



## **Microbial Mats and Seafloor Recolonization following Mass Extinctions**

Catherine Mascord (1), Liam Herringshaw (1), Krysia Mazik (1), Daniel Parsons (1), and Duncan McIlroy (2)  
(1) University of Hull, Energy and Environment Institute, Geography, United Kingdom (c.mascord@2017.hull.ac.uk), (2) Memorial University of Newfoundland, St Johns, Canada

Microbial induced sedimentary structures are produced by the interaction between microorganisms, the compounds they produce and the host sediment. These include Kinneyia structures which are produced by the growth of microbial matgrounds; blanket-like communities of microbes that glue sediment and themselves together by secreting Extracellular Polymeric Substances).

Matgrounds, and the Kinneyia structures they produce, are prevalent throughout the Proterozoic (2500-541Ma), However matgrounds decline rapidly during the Cambrian (540-485 Ma) as new species of burrowing animals (infauna) evolved. These animals disrupted the matgrounds, mixing dissolved oxygen into the sediment and redistributing deposited material, thus establishing modern-like animal-dominated mixground assemblages.

Mixgrounds are dominant on the seafloor today and throughout the Phanerozoic, however Kinneyia structures do see several resurgences in the fossil record. These are usually associated with oceanic anoxia and marine extinction events (Mata and Bottjer, 2009) and indicates a return to Proterozoic-like matgrounds following mass extinctions, before the eventual recovery of mixground assemblages. As a result, post-extinction recovery mimics the initial early Cambrian colonization of the seafloor.

This research combines fieldwork, examining the fossilized relationship between infauna and matgrounds, and experimental work, using modern animals in anoxic and matground-dominated sediments as a model for infauna during the Early Cambrian. This will allow us to better understand the infaunal conditions that allowed the sediment to be colonized and could provide an important insight into the recovery of ecosystems following mass extinctions.

### Reference

MATA, S. & BOTTJER, D. 2009. The paleoenvironmental distribution of Phanerozoic wrinkle structures. *Earth Science Reviews*, 96, 181-195.