

Christine SOLON  
Lewis and Clark Fund in Astrobiology  
awarded May, 2013

## **Morphology and Ecology of an Enigmatic Ediacaran Taxon**

### **Project Report**

I spent a month at Nilpena in South Australia beginning to collect data for a project examining the morphology and ecology of the Ediacaran taxon *Rugoconites*. I spent most of my time there locating and then photographing and making latex molds of the *Rugoconites* specimens that have been preserved on beds at this site. I also noted other fossils and features preserved on these beds, as well as the fossils and features of beds where *Rugoconites* was *not* present to potentially aid in determining if certain conditions were necessary for this taxa to live or be preserved.

Because of the unique preservation of these fossils on large (multiple square meters in area) beds and possibilities this creates for understanding the ecology of these taxa, specimens are not broken out of the beds to be brought back to the lab. Instead, photographs and latex molds are used made *in situ* in the field and these are brought back, leaving the fossils and beds intact for future study. In total, I photographed and latexed about 80 specimens of *Rugoconites*. I brought the photographs and molds back with me to the lab for continued examination. These will be measured and analyzed to determine if there are size distribution patterns on the beds. I will also use them to compare the morphology of these fossils to those housed in the South Australia Museum with the goal of clarifying the differences between the two species of *Rugoconites* that are currently described and further investigating whether any of these differences may be influenced by taphonomy.

Because their taxonomic affinities are unknown, understanding the paleoecologic issues such as size distribution frequencies and environmental and taphonomic conditions as related to these taxa are the best ways for us to establish what this early ecosystem of the first multicellular animal life on Earth was like.

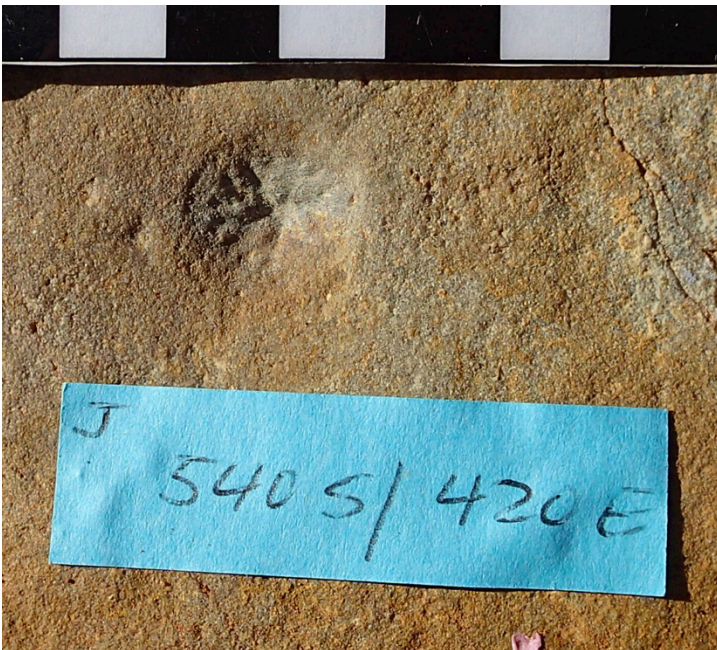
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### Photographs from Field Work



A bed with fossils in the process of being latexed. After the latex molds were thick enough, they were pulled off the bed and brought back to the lab.



A *Rugoconites* fossil. Each increment on the scale bar is one centimeter.