

LOWER TRIASSIC MICROBIALITES VERSUS SKELETAL CARBONATES, A COMPETITION ON THE GONDWANA MARGIN

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As shown by Baud et al. (2005, 2007), a major crisis occurred in Phanerozoic carbonate systems during the end-Permian mass extinction that involved a wholesale change in oceanic geochemistry. The prolific upper Paleozoic skeletal carbonate factory was abruptly replaced by a non-skeletal carbonate factory (Baud, 1998). When preserved between the two carbonate systems, the boundary is marked by a post-extinction clay (boundary clay) of latest Permian age (*preparvus-meishanensis* conodont zone). Microbial communities affected sedimentation in a variety of normal marine areas (Baud et al., 1997).

On the Cimmerian margin and on the Gondwana margin, from Zagros through Taurus westward, a post-extinction calcimicrobial unit occurs above the extensive Permian skeletal carbonate platform exposed in the shallow, low energy post-extinction carbonate ramp with massive thrombolitic mounds and/or stromatolites. To the east, on the Gondwana margin in Oman and North India, the calcimicrobial unit is more discrete or absent as shown by the Wasit block (Krystyn et al., 2003), where the skeletal carbonate is entirely building the basal Triassic limestones. In the Salt Range (Pakistan), with deepening of depositional environment, the basal Triassic crinoid-brachiopod grainstones are progressively replaced by ammonoid-bivalve packstone-wackestone (Wignall and Hallam, 1993). For these authors, the matrix of the limestone beds in the Ceratite marls is made of disintegrated shells of the bivalve *Leptocondria minima*. A similar situation exists in Kashmir with deeper limestone deposits. There are no visible microbial textures seen or published in the Lower Triassic of Zaskar and the Spiti areas (Western Tethys Himalaya), but more research is needed.

In a Tethys Himalaya section of Central Nepal, Bassoulet and Colchen (1976) report a planar stromatolite bed of half a meter thickness in their “coupe 2” of Ganesh Himal (probable Dienerian age), between skeletal (bivalves-ammonoids) lime wackestone to packstone beds.

To the east, in the Tulong section of South Tibet, isolated stromatolite buildups (cm to dm) have grown on the top of ammonoid wackestone-packstone beds (Smithian age: H. Bucher, oral communication). In this section, the Spathian red ammonoid limestones show levels with stromatolitic and thrombolitic texture, but the microbial activity seems incidental compared to the skeletal carbonate production (mainly ammonoids and bivalves).

In summary, in the southern latitudes of the Gondwana margin, in contrast to the low latitudes and equatorial domains, the environments of deposition are more favorable to the skeletal organisms, which are in competition with the microbial carbonate factory, but the result is a very low rate of deposition (condensed deposit).

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