

Ichnological Observations in the Upper Triassic Baldonnel Formation: Implications for Palaeoenvironmental Analysis

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The Upper Triassic Baldonnel Formation of westernmost central Alberta and northeastern British Columbia is a mixed siliciclastic-carbonate unit that represents part of the last major episode of carbonate deposition in the Western Canada Sedimentary Basin. The Baldonnel represents the lower portion of a significant but gradual transgression that continued into the overlying, deeper-marine carbonates of the Pardonet Formation.

Baldonnel successions are dominated by locally dolomitized fine (~0.5 mm) to medium (2-4 mm) grained crinoid ossicle-brachiopod fragment wackestones and packstones that also serve as the primary reservoir facies. The carbonate succession is interrupted locally by siliciclastic siltstones and fine-grained sandstones.

Preliminary examinations of carbonate wackestone-packstone successions from the westernmost subsurface developments in the Baldonnel have revealed two distinctive ichnofossil suites. A suite including *Asterosoma*, *?Cylindrichnus*, *Planolites*, *Palaeophycus*, and *Teichichnus* is locally present throughout but becomes increasingly prominent towards the top of the succession. A second suite, to date only observed in lower intervals, includes *Diplocraterion*, *?Skolithos*, *Teichichnus* and *?Thalassinoides*.

The *Asterosoma* suite is consistent with the *Cruziana* ichnofacies recognized in siliciclastic sequences and represents moderate to low-energy environments. The increasing prominence of this association up-section is consistent with overall transgression and deepening of the marine basin during Baldonnel time. The *Diplocraterion* suite is representative of the higher-energy, commonly shallower-water *Skolithos* ichnofacies. Mapping of these ichnofossil assemblages will prove valuable in understanding Baldonnel palaeogeography and palaeoenvironment.

Local concentration of the *Diplocraterion* suite at single horizons represents a potential *Glossifungites* surface that, if regional in extent, may represent a valid exploration target.