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.