

The Role of Endolithic Cyanobacteria in Stromatolite Lithified Laminae

LEE PRUFERT-BEBOUT¹, R. PAMELA REID²
AND IAN G. MACINTYRE³

¹NASA-Ames Research Center, Exobiology Branch, Moffett
Field, CA 94035 USA leslie.e.bebout@nasa.gov

²Rosenstiel School of Marine and Atmospheric Science,
University of Miami, 4600 Rickenbacker Causeway,
Miami, FL, 33149 USA preid@rsmas.miami.edu

³Dept. Of Paleobiology, National Museum of Natural History,
NHB-125, Smithsonian Institution, Washington DC, 20560
USA macintyre@si.edu

Endolithic cyanobacteria, well documented as agents of biological erosion [1], can in some instances also play a net constructional role. In particular, *Solentia* sp. facilitates growth and stabilization of modern stromatolites by forming lithified layers of fused grains in a two-phase process of boring, followed by infilling and new mineral precipitation. Living stromatolites at Highborne Cay, Exumas, Bahamas, exhibit (200 to 1000 µm) lithified layers of fused ooids that have been micritized and welded together at point contacts [2]. In our laboratory culture of *Solentia* spp. isolated from the field and inoculated onto fresh ooids, we observed this process directly, tracking short-term intermediate steps seldom observed in the field [3]. The constructional role of endoliths in modern stromatolites sheds further light on the lithification process. Similar grain welding as a result of microboring has also been observed in stromatolites at other sites, such as Shark Bay, Australia [4].

[1] Golubic, S. *et al* (1984) *J. Paleontology*, **58**, 351-361 [2] Reid, R.P. *et al* (2000) *Nature*, **406**, 989-992 [3] Macintyre *et al* (2000) *Sedimentology*, **47**, 915-921 [4] Reid, R.P. *et al* (2003) *Facies*, **49**, p. 45-53