

A New Species of the Genus *Iranophyllum* from the Permian Shirasaki Limestone at Yura-machi, Wakayama Prefecture

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An interesting coral new species described in this article was collected by I. NAGAI, a pupil of the Attached Ikeda Junior High School, from the Permian Shirasaki Limestone at Yura-machi, Hitaka-gun, Wakayama Prefecture, Southwest Japan.

According to YAO, ICHIKAWA and ISHII (1970), this limestone is composed of three formations such as the Sh1, Sh2 and Sh3 Formations. The Sh1 and Sh2 Formations are in fault contact. The Sh2 Formation is overlain disconformably by the Sh3. From the data of many foraminiferal species, they thought that the Sh1 Formation belongs to the lower Lower Permian (*Triticites* spp. zone), the Sh2 to the lower and middle Middle Permian (*Parafusulina kaerimizensis* to *Neoschwagerina craticulifera* zones), and the Sh3 to the lower Upper Permian (*Yabeina* aff. *globosa* zone), although ISHII (personal communication) considers at present that the Sh3 Formation (*Yabeina* aff. *globosa* zone) belongs to the upper Middle Permian.

A limestone material yielding the present coral new species was collected from calcirudite in the lower part of the Sh3 Formation. According to YAO et al (1970), the lower part consists of the alternation of calcirudite and calcarenite. The calcirudite is composed of intraclasts and many abraded foraminiferal tests which are thought not to have been derived from the Sh1 Formation but from the Sh2, according to YAO et al. (1970). The abraded tests are enclosed by medium-crystalline sparite. *Yabeina* aff. *globosa* was found in some intraclasts. In this study, the abraded tests of the present coral new species and of some foraminiferal species, such as *Neoschwagerina* sp. indet., *Pachyphloia* sp. indet., *Schwagerininae* gen. et sp. indet., were found from the same locality. These tests are also enclosed by medium-crystalline sparite. The faunal composition of Foraminifera is very similar to that reported by YAO et al. (1970) from the Sh2 Formation, in which they recognized *Neoschwagerina craticulifera*, *N. simplex*, *Parafusulina kaerimizensis*, *Verbeekina verbeeki*, *Codonofusiella* sp., *Schwagerina* sp., *Schubertella* sp., *Pachyphloia* sp. and others.

The present coral new species resembles the following species of *Iranophyllum*:

Iranophyllum (*Iranophyllum*) *tunicatum* IGO, 1959; *I. (I.) amygdalophylloideum* (HUANG, 1932a); *I. (I.)* sp. a and b of MINATO and KATO (1966).

Iranophyllum (*Iranophyllum*) *tunicatum* was described by IGO (1959) from the upper part of the *Pseudoschwagerina* zone at Fukuji, Gifu Prefecture, central Japan. Later it was discovered from the *Neoschwagerina* zone at Iwaizaki, Miyagi Prefecture, North-east Japan (MINATO and KATO, 1965).

Iranophyllum (*Iranophyllum*) *amygdalophylloideum* occurs in the Permian of China (MINATO and KATO, 1965). Originally it was described by HUANG (1932a) as *Lophophyllum amygdalophylloidea*. According to HUANG (1932a,b), it was found together with *Waagenophyllum* (*Waagenophyllum*) *wengchengense* from the Middle Permian ("Wentzelella timorica" to *Neoschwagerina craticulifera* zones) in Kueichow, China. Later WU (1957) discovered *W. (W.) wengchengense* from the Wuchiaping Limestone (*Codonofusiella* zone) in southern Shensi, China. *Amygdalophyllum nantanense* HUANG, 1933, which was regarded as a younger synonym of *Iranophyllum (I.) amygdalophylloideum* by MINATO and KATO (1965), was reported from the Chuanshan Limestone (*Pseudoschwagerina* zone) in southern Kuangsi, China. Therefore, *Iranophyllum (I.) amygdalophylloideum* may range from the *Pseudoschwagerina* zone to the *Neoschwagerina* zone (or to the *Codonofusiella* zone).

Iranophyllum (*Iranophyllum*) sp. a and *I. (I.)* sp. b of MINATO and KATO (1966), who considered the former to be identical to *Iranophyllum carcinophylloides* and the latter to *I. tunicatum*? of FLÜGEL (1965), occurred in the Middle Permian (probably *Neoschwagerina* zone) in Afghanistan.

Judging from the above-mentioned stratigraphic ranges or occurrences of most similar species of coral, the present writers consider that the test of the present coral new species found in the lower part of the Sh3 Formation may have been reworked

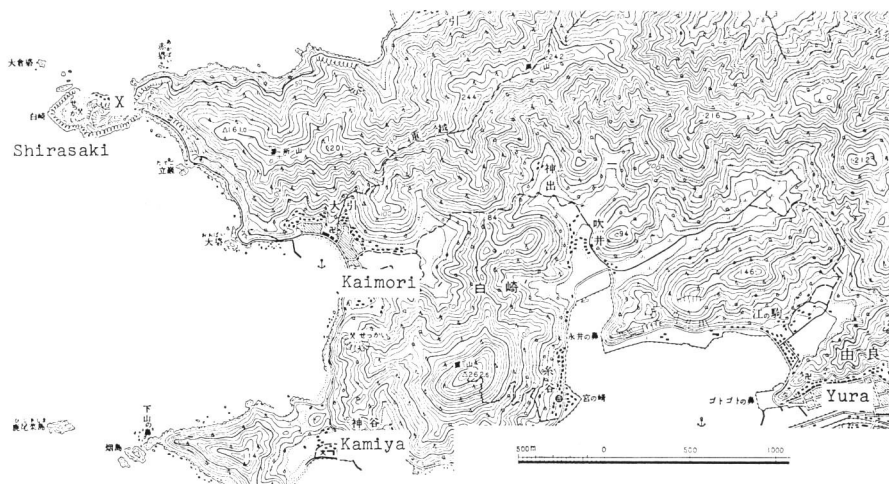


Fig. 1. Map showing the fossil locality. X: Fossil locality.

from the Sh2. This supposition does not conflict with the evidences from the associated Foraminifera.

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Systematic Description

Family Waagenophyllidae WANG, 1950

Subfamily Wentzelellinae HUDSON, 1958

Genus *Iranophyllum* DOUGLAS, 1936

Subgenus *Iranophyllum* DOUGLAS, 1936

Iranophyllum (Iranophyllum) shirasakiense, n. sp.

(Plate 1, figs. 1-2)

Corallum is simple. Corallite is conical in form and medium in size.

Transverse section: Corallite is $17.0 \pm$ mm in calicural diameter in mature stage. External wall is missing. Septa are in four orders, sinuous or nearly straight. They show the diffuso-trabecular to the fibro-normal types under microscope. Major ones are more or less rhopaloid in shape; they are about 30 in number. An imperfect inner wall are formed by their flexed ends. Minor ones are variable in length, ranging usually from $1/2$ to $4/5$ the length of major ones; some ones lean on their neighboring major ones on the counter sides. Tertiary ones are also observable but are not uniformly distributed throughout the corallite. They are usually $1/3$ to $2/3$ the length of minor ones; many ones lean on their neighboring minor ones. Quaternary ones are only sporadically developed. They are about $1/2$ as long as tertiary ones. Dissepiments are arranged in concentric pattern. Axial structure is large in size and subelliptical in shape, occupying about $1/3$ the diameter of the corallite. It is composed of axial tabellae and septal lamellae. The latter two are very thick in outer part. Median plate is indistinct.

Longitudinal section: Elongate dissepiments and clino-tabulae are relatively well developed. Very short horizontal tabulae are also found. However, globose dissepiment is not seen for the presence of septa. Axial structure is composed of regularly up-arching axial tabellae. The latter ones are very steep on both sides where they are very thick.

Comparison: The present form resembles *Iranophyllum* (*Iranophyllum*) sp. a of MINATO and KATO (1966, pp. 39–40; FLÜGEL 1965, pp. 10, 12, Abb. 2) in many respects. The corallite of the former, however, are conical in form, but the latter's one cylindrical. Besides, the median plate of the former is indistinct. It is similar to *Iranophyllum* (*Iranophyllum*) *amygdalophylloideum* HUANG, 1932a (pp. 31–32, pl. 2, figs. 13a-b, pl. 16, fig. 7; 1933, p. 115, pl. 1, figs. 2a-b; MINATO and KATO, 1965, p. 175), but differs from the latter in the construction of the axial structure. It is also similar to *Iranophyllum* (*Iranophyllum*) sp. b of MINATO and KATO (1966, pp. 39–40; FLÜGEL, 1965, pp. 12, 13, Abb. 3). However, the former is distinguishable from the latter, in having less numerous tertiary and quaternary septa and different construction of the axial structure. It differs from *Iranophyllum* (*Iranophyllum*) *tunicatum* IGO, 1959 (pp. 82–83, pl. 8, figs. 1a-b, text-fig. 1; MINATO and KATO, 1965, p. 174, pl. 15, figs. 2–5) in having no carinated septa and less numerous tertiary and quaternary septa.

Occurrence: The Shirasaki Limestone at Yura-machi, Hitaka-gun, Wakayama Prefecture, Southwest Japan.

Collector: Isao NAGAI.

Repository: Reg. No. PA 11668 (holotype) (National Science Museum, Tokyo).

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Explanation of Plate 1

Figs. 1–2. *Iranophyllum* (*Iranophyllum*) *shirasakiense* n. sp.

Fig. 1. Transverse section ×6.0 (PA11668a)

Fig. 2. Longitudinal section ×6.0 (PA11668b)

