

MICROSTRUCTURE ANALYSIS IN STROMATOLITES FROM  
THE TARAHUMARA FORMATION IN SONORA, MEXICO.

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An important part of the early microbial life has left its geological record in the form of stromatolites, which were dominant for most of the Precambrian times. If Hutton's hypothesis is correct, Phanerozoic stromatolites may help in interpreting the origin and significance of Precambrian stromatolites and the environmental conditions under which they were formed. It has been proposed that the main processes involved in stromatolite construction are trapping, binding and precipitation of sedimentary particles. The relative influence as well as the type of building microorganisms of one of these processes is recorded in the stromatolitic microfabric. Consequently the study of microfabric is key to understanding the processes implicated in stromatolite construction and genesis.

The Tarahumara Formation is a vulcano-sedimentary sequence of Late Campanian age where Phanerozoic stromatolitic limestones, locally referred to as Tarahumara Formation in Rancho Huepac is exposed in the Central part of Sonora, Mexico. The stromatolites show variation in macrostructure, ranging from planar encrustations to well-developed biostromes. The stromatolitic microfabric shows a pattern in texture, lamination and fabric that among other features, suggest a microbial origin. The stromatolites' rhythmicity is due to alternating light micritic laminae with microfossil assemblages and dark micritic films with high organic matter content. A detailed petrological analysis on the stromatolites' microfabric has been made using several techniques. Their analysis indicates fabric-selective biomicrite from algal and bacterial origin with a strong binding activity. The results suggest that these deposits were formed by *in situ* calcified mats of benthic microbial life. This interpretation is also of palaeoecological significance and can be correlated to the stromatolite macrostructure.