
Three-dimensional morphological characterization and
petrography of the trace fossil *Rosselia*

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The ichnogenus *Rosselia* is recognized as a vertically oriented burrow that consists of a cone- or funnel-shaped portion with a central shaft with meniscate backfill. The conical portion of *Rosselia* has been inferred to consist of either imbricate concentric layers of matrix surrounding a cylindrical shaft, or helioidal swirls, both tapering downwards. *Rosselia* can be found in strata from the Lower Cambrian to Pleistocene. Most often, it is found in shallow sub-littoral near-shore environments, but has also been observed in deep water. In the tide-dominated Jurassic Ile Formation off shore Norway, *Rosselia* was found to occur only in sub-tidal settings, supporting observations found in the tide-dominated Lajas and Tilje Formations that *Rosselia* is a good indicator of sub-tidal depositional environments. A sample collected from Bell Island, Newfoundland, contains several well-preserved vertical burrows that have been identified as the trace fossil *Rosselia*. The purpose of this honors project is to construct a high-resolution three dimensional morphological model of the ichnogenus *Rosselia* based on pre-established serial grinding methodology. The serial images through the specimen will allow complete three-dimensional morphological reconstruction of this trace fossil for the first time. The three-dimensional model will be used to assess hypotheses for the formation of the trace fossil *Rosselia*. Through this project it will be possible to apply the techniques of three-dimensional morphological modeling to better understand the trace fossil *Rosselia*, which is a common trace fossil routinely used as a paleo-environmental indicator.