MICROBIALITE ELONGATION BY MEANS OF COALESCENCE: AN EXAMPLE FROM THE UPPER CAMBRIAN NOTCH PEAK FORMATION.

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Macro-scale elongate microbialites are thought to be shaped by directional hydrodynamics working in concert with secondary processes such as scour and sediment accretion at the long axes. The extent to which one process competes against or participates with other processes is still not fully understood. Since microbialites and microbialite-related morphogenesis are significant factors in paleoenvironmental reconstruction, any unknown mechanisms associated with microbialite morphogenesis, especially related to microbialite elongation will prove a valuable tool.

This study presents an analysis of an upper Cambrian microbialite bed in western Utah revealing an array of microbialite forms consistently linked in a vertical morphologic progression over an area of more than 12 km^2. Stromatolitic microbialites change from round, decimeter-sized forms to large, elongate structures many meters in length, branching back to round, centimeter-sized profiles at the top of the bed. We suggest that these elongate microbialites, although influenced by hydrodynamically related scour and sediment accretion, owe their primary elongate form to another, relatively unexplored mechanism—microbialte coalescence. In this model, decimeter-sized, round microbialites coalesce together in the direction parallel to current-flow, eventually becoming a distinct elongate structure many meters in length. Awareness of such a mechanism will no doubt be of great value to those involved in microbialite morphogenesis, which in turn could prove fruitful in the reconstruction of ancient depositional environments.

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