



The basal Triassic microbialites, between reef building and red ammonoid limestone

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Abstract

In Armenia on the northern side of the Neotethys, within the post-extinction lower Triassic so-called reef gap, a described 15-m high basal Triassic sponge-microbial buildup, with overturned cone-shaped geometry and a 8-m top head diameter, is built by thrombolite domes associated with keratose sponges. The growing duration from basal Griesbachian up to lower Dienerian is about 500'000 years.

On the southern, Gondwana side of the Neotethys in Oman, with same starting age and at apparently similar 80-100-m water depth, one of us, HB, discovered a red ammonoid limestone succession. This belongs to one large boulders, issued of a past dismantle Hallstatt-type pelagic platform and crops out near the top of Djebel Rabat Range about 80-km South of Muscat (Oman). It consists of a 30-m thick, thin stratified limestone and well dated from latest Permian to middle Smithian. Overlying a metric thick latest Permian dark limestone substratum, it is the unique known red ammonoid limestone with deposition starting at Griesbachian time. The Induan succession is 18-m thick. According field observations, these limestone beds, red-rosa to yellow according to surface alteration, are showing successions of tabular thrombolite that forms centimetric to metric large mound with very low angle flanks and low elevation. The microbial bindstone microfacies shows coccoidal lime silt, lime mud and filaments. We note numerous laterally discontinuous solitary fenestral structures, but more commonly they form stromatactis layers surrounded by keratose sponge fibers and filament sheath.

The above 11-m thick lower Olenekian well red colored ammonoid limestone shows in addition to previous microfacies, unusual carbonate textures, such seafloor aragonite fans large botroidal cement, bacterial sheaths, coccoids and frutexites-bearing microbialites. These lower Olenekian observations with the unusual carbonate textures establishes the continuity of microbialite production and the time junction with the "Time-Specific Facies" (TSF) attributed to the similar Smithian red ammonoid limestones deposition of the Alwa Formation of the nearby Baid Range.

This unique record of a red ammonoid limestone deposition showing this continuous growth of post-extinction microbialites associated with sponges, from Griesbachian to middle Smithian, indicate a duration more than 2 million years.

During the late Olenekian time, the pattern in time-space distribution of these red ammonoid limestones changed onward and have been described from western Neotethys and from Central Himalaya up to middle Spathian part of the Luolou Fm in the Nanpanjiang Basin (Yangtse Block, S. China).

Keyword: Sponge-microbial buildup, Induan, Olenekian, Neotethys, Oman