

## Mesozoic Brachiopods from Alaska as Paleogeographic, Paleoecological and Tectonic Tools in Terrane Analysis, including Additional Western Cordillera Localities

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Brachiopods have been used extensively in the Paleozoic for paleobiogeographic, paleogeographic and tectonic reconstructions. In the Mesozoic brachiopods are generally less diverse and less abundant than in the Paleozoic. However, at times especially during the Triassic and Jurassic they can be locally abundant in the Western Cordillera and we summarize here some recent work on these faunas to underscore their utility and potential in paleogeographic, paleoecological, and tectonic studies.

Triassic: In the Middle Triassic (Ladinian) of the Peace River, British Columbia, autochthonous brachiopod faunas are represented by the abundant terebratulid *Aulacothyroides*, a good Boreal indicator.

A diverse Late Triassic (Norian) brachiopod fauna from the Chulitna Terrane, Alaska (Stefanoff et al., 1999) shows Tethyan affinities and is considered to indicate a low latitude paleogeographic setting during the Late Triassic. Another Tethyan indicator is the athyrid *Pexidella* from the Late Triassic Hyd Group of Kuiu Island and adjacent Keku Strait, South-East Alaska (Alexander Terrane). The spiriferid *Spondylospira lewesensis* (Lees) is well-known in the Norian of the Western Cordillera and is restricted to the Eastern Pacific, while other spiriferids are endemic (Hoover, 1991). The Norian terebratulid *Pseudorhaetina* may also prove to be restricted to the Eastern Pacific.

Jurassic: The spiriferids *Liospiriferina* and *Callospiriferina* were recorded from the Early Jurassic of the Farewell and Peninsular terranes, Alaska (Sandy and Blodgett, 2000). These are considered to indicate a lower latitude placement for these terranes during the Early Jurassic. Brachiopods are known from the Early (*Gibbirhynchia*, *Piarorhynchia*, and *Lobothyris*) and Middle Jurassic (*Kallirhynchia*, *Lobothyris*?) of the Queen Charlotte Islands, British Columbia (Wrangellia; Sandy et al., 1996). These all have links with low- to mid-latitude faunas from Europe. Jurassic brachiopods that have been reported to have associations with cold-seep hydrocarbon carbonates developed in chemosynthesis based environments include *Anarhynchia* (California, Oregon), *Sulcirhynchia* (Oregon), and *Cooperrhynchia* (California). Cretaceous: The Early Cretaceous brachiopod *Peregrinella* was reported from the eastern Alaska Range, Wrangellia, by Sandy and Blodgett (1996). Other occurrences of this genus (e.g., California, France, Ukraine) have been considered to be associated with chemosynthesis-based environments in cold-seep carbonates. Given this association, the overriding control on the occurrence of *Peregrinella* would appear to be controlled by the distribution of hydrocarbon seeps. *Peregrinella* has typically been considered a Tethyan indicator. However, in view of its strong association with hydrocarbon seeps it may be more a tracker of seep environments than a strong Tethyan indicator. Such constraints may be applicable to the other cold-seep associated brachiopods from the Jurassic.