Characterization of Microbialites in Bridger Bay, Antelope Island, Great Salt Lake, Utah

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ABSTRACT

- Microbialites form when cyanobacteria grow in lag deposits. These can be preserved as fibrous limestones and stromatolites which can grow up to 4 m high. The microbialites of Bridger Bay, Antelope Island, Great Salt Lake, have undergone marked changes in their elevation and morphology resulting from sediment accumulation, lake-level changes, and wave action; which has resulted in the erosion of microbial structures into smaller forms.

- The microbialites of Bridger Bay were subjected to increasing wave action through reduced lake levels. The surface of the structures was eroded into a coarser, more grainy, possibly ooid-type substrate. The microbialites were later covered with more organic-rich mud, creating a dark-colored layer between the domal structures.

- The pustular grains eroded from the microbial structures are thought to be remnants of thrombolites, which are typically marine. The structures are likely the result of microbial activity in a near-shore setting.

- The microbialites' morphology and distributions reflect the changing lake level and wave action. The structures are aligned in groups parallel to the shoreline, indicating the influence of wave direction.

- The dark-colored material between the domal structures is composed of "pustular" grains eroded from the microbialites. The pustular grains are thought to be eroded remnants of thrombolites.

- The microbialites are characterized by their microbial pustule structures, which are honey-brown, highly organic structures with moderately sized thrombolites. The margins of the thrombolites are fringed with filamentous cells.

- Detrital silicate and carbonate grains are incorporated into the microbialites, along with organic-rich mud. The microbialites are radially bladed cemented structures with a honey-brown, highly organic interior.

- The microbialites have undergone radial recrystallization of micrite cement. Note cerebrodoid oooids with quartz nuclei near the microbialite's center.

- The microbialites have undergone bleaching white by the sun. The outer surface of the structures is covered by a 0.75 m (2.5 ft) layer of sand which covers unconsolidated ooids and mud. When submerged in the water, the outer surface of the structures is covered by a 0.75 m (2.5 ft) layer of sand which covers unconsolidated ooids and mud.