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<https://doi.org/10.5109/1544205>

出版情報 : 九州大学理学部紀要 : Series D, Geology. 24 (1), pp.25-31, 1978-11-10. Faculty of Science, Kyushu University

バージョン :

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A Middle Triassic Ammonite from the Isatomae Formation, Kitakami, Japan

Takeshi ISHIBASHI

Abstract

A Middle Triassic ammonite, *Discoptychites inaicus* (DIENER), is described based on a specimen from the Isatomae formation of the Kitakami Mountains, which is better preserved than the holotype. Notes are given on the ptychitid ammonites from Japan.

Introduction

As is well known, almost all of the Middle Triassic ammonites of Japan have been obtained from the Inai Group of the Kitakami Mountains. The present specimen was collected by the Late Mr. Akira ONO, a student of the Department of Geology, Kyushu University in 1944 from the type-locality of the Isatomae Formation with some indeterminable ammonites, and has been preserved at the Department of Geology, Kyushu University. The information about the locality and field evidence was given by Professor Emeritus Tatsuro MATSUMOTO of Kyushu University with whom A. ONO investigated the stratigraphy and geology of the Inai area at that time.

The stratigraphy and paleontology of the Triassic system distributed in the Kitakami Massif have been studied by many geologists. The Isatomae Formation (ONUKI and BANDO, 1959a) is the upper part of the Inai Group, and yields about 30 species of ammonoids. These ammonoids were described mainly by MOJSISOVICS (1888), DIENER (1915), SHIMIZU (1930) and BANDO (1964). Two species of them, "*Ptychites inaicus*" and *Ptychites* sp., were described by DIENER (1915) from the rock quarry east of Isatomae, Miyagi Prefecture.

The present specimen was collected from another locality (Fig. 1). It is evidently identified to "*Ptychites inaicus* DIENER" but the generic name is changed to *Discoptychites* as mentioned below.

I express my sincere thanks to Professor Emeritus Tatsuro MATSUMOTO of Kyushu University who gave me useful information about the present material and valuable suggestions. Thanks are due to Professor Ryuzo TORIYAMA of Fukuoka University for reading manuscript and encouragement.

Notes on the ptychitid ammonites from Japan

Considerably numerous ptychitid ammonites are known from the Middle

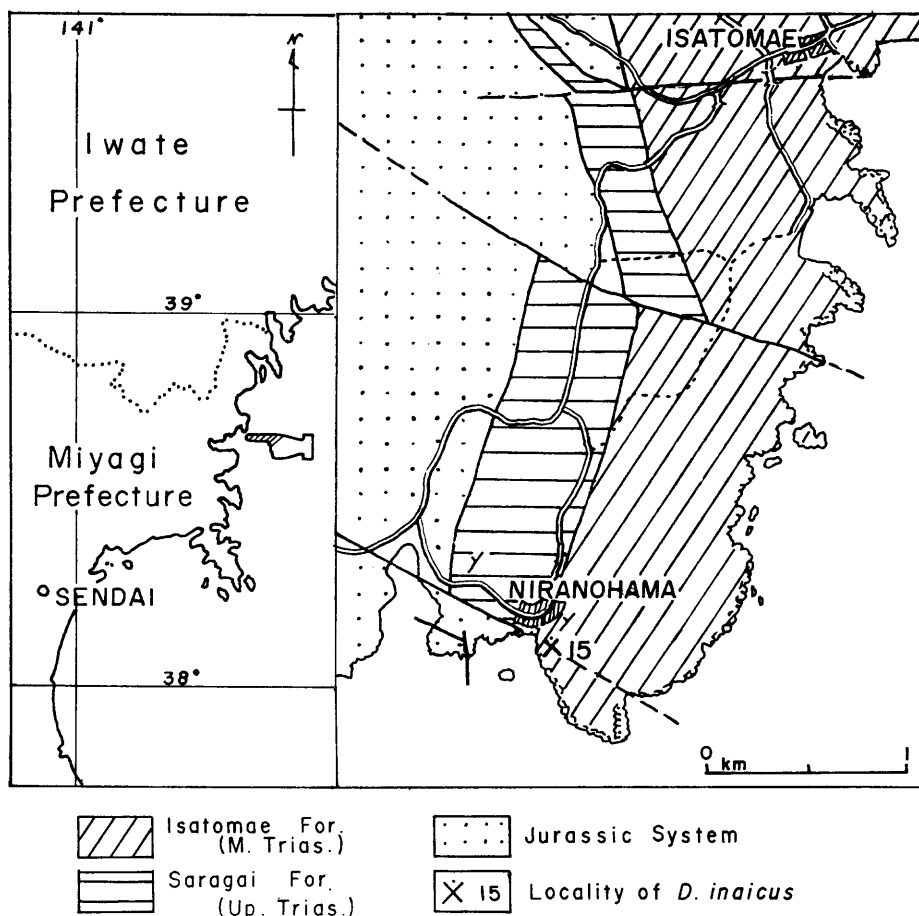


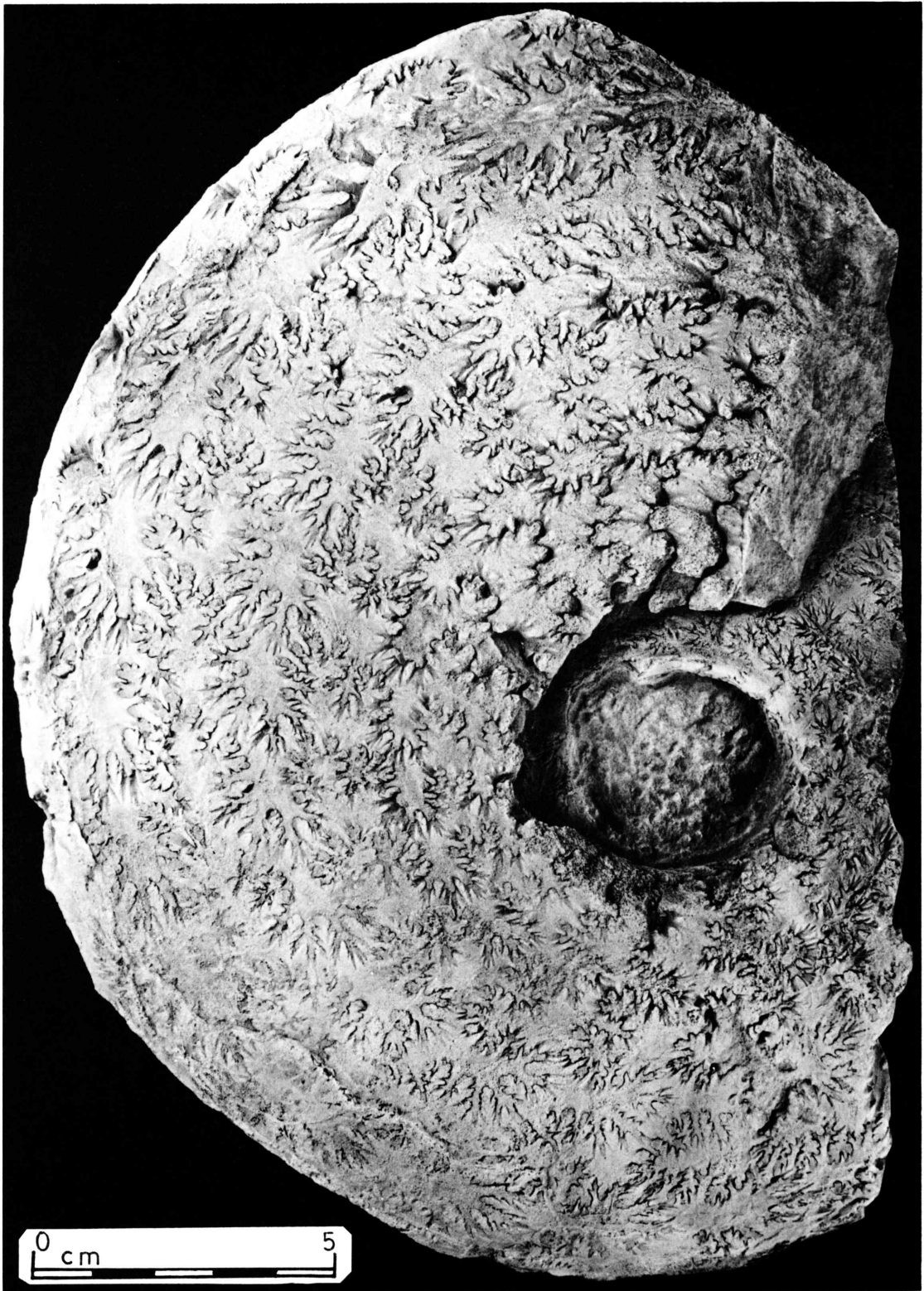
Fig. 1. Geological map simplified from the original of T. MATSUMOTO showing the locality of *Discoptychites inaicus* (DIENER)

Triassic of Japan. They are referred to the four genera, *Ptychites*, *Flexoptychites*, *Discoptychites* and *Sturia*, and occur in four formations as follows:

Isatomae Formation [Kitakami]	{	<i>Sturia japonica</i> DIENER
		<i>S.</i> cf. <i>sansovinii</i> (MOJSISONICS)
		<i>S.</i> sp.
		<i>S.</i> ? sp.
		" <i>Ptychites inaicus</i> DIENER"
		<i>Ptychites</i> sp.

Explanation of Plate 7

Fig. 1. *Discoptychites inaicus* (DIENER)Page 29
Lateral view with whitening. See p.27, Fig.3 and p.30, Fig.4-b.
(GK. F567)



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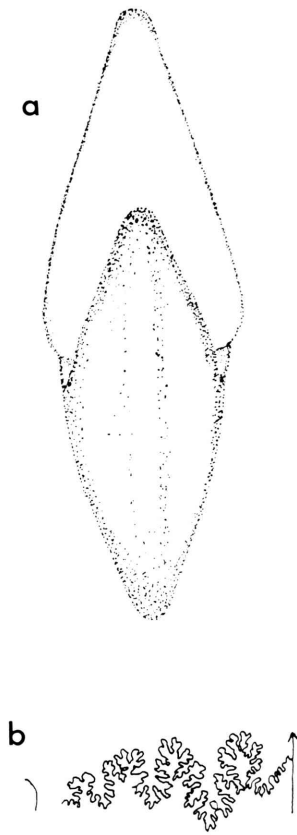


Fig. 2. Diagrammatic sketch of the type-species, *Discoptychites megalodiscus* (BEYRICH) a; frontal view b; suture-line $\times 1$

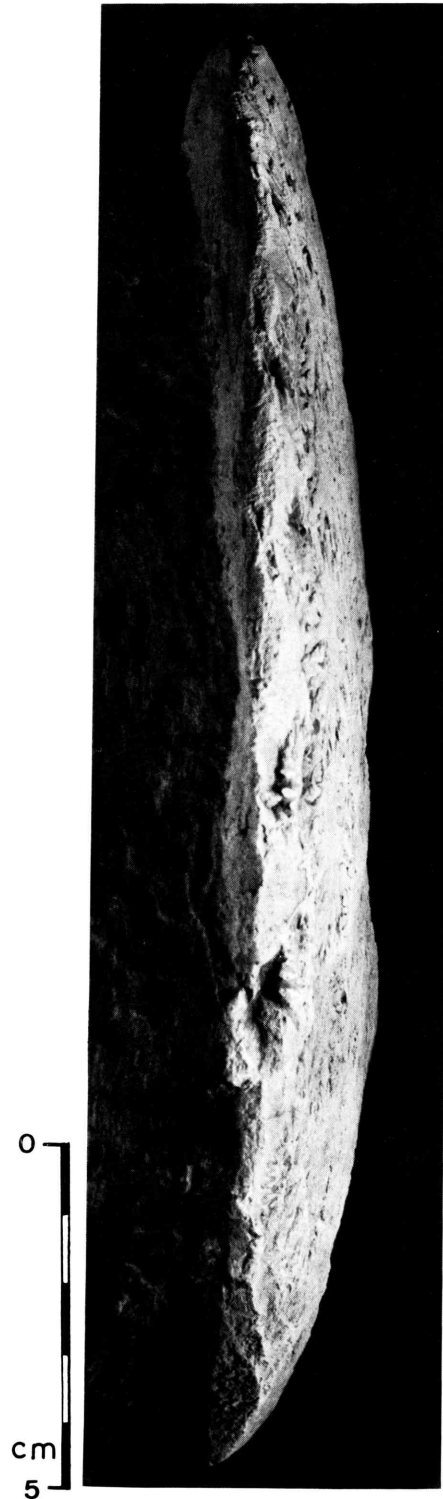


Fig. 3. Photograph of ventral view of *Discoptychites inaicus*. See Pl. 7, Fig. 1 and p. 30, Fig. 4-b.

Rifu Formation [Kitakami]	{	<i>Discoptychites compressus</i> (YABE and SHIMIZU)
		<i>Dis. compressus hamadaensis</i> (ONUKE and BANDO)
		<i>Flexoptychites rifunus</i> (YABE and SHIMIZU)
		<i>F. matsushimaensis</i> BANDO
		<i>Ptychites yabei</i> SHIMIZU
		<i>P. aff. cognatus</i> (OPPEL)
		<i>P. nipponicus</i> BANDO
		<i>P. miyagiensis</i> BANDO
		<i>P. cf. trocheaeformis</i> (LINDSTOEM)
		<i>P. spp.</i>
Tao Formation [Shikoku]		<i>Ptychites</i> sp.
Zohoin Formation [Shikoku]		<i>Ptychites</i> sp.

The Isatoma Formation (Upper Anisian) is characterized by the occurrence of *Sturia*. *Sturia japonica* DIENER is very similar in sculpture of lateral side and suture-line to *Sturia sansovinii* MOJSISOVICS reported by DIENER (1897) from the Himalaya region and to *S. cf. sansovinii* reported from the present formation (ONUKE and BANDO, 1959b). But *S. japonica* has a much larger shell (550 mm in diameter), about two times as large as that of *S. sansovinii* from the Himalaya.

Two species of *Discoptychites* are now known from the Isatoma Formation and the Rifu Formation of the Inai Group. *Discoptychites inaicus* (DIENER) from the former is described in this article. *Discoptychites compressus* (YABE and SHIMIZU), originally described under the generic name of *Ptychites*, was transferred to *Discoptychites* by KIPARISOVA (1961) and BANDO (1976). I rather agree with BANDO (1964, p. 61) to consider that *Ptychites compressus* could be rather referable to *Flexoptychites* than to *Discoptychites*, because *Flexoptychites* has distinct and wide radial ribs and complex suture-line: But as I have had no chance to examine the original material, I provisionally follow their current interpretation for the time being.

Flexoptychites rifunus (YABE and SHIMIZU) and *F. matsushimaensis* BANDO are known from the Rifu Formation and their stratigraphic position is referred to as the Ladinian in Japan. Some species of *Ptychites* are reported from the Ladinian Rifu and Zohoin Formations and the Anisian Tao Formation. Species of *Ptychites* from the latter two formations of Shikoku are indeterminable. The Rifu Formation yields a respectable number of specimens having sculptures on shells and suture line, but almost all of them are secondarily compressed laterally and their whorl sections are hardly seen with any precision. It follows that the precise generic assignment is difficult for some of the ptychitid ammonoids from Japan.

Paleontology

Family Ptychitidae MOJSISOVICS, 1882

Genus *Discoptychites* DIENER, 1916

Type-species:—*Ammonite megalodiscus* BEYRICH, 1867

Remarks:—Based on *Ptychites megalodiscus* (BERYICH) as the type-species *Discoptychites* was established by DIENER (1916) for some *Ptychites* having an acute venter, but no generic diagnosis was given. However, it is strange that the genus *Discoptychites* was neglected by DIENER (1925) himself and KUTASSY (1933) in their systematics. Later this genus was revived by SPATH (1951) with establishment of *Flexoptychites*, *Alloptychites*, *Metasturia*, and *Parasturia* in the family Ptychitidae. He made clear the characteristics of the genus *Discoptychites* into which "*Ptychites megalodiscus* (BEYRICH)", "*Ptychites evolvens* MOJSISOVICS" and "*P. fastigatus* DIENER" were included. After SPATH this genus has been accepted by all paleontologists (i e., KUMMEL, 1957; 1960: KIPARISOVA, 1961: BANDO, 1976; VENZO and PELOSIO, 1968).

Discoptychites inaicus (DIENER)

Pl. 7, Fig. 1: Fig. 3 and Fig. 4-b

1915. *Ptychites inaicus* DIENER; *Denkschr. Akad. Wiss. Wien*, 92, p. 20, pl. 4, figs. 1a-b.

Material.—The specimen at hand (GK.F 567) is 217 mm in diameter and about 18 mm in width, but it is laterally compressed secondarily. The umbilicus is about 40 mm in diameter. The living chamber is lost.

Description.—Shell large, involute discoidal, laterally compressed with acute venter. Side gently convex with very weak radial folding without spiral ribs, nodes or tubercles. Outer whorl deeply embracing almost all part of inner whorl, gradually increases its height, 103 mm high in the maximum. Umbilicus, rather narrow, 40 mm in diameter, its shoulder sharply rounded. Septa ammonitic, first lateral lobe deepest and second lateral lobe smaller with accessory lobes, lateral lobes near umbilical seam simple, second lateral saddle highest.

Remarks.—DIENER (1915) originally described *Ptychites inaicus* along with some bivalves and ammonoids which were deposited at Tohoku University or collected by himself. The holotype is evidently deformed to a egg-shape but low and wide ribs and suture-line are well preserved. The present specimen is not so much deformed as the holotype, and is easily referred to as "*Ptychites inaicus*" by the characteristics of shell and suture-line. In the original figure of the holotype the ventral view was not given by DIENER. The present specimen and the holotype resemble remarkably each other in the characters of sutures (Fig. 4). DIENER compared his specimen to *Ptychites rugifer*, the type-species of *Ptychites*, from the Muschelkalk of Europe, but *Ptychites rugifer*, including the holotype, from the Himalaya (DIENER, 1895, p. 64, pl. XXII, figs. 1-2, pl. XXIII, figs. 1-2, pl. XXIV, figs. 1-2) has globose shells like arceetid ammonites, distinct radial ribs and rounded ventrolateral shoulders.

The present species is closely related to *Discoptychites megalodiscus*, the type-species, described by BEYRICH (1867) from the Alps, in the shape of whorl section and the pattern of suture-line, but it is distinguished by the difference of width of umbilicus to diameter of whorl and suture-line (Fig. 2). The present specimen is rather similar to *Discoptychites megalodiscus* described by MOJSISO-

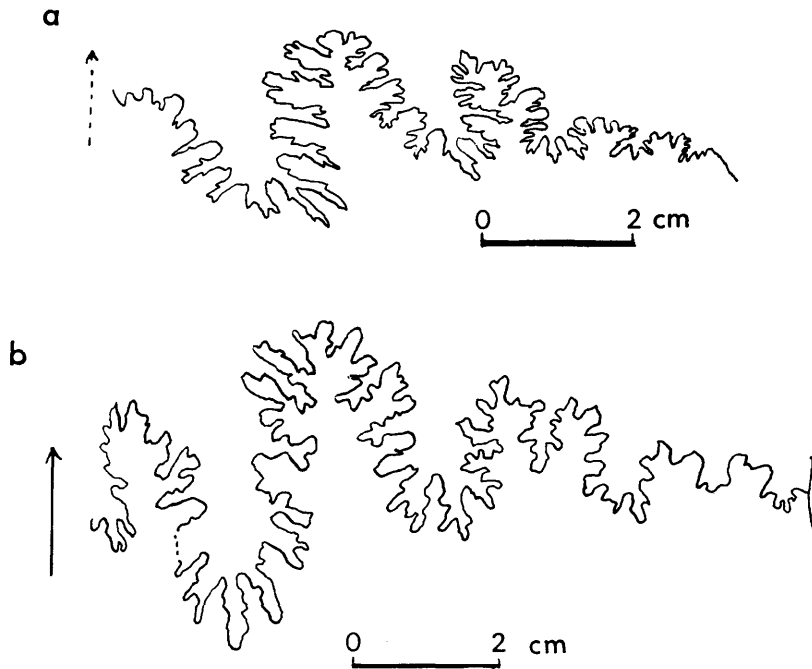


Fig. 4. *Discoptychites inaicus* (DIENER). Diagrammatic sketches of suture-line of the holotype (a) and the present specimen (b) (at whorl-height=100 mm)

VICS (1882, p. 253, pl. LXXVII, fig. 1, LXXVIII, figs. 1-2), having the shell size as large as the present specimen and very similar whorl section, but is slightly different in suture-line. In the latter the first lateral saddle is the highest, while in the former the second lateral saddle is the highest.

Discoptychites inaicus is considered to be most related to *D. evolvens* described by MOJSISOVICS (1882, p. 253, pl. LXXV, figs. 1 and 4, pl. LXXVI, fig. 1) from the Alps. One illustrated as pl. LXXV, fig. 1 has a shell as large as the present one, a similar whorl section, and similar pattern of suture-line. Other specimens referred to *D. evolvens* have been reported by several authors without illustration. Apart from them, a comparison is needed between the present specimen and the following two; one is *D. cf. evolvens* described by VENZO and PELOSIO (1968, p. 126, pl. 16, figs. 16a-c, 17a-c) from the northern area of Bergamo, Italy (the Bergamo Alps), the other was originally referred to *Flexoptychites acutus* (MOJSISOVICS) from the same mountains by CASATI and GNACCOLINI (1967, p. 137, pl. 10, figs. 7a,b), which is latter referred to *D. evolvens* by VENZO and PLESISO (1968, p. 127). These specimens are also similar to the present specimen but differ in having a smaller ratio of umbilicus to shell diameter and a wider rounded venter.

Occurrence.—Upper part of the Isatomae Formation (Anisian). Locality: 15, Southern coast of Niranohama, Utatsu-cho, Motoyoshi-gun, Miyagi Prefecture (Fig. 1).

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