

Aulostegites nodai, a New Species of Early Silurian Tabulate Coral from the Gionyama Formation, Miyazaki Prefecture

Shuji Niko¹ and Tomio Adachi²

¹ Department of Environmental Studies, Faculty of Integrated Arts and Sciences, Hiroshima University,
1–7–1 Kagamiyama, Higashihiroshima, Hiroshima 739–8521, Japan

E-mail: niko@hiroshima-u.ac.jp

² 3–2–26 Kadokawa Nishisakae, Higashiusuki, Miyazaki 889–0622, Japan

E-mail: t_adachi@taupe.plala.or.jp

Abstract A new auloporid tabulate coral species, *Aulostegites nodai*, is described from the upper Wenlock (Lower Silurian) G2 Member of the Gionyama Formation in the Kuraoka area, Miyazaki Prefecture. The Early Silurian species differs from a comparable species, *A. longlinensis* Chow in Xian *et al.*, 1980 from the Lower to Middle Devonian of South China, in its smaller corallite diameters and shorter spine-like projections. *Aulostegites* sp. indet. (Senzai and Niko, 2003) from the Fukata Formation, Yokokurayama Group, Kochi Prefecture is conspecific with *A. nodai*.

Key words: Wenlock, Early Silurian, tabulate coral, Auloporida, *Aulostegites nodai* sp. nov., Gionyama Formation, Miyazaki.

Introduction

In contrast to diverse favositines, alveolitines, heliolitines and halysitines, records of auloporids are relatively scarce in the tabulate coral fauna of the Silurian Gionyama Formation, Kurosegawa Terrene. So far only three species have been known to occur, including *Aulocystis okitsui* Niko, 2001 from the lower Ludlow (Upper Silurian) G3 Member (Niko, 1998), *Syringopora utsumiyai* Niko and Adachi, 2004 from the upper Wenlock (Lower Silurian) G2 Member, and *Syringoporella?* sp. indet. from the G3 Member (Niko and Adachi, 2004). In 2007, intensive collecting efforts by the junior author were resulted in the discovery of a specimen belonging to the fourth species of auloporid corals at the western slope of the Mt. Gion-yama (locality 1; see Niko, 1998 for its geographic and geologic settings) in the Kuraoka area, Miyazaki Prefecture, southern Japan. We describe herein a new species, *Aulostegites nodai*, on the basis of this new material, whose repository is the National Science Museum (prefixed NSM). This report is

the seventh part of our serial project concerning the Gionyama fauna.

Systematic Paleontology

Order Auloporida Sokolov, 1947

Superfamily Syringoporoidea Fromentel, 1861

Family Roemeriidae Počta, 1904

Genus *Aulostegites* Lejeune and Pel, 1973

Type species: Aulostegites hillae Lejeune and Pel, 1973.

Remarks: Based on discussions by Senzai and Niko (2003), we place this genus within syringoporooid roemeriids rather than auloporoid aulocystids in Hill (1981) or auloporoid romingeriids in Lin *et al.* (1988).

Aulostegites nodai sp. nov.

(Figs. 1-1–7)

Aulostegites sp. indet., Senzai and Niko, 2003, p. 68, figs. 1-A–D, 2-A–D.

Holotype: NSM PA15803, from which five

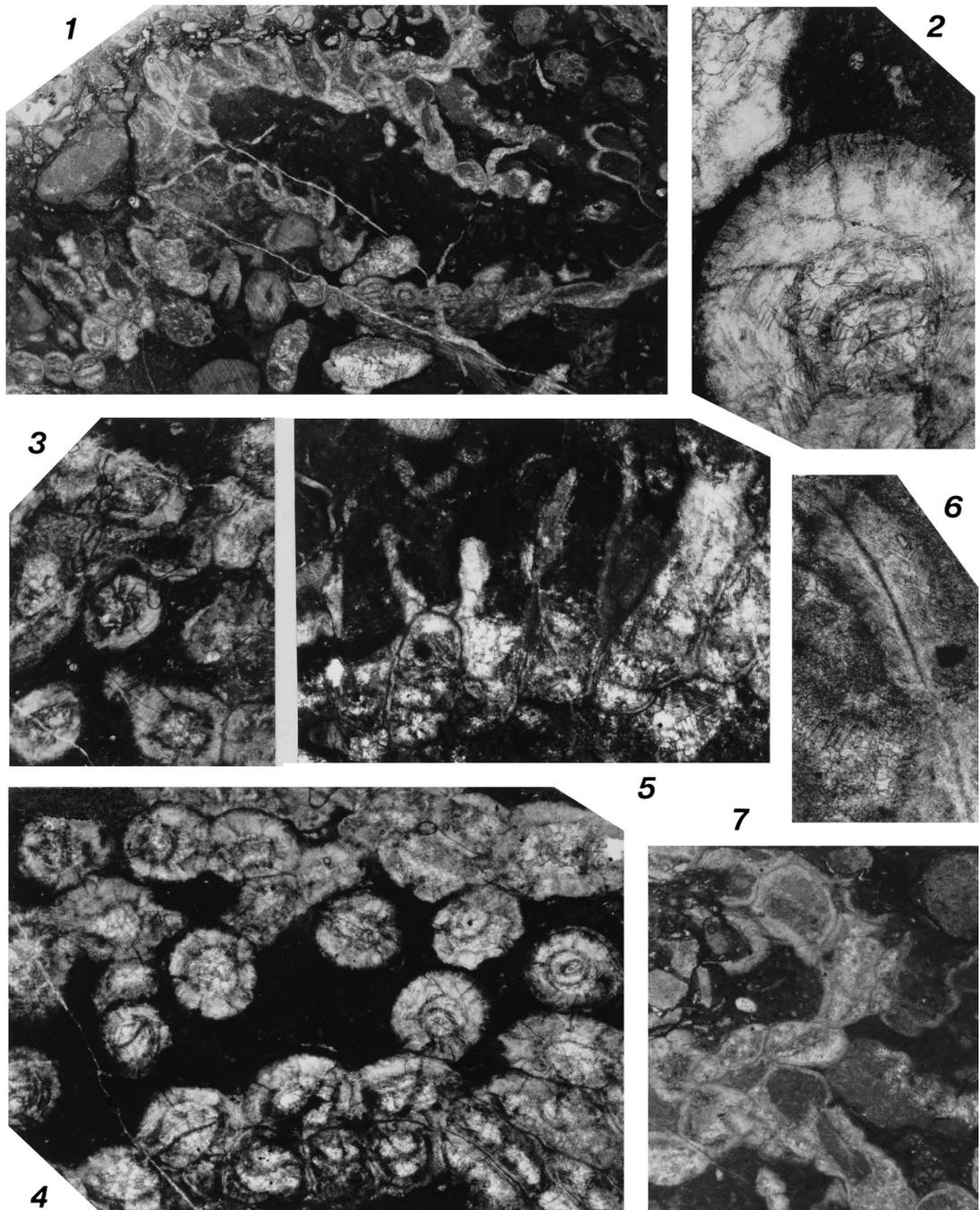


Fig. 1. *Aulostegites nodai* sp. nov., holotype, NSM PA15803, thin sections. 1, longitudinal section of corallum, associated with pachyporid favositid *Striatopora sugiyamai* Niko and Adachi, 1999, $\times 5$. 2, partial enlargement of transverse section of distal corallite, to show corallite wall structure, $\times 50$. 3, 4, transverse to oblique sections of corallites, note spine-like projections, $\times 14$. 5, longitudinal sections of corallites, $\times 14$. 6, partial enlargement of longitudinal section of proximal corallites, to show intercorallite wall structure and mural pore, $\times 50$. 7, longitudinal section of corallum, showing parent corallite and offsets, $\times 10$.

thin sections were made.

Diagnosis: Species of *Aulostegites* with small corallite diameters, ranging 0.48 to 1.16 mm with 0.95 mm mean, and thickened walls in distal corallites, up to 0.48 mm in cerioid and 0.38 mm in phaceloid portions; mural pores occur with relatively high frequency; shape and spacing of tabulae are irregular; short spine-like projections developed in tabularium.

Description: Corallum encrusting, composed of multiple lamellae with at least four layers; gross corallum shape is thick tabular, attaining 48 mm in width and 23 mm in height; approximate height of lamella ranges from 0.8 to 3.6 mm. Each corallite consists of proximal prostrate portion indicating alveolitoid-like arrangement, and distal upwardly directed portion indicating cerioid to phaceloid arrangement; transverse sections of corallites are sub-polygonal, hemi-circular to fan-shaped in proximal portion, and sub-polygonal to circular in distal portion; distal ends of corallites are commonly free, and differentiated into weakly inflated simple calices and parent individuals, latter of which produce at least two offsets to form new lamella; diameters of corallites are small for genus, between 0.48 and 1.16 mm, with 0.95 mm mean; calices and usual tabularia have circular to sub-circular transverse sections; calical depth usually deep. Intercorallite walls in proximal portion are thin to relatively thin, 0.04–0.19 mm, then rapidly thickening up to 0.48 mm in cerioid portion, consisting of median dark line (fused epitheca) and stereoplasm; corallite walls in phaceloid portion attain to 0.38 mm in thickness; constituents of corallite walls are epitheca and stereoplasm, the latter of which structure differentiated into outer darker layer of rect-radiate fibers and inner transparent layer; microstructure of inner layer may be lamellar; thickness of outer layer occupies approximately 14–27 percent of stereoplasm thickness; mural pores have sub-circular profile, occur near corallite corners in alveolitoid-like and cerioid portions with relatively high frequency for genus; diameter of typical mural pore is 0.14 mm; tabulae irregular in shape, complete with sagging

(concave proximally), nearly flat, oblique and up-arched (concave distally) profiles, or incomplete with oblique and vesicular profiles, in addition infundibuliform tabulae are rarely developed; spacing of tabulae also irregular, ranging from crowded to nearly absent; short conical spine-like projections, usually 0.08–0.13 mm in length, are commonly developed in tabularium.

Etymology: The specific name honors the late Dr. Mitsuo Noda, in recognition of his contributions for stratigraphy and paleontology in the Silurian strata of the Kurosegawa Terrene.

Occurrence: The holotype was collected from impure limestone pebble in the G2 Member of the Gionyama Formation. The age of *Aulostegites nodai* sp. nov. is best constrained as late Wenlock (Early Silurian).

Discussion: In possession of the spine-like projections and the thickened intercorallite (and corallite) walls, *Aulostegites nodai* sp. nov. is comparable with an Early to Middle Devonian species, *A. longlinensis* Chow in Xian *et al.* (1980, p. 131, 132, pl. 43, figs. 7a, b), from Guangxi, South China, but the new species can be readily distinguished from the Chinese species by its smaller corallite diameters (ranging from 0.48 to 1.16 mm with 0.95 mm mean versus 1.0–1.4 mm in *A. longlinensis*) and its shorter projections (usually 0.08–0.13 mm versus 0.2 mm in ditto).

The two fragmentary coralla from the upper Wenlock calcareous shale of the Fukata Formation, Yokokurayama Group, Kochi Prefecture were assigned by Senzai and Niko (2003) to *Aulostegites* sp. indet., that was the oldest and first Silurian record of this genus. Comparing with the present material, the Yokokurayama specimens exhibit slightly smaller corallite diameters, usually 0.7–0.9 mm, and have the sagging tabulae as predominate forms, but these characters are within the range of intra-specific variability observed for *A. nodai*.

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