琉球列島完新世サンゴ礁コアにおけるマイクロビアライト（礁性微生物岩層）の発見
Reefal microbial crusts found in a Holocene reef sediment core, off Okinawa Island, the Ryukyu Archipelago

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Reefal microbialites are fine-grained, non-skeletal crusts, locally common in late Quaternary coral reef deposits. They are interpreted as microbial carbonates produced by heterotrophic bacterial communities. The carbonate crusts are typically up to 10 cm thick and form the late stage of reef developments, covering on framework skeletons. Major questions still remains unanswered concerning their uneven distributions in space and time, formation process and controlling factors. Here we first report fine-grained, non-skeletal carbonate crusts in a Holocene reef core drilled at Naha New Port area, off west of Okinawa Island, the Ryukyu Archipelago, which are similar in texture and fabric to reefal microbialites reported from deglacial reef deposits from other coral reef regions. The carbonate crusts are up to several centimeters in thickness, and mainly developed in a particular stratigraphic horizon (depth: 5~6 mbsl, age: ca. 7 ka), from which the crust thickness decreased downward and upward. Based on their external surfaces and internal sections, these crusts are classified mostly as a digitate type (thrombolite) and partly as a weakly layered type (stromatolite). Surface elemental analysis showed that crusts are composed mainly of Ca and Mg (Mg calcite). Microscopic observations clearly showed a biological succession from in situ bioeroded corals, overlain by coralline algae and encrusting foraminifers, finally to fine-grained crusts. Silt-sized grains were mainly made of peloids, with subordinate bioclastic and siliciclastic grains. SEM-EDX analysis recognized four different elemental spectrum patterns in the carbonate crusts: sulfur (S)-rich pattern (interpreted as trapped skeletal Mg calcite grains), poor S pattern (precipitated Mg calcite crystals with Mg/Ca ratio of ~0.14), Si and Al common pattern (precipitated Mg calcite crystals with trapped siliciclastic grains or clay minerals), and no Mg pattern (trapped coral aragonite grains). These petrographic and geochemical features are very similar to reefal microbialites found in deglacial reef deposits from other coral reef regions. Some differences in thickness and elemental compositions are possibly related to environmental settings (a volcanic hinterland vs. a mixed carbonate-siliciclastic hinterland).

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