

## **THE GREAT ORDOVICIAN BIODIVERSIFICATION EVENT: TEMPORAL AND SPATIAL CHANGES DISPLAYED BY CONODONTS ACROSS THE CANADIAN CORDILLERAN MARGIN OF LAURENTIA.**

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Conodonts are one of the most important Ordovician fossil groups. Abundant carbonates in low-latitude Laurentia enable a detailed analysis of the spatial and temporal changes in conodont biodiversity through the Great Ordovician Biodiversification Event (GOBE). Three east–west (platform-miogeocline-shelfbreak-basin) transects through the Canadian Cordillera, with exceptional outcrops in alpine terrain, provide a stratigraphic framework yielding the environmental gradients and abundant faunas necessary for a comprehensive biodiversity analysis. The initial radiation of euconodonts in the Early Ordovician is dramatic with a progressive lateral community differentiation. The early Middle Ordovician is marked, as with many other faunal groups, by both increased species diversity and a wider variety of apparatus plans. The partition between the Atlantic and Midcontinent Realms occurs clearly along the ancient shelfbreak, but penetrates inboard during periods of transgression (sequence flooding surfaces) and/or ramped margin development. During most time intervals, greatest species diversity occurs in the outer platform, decreasing inboard as well as outboard. The shelfbreak records moderately high species diversities but there is a rapid decline further outboard into the deep marginal basins. Both the shelfbreak and outer platform appear to be locations for taxonomic innovation. Periods of margin oversteepening, at times combined with regression, create restricted hypersaline conditions inboard with specialized, low diversity conodont faunas. Strontium (Sr) and neodymium (Nd) isotope studies on conodonts provide additional data to indicate the influence of a Middle Ordovician superplume and to relate faunal differentiation to water–mass partitioning.