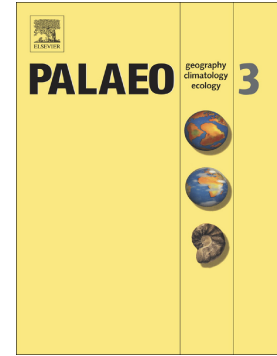


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Ichnology and depositional environments of the Upper Ordovician Stony Mountain Formation in the Williston Basin, Canada: Refining ichnofacies and ichnofabric models for epeiric sea carbonates

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ABSTRACT

Ordovician epeiric sea carbonates in intracratonic basins of Laurentia are enigmatic due to their unique depositional settings and the absence of modern analogs. Integrated ichnologic and sedimentologic analysis of the Upper Ordovician Stony Mountain Formation in the Williston Basin of Canada allows recognition of neritic-marine, nearshore-marine, open-lagoon, restricted-lagoon, peritidal sand-shoal and peritidal-flat subenvironments. The *Cruziana* ichnofacies occurs in neritic (between fair-weather and storm wave bases) and nearshore (around fair-weather wave base) marine environments. The depauperate *Cruziana* ichnofacies is present in open- and restricted-lagoon environments, indicating a shift from fully marine to stressed conditions. In the open lagoon, composite ichnofabrics related to omission surfaces illustrate the low rates of background sedimentation interrupted by event deposition and early cementation, illustrating the *Glossifungites* and *Trypanites* ichnofacies. The decreased size of discrete burrows in the restricted lagoon is attributed to reduced oxygenation under stagnation rather than hypersalinity. The peritidal complex includes high-energy sand shoals and low-energy tidal flats. Only monospecific colonization took place sporadically in associated subtidal environments within the peritidal complex deposits.

Keywords: Ichnology, epeiric seas, depositional environments, Ordovician, Williston Basin, Stony Mountain Formation

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