

A Redescription of Permian Rugosa *Waagenophyllum* (*Waagenophyllum*) *compactum* Minato and Kato, 1965

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Abstract A Permian rugose coral, *Waagenophyllum* (*Waagenophyllum*) *compactum* Minato and Kato is redescribed herein on the basis of transverse and longitudinal sections of well-preserved specimens collected from the Permian Akasaka Limestone in Gifu Prefecture, Central Japan. This species is characterized by having a densely constructed axial structure, generally indistinct median plate, long minor septa, thick septa and fairly well developed globose to elongate dissepiments.

Key words: Akasaka Limestone, Permian, redescription, rugosa, *Waagenophyllum* (*Waagenophyllum*) *compactum*

Introduction

Waagenophyllum (*Waagenophyllum*) *compactum* was proposed by Minato and Kato in 1965 as a new species of a genus *Waagenophyllum*, from possibly the *Yabeina* Zone of the Akasaka Limestone at Ogaki City, Gifu Prefecture, Central Japan. The original description was based on the only transverse section with calcite veins in the corallites, but recently the authors have found well-preserved specimens from the type locality, and a redescription of this species based on transverse and longitudinal sections is now possible.

The present specimens were collected by the third author (A. Hosono) from the Upper Member of the Akasaka Limestone Formation (Ozawa & Nishiwaki, 1992) (Fig. 1). This horizon is characterized by the presence of *Yabeina globosa* (Yabe), *Neoschwagerina minoensis* Deprat and *Kahlerina* sp., and is correlated to the upper Middle Permian.

The specimens studied herein are deposited in the National Science Museum, Tokyo (NSM).

Systematic Description

The terminology of the septal fine structure follows Kato (1963).

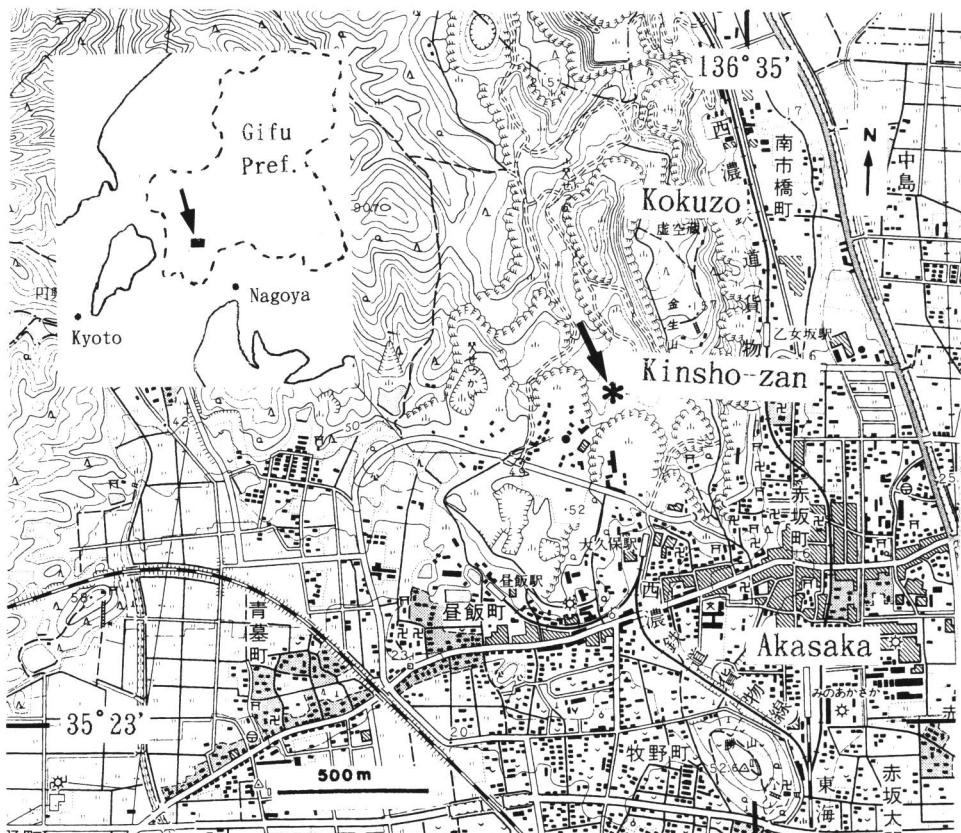


Fig. 1. Map showing coral fossil locality. Base map, "Ogaki", 1:25,000 quadrangle of Geographical Survey Institution.

Family Waagenophyllidae Wang, 1950
 Genus *Waagenophyllum* Hayasaka, 1924
 Subgenus *Waagenophyllum* Hayasaka, 1924

***Waagenophyllum (Waagenophyllum) compactum* Minato and Kato, 1965**

Figs. 2, 3

Waagenophyllum (Waagenophyllum) compactum Minato and Kato, 1965, p. 120–122, text-fig. 46.

Material: Six and four thin sections from two specimens, NSM PA14564 and NSM PA14565 were studied.

Description: Corallum compound and fasciculate, consisting of subcylindrical corallites.

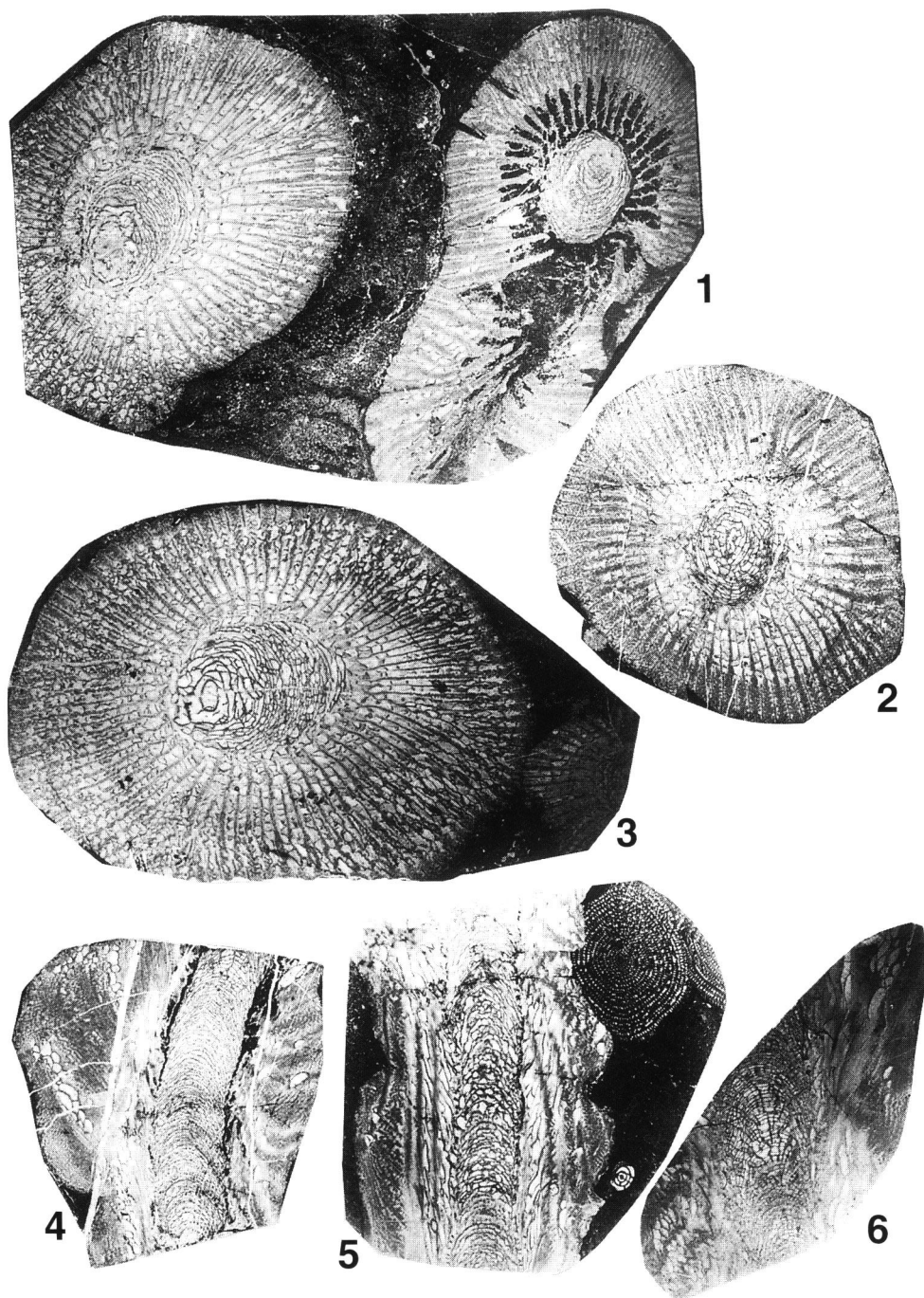


Fig. 2. *Waagenophyllum* (*Waagenophyllum*) *compactum* Minato and Kato, NSM PA 14564, thin sections. 1–3, transverse sections, $\times 3$. 4–6, longitudinal sections, $\times 3$.

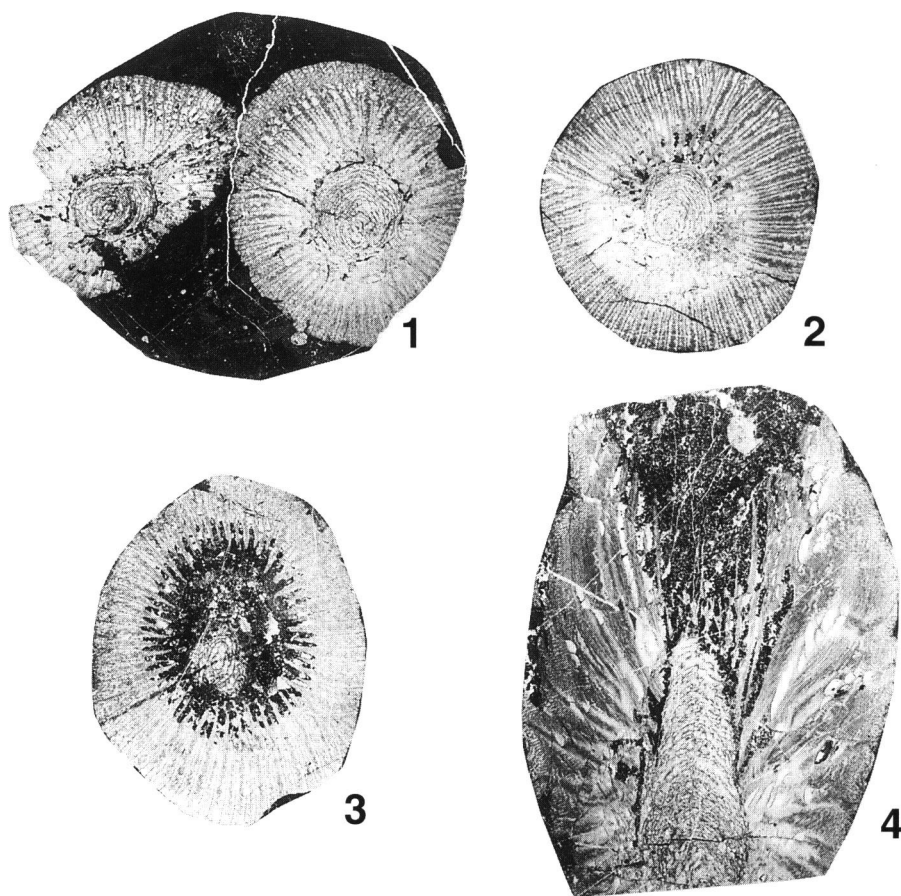


Fig. 3. *Waagenophyllum* (*Waagenophyllum*) *compactum* Minato and Kato, NSM PA 14565, thin sections. 1–3, transverse sections, $\times 3$. 4, longitudinal section, $\times 3$.

In transverse section, corallites subcircular to subellipsoidal in outline, ranging from 12.0 to 24.0 mm in diameter. Corallite wall missing. Septa of two orders, major and minor in alternation; they straight or slightly sinuous. Septa very thick and almost completely in contact or only a little apart from each other in the peripheral and medial portions, although they thinning toward distal end. Septal fine structure rhabdo-trabecular to diffuso-trabecular types. Major septa 30 to 44 in number. They long, but do not directly unite with septal lamellae. Minor septa long and $2/3$ to $5/6$ length of major septa. Dissepimentarium wide, consisting of numerous rows of dissepiments. Dissepiments arranged in concentric, angulo-concentric and lateral pattern. Pseudoherringbone dissepiments rarely present. Tabularium relatively narrow. Concentric tabulae arranged in a few rows. Axial structure subcircular to subellipsoidal in

outline, 1/4 to 1/3 diameter of corallite, consisting of densely constructed axial tabellae and radially disposed numerous septal lamellae. Septal lamellae frequently discontinuous. Median plate generally indistinct.

In longitudinal section, corallite wall missing. Dissepimentarium wide, consisting of numerous rows of globose to elongate dissepiments; elongate ones generally arranged in inner portion. Tabularium relatively narrow and composed of clinotabulae. Very short horizontal tabulae observed in places. Axial structure composed of densely constructed dome-like axial tabellae and frequently discontinuous septal lamellae. Discontinuous median plate occasionally discernible. Axial tabellae 12 to 17 in vertical distance of 2 mm. Calice deep with a prominent calicural boss.

Discussion: Minato and Kato (1965) has considered a coral described under the name of *Waagenophyllum longiseptatum* from the Permian Taisyaku Limestone by Yokoyama (1960, p. 241, 242, pl. 23, figs. 3a–e) as a synonymy of *Waagenophyllum* (*Waagenophyllum*) *compactum*, but the latter is distinguished from the former in having a more densely constructed axial structure and larger corallites.

The present species resembles *Waagenophyllum* (*Waagenophyllum*) *smithi* Minato and Kato (1965, p. 122, 123; Smith, 1935, p. 34–36, pl. 8, figs. 1–6) from the Middle Productus Limestone, Salt Range, Pakistan in having a compact axial structure and thick septa. However, the former can be distinguished from the latter in having a generally indistinct median plate, long minor septa, large corallites and fairly well developed globose to elongate dissepiments.

This species is also similar to *Waagenophyllum* (*Waagenophyllum*) *akasakense* (Yabe, 1902, p. 4, 5, fig. 3; Yabe & Hayasaka, 1915, p. 100–104; Minato, 1955, p. 114, 115, pl. 37, fig. 7; Minato & Kato, 1965, p. 114–116, pl. 6, figs. 1–8, text-figs. 42, 48ak) from the Upper Member of the Akasaka Limestone Formation in having relatively large corallites, long minor septa and thick septa, but differs from the latter in having a densely constructed axial structure.

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