Gigantoproductus (Carboniferous Brachiopoda) from the lowest part of the Ichinotani Formation, Fukuji, Hida Gaien Belt, central Japan

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Abstract

A productid brachiopod *Gigantoproductus sarsimbaii* (Sergunkova, 1935) is described from the lowest part of the Ichinotani Formation (upper Visean-Serpukhovian), Fukuji, Hida Gaien Belt, central Japan. *G. sarsimbaii* has been described from the lower and middle Visean of Kirgizia. The occurrence of this species from Fukuji indicates a palaeobiogeographical relationship between Fukuji and Kirgizia in the Early Carboniferous (Visean) time.

Key words: Brachiopoda, central Japan, Fukuji, *Gigantoproductus*, Ichinotani Formation, Visean.

Introduction

The Ichinotani Formation, named by Kamei (1952), is exposed along the middle Ichinotani Valley, lower Mizuyagadani Valley, Mizuboradani Valley, and Ozako Valley, Fukuji, Gifu Prefecture, Hida Gaien Belt, central Japan (Fig. 1). Recently the third author (Y. Miyake) collected two large brachiopod specimens from black limestone of the lowest part of the Ichinotani Formation at the middle Ichinotani Valley.

In this paper, we (Y. Ibaraki and J. Tazawa) describe the specimens as *Gigantoproductus sarsimbaii* (Sergunkova, 1935). This species has been described from the lower and middle Visean of Kirgizia, central Asia (Sergunkova, 1935; Gladchenko, 1955; Galitzkaja, 1977).

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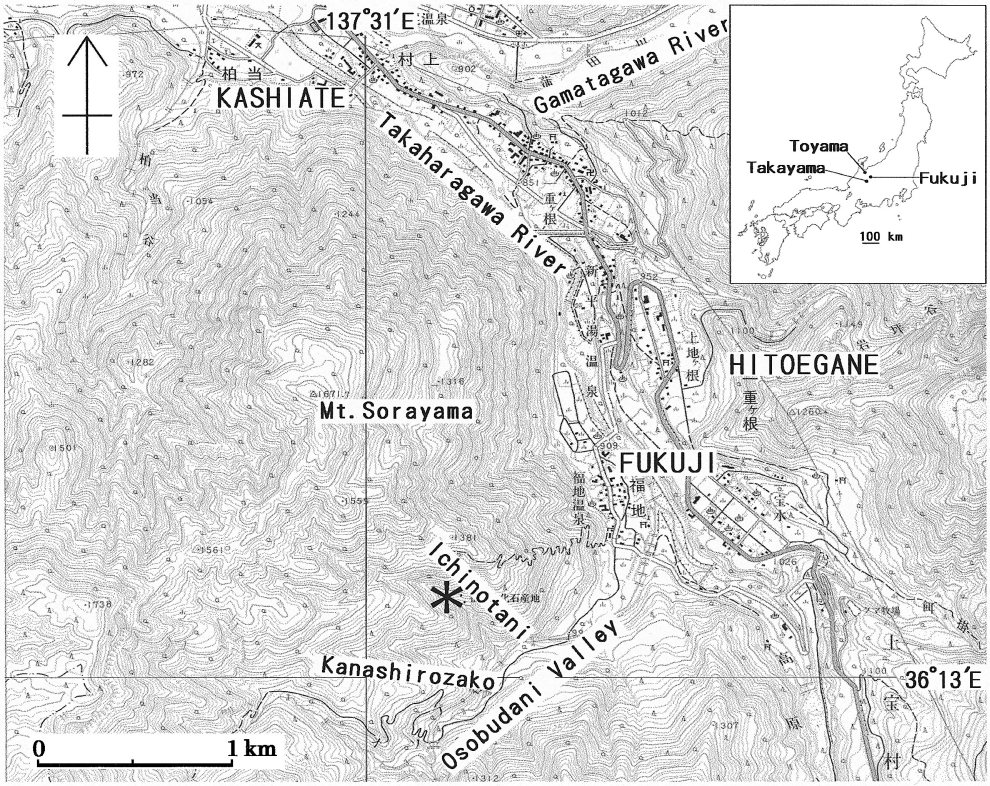

Fig. 1. Map showing the fossil locality (asterisk). Using the topographical map of "Yakedake" scale 1:25,000 published by the Geographical Survey Institute of Japan.

The age of the lowest part of the Ichinotani Formation is considered to be late Visean to early Serpukhovian, based on the fusulinids (Niikawa, 1978, 1980), smaller foraminifers (Adachi, 1985) and brachiopods (Tazawa and Kato, 1986). The occurrence of *G. sarsimbaii* from the lowest part of the Ichinotani Formation indicates a palaeontological relationship between Fukuji and Kirgizia in the Early Carboniferous (Visean) time.

The brachiopod specimens described herein are registered and housed in the Fossa Magna Museum, Itoigawa City, Niigata Prefecture.

Systematic descriptions

Order Procuctida Sarytcheva and Sokolskaya, 1959

Suborder Productidina Waagen, 1883

Superfamily Linoproductoidea Stehli, 1954

Family Monticuliferidae Muir-Wood and Cooper, 1960

Subfamily Gigantoproductinae Muir-Wood and Cooper, 1960
Tribe Gigantoproductini Muir-Wood and Cooper, 1960
Genus *Gigantoproductus* Prentice, 1950

Type species.—*Productus giganteus* Sowerby, 1822.

Gigantoproductus sarsimbaii (Sergunkova, 1935)
Figs. 2.1a-2.2c

Productus (*Gigantella*?) *sarsimbaii* Sergunkova, 1935, p. 10, pl. 2, figs. 1-3.
Productus (*Gigantoproductus*) *sarsimbaii* Sergunkova: Gladchenko, 1955, p. 19, pl. 14, figs. 1-3.
Gigantoproductus sarsimbaii (Sergunkova): Galitzkaja, 1977, p. 141, pl. 51, figs. 3, 4; pl. 52, fig. 7; pl. 53, figs. 1-4.
Gigantoproductus tulensis (Bolkhovitinova): Galitzkaja, 1977, p. 143, pl. 54, figs. 1, 2.
Gigantoproductus sp. Tazawa and Kato, 1986, p. 396, pl. 78, fig. 7.

Material.—Two ventral valves, FMM1740, 1741.

Description.—Shell small for genus, transversely semicircular in outline, with greatest width at hinge; length 57 mm, width 73 mm in the larger specimen (FMM1741); length 53 mm, width about 71 mm in the smaller specimen (FMM1740). Ventral valve moderately convex in lateral profile, strongly geniculated at anterior margin of ventral valve, both posterior and anterior parts of ventral valve flattened; flanks steep; umbo small and pointed; ears large, triangular, and well demarcated from flanks; sulcus broad and shallow. External surface of ventral valve ornamented with numerous costae; costae regular, numbering 7-8 in 10 mm at about midvalve; several rugae on both of flanks and ears; no fluting; numerous fine growth lines over the valve; spines or spine bases absent or not preserved. Shell thickness about 2 mm for anterior of ventral valve.

Remarks.—These specimens are referred to *Gigantoproductus sarsimbaii* (Sergunkova, 1935), which originally described from the lower Visean of the Talass, Tian-Shan area, western Kirgizia from account of size, shape, and external ornament of ventral valve, particularly in its size, shape of umbo and in having several rugae on flanks and ears. *Gigantoproductus* sp. Tazawa and Kato, 1986, from the same horizon and the same locality of Fukuji is referred to *G. sarsimbaii* in size, number of costae, having numerous fine growth lines over the valve, and having broad and shallow sulcus.

Gigantoproductus irregularis (Yanishevsky), described and figured by Sarytcheva (in Sarytcheva and Sokolskaya, 1952, p. 132, pl. 36, fig. 182) from the Serpukhovian of Moscow Basin, is similar to *Gigantoproductus sarsimbaii* in its size and shape of umbo, but it differs in its irregular costae and smaller ears.

Gigantoproductus sp. Tazawa, 2004 (p. 415, fig. 2.1), from the late Visean to

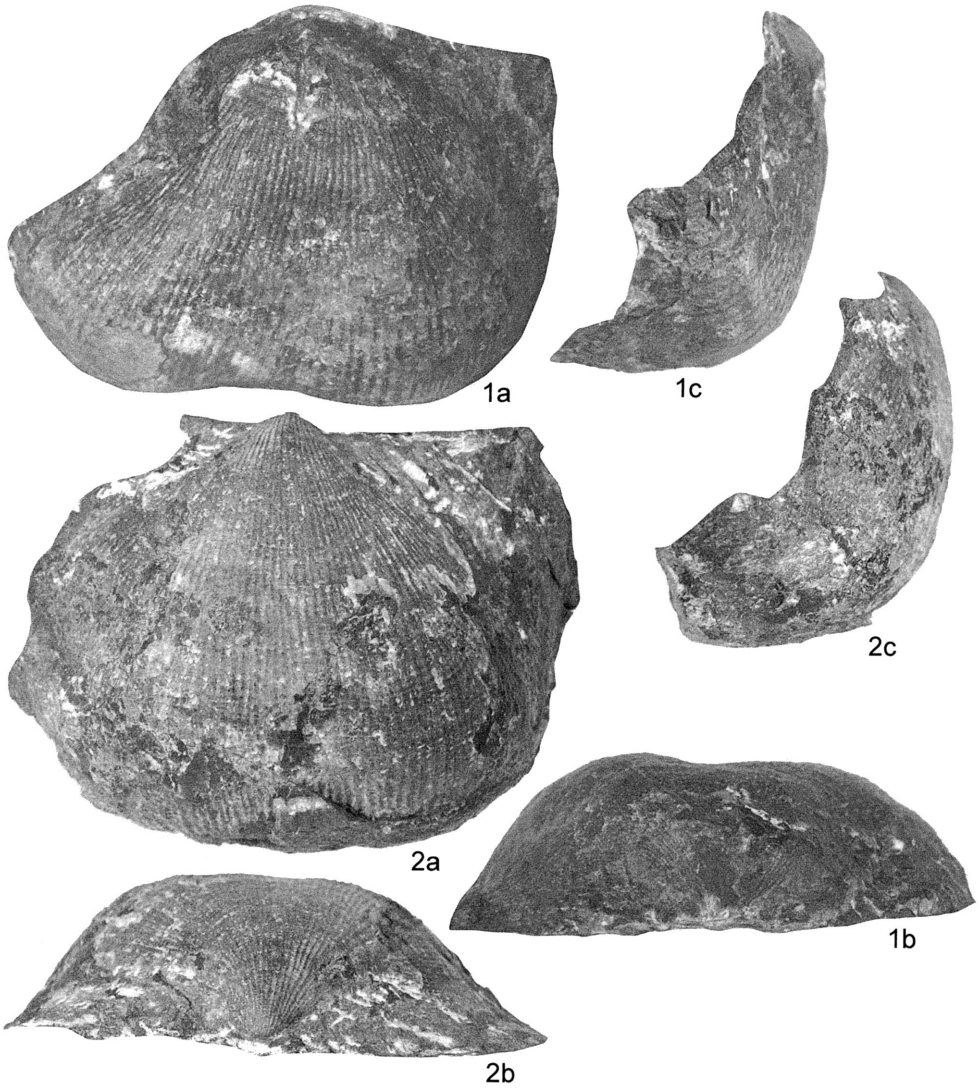

Fig. 2. *Gigantoproductus sarsimbaii* (Sergunkova, 1935), from the lowest part of the Ichinotani Formation at the Ichinotani valley, Fukuji. 1a-c: ventral, posterior and lateral views of ventral valve, FMM 1740. 2a-c: ventral, posterior and lateral views of ventral valve, FMM 1741. All figures are in natural size.

Serpukhovian limestone block of Tsuchikurazawa, Kotaki, Omi area, central Japan, is somewhat similar to *G. sarsimbaii* in size, number of costae and having broad and shallow sulcus, but differs in having several shallow fluting on venter and flanks.

Distribution.— Middle Visean of northern Kirgizia; lower Visean of western Kirgizia; upper Visean of Fukuji, central Japan.

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