. Every second or third ribs are longer and provided with a tubercle at the umbilical shoulder and another, inner lateral tubercle close to the umbilical one. The tubercles

are normally bullate but periodically they may be more nodose. Behind the periodic rib with a stronger umbilical tubercle there is a shallow depression which seems to be reminiscent of a better marked constriction in a younger stage. The shorter ribs are intercalated between or branched from the longer ones and of dissimilar length. On the outer part of the whorl every rib has an inner and outer ventrolateral tubercles and a siphonal one of low to moderate intensity. The inner ventrolateral tubercle is much distant from the inner lateral one without intervening outer lateral one.

The incompletely preserved body-chamber shows the ribs and tubercles which seem to be similar to those on the phragmocone, but the ribs tend to become more distant on the later part. Some of the umbilical tubercles are bullate and indistinct but others are nodose and fairly strong.

A line of narrow and shallow depression runs spirally between the rows of umbilical and lower lateral tubercles for the last half whorl. This may be a kind of injury or pathology caused by some parasitic animal. It is situated approximately at the ocular sinus.

The external sutures are well exposed on the late part of the phragmocone. They show deep E, fairly large saddle E/L, which is situated on the ventrolateral part and difficult for precise measurements but higher than broad and bifid with moderate depth, rather narrow and deep L, which has fairly deeply incising lobules, rather narrow saddle L/U₂, which is higher than broad, deeply bifid, narrow U₂, about a half of L in depth, and then lower and smaller auxiliary elements on the umbilical shoulder and wall.

Measurements (in mm):

	Diameter	Umbilicus	Height	Breadth	B./H.
End of phragmocone	125.0 (1)	39.0 (.31)	55.0 (.44)	45.0 (.36)	0.82
—80°	101.0 (1)	33.0 (.32)	46.5 (.46)	39.0 (.39)	0.84
For comparison					
Nantes specimen ¹	131.0 (1)	45.0 (.34)	53.0 (.40)	49.0 (?) (.37)	0.92

¹ Measured on pl. 44, figs. 1–3 of KENNEDY *et al.*, 1980.

Occurrence: Loc. RO-997 of S. UCHIDA (=loc. R 4017a of TANABE *et al.*, 1977), near the confluence of the tributary Nakakinembets with the River Obirashibets. Greenish dark grey, fine-sandy siltstone in the lower part of Unit Mm-n, upper part of the Middle Yezo Group. Large forms of *Inoceramus hobetsensis* NAGAO et MATSUMOTO are contained in the siltstone of the nearby locality, which suggest the upper part of the Middle Turonian.

Comparison: The specimen described above shows well the diagnostic characters of *Romaniceras kallesi* (ZÁZVORKA, 1958), from the Middle Turonian of Czechoslovakia, France and Spain, redescribed by KENNEDY *et al.* (1980). It is somewhat, but not much, larger than the adult specimen (Nantes specimen of KENNEDY *et al.*, 1980) from Touraine, France. Although it shows generally the ribs which are predominant over tubercles, some of the umbilical tubercles are nodose and moderately strong on the body-chamber. This point can be regarded as a variation within the same species.

The external suture is best shown by this specimen among the hitherto described ones.

According to KENNEDY *et al.* (1980, p. 348) *R. kallesi* occurs in early mid Turonian in Europe, but ROBASZYNSKI *et al.* (1982, p. 131–133) have recorded its occurrence from Members D and E of the “Tuffeau de Saumur” and probably also from Member F of the “Sables glauconieux”. In other words, *R. kallesi* ranges almost through the main part of the Middle Turonian in the type area, excluding the basal and uppermost parts. Therefore the occurrence of an example from the comparatively upper part (if not uppermost part) of the so-called Middle Turonian (Zone of *Inoceramus hobetsensis*) in Japan can be understood as representing the upper part of the range of this species. It is interesting to note that this example is comparatively larger than the normal form.

Discussion

Relationship between *Romaniceras kallesi* (ZÁZVORKA) and *Romaniceras pseudodeverianum* (JIMBO)

Since *Acanthoceras pseudodeverianum* JIMBO (1894, p. 178, pl. 21, fig. 1, 16) was established on a specimen from the Obirashibetsu area of Hokkaido, very few example of the same species has been reported, except a comparable specimen (GH. 12437) in the Geological Collections of Hokkaido University (see MATSUMOTO *et al.*, 1957, p. 22). This is rather unusual seeing that many palaeontologists frequently visited this area to collect fossils.

On looking at an example of *Romaniceras kallesi* described above, it occurred to one of us (T. M.) that *R. kallesi* is closely similar to *R. pseudodeverianum* and that the two nominal species might be identical. It should be also noted that *R. pseudodeverianum hispanicum* WIEDMANN (1960, p. 735, pl. 2, figs. 3, 4) from Spain was regarded by KENNEDY *et al.* (1980, p. 342, pl. 45, figs. 5–7) as a synonym of *R. kallesi*.

The holotype (UMUT. MM7516) of JIMBO's species is unfortunately incomplete, as KENNEDY *et al.* (1980) complained, but it does show a rather evolute coiling, slow rate of whorl increase, umbilicus of moderate size (35% of D), subrectangular whorl section with less convex flanks and a low (not much arched) venter, bullate umbilical and inner lateral tubercles which are approximated, and rather narrow ribs which are predominant over tubercles and separated by wider interspaces, as MATSUMOTO *et al.* (1957, p. 22, pl. 8, fig. 8) have already described. These characters conform essentially to the diagnosis of *R. kallesi*.

There are, however, a few peculiar points of this holotype as compared with the hitherto described “normal” specimens of *R. kallesi*. Namely its larger size and less numerous ribbing are noted. The body chamber is preserved for about 140° in it and the diameter at the end of the phragmocone is about 150 mm, which is somewhat, but not much, larger than the specimen described above. We presume, however, that there could be a variation in size and that the average size could increase with time during the geological range of a species. The ribs number 14 to 16 per half whorl in

the holotype of *R. pseudodeverianum*, while they are 21 to 24 in the Nantes specimen, an adult example of *R. kallesi* figured by KENNEDY *et al.* (1980, pl. 44, figs. 1–3) and also in the holotype of that species. As in many species of the acanthoceratid ammonites, there could be a certain extent of variation in the density and coarseness of ribs. In fact the holotype of WIEDMANN's *hispanicum*, which was regarded as identical with *R. kallesi*, has almost the same rib density and coarseness as that of Jimbo's *pseudodeverianum*.

To sum up, we propose, on the grounds discussed above, two alternatives that *R. pseudodeverianum* (JIMBO, 1894) is a senior synonym of *R. kallesi* (ZÁZVORKA, 1958), admitting a considerable extent of variation, or that the two species are distinct but closely allied to each other. To give the final conclusion we should look for try to find more specimens to know the variation of this (or these) species in the Hokkaido populations. For the time being we use the better defined *R. kallesi* in the identification of the described specimen. Anyhow, we would not put *R. pseudodeverianum* (JIMBO) in a synonymy list of *R. deverianum* (d'ORBIGNY, 1841) (see KENNEDY *et al.*, 1980, p. 338). Someone might regard it as a transitional form between *R. kallesi* and *R. deverianum*, but even if it is so, it is closer to *R. kallesi*.

The geological age of *R. kallesi* was indicated as early mid Turonian by KENNEDY *et al.* (1980) but actually it ranges up to the upper part (if not top) of the Middle Turonian in France (ROBASZYNSKI *et al.*, 1982). The occurrence of the described Japanese specimen in the upper part of the so-called Middle Turonian in Hokkaido marks the distribution of the same species to Japan in that age. The precise locality of the holotype of *R. pseudodeverianum* is unknown but the lithology of the rock matrix of that specimen is similar to the one described in this paper.

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Explanation of Plate 1

- Figs. 1, 2. *Romaniceras kallesi* (ZÁZVORKA). NSM-PM 9585 from loc. R 4017a, Obira area (S. UCHIDA coll.)
1. Lateral (a) and frontal (b) views of the whole specimen, $\times 3/4$.
 2. Lateral view of the phragmocone of the same specimen, $\times 2/3$.
- Photos by courtesy of Dr. M. NODA.

