Oman oases: contrasting carbonate sediments on the Gondwana margin in the immediate aftermath of the Permian-Triassic boundary mass extinction

Baud, A.[1], Goudemand, N.[2], Brosse, M.[3], Frisk, Å.[3], Bucher, H.[3], Richoz, S.[4]

[1] Parc de la Rouvraie 28,CH-1018 Lausanne, Switzerland - aymon.baud@unil.ch
[2] Paleobiology Group, Stanford, Palo Alto, CA, USA
[3] Paleontological Institute and Museum, CH-8006 Zurich, Switzerland
[4] Institute of Earth Sciences, University of Graz, Heinrichstrasse 26, Graz, A-8010, Austria

Basal Triassic carbonate sediments are cropping out on the Gondwana margin in Oman, which are well dated (*Hindeodus parvus* to *Isarcicella isarcica* zones). These sediments reveal the contrasted oceanic conditions that prevailed in the immediate aftermath of the end-Permian "great dying".

The Griesbachian shallow water carbonate platform consists of a 20 m. thick stack of light grey lime mud beds (5-20 cm thick), and is lacking skeletal material and trace fossils. This shallow water platform exported non-skeletal lime mud on the slope. Extended slope deposits are exposed in the Wadi Maqam of the Sumeini area in northwestern Oman. The Permian-Triassic Boundary shales are overlain by laminated limestone, which are 10m thick, and consist of lime mud, which is locally thinly contorted, without any skeletal elements. Some trace fossils appears only in the upper part of the *Isarcicella isarcica* conodont zone.

Coeval, Griesbachian shallow oceanic plateau carbonates were recently discovered in the Batain area (southeastern Oman). These are reworked as boulders in mid-Jurassic conglomerates. In marked contrast with the shallow water platform sediments, these boulders consist of highly diversified skeletal accumulations. A one-meter thick boulder contains a varied and abundant benthic and nektonic fauna of crinoids, echinoids, ammonoids, bivalves, gastropods, microconchids, ostracods, conodonts and foraminifers.

Echinoderms are the main component of the calcarenite (lime packstone with lime mud matrix). The disarticulated crinoid columnals are mixed with mostly unbroken molluscan shells showing no signs of abrasion or bioerosion. This preservation suggests either absence of or minimal lateral transport.
This crinoidal limestone, deposited within the early to mid Griesbachian *Hindeodus parvus* to *Isarcicella isarcica* conodont zones, differs from the coeval part of the less diversified Wasit block, recording a coquina build-up floating in calcite cement (lime floatstone).

There is no evidence of anoxia on this well oxygenated shallow neritic plateau, nor any sign of "intense post-extinction acidification". This may explain why the Oman neritic oceanic plateau records a very early (i.e. Griesbachian) episode of marine ecosystem recovery.
The oceanic mounds or plateaus apparently escaped the environmental deterioration that prevailed on the continental platform and slope and may have functioned as oases.