

## The Ichnological Expression of Marine and Marginal Marine Conglomerates and Conglomeratic Successions, Cretaceous Western Interior Seaway, Alberta and NE British Columbia

James A. MacEachern and Travis W. Hobbs\*

Dept. Earth Sciences, Simon Fraser University, Burnaby, B.C., Canada, V6E 1S6

[jmaceach@sfu.ca](mailto:jmaceach@sfu.ca), [twhobbs@sfu.ca](mailto:twhobbs@sfu.ca)

Although uncommon, conglomeratic successions and their associated interbeds do, nonetheless, contain trace fossils that attest to their marine or marginal marine origins. Analyses of several Cretaceous intervals delineate ichnological assemblages consistent with upper shoreface-foreshore, estuarine incised valley, open bay/bay margin, and transgressive ravinement settings.

Upper shoreface and foreshore conglomerates are well sorted, clast supported, and display good clast segregation. Rare bioturbation comprises *Palaeophycus*, *Ophiomorpha*, *Cylindrichnus*, *Rosselia* and fugichnia. Interbedded sandstones and pebbly sandstones may contain *Macaronichnus* and *Palaeophycus*.

Burrowed incised valley conglomerates and pebbly sandstones reflect tidal inlet channel fills and flood-tidal deltas at wave-dominated estuary mouths. Ichnological suites contain *Teichichnus*, *Ophiomorpha*, *Skolithos*, *Diplocraterion*, *Arenicolites*, *Rosselia*, *Cylindrichnus*, and fugichnia. Intercalated sandstones and mudstones are moderately burrowed, with *Planolites*, *Teichichnus*, *Terebellina (sensu lato)*, *Ophiomorpha*, *Palaeophycus*, *Asterosoma*, *Chondrites*, *Conichnus* and fugichnia.

Open bay/bay margin conglomerates and conglomeratic sandstones are markedly heterolithic, commonly trough cross-stratified, and moderately burrowed, with *Diplocraterion*, *Skolithos*, *Palaeophycus*, *Conichnus* and *Ophiomorpha*. Interbedded sandstones and mudstones contain *Teichichnus*, *Planolites*, *Terebellina*, *Arenicolites*, *Bergaueria*, *Rosselia*, *Asterosoma*, *Cylindrichnus*, *Thalassinoides*, and fugichnia.

Transgressive conglomeratic lags and pebbly sandstone sheets mantle wave or tidal scour ravinement surfaces, and commonly infill palimpsest *Diplocraterion*, *Skolithos*, *Arenicolites*, *Thalassinoides*, and *Rhizocorallium* of the *Glossifungites* ichnofacies demarcating these discontinuities. Transgressive lags may be variably burrowed with virtually any softground suite, depending upon the paleoenvironmental setting. Tidal scour ravinement lags at incised valley mouths, for example, may be weakly burrowed with an impoverished *Skolithos* ichnofacies, whereas wave ravinement lags produced during regional transgression may contain open marine, diverse mixed *Skolithos-Cruziana* assemblages.