

A new species of *Stacheoceras* (Permian ammonoid) from the Upper Permian in the South Kitakami Belt, Northeast Japan

MASAYUKI EHIRO

The Tohoku University Museum, Sendai 980-8578, Japan

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Introduction

Stacheoceras Gemmellaro is a well known, globally distributed genus of Permian ammonoids ranging from the Artinskian to Changhsingian (Kullmann *et al.*, 2000) or from the Kungurian to Changhsingian (Leonova, 2002). Over 50 species of the genus have hitherto been known worldwide, almost all of which are rather small in size, with diameters less than 10 cm. Only two species, *Stacheoceras xiukangense* Sheng and *S. raridentatum* Sheng from Xizang, southwest China, attain a diameter over 10 cm (Sheng, 1984, 1988). The following taxa of *Stacheoceras*, all regular-sized, have been reported from the Wordian to Changhsingian strata of the South Kitakami Belt, Northeast Japan: *Stacheoceras* aff. *grünwaldti* Gemmellaro (Hayasaka, 1965), *S. iwaizakiense* Mabuti (Mabuti, 1935; Ehiro and Bando, 1985), *S. otomoi* Ehiro, Shimoyama and Murata (Ehiro *et al.*, 1986), *S.* cf. *trimulti* Diener (Working Group on the Permian-Triassic Systems, 1975) and *S.* sp. (Hayasaka, 1940; Koizumi, 1975; Ehiro *et al.*, 1986; Ehiro and Araki, 1997; Ehiro, 2001).

Recently a considerably large specimen of *Stacheoceras* was recovered from the Upper Permian of South Kitakami Belt, Northeast Japan. It has also a more complex external suture line than all the previously known species. This paper describes it as a new species, *Stacheoceras giganteum* sp. nov.

Stacheoceras giganteum sp. nov. was collected by Hitoshi Hasegawa from a calcareous nodule included in mudstone of the lower part of the Suenosaki Formation exposed along the Pacific coast of Ishihama, Minamisanriku-cho (former Utatsu-cho), Motoyoshi-

gun, Miyagi prefecture. The fossil locality is the same as Loc. 3 of Utatsu district in Ehiro and Bando (1985) and yields such ammonoid fossils as *Stacheoceras iwaizakiense* Mabuti, *Timorites intermedium* (Wanner), *Pseudogastrioceras* sp., *Araxoceras* cf. *rotoides* Ruzhentsev, *A.* sp., *Vescotoceras japonicum* (Bando and Ehiro), *V.* sp., *Dzhulfoceras* cf. *furnishi* Ruzhentsev (Ehiro and Bando, 1985; Ehiro *et al.*, 1986; Ehiro, 2001). Based on these ammonoids, especially on the occurrence of *Pseudogastrioceras*, *Araxoceras*, *Vescotoceras* and *Dzhulfoceras*, the fossil horizon of the lower part of the Suenosaki Formation is correlatable with the Upper Permian Wuchiapingian (Ehiro and Bando, 1985; Ehiro, 2001)

Systematic description

Subclass Ammonoidea Agassiz, 1847

Order Goniatitida Hyatt, 1884

Suborder Goniatitina Hyatt, 1884

Superfamily Cycloloboidea Zittel, 1895

Family Vidrioceratidae Plummer and Scott, 1937

Genus *Stacheoceras* Gemmellaro, 1887

Type species.—*Stacheoceras mediterraneum* Gemmellaro, 1887

Stacheoceras giganteum sp. nov.

Figures 2a–d

Material.—Holotype, IGPS coll. cat. no. 109698 collected by H. Hasegawa from the lower part of the Suenosaki Formation at Ishihama (Loc. 3 of Ehiro and Bando, 1985), Minamisanriku-cho, Miyagi Prefecture.

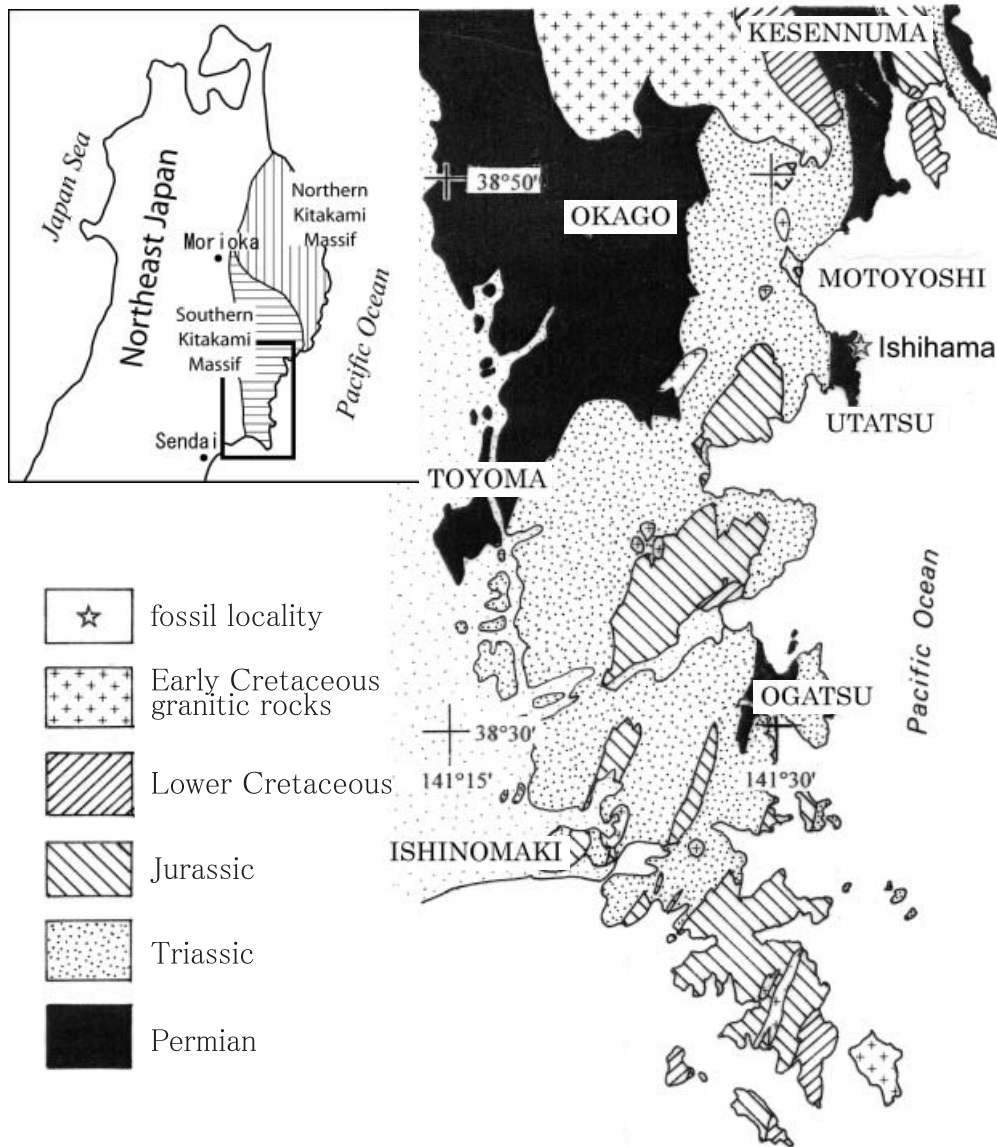


Figure 1. Locality map.

Diagnosis.—Large-sized *Stacheoceras* with subparallel sides and subrectangular cross section in mature stage. Suture most advanced form in the genus.

Description.—A large natural cast slightly deformed elliptically, diameter of which attains more than 130 mm. Shell involute with almost closed umbilicus. Length of the living chamber exceeds one volution. At the diameter of 111.8 mm the height and width are 66.5 and 48.8 mm, respectively. Conch form subglobular in outline having broadly convex sides and venter with broadly rounded umbilical and ventral shoulders. In the last volute the form is subrectangular, having nearly flat sides and broadly convex venter

with rounded ventral shoulders. Surface almost smooth with fine faint growth lines.

External suture consists of a large and wide ventral lobe and many lateral lobes. All saddles rounded. Ventral lobe divided by moderately high median saddle into two wide denticulated branches. Branches primarily bidenticulated, but with a shallow denticle on the lower part of the lateral sides, thus having an almost tridenticulated appearance. More than eight lateral lobes on the lateral side. First lateral lobe is largest and divided by narrow median saddle into two denticulated prongs. Prongs asymmetrically bidenticulated and both denticles near the median saddle lon-

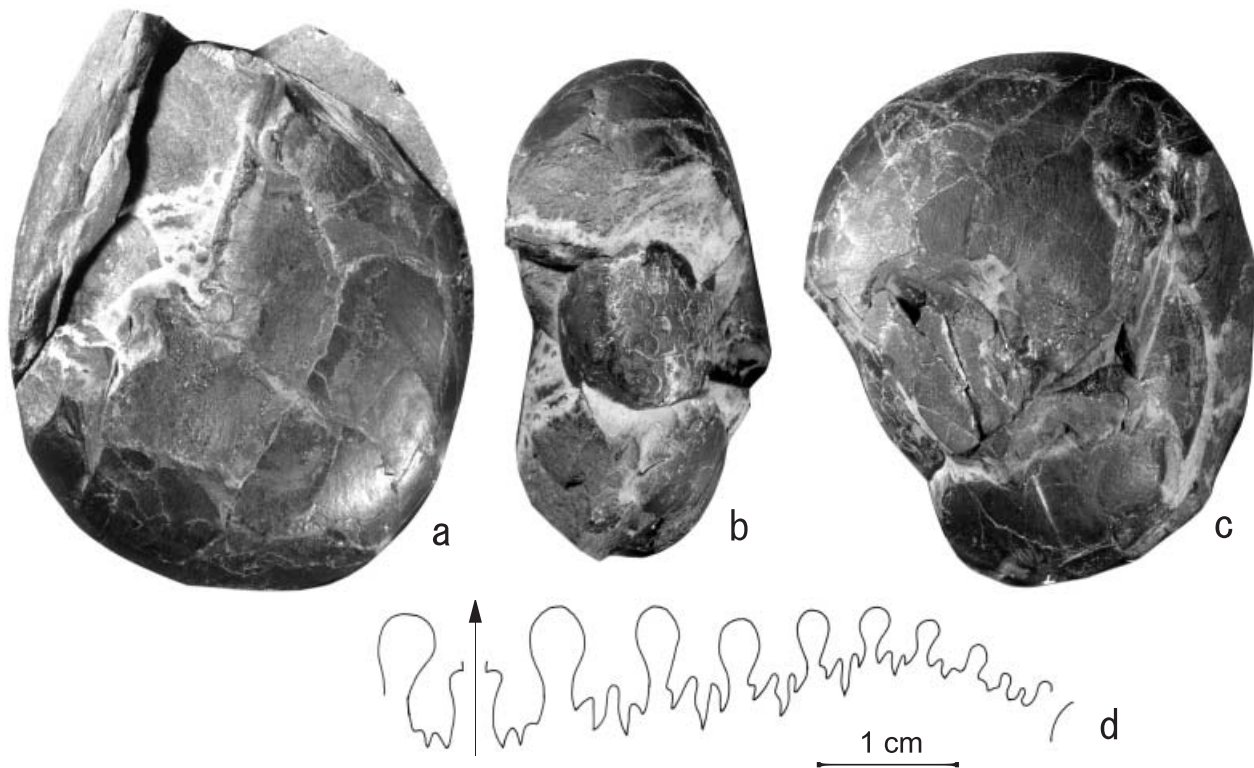


Figure 2. *Stacheoceras giganteum* sp. nov. from the Suenosaki Formation, IGPS coll. cat no. 109698 (Holotype): a and c, lateral views, $\times 0.6$; b, ventral view, $\times 0.6$; d, external suture line.

ger. Second to seventh lateral lobes primarily trifid and gradually diminish in size toward umbilicus, but ventral prongs in the second to fourth lobes have small additional shallow denticles on the lower part of the ventral side. Eighth lobe shallow and bifid. Suture on the umbilical shoulder not seen.

Comparison.—*Stacheoceras xiukangense* Sheng (Sheng, 1984, p. 236, pl. 1, fig. 2, pl. 2, fig. 1, text-fig. 7; Sheng, 1988, p. 158, pl. 2, figs. 1–2, text-fig. 6) somewhat resembles the present species in its large size and having somewhat flattened sides, but is clearly distinguished by its rounded ventro-lateral shell form and simple suture lines. *Popanoceras (Stacheoceras) trimulti* Diener (Diener, 1897, p. 9, pl. 1, fig. 1a–f) has complex suture lines, just as *S. giganteum* does, with tridenticulated prongs of the ventral lobe and two bidenticulated branches of the first lateral lobe. It, however, differs from the latter in its small size, subglobular shell outline and showing no additional denticles in the second to fourth lateral lobes.

Etymology.—The specific name is derived from its considerably large size for the genus.

Occurrence.—The lower part of the Suenosaki Formation, distributed in the Utatsu district, Southern Ki-

takami Massif, Northeast Japan. Lower Wuchiapingian.

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