

OCEANIC RECORD OF THE PERMIAN-TRIASSIC CRISIS: VIEW FROM TETHYS (HAWASINA, OMAN) AND COMPARISON WITH PANTHALASSA (ACCRETATE TERRANES)

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The Oman Mountains expose the middle Permian to lower Triassic Buday'ah section of oceanic sediments belonging to the South margin of the Tethys. The tectonically truncated Permian litho-units start with pillow basalts. Above, radiolarites and siliceous shales, 5 to 8 m thick, are dated from late Wordian to late Capitanian (Cordey in Baud et al., 2001). Within the overlying beige siliceous shales, Wuchiapingian in age at its base (Kozur in Richoz et al., 2005), we note the progressive loss of the radiolarian fauna and its replacement by calcareous shale near the boundary. The overlying basal Triassic sediments consist of thinly bedded platy limestones associated with beige shale, about 10 m thick. This unit is overlain by papery limestones (7 m, Smithian?) and olive shales (5 m, Spathian?). Radiolarian recovery forming radiolarites did not occur before Ladinian time on this Tethyan oceanic margin.

The oceanic sediments of the Mino-Tamba terrane from Japan include the boundary within a 15 m interval of black shales intercalated within radiolarian cherts of respectively Late Permian (early Changhsingian) and Early Triassic (Olenekian) ages according to Isozaki (1997). This records an important decrease of siliceous bioproductivity in the Late Permian, within a major anoxia event and followed by a progressive recovery of siliceous planktic productivity in the early Triassic. In the Cache Creek terrane (British Columbia) similar lower Triassic black shales are intercalated between middle Permian and middle Triassic radiolarian cherts (Isozaki, 1997). The recent discovery of an unique, continuous, Permian to Triassic radiolarite sequence at Arrow Rocks, an islet in Northland, New Zealand (Waipapa terrane), indicates that there was no chert gap in the Southern Panthalassa ocean floor and that the mostly red cherts likely show an oxic environment (Takemura et al. 2002).

Comparing our Tethyan oceanic section with published Panthalassa sections shows that all localities display radiolarian cherts as the dominant type strata in the Middle Permian. Up section, successions grade into "boundary shales" and/or black shales of various thicknesses and this change occurs earlier in the Tethys (Wuchiapingian) than in Panthalassa oceanic sections, except in southern Panthalassa where the chert deposition is continuous. The chert gap is of a longer duration in the Tethys (20 My) than in Panthalassa Mino-Tamba terrane (8 My) or Cache Creek terrane (12 My). There is no chert gap in the Southern Panthalassa. During the Early Triassic, the Tethyan margin exports microbial carbonate up to the close oceanic realm (platy to papery limestones). The Panthalassa oceanic sections are devoid of carbonate and biogenic siliceous sedimentation reappears progressively up section.

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