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TWO SPIRIFERIDS FROM THE HIKOROICHI FORMATION (TOURNAISIAN) IN THE KITAKAMI MOUNTAINS, JAPAN

by

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(with 1 plate)

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Abstract

Two Tournaisian brachiopods, *Imbrexia* cfr. *incertus* and "*Spirifer*" *mundulus* are described from the Hikoroichi Formation in the Kitakami Mountains, Japan.

Introduction

Mr. T. Nakamura, a student of our department recently collected some brachiopods from the Hikoroichi Formation developed in the northwestern part of the Setamai-Sakari district of the Kitakami Mountains. Also many previously collected brachiopods by the junior author from the same formation in the eastern part of the Setamai-Sakari district are at our disposal.

Among them, only rather significant brachiopods are dealt with in this article.

They are *Imbrexia* cfr. *incertus* (Hall) and "*Spirifer*" *mundulus* Rowley. Both species, in the USA, are said to have been obtained from the Burlington limestone of Osagian. But actually in the Kitakami Mountains they both occur from the Hikoroichi Formation which we believe to be lower Tournaisian in age.

Before going into description the authors wish to thank Mr. Nakamura for donating his collection, Dr. Koji Nakamura for the information upon literatures, Mr. Sumio Kumano for his effort in taking photographs of brachiopods here described, and Miss E. Mima for typing the manuscript.

Description of species

Genus *Imbrexia* Nalivkin, 1937

Type species (original designation): *Spirifer imbrex* Hall.

Remarks: The genus was well defined by Carter (1974, p.685).

According to him the genus is easily distinguished from the other similar

genera, such as *Unispirifer* Campbell (1957) in possessing rather angular fold and sulcus, regularly imbricating growth lamellae and commonly bifurcating costae in the former.

Carter (1974) mentioned that the genus occurred in the USA and in the USSR from strata ranging from Upper Tournaisian to Lower Viséan.

However Sarycheva et al (1963) described *Imbrexia topkensis* Besnossova from the Abyshevsky horizon which seems to the authors to be lower Tournaisian because of the possession of *Cyrtospirifer* in its fossil assemblage.

Imbrexia cfr. *incertus* (Hall)

Pl. 1, figs. 2-11.

Compared with: *Spirifer incertus*, Weller, 1914, p.335, pl.41, figs.6-14.

Material: Much deformed single specimen (UHR. no.30191) is available for study. The specimen is composed of three parts; (1) external mould of a ventral valve of which posterior part is missing; (2) external mould of a dorsal valve together with umbonal region of the ventral valve; and (3) "Steinkern". Shell substance is completely removed.

Description: Shell medium in size, moderately biconvex, wider than long. Outline transversely subelliptical; lateral extremities subangular; fold and sulcus well developed. Shell is about twice as wide as long. The greatest width may be along the hinge line which is estimated as 65 mm.

Beak of the ventral valve is small and a little incurved. Sulcus begins to develop at a little below the beak, and is gradually widened anteriorly. Costae on both sulcus and flanks are bifurcating only in umbonal region, and extend to the anterior commissure without further intercalation or bifurcation. There are 22 or 23 subangular costae on both flanks.

External surface of the shell, except for umbonal region, is demarcated by well developed imbricating growth lines.

External mould of the dorsal valve is somewhat incurved, due to later compaction.

"Steinkern" is about 40 mm wide, 22 mm long and 12 mm thick. On the ventral side, rather small muscle scars are preserved, divided into two parts by a shallow and narrow sulcating line. Sulcus is shallow. On the dorsal side fold is clearly distinguished from flanks. Interarea is relatively wide and delthyrium is broadly triangular. Neither dental plates nor septa seem to be present.

Remarks: Although not favourably preserved the Japanese specimen resembles *Spirifer incertus* described by Weller (1914). Carter (1974) mentioned that the surface ornament was strongly imbricate in *Spirifer incertus* when he compared that with *Spirifer imbrex*, the type species of *Imbrexia*. *Spirifer incertus* is

known from Burlington limestone of USA.

Reg. No.: UHR 30191

Locality: North of Karo-yama, Sumita-cho, Kesen-gun, Iwate Pref.

Horizon: Hikoroichi Formation (-II)

Collector: T. Nakamura.

"Spirifer" mundulus Rowley

Pl.1, fig.1

1914: *Spirifer mundulus*, Weller, p.333, pl.44, figs.15-19.

Description: Internal mould of a ventral valve is at hand.

Shell small, much wider than long. Maximum width is along the hinge line. Width of the ventral valve is 24 mm, length is 6 mm. Lateral costae are not very well imprinted on the internal mould, however, more than 6 costae may be seen on each slope. Sulcus is very narrow, and is bounded by a pair of prominent costae. Shell ornamentation is weakly lamellose, especially near the anterior margin where external mould is only feebly preserved.

External character and internal structures of dorsal valve are unknown.

Remarks: Although material is scanty, the present form has small shell as a whole. It has transversely wider shell with acute cardinal margin, with very narrow sulcus bounded by strong costae. These characteristics suggest that the Japanese form is identical with the American "*S.*" *mundulus*, which comes from Lower Burlington limestone.

Reg. No.: UHR 18943

Locality: Taishiro-bata, Ohmori, Hikoroichi-machi, Ohfunato, Iwate Pref.

Horizon: Hikoroichi Formation (-III)

Collector: M. Kato

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Explanation of Plate 1

Fig. 1. "*Spirifer*" *mundulus* Rowley
Internal mould of ventral valve (x3)
UHR 18943

Figs. 2-11. *Imbrexia* cfr. *incertus* (Hall)
2.- Dorsal view of "Steinkern" (x1.5); 3.- Ventral view of "Steinkern" (x1.5); 4.- Cardinal view of the same "Steinkern" (x2); 5.- Silicon rubber cast of ventral valve (x1); 6.- Silicon rubber cast of dorsal valve and beak of ventral valve (x1); 7.- Cardinal view of silicon rubber cast (x1.6); 8.- External mould of ventral valve (x1.2); 9.- External mould of dorsal valve and beak of ventral valve (x1.3); 10.- Cardinal view of the external mould of both ventral and dorsal valve (x1.9); 11.- External mould of a portion of dorsal valve showing imbricate sculpture of the shell ornamentation (x8) UHR 30191.

TWO SPIRIFERIDS FROM THE HIKOROICHI FORMATION

Plate 1

