

## Can stromatolite lamination be explained by present-day marine examples? An answer from the Cretaceous Leza Fm (Camereros Basin, Spain)

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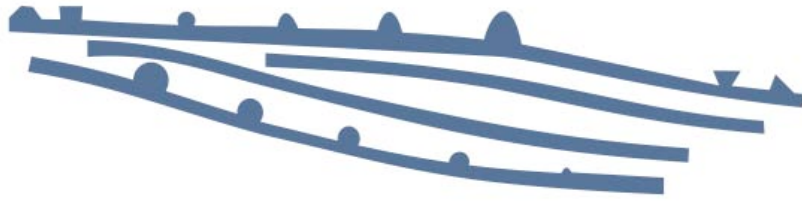
Macroscopic lamination is a defining feature of stromatolites. It can reflect a variety of processes with differing distributions in time and space. Claude Monty in 1976 recognized two main types of lamination: *alternating* lamination produced by superposed layers of differing texture, and *repetitive* lamination due to hiatuses separating layers of similar texture. Repetitive lamination has been described in present-day stromatolites from the Bahamas and Shark Bay (Australia), and it has been proposed that this type of lamination, defined by thin micritic horizons at discontinuities, is widespread in modern and ancient stromatolites. To assess the relative importance of alternating and repetitive lamination, we examined stromatolites that exhibit both these styles of macrolamination in the Barremian-Aptian Leza Fm (Camereros Basin, northern Spain), and compared them with published examples from a wide range of environments and ages by measuring the thicknesses of the dark and light layers which create the lamination seen in thin-section.

The Leza data clearly distinguish alternating lamination (with dark and light layers of broadly similar thickness) from repetitive lamination in which the dark layers are generally much thinner. Based on these lamina characteristics, published data show significantly more examples of alternating lamination than repetitive lamination in both Phanerozoic and Precambrian examples. Alternating lamination is likely to be common because it can form in a wide variety of ways (e.g., mat growth, mineral precipitation, grain accumulation). In contrast, repetitive lamination requires a narrower combination of specific processes such as single fabric accretion and episodic hiatus development, and it has only been found as the main origin of lamination in relatively rare coarse-grained stromatolites and in spar-dominated Proterozoic stromatolites. This does not support the view that repetitive lamination is geologically very common and widespread. Our data instead indicate that most ancient stromatolites exhibit alternating lamination.

INTERNATIONAL ASSOCIATION OF SEDIMENTOLOGISTS REGIONAL MEETING

# 28<sup>th</sup> IAS

## Meeting Zaragoza 2011



28<sup>th</sup> IAS Meeting of Sedimentology, 5—8 July 2011, Zaragoza, Spain

# Abstracts

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