

Ichnologic Imposters: Deformation Structures that Resemble Burrows – Is it Possible to Make a Distinction?

Cynthia A. Hagstrom* and S. George Pemberton
Ichnology Research Group, Department of Earth and Atmospheric Sciences
University of Alberta, 114 St – 89 Ave. Edmonton, AB T6G 2E1
hagstrom@ualberta.ca

ABSTRACT

The proper identification of biogenic structures in core can be a daunting task owing to the limited exposure on the core face and the variable orientation of the plane intersecting the trace fossil. This task is made even more challenging in sediment containing deformation and water expulsion structures as these structures can mimic traces and therefore raise the question of whether the structures are indeed biogenic.

Excellent examples of deformation structures that mimic trace fossils can be found in the Bahariya Formation of the Western Desert of Egypt. These “pseudo” burrows are most common in heterolithic sandstone and mudstone units that were rapidly deposited and therefore susceptible to syn-sedimentary deformation and dewatering. Load cast ripples, contorted bedding, flame structures and syneresis cracks can all resemble trace fossils, as can sand bodies that have been affected by syn-sedimentary microfaulting and fluid expulsion.

Within the Bahariya Formation the most common ichnogenera confused with deformation structures are *Asterosoma*, *Planolites*, *Gyrolithes*, *Lockeia*, *Thalassinoides*, *Palaeophycus*, *Bergaueria* and fugichnia. In authenticating these burrows it is important to 1) carefully examine all core faces for three dimensional biogenic forms, 2) look for cross-cutting relationships between burrows and surrounding sediment, and 3) search for sand bodies that represent an intermediate form between a sedimentary structure and a burrow (for example, a starved ripple sinking into underlying mud, losing its ripple form and beginning to resemble a burrow). In general the identification of biogenic structures in deformed sediment is extremely problematic and should only be done with extreme caution.