Halysites miyazakiensis, a New Species of Silurian Halysitids (Coelenterata: Tabulata) from the Gionyama Formation, Miyazaki Prefecture, Japan

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Abstract *Halysites miyazakiensis* sp. nov. is described from the Ludlow (early Late Silurian) G3 Member of the Gionyama Formation in the Kuraoka area, Miyazaki Prefecture, southern Japan. The new species can be separate from comparable species, such as *H. catenularius* (Linnaeus, 1767) and *H. junggarensis* Lin and Wang *in* Wang, 1981, by its morphologic combination of the large and well-inflated corallites, the thick to very thick corallite walls, and elongated rectangular profiles in the most common coenenchymal tubules. It is also characteristic for this new species that the rank junctions occur even at the lateral corallite walls.

Key words: Ludlow (early Late Silurian), G3 Member, tabulate coral, *Halysites*

Introduction

Following Niko and Adachi (2013) on the halysitid tabulate coral assemblages of the Gionyama Formation, the present report deals with an additional specimen of halysitids for the fauna. It was collected by the second author (T. A.) from a float block of gray to reddish gray limestone (bioclastic wackestone) on the northern slope of Mt. Gionyama in the Kuraoka area, Miyazaki Prefecture, southern Japan. Judging from lithology, this block is apparently derived from the Ludlow (early Late Silurian) G3 Member. We describe herein a new species, *Halysites miyazakiensis*, on the basis of this new specimen.

Systematic Paleontology

Subclass Tabulata Milne-Edwards and Haime, 1850
Order Halysitida Sokolov, 1947
Family Halysitidae Milne-Edwards and Haime, 1849
Subfamily Halysitinae Milne-Edwards and Haime, 1849

Genus **Halysites** Fischer von Waldheim, 1828

Type species: *Tubipora catenularia* Linnaeus, 1767.

Halysites miyazakiensis sp. nov.

(Figs. 1-1–5)

Holotype: NMNS PA18296, from which 10 thin sections were made. Repository of the specimen is National Museum of Nature and Sciences, Tokyo.

Diagnosis: *Halysites* with ranks indicating somewhat variable length, but usual ones consist of three to five corallites; lacunae elongated and gently curved or subpolygonal; rank junctions occur at corallite junctions and lateral corallite walls; corallites well inflated, indicating subelliptical to nearly circular profiles, and large with approximate sizes of 2.1 mm in length and 2.0 mm in width; form ratios (length/width) of corallites approximately 1.07; corallite walls thick to very thick; septal spines well-developed; tabulae complete; in transverse section, coenenchymal tubules narrow and most common their shapes are elon-
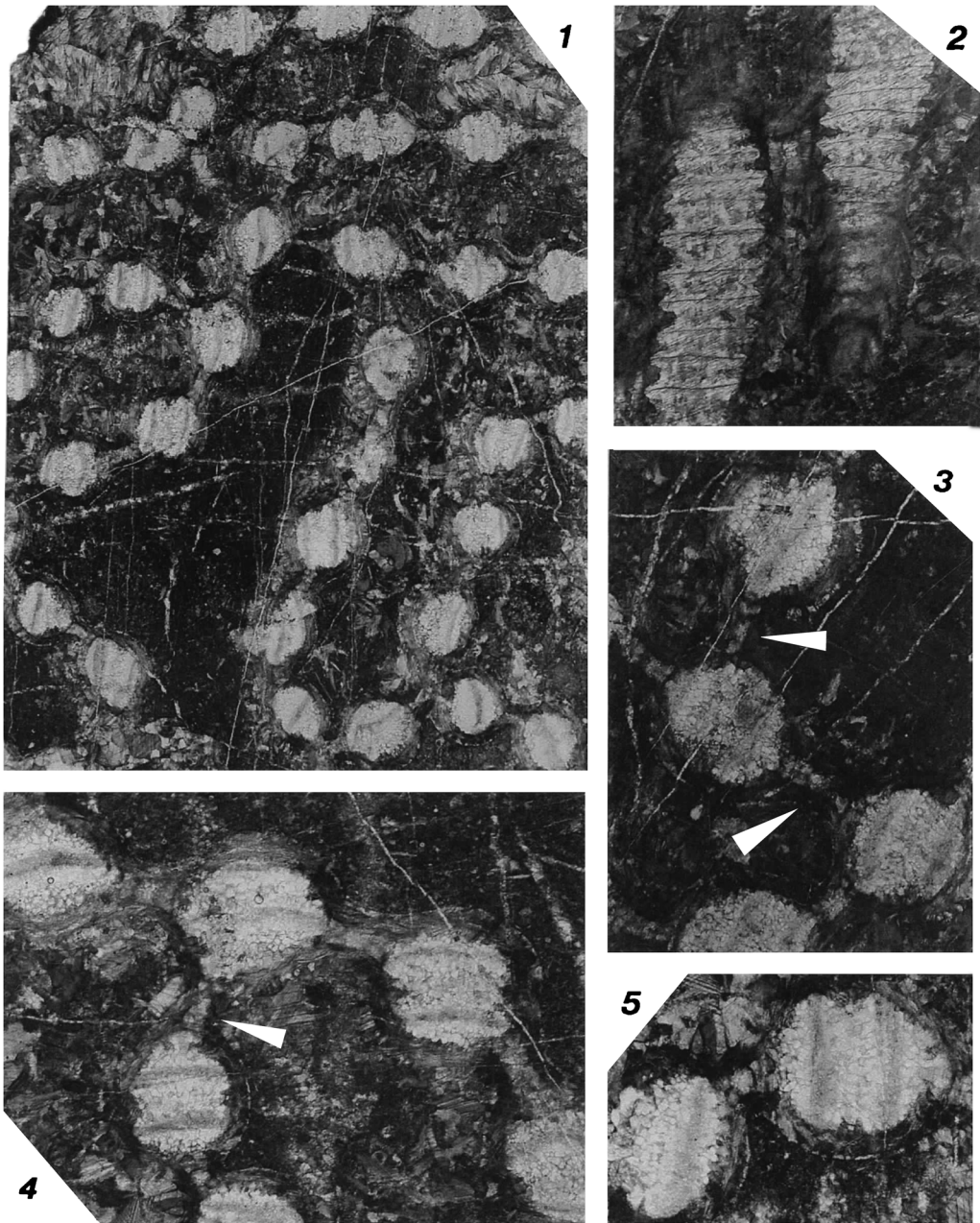
Fig. 1. *Halysites miyazakiensis* sp. nov., holotype, NMNS PA18296, thin sections. **1**, transverse section, ×5. **2**, longitudinal section, note well-developed septal spines, ×10. **3**, **4**, transverse sections, note rank junctions at lateral corallite walls (arrows) and elongated profiles of coenenchymal tubules, ×10. **5**, partial enlargement of Fig. 1-1 to show thick corallite walls and well-developed septal spines, ×14.

gated rectangular attaining 1.36 mm in length.

Description: A single fragmentary specimen is available for study; it is massive halysitoid and attains 95 mm in width. Ranks exhibit somewhat variable length, ranging from very short to relatively long; the former ranks consist of a single corallite and the longest rank is made up of eight corallites; commonly, there are three to five cor-

allites in a rank; in transverse section, ranks are broadly curved to nearly straight; lacunae are elongated and gently curved, or subpolygonal in transverse section; rank junctions commonly occur at corallite junctions, but junctions at lateral corallite walls are not rare. Corallites well inflated with subelliptical to nearly circular transverse sections and large; sizes of corallites are 1.78–2.72 mm in length and 1.67–2.34 mm in width; their approximate mean length and width are 2.1 and 2.0 mm respectively; form ratios (length/width) range from 0.85 to 1.30, with 1.07 in mean; tabularia commonly indicate subcircular transverse sections; no calice preserved; increase is not detected in sectioned parts. Corallite walls thick to very thick, 0.23–0.42 mm, differentiated into outer layer of epitheca and inner stereoplasmic layer; lamellar microstructure of the latter layer is partly preserved; intercorallite walls (between tabularium and coenenchymal tubule) are approximately 0.08 mm in thickness; septal spines well-developed, relatively large, high conical to rod-like with length of 0.19–0.50 mm in their protruded portions into tabularia; tabulae complete and horizontal; there are 4–7 tabulae in 2 mm of corallite length. Coenenchymal tubules present all corallite and rank junctions; in transverse section, tubules are narrow and indicate variable shapes ranging from compressed rectangular (rare), square (relatively rare) to elongated rectangular (most common) or three-pointed profiles at some rank junctions; the former three tubules have 0.42–0.71 mm in width; length of elongated rectangular tubules attains to 1.36 mm; tubule diaphragms complete.

Etymology: The specific name is derived from prefectural name, Miyazaki, of the type locality.

Discussion: Among the previously known Gionyama species belonging to the genus *Halysites*, *H. catenularius* (Linnaeus, 1767; Niko and Adachi, 2013, p. 17, 20, figs. 1-1–5; 2-1–6) is most similar to *H. miyazakiensis* sp. nov. in its corallite shape and size. However, the new species can be easily differentiated from *H. catenularius* by the possession of the thick to very thick corallite walls and the elongated coenenchymal tubules. In addition, the rank junctions occurring at the lateral corallite walls are not recognized in *H. catenularius.*

The coenenchymal tubules of *H. junggarensis* Lin and Wang *in* Wang (1981, p. 58, pl. 29, figs. 3a, b) from the Middle Silurian of Xinjiang Uygur, Northwest China also indicate elongated rectangular profiles. They differ in corallite sizes and form ratios. *Halysites junggarensis* has the somewhat smaller corallites with 1.9–2.1 mm in length and 1.3–1.6 mm in width and the less inflated corallites with approximate form ratios of 1.2–1.4 than those of the present new species.

Acknowledgements

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