

Gokaselites, a New Genus of Silurian Tabulate Coral from the Gionyama Formation, Miyazaki Prefecture

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Abstract An alveolitid coral *Gokaselites nodai* gen. et sp. nov. is proposed for material from the Early Silurian of southern Japan. The new genus differs from the previously known alveolitines by its laminar corallum form, differentiated corallites into the prostrate and erect portions with the partly subpolygonal corallite cross sections, narrow corallite diameters, thickened distal intercorallite walls, and connecting protuberances. A phylogenetic relationship to the Devonian genus *Crassialveolites* with *Gokaselites* is suggested. Stratigraphic horizon of the new coral is the G2 Member in the Gionyama Formation.

Key words: Early Silurian, *Gokaselites nodai*, Alveolitidae, Gionyama Formation, Miyazaki

Introduction

As the second account in a series describing the Silurian tabulate coral fauna of the Gionyama Formation in southern Japan, this paper documents a new genus and species of an alveolitid from the late Wenlockian (Early Silurian) G2 Member. Its collecting site is identical with locality 1 that was given in fig. 1 of preceding Niko (1998). The tabulate coral specimens studied are deposited in the National Science Museum, Tokyo.

Systematic Paleontology

Family Alveolitidae Duncan, 1872
Subfamily Alveolitinae Duncan, 1872
Genus *Gokaselites* nov.

Type species: *Gokaselites nodai* sp. nov., by monotypy.

Diagnosis: Laminar coralla with slender corallites consisting of prostrate, thin-walled proximal portions and erect, moderately thick-walled distal portions; cross sections of corallites usually fan-shaped to subpolygonal; calices narrow, perpendicular to surface; both mural pores and connecting protuberances recognized; tabulae

complete; very short septal spines bear on recumbent intercorallite walls.

Remarks: The new genus is discussed with *Gokaselites nodai* sp. nov.

Etymology: The generic name is derived from the town named Gokase near the type locality.

***Gokaselites nodai* sp. nov.**

Figs. 1, 2

Holotype: NSM PA14528, from which seven thin sections were made.

Other specimens: Nine thin sections were studied from the six paratypes, NSM PA14529–14534.

Diagnosis: As for the genus.

Description: Coralla encrusting, laminar in growth form, alveolitoid to partly cerioid; maximum observed size of largest corallum (paratype, NSM PA14529) attains 65 mm in diameter and 11 mm in height. Corallites slender; each corallite consists of proximal prostrate and reclined portion with subtrapezoid to fan-shaped in cross sections and distal erect portion with fan-shaped, hemi-circular to indistinct 4–6 sided subpolygonal in cross sections; diameters of distal corallites reach 0.7×0.5 mm to 0.9×0.8 mm; calices narrow, opening to surface of corallum at nearly right angles, visor-like structure at aperture absent; increase of new corallites lateral, relatively common. Intercorallite walls composed of median dark line and stereoplasm, thin in proximal prostrate portions with 0.06–0.08 mm in thickness, then both median dark line and stereoplasm moderately thickened in distal erect portions attaining 0.23–0.29 mm in thickness; microstructure of stereoplasm may lamellar; mural pores sporadic, on narrow sides of corallites at or near angles, approximately 0.18 mm in diameter; connecting protuberances commonly recognized in distal erect portions, circular in cross section with 0.14–0.19 mm in inside diameters; tabulae relatively rare, complete, rectangular to corallite, usually straight in longitudinal section; septal spines very short, approximately 0.07 mm in length, well-developed on recumbent intercorallite walls in distal prostrate portions; squamula absent.

Discussion: *Gokaselites nodai* gen. et sp. nov. is placed within the subfamily Alveolitinae because of its fan-shaped cross section of corallites even in the distal portions, and absence of the squamula and the visor-like structure. Among the previously known genera of the subfamily, *Gokaselites* is closest morphologically to the Devonian genus *Crassialveolites* (Sokolov, 1955; and its subjective junior synonym *Microalveolites*) that was proposed on the basis of *Alveolites crassiformis* Sokolov (1952, pl. 24, figs. 1, 2; Sokolov, 1955, pl. 30, figs. 6, 7) from the Middle Devonian in the Central Russia Upland. The genera share the similar proximal corallite morphology indicating prostrate forms with thin intercorallite walls, that also shown by Leleshus (1972, Abb. 1) in an Early Devonian species *Crassialveolites minimus*. In addition, the erect orientation, the narrow and partly subpolygonal cross sections and

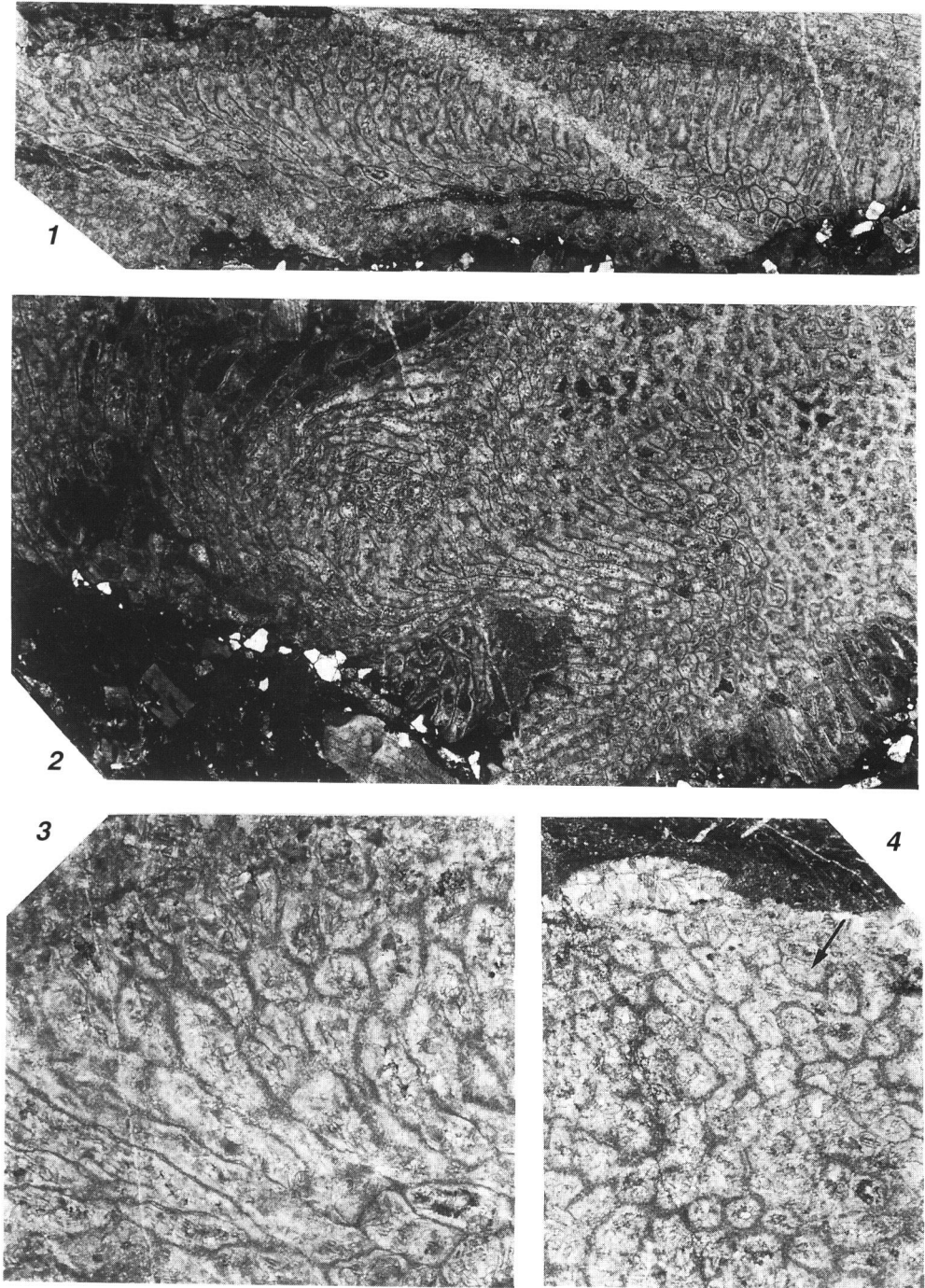


Fig. 1. *Gokaselites nodai* gen. et sp. nov., thin sections. 1–3, holotype, NSM PA14528, 1, longitudinal section, $\times 5$. 2, transverse section, $\times 5$. 3, partial enlargement of Fig. 1-1, $\times 14$. 4, paratype, NSM PA14533, transverse section, arrow indicates connecting protuberance, $\times 10$.

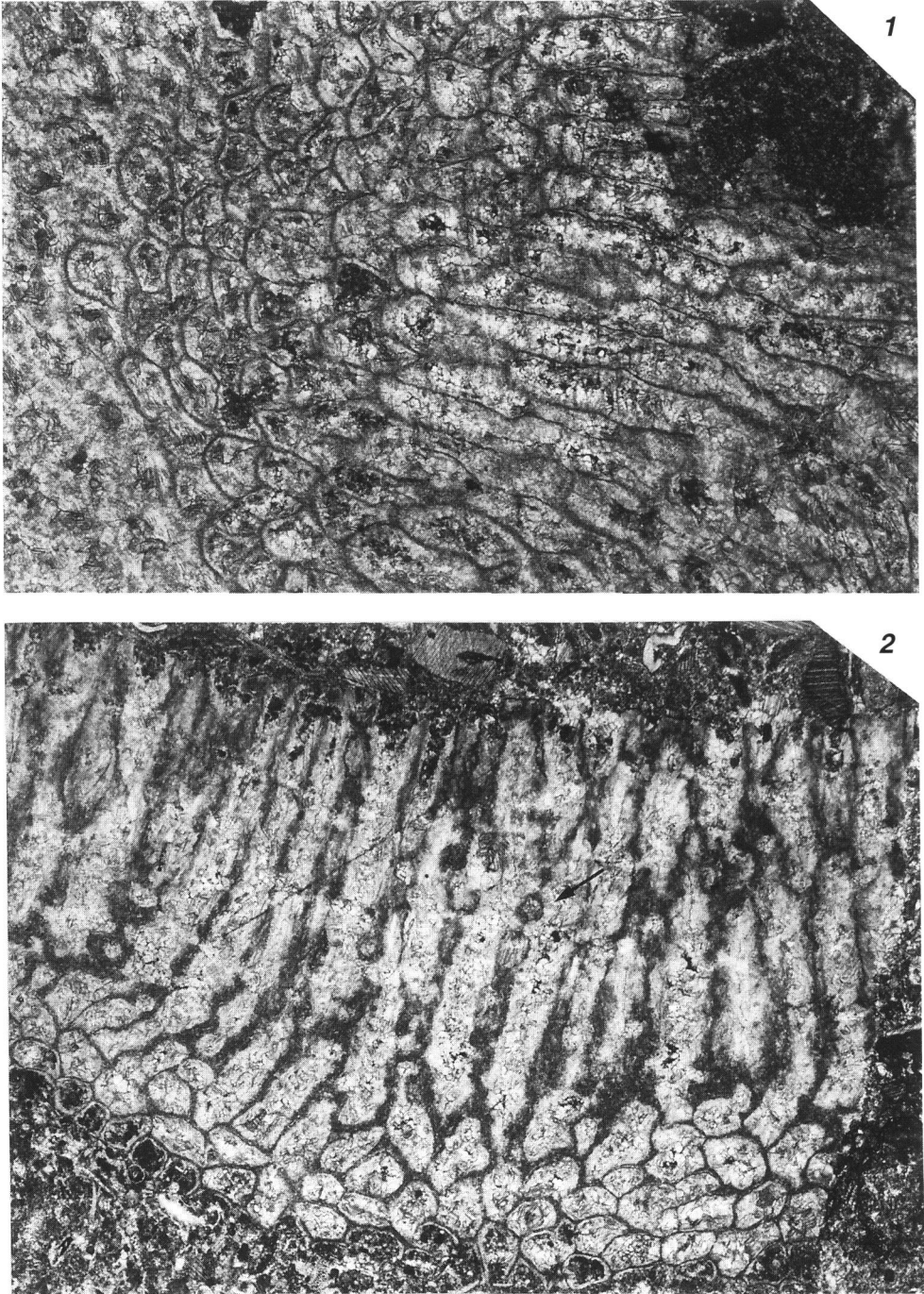


Fig. 2. *Gokaselites nodai* gen. et sp. nov., thin sections. 1, holotype, NSM PA14528, partial enlargement of Fig. 1-2, $\times 14$. 2, paratype, NSM PA14532, longitudinal section, arrow indicates connecting protuberance, $\times 14$.

the thickened intercorallite walls in the distal corallites are also diagnostic features in *Crassialveolites*. Although *Gokaselites* is distinguished from *Crassialveolites* by its laminar corallum form and connecting protuberances, the both genera may have phylogenetic relationship.

Kim (1971, pl. 28, figs. 3a, b) described “*Subalveolites*” *gracilis* from the Wenlockian of Central Asia as a new alveolitid with the connecting protuberances. However, the thin intercorallite walls throughout the coralla clearly separate it from *Gokaselites nodai*.

Etymology: The specific name honors the late Dr. Mitsuo Noda, in recognition of his contributions to knowledge of the Middle Paleozoic strata and fauna in southern Japan.

Occurrence: All specimens were collected from gray-green limestones in limestone conglomerate of the G2 Member, Gionyama Formation. Common.

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