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THE SMITHIAN (EARLY TRIASSIC) RED AMMONOID LIMESTONE OF OMAN, REFUGE FOR SPONGE – MICROBIAL BUILD-UPS DURING A RECOVERY PHASE

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In the Oman Mountain area, an isolated, drowned carbonate platform, called "Ba'id" Exotic is lining the Wadi Alwa. The Baid Formation consists of middle to late Permian shallow water limestone capped by an erosional surface due to emersion. The overlying Alwa Formation is a lower Trias to lower Jurassic, distal open marine cephalopod limestone. The Lower Alwa Formation is represented by a 25 meters thick sequence of red ammonoid limestone, lower to upper Smithian in age and overlying a 6 meters thick pinkish micro-granular dolomite (Dienerian?). Carbon isotope values show a 3‰ negative shift between the basal dolomite and the overlying lower Smithian red limestone, followed by an unusual 2‰ positive peak within the middle Smithian limestone.

Earlier sedimentological works on this red ammonoid limestone focused on the microbialites. Stromatolites and unusual carbonate textures, such as seafloor aragonite fans, sheet cracks, large botroidal cement, bacterial sheaths, coccooids and frutaxites-bearing microbialites occur (Woods & Baud, 2008). Many stromatolite cavities are also linked with these microbial-induced features. New thin sections analysis reveals numerous sponge spicules around small cavities. This confirms the collapse of soft sponge bodies. As consequence, the thick red stromatolite beds are now reported to sponge – microbial build-ups.

Recently, small sponge – microbial reefs have been discovered in Smithian limestone of Western United State (Brayard et al., 2012). This Oman data is adding new area and new distal open marine facies for Metazoan reef growth during the early Triassic. Background studies also suggest a low oxygen concentration and supersaturation with respect to CaCO₃ within the water column for this unusual lower Olenekian red ammonoid limestone deposit.

References

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T167. The Road to Recovery—The Nature of Biotic and Geochemical Cycles During the Early Triassic

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