A Gigantic Parahoplitid Ammonite from Northern Hokkaido

Tatsuro Matsumoto

Introduction

Years ago, Professor Wataru Hashimoto and Dr. Takashi Koiwai obtained a gigantic ammonite from the northern part of the Teshio Mountains, northern Hokkaido. This was listed at first as Parahoplites sp. (Matsumoto in Takai et al. 1963, p. 111; Hashimoto et al., 1967, p. 10) and then Parahoplites sp. aff. P. maximus Sinzow (Obata & Matsumoto, 1977, p. 166), but has long been left undescribed.

This ammonite came from the upper part of the Lower Yezo Group, locally called the Kamiji Formation in the Teshio Mountains. It must be useful not only for the age correlation but also for the interpretation of the sedimentary conditions of the Lower Yezo Group. It is kept in the Collections of the Geological Survey of Hokkaido, Sapporo. As a foundation to reply to these questions, I give here its palaeontologic description.

Before going further, I thank Professor Wataru Hashimoto, Drs. Sutekazu Nagao, Kiyoshi Hasegawa and Koji Takahashi for their kind arrangements towards this study, also Dr. Ikuo Obata and Mr. D. Phillips for their help to the access of relevant specimens and references, Messrs. Nobuhiko Wada and Shigehiro Uchida for their assistance in taking photographs and Dr. Yasumitsu Kanie for some geological information.

Palaeontologic Description

Subclass Ammonoidea Zittel, 1884
Order Ammonitida Hyatt, 1889
Superfamily Deshayesitaceae Stoyanow, 1949
Family Parahoplitidae Spath, 1922
Genus Parahoplites Anthula, 1899

_Type species:_ Parahoplites melchioris Anthula, 1899 (from the Upper Aptian of Daghestan, Caucasus) by original designation.

_Remarks:_ —For the generic diagnosis and the relations with other genera see Casey, 1965 (p. 400).

Certain species hitherto described under Parahoplites are known to attain to a large size, but the species to be described below may be the largest of all and itself has distinctive characters.

*Parahoplites colossal* sp. nov.

Pl. 1, Figs. 1–3; Pl. 2, Figs. 1–3;
Text—fig. 1

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Material: —A single specimen, holotype, the Geological Survey of Hokkaido Collection No. 187, collected by Professor Wataru Hashimoto & Dr. Takashi Koiwai. It is well preserved on the left side but is dissolved into rock matrix on the right side. Its last portion is somewhat dislocated by a joint and distorted.

Diagnosis: —Huge shell with fairly rapid expansion of outer whorl in height and breadth. In the middle growth-stage ribs fairly dense, bullate at the umbilical shoulder, with branching and intercalation on outer part where ribs tend to be weakened as the shell grows. Body-chamber broadened and somewhat inflated with high and vertical umbilical wall. On its later half appear robust ribs with fairly wide intervals, crossing the venter with broadening.

Description: —The holotype is about 70 cm in diameter and its last suture is at about the whorl-height \( H = 180 \, \text{mm} \) and diameter \( D = 410 \, \text{mm} \). The whorl enlarges with a moderate ratio \( h/H = 1.68 \) for 180°, embracing about a quarter of the inner whorl in lateral view. The umbilicus is of moderate width, about 28% of \( D \) in the adult stage, and surrounded by a steeply inclined (earlier) to almost vertical (later) umbilical wall and a subangular umbilical shoulder.

The whorl is higher than broad. In the septate whorl \( B/H = 0.75 \) or so, with flanks rather flattened and parallel on the inner half, converging gradually to a moderately arched venter. The body-chamber is broadened, with higher umbilical walls, gently inflated flanks and a broadly rounded venter (Fig. 1).

The septate whorl is ornamented with fairly crowded ribs of moderate breadth with intercalated shorter ones. The long ribs are provided with bullate tubercles at the umbilical shoulder. They run nearly radially on the flank and tend to be weakened and broadened outward, sometimes with indistinct branching.

On the earlier half of the body-chamber, the ribs and umbilical bullae are much weakened, becoming almost obsolete on the outer part. On the later half, they are abruptly strengthened.

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**Fig. 1** *Parahoplites colossus* sp. nov.

Diagrammatic whorl-sections. A: late part of the septate whorl; B: body-chamber, about 180° later than A. Scale bar: 40 mm.
and thickened, being separated by wider interspaces. Some of these ribs have thick but blunt tubercles at the umbilical shoulder; others have no tubercle.

In addition to the ribs there are lirae or fine riblets on the surface of the shell, which run on the ribs and also the interspaces in parallel to the ribbing. The lirae and the ribs are radiate on the umbilical wall, nearly rectiradiate or slightly arcuate (concave forward) on the flank and cross the venter nearly vertically or with a very gently forward curvature.

Partly exposed sutures show the pattern of the Parahoplitidae. Those on the late part are finely incised.

**Measurements (in mm):**

<table>
<thead>
<tr>
<th></th>
<th>Diameter</th>
<th>Umbilicus</th>
<th>Height</th>
<th>Breadth</th>
<th>B/H</th>
</tr>
</thead>
<tbody>
<tr>
<td>−90°</td>
<td>557</td>
<td>154(.28)</td>
<td>242(.43)</td>
<td>210(.38)</td>
<td>.88</td>
</tr>
<tr>
<td>−270°</td>
<td>—</td>
<td>—</td>
<td>144</td>
<td>108</td>
<td>.75</td>
</tr>
</tbody>
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For comparison

(1) :  *P. giganteus* Roubaud (1938, p. 165, pl. 2, fig. 5)
(2) :  *P. maximus* Sinzow (a : lectotype, b : Casey, 1965, pl. 69, fig. 1)
(3) :  *P. nutfieldiensis* (J. Sowerby) (Casey, 1965, p. 406, pl. 68, fig. 2)

**Comparison:** Large shells have been known in some previously described species of *Parahoplites*, such as *P. giganteus* Roubaud, 1938, from the Aptian of the northern Caucasus, *P. maximus* Sinzow, 1907, from the Upper Aptian of Mangyschlag peninsula and England, and *P. nutfieldiensis* (J. Sowerby, 1815) (em. Casey, 1965) from the Upper Aptian of England. The largest of them is 415 mm in diameter in the second species (measured by Casey, 1965, p. 410), but the described holotype of the new species from Hokkaido is still larger, attaining about 700 mm in diameter. The specific name is derived from Colossus of Rhodes, the gigantic statue of Apollo.

*P. colossus* resembles generally the above three species in the shell-form, the mode of ornamentation and the pattern of sutures. It is closer to *P. giganteus* than to the other two in having distant ribs on the body-chamber, but the ribs are much stronger and more frequent in our species. It is, furthermore, less involute and more widely umbilicated than *P. giganteus*.

In the coarseness of the ribs on the septate whorl, this species is more similar to *P. maximus* than to *P. nutfieldiensis*. It is again less involute and more widely umbilicated than *P. nutfieldiensis*. Although the wholly septate lectotype of *P. maximus* (reillustrated by Casey, 1965, text-fig. 148a, b) is more involute and more narrowly umbilicated than the holotype of *P. colossus*, the large specimen (GSM, 8306) with a nearly complete body-chamber, referred to *P. maximus* by Casey (1965, p. 410, pl. 69 fig. 1), shows dilation of the umbilicus (U/D = 0.31). In the latter the ribs are gradually weakened on the body-chamber without development of such robust sculptures as in the holotype of *P. colossus*.

**Occurrence:** Fallen block from a cliff on the left side of the lower course of the stream called the Pankenai, near Utanai, Nakagawa, Teshio, northern Hokkaido (Fig. 2). It came from the second member (Kj 2) of the Kamiji Formation. Lower Yezo Group (Hashimoto et al. 1967). For more detail see an appendix in Japanese by Takahashi & Kanie.
Fig. 2 Map showing the locality of *Parahoplites colossus* sp. nov.

(Geological outline after Igi, 1959)

LY = Lower Yezo Group (LY1 = lower, LY2 = middle, LY3 = upper parts), S = Sorachi Group,
SP = Serpentine, T = Upper Tertiary, UT = Utanai, NR = National Railway, ● = Locality of the
described ammonite.

**Concluding Remarks**

The new species described in this paper is allied to *Parahoplites maximus* Sinzow, *P. giganteus* Rouchadzé and *P. nutfieldiensis* (J. Sowerby) but has its own diagnostic characters. These allied ammonites occur in the Upper Aptian of Europe in the North Temperate Realm. Two of them characterize the Zone of *Parahoplites nutfieldiensis* in England, that is middle Upper Aptian. Therefore, the same age is suggested for the described new species, *P. colossus*.

Species of *Parahoplites* occur normally in sediments of comparatively shallower sea facies. In England some large specimens, sometimes with body-chambers preserved, are embedded in the Lower Greensand. In the case of *P. colossus* it was in a calcareous nodule in a layer of muddy fine-grain sandstone. The Kamiji Shale Formation overlies the Onodera Sandstone Formation. The described huge specimen has a nearly complete length of the body-chamber and is hardly interpreted to have been transported for a long distance by turbidity current. The Lower Yezo Group has been regarded generally as sediments of flysch or turbidite facies, but this ammonite may suggest the interfingering of a bed of non-turbidite facies. Its solitary occurrence may owe to transportation for some distance from the adjacent shallower part.

**References Cited**

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北海道北部産のパラホップリテス科巨大アンモナイト

松本達郎

要旨：天塩山地北部、中川町歌内南方バンケナイ川下流の下部エゾ層群神路層から橋本瓦・小岩井隆男博士が採集し、北海道立地下資源調査所に保管されている巨大アンモナイトを記載した。P. maximus Sinzow や P. giganteus Rouchadzé に類似するが、さらに巨大で、住房にふくらみがあり、その後半期に強い筋が発達することなどで区別され、新種である、P. colossus と命名した。この化石は白亜紀アプチアンの後期を示唆する。なお化石から推定される古環境についても論述した。産地の地質の詳細については付記を参照されたい。

付記(Appendix)

記載されたアンモナイト Parahoplites colossus
産出地点的地質について
Geology surrounding the locality of Parahoplites colossus

高橋功二・関江康光

Kohji Takahashi and Yasumitsu Kanke

筆者らは、1983年6月および9月、新種として記載された巨大なアンモナイト Parahoplites 産出地点周辺の地質について調査を行なった。アンモナイト産出地点は、北海道中川郡中川町下中川付近のバンケナイ川下流である。以下、調査時に作成した地質踏査図をもとに、アンモナイト産出地点周辺の地質の概要について述べる。

地質踏査図（第3図）に示したように、バンケナイ川下流地域は、下流部左岸の露頭番号Sn1および上流部右岸Sn6、Sn7に連続した大露頭がみられるが、一般に露頭の発達が悪い、また地質もかなり複雑である。記載されたアンモナイトは、橋本瓦教授の御教示によるとSn2とした露頭付近の河床で採集された。

Sn2は、延長約150mの露頭で、下流側はタービッド層をしめす砂岩泥岩互層、上流側は石灰質ノジュールを含む泥質粒砂岩からなり、下流側（南）へ50～70°傾斜している。しかし砂岩泥岩互層にみられる斜板状理から逆旋層と判断され、上流側が上位層となる。第3図には、この露頭の柱状図を示した。砂岩泥岩互層には、厚さ約1mの凝灰岩が挟む。凝灰岩は青灰色～緑灰色をしめし、一部チャート状の外観を呈する。顕微鏡下で観察すると、ビトリック組織をしめし、基生には結晶物として石英・斜長石・黑雲母などが、岩石片として安山岩質岩がみとめられる。また、薄片で分散状がみとめられ、フッ酸処理を行なったけれども単体を検出できなかった。泥質粒砂岩は、砂岩泥岩互層から消滅する。青灰色～灰色を呈し、部分的に粗粒となり、まれに細円礫を含んでいる。この砂岩中に含まれる石灰質ノジュールは、径1mから2mの巨大なもので、周辺の河床にも転石として多くみとめられる。記載された Parahoplites は、これらのノジュール中に含まれていたもので、泥質粒砂岩からもたらされた。
第3図 Parahoplites産出地点周辺の地質踏査図

Fig. 3 Route map along the lower coae of Pankenai gawa

ものと判断される。

Sn2の上流Sn3は、暗灰色～黒色のシルト岩泥岩が露出しており、桐本ほか（1967）がVenezoliceras (?)sp.を採取した地点と考えられる。この露頭とSn2との間に著しい断層破砕帯がみとめられる。Sn3の下流Sn1Bには、Sn3と類似したシルト岩泥岩がみられる。Sn2との関係は観察できなかったが、走向・傾斜のみかけの断層が推定される。

上流部の大露頭Sn6およびSn7は、断層によりかなり破砕されているが、前述のSn2に類似した地層がみられる。Sn6はおもに河床部に露出するが、巨大な石灰質ノジュールを含む暗灰色～青灰色細粒砂岩からなり、Parahoplitesを産出した岩層に類似する。大露頭の大部分を占めるSn7は、ナピダ
イト相の砂岩泥岩互層で、Sn2と同質の凝灰岩を挟在する。なお、Sn6とは断層破砕帯で境される。これらの地層は、南へ傾斜する亜斜と考えられ、巨視的にみるとSn2との間に向斜構造が推定できそうである。

上にのべた地域を含む広域的な地質図は、猪木 (1959)、橋本在編 (1967) により公刊されている。これによると Parahoplites を産出した地層については、橋本は下層エノ層群神路層のKj2層、猪木は下部エノ層群上部のLy3層としている。神路層は下部エノ層群の主部をしめる厚い地層で、橋本は下位よりKj1～Kj8に細分しており、その全層厚をKj1～Kj8まで累算すると2,000 mに達するとしている。猪木のLy3は、この地層の上部に相当する。模式地（調査地域より南部天塩川流域周辺）の観察を含めた筆者らの予察的調査でも、化石産出した層準はイト相からあきらかに神路層に対比できる。しかし、産出地点周辺の地質は断層等によりか

なり筆そうしており、透頭条件も断片的であるため、橋本のどの層準にあたるのかあきらかにできなかった。また、橋本のKj4層には頁岩質の、猪木のLy3層中には岩質の記載はないが凝灰岩の挟在が報告されている。この凝灰岩がSn2の凝灰岩にあたるのかどうかも明らかではない。

報告にあたり、化石産地を始め、種々御教示いただいた東京教育大学名誉教授橋本在博士、原稿の査読を頂いた九州大学名誉教授松本達郎博士、および当所地質調査部長長谷川清氏、そして筆者らの地質調査に同行頂いた北海道大学川口通世氏に感謝の意を表する。

文 献
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Explanation of Plate 1

Figs. 1-3 Parahoplites colossus sp. nov.
Ventral (1), lateral(2) and frontal (3) views, × 1/5.
Explanation of Plate 2

Figs. 1–3  *Parahoplites colossus* sp. nov.

Parts of holotype. 1: Suture on the inner whorl; 2: sutures on the outer whorl; 3: oblique view showing the lirae or riblets in addition to the ribs.