

New Occurrences of the Trace Fossil *Oldhamia* and Prospects for Early Cambrian Deep-marine Biostratigraphy

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In many Early Cambrian deep-water siliciclastic successions the ichnofossil *Oldhamia* provides the only direct evidence of the succession's age. *Oldhamia* commonly consists of fan-shaped or dendritic networks of small, tightly spaced burrows radiating from a common point or axis, although *Oldhamia? watti* is characterised by irregular, loosely spaced burrows.

In the British Mountains (northwesternmost Yukon Territory), *Oldhamia* aids in subdividing and correlating the lower part of a 2-3 km thick, deformed, pre-Mississippian succession. The *Oldhamia*-bearing interval consists of carbonate, shale, siltstone, and turbiditic sandstone deposited on a north-facing margin, possibly a prograding slope. Despite faulting and folding, a consistent stratigraphy can be recognized. In the southern British Mountains the basal stratigraphic interval is barren, but the succeeding 1300 m of strata display three stratigraphically restricted trace-fossil assemblages. In ascending order, these are characterised by: (1) *Oldhamia? watti* and simple, horizontal burrows; (2) *Oldhamia? watti*, horizontal burrows, and poorly formed *Oldhamia curvata* and *Oldhamia radiata*; and (3) abundant, well-formed *Oldhamia curvata*, *Oldhamia flabellata*, and *Oldhamia radiata*.

Previous workers recognised that *Oldhamia* shows evolution from radial to dendritic patterns during the Early Cambrian. Our work demonstrates an earlier trend of evolution from loose, irregularly radiating *Oldhamia watti* to a younger assemblage characterised by more typical, tightly radiating *Oldhamia*. It may thus be possible to recognise up to three *Oldhamia*-based biozones in Neoproterozoic-Early Cambrian deep-marine siliciclastic successions. If such biozones can be recognised, an outstanding issue will be their correlation with trace-fossil biozones now utilised in earliest Cambrian platformal successions.