

PROTEROZOIC-LIKE/TYPE BASAL TRIASSIC MICROBIAL BUILD-UPS OF UNUSUAL HEIGHT IN ARMENIA

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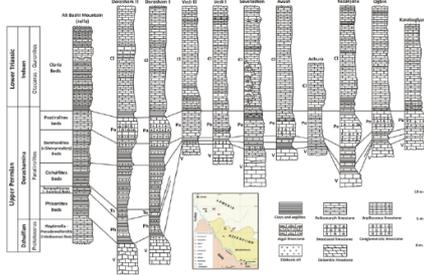
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Introduction

The Transcaucasia region is one of the places in the world where continuous sections of Upper Permian and Lower Triassic strata with marine faunas can be observed. The boundary beds are exposed in the south of Transcaucasia, the NW Iran, the Nakhichevan and the adjacent part of Armenia.



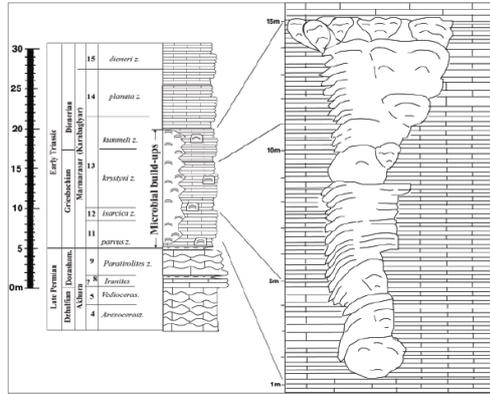
Map of the area with PTB sections (from Ghaderi et al., 2014, fig. 1a)



South Armenia PTB stratigraphic sections from Rostovstev and Azarian (1973)

Stratigraphy

In this Zangakatum section, red marls corresponding to the latest Pseudotirolites zone of the Permian are overlying the Paratirolites red nodular limestone of the upper Akhura Formation, Late Changhsingian in age (local Dorashamian). The following Marmarasar Formation with a dated base of the lowermost Triassic *H. parvus* conodont zone, is showing domal microbial buildups, some up to 15m high, spaced from 1 to 20m and surrounded by deep ramp bedded platy lime mudstone to wackestone with ammonoids, thin shelled bivalves, ostracods, small gastropods and rare micro-foraminifers.

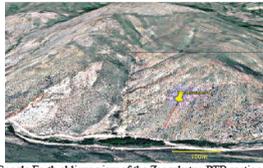


The Zangakatum Permian-Triassic stratigraphic section with a sketch of a 1.4m high microbial buildup, on the right, pictures of the median and of the top head of the thrombolite buildup.



Geological setting

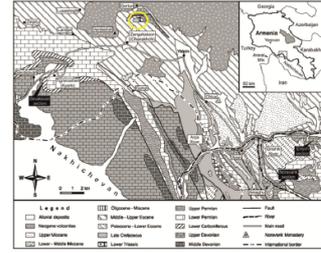
The Zangakatum profile (Transcaucasia, S Armenia) is situated in Armenia, about 60km SE of Yerevan. It has been described as former Sovietachen section by Kotlyar et al. (1983) and by Aslanian, 1984. Studies on stable isotopes have been done by Baud et al., 1989, and on microbialite by Baud et al., 1997. A detailed conodont stratigraphy is given in Zakharov et al., 2005.



Google Earth oblique view of the Zangakatum PTB section



Face view of the Zangakatum PTB section from opposite side



Geological map of the Zangakatum area (yellow ring) and SE Armenia



The laterally 2-5cm thick bedded lime mudstone

Basal Triassic thrombolites geometry

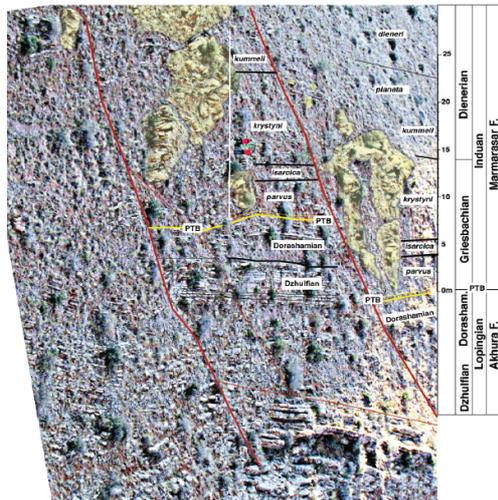
The thrombolites upward growth show sharp-bounded head margins followed by catch-up of the bedded lime mudstone deposition. The overturned cone-shaped buildup geometry has a top head diameter up to 8m width, made of numerous thrombolite domes, 1.5m above its base. We evaluate the water depth under storm wave base and the asymmetrical buildup growth due to a steady bottom current condition. Subtle changes in paleo-environments during the Dinerian *kummeli* conodont zone suddenly break off the thrombolite growth and stopped this post-extinction microbial buildups after an estimated duration of 700000 years.



Top head of the thrombolite buildup



Median part of the thrombolite buildup with steep flank



Face view of the basal Triassic microbial buildups (in light yellow) with stratigraphic data across the PTB

Conclusion

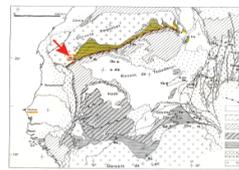
Following the End of Permian great extinction, the microbialite settlements get large accommodation space and steady state environmental conditions in this part of the Transcaucasian margin and followed the same strategy buildup development, here anachronistic, as the deep Late Proterozoic branching microbial reefs.

References

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Late Proterozoic Conophyton-Jacutophyton biostromes of Atar area (Mauritania)

According to Bertrand-Sarfati and Moussine-Pouchkine, 1999, the Late Proterozoic Conophyton-Jacutophyton biostromes of Atar area (Mauritania), growing in apparently similar 80-100m water depth, with quiet condition, the trunks acquire a cylindrical shape and a high synoptic relief more than 2m of elevation above the sediment surface with a total up to 4m height of the individual columns branching in their upper part. Surrounded by lime mud, the thickest buildup is more than 40m but other have lower, up to 10-15 m thickness with a higher density of individual buildups.



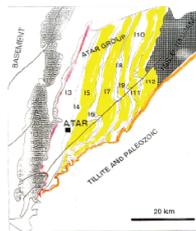
West Africa sketch map (from Bertrand-Sarfati et al., 1999).



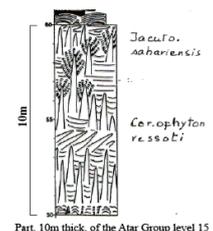
Top of 10m high Jacutophyton buildups



A 1 m high Jacutophyton trunk section



Atar area sketch map (from Bertrand-Sarfati et al., 1999).



Part, 10m thick, of the Atar Group level 15 section (from Bertrand-Sarfati et al., 1999).



Top head of Jacutophyton buildup