

SPONGE-MICROBIAL BUILDUPS: A NEW LOOK AT THE ENIGMATIC BASAL TRIASSIC "CRYSTAL LAYERS" OF CENTRAL IRAN

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At the basal Triassic equatorial distal carbonate ramp of Central Iran, anomalous carbonates has been deposited, so called "crystal layers" or "carbonate crust"¹. However, we demonstrate here that these carbonates are part of sponge-microbial buildups, similar to those of the same age recently described in South Armenia². We focus on two well-known Permian-Triassic boundary localities with the same lithological succession, the Kuh e Hambast section east of Abadeh city and the more distal Shareza section near Isfahan. In both sections, the extinction horizon corresponds the top of the uppermost Permian *Paratirolites* limestone. At Kuh e Hambast, the overlying 40 cm thick boundary shale is conformably capped by 1.6 m of basal Triassic dark lime mudstone containing four successive horizons of decimeter to meter scale elongated to cup shaped mounds. Thinly laminated candelabra or chimney-like structures are protruding from a common base and/or are growing side by side; these features are interpreted here as branching columnar stromatolites. Replacement of possible keratose demosponge fibers are widely present in the lime mudstone matrix. Thus we interpret these structures as sponge-microbial buildups which can be followed laterally for several kilometers. At Shareza section (20 m), there are five sponge-microbial buildup levels overlying each other. Two of them are included within a 3 m thick shaly lime mudstone interval just above the boundary shale. The first buildup level, 10-15 cm thick and latest Permian in age, is made of micro-laminated calcite crystal bundles interpreted as digitate stromatolite, with calcite-cemented filamentous interspace in a micritic clumps interpreted as sponge fossils. The second, only 25 cm thick, is correlated with the one of Kuh e Hambast, and consists of open bowl shaped fan of digitate stromatolites surrounded by a dark lime mudstone matrix with sponge fibers (possible keratose). About 6 m above the base of the boundary shale, twelve mounds can be observed along the 300 m long outcrop. The biggest one, up to 2 m thick, is showing a core of calcite crystal fans capped by thrombolites. Others mounds, inverted cone-shaped structures of 1m high and 50cm wide, are composed of superposed thrombolitic open bowl, or consist of complex aggregates of small buildups of thrombolites, bushy dendrolites or digitate stromatolites. Sponge fibers debris in the lime mud matrix have been observed in thin sections. At 16 and 20m above the base of the boundary clay, the upper sponge-microbial layers are 20-30 cm thick mounds made of thrombolites and bushy dendrolites. The close similarities between the South Armenian sponge microbial build-ups² and the Central Iran "Crystal fan" fabrics confirm the new interpretation presented here.

References

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