

ORAL PRESENTATION

MASTOGLOIA SMITHII THWAITES *EX* WM. SMITH: A STRUCTURAL ENGINEER OF CALCAREOUS MATS IN KARSTIC SUBTROPICAL WETLANDS

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Mastogloia smithii Thwaites *ex* Wm. Smith is the dominant diatom in microbial consortia that form thick stromatolitic mats in the karstic, freshwater wetlands of the subtropical Americas. Despite oligotrophy, frequent desiccation, high irradiance and temperatures and occasional fire, freshwater stromatolites in these wetlands can produce over 2000 g m⁻² of organic biomass, prompting studies that examine stress resistance and maintenance of structural integrity under extreme conditions. Collections from over 300 sites in the Florida Everglades and similar wetlands in Belize, Jamaica and the Yucatan show *M. smithii* to be a persistent structural component of freshwater stromatolites, present in 97% of samples and comprising ~ 40% of frustule counts of a diverse diatom community. Valves at various stages of division have been observed encased in extracellular polysaccharide that exceeds the cell volume; SEM observations confirm issuance from girdle band pores resulting in suspension of the cell in the filamentous cyanobacterial matrix. Experiments manipulating phosphorus, irradiance, desiccation, grazers and fire show that *M. smithii* populations are (1) reduced to zero in the presence of above-ambient phosphorus concentrations, (2) unaffected by 99% irradiance reduction, (3) capable of persisting 8 months of desiccation, (4) protected from grazers by embedding in calcitic mats and (5) able to reform mats 20 days after fire. This widespread diatom taxon appears to play a critical role similar to that of stromatolitic cyanobacteria in subtropical wetlands, and its disappearance in the presence of enrichment threatens biodiversity and function in these systems that are increasingly influenced by urbanization.