

## **Record of the Permo-Triassic Crisis in Oceanic Environments: New Targets in Oman, Nevada, and British Columbia**

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Data from the great Permo-Triassic biotic crisis are restricted to a limited number of geological sections, often characterized by an unconformity within continental platform successions (Wignall et al.; 1996). In order to solve this problem (global regression event), the study of oceanic successions emerges as one alternative. Recent attempts confirm this potential: for instance, pelagites of the Mino-Tamba terrane from Japan include the boundary within a 15 m interval of black shales intercalated within radiolarian chert of respectively late Permian (Changxingian) and early Triassic (Dienerian) ages (Isozaki; 1997). This succession has been interpreted as recording a significant decrease of siliceous bioproductivity in the late Permian, predating a major anoxia event around the boundary, followed by progressive recovery of siliceous planktic productivity in the early Triassic (Isozaki, *ibid.*). Present debate also includes the patterns of selectivity of extinctions and the search for suitable paleoceanographic causes (Knoll et al.; 1996) as well as mechanisms of survival and recovery specific to each faunal group. For planktic and nektonic organisms around the P-T boundary, these mechanisms are not always well documented.

In this perspective, we thought of testing the quality of the sedimentary record from various oceanic successions, as well as investigate the paleogeographic range and timing of this anoxia on a global scale. For this purpose, we selected two domains: the Oman Mountains and the North American Cordillera, identified as two complementary areas from two major domains of the world ocean at the end of the Permian: Tethys and Panthalassa. Our multidisciplinary approach is based on: (1) biochronologic, paleobiogeographic and evolutionary study of radiolarian, conodont, ostracod, ammonite and pseudoplanktic bivalve faunas; (2) facies analysis and stable isotopes geochemistry. We identified and sampled several Permo-Triassic oceanic successions of the Hawasina series (Oman), the Candelaria flysch and the Black Rock terrane (Nevada), and the Cache Creek terrane (British Columbia). Four preliminary observations can be drawn from our first phase of field work: (1) most localities display radiolarian chert as the dominant type strata in the late Permian; (2) up section, successions grade into "boundary shales" and/or black shales or various thicknesses devoid of apparent unconformities; (3) earliest Triassic successions usually consist of shales and/or platy carbonates; (4) siliceous sedimentation reappears progressively up section. This typology is consistent from one locality to another, along with close lithologic resemblance between remote localities, for instance the Hawasina series (Oman) and the Black Rock terrane (Nevada). Differences of sedimentation rates related to the amount of carbonate input within starved basins seems a significant factor for some local variations. Biochronology and geochemistry in progress will be critical in support of these preliminary correlations.

Isozaki, Y., *Science*, 276, 235-238, (1997).

Knoll AH, Bambach RK, Canfield DE & Grotzinger JP, *Science*, 273, 453-457, (1996).

Wignall PB, Kozur, H, & Hallam, A, *Historical Biology*, 12, 39-62, (1996).