

A multi-proxy approach of the Bajocian sedimentary crisis in western Tethys

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A carbonate productivity crisis is recorded in western Tethys during the Early Bajocian (170 Ma) and coincides with the onset of biosiliceous sedimentation in several tethysian basins. A $\delta^{13}\text{C}_{\text{carb}}$ positive excursion of regional extent preceded the crisis [1; 2] giving evidence of a global perturbation of the carbon cycle.

The birth of the Pacific Plate and also a major pulse of subduction related magmatism [3] may have triggered an increase of atmospheric CO_2 level at this period, while opening of the Liguro-Piemontese Ocean may have cause rearrangement of oceanic stream patterns of circulation. [3] suggest that these global conditions lead to eutrophication of marine environment and possibly acidification both inducing an ecological crisis for the main carbonate factories.

In order to test the likelihood of proposed hypotheses, two sections of Early Bajocian age were investigated according to a geochemical multi-proxy approach. The first section from the Subbetic realm (South Spain) is characterized by calcareous marly alternation deposited in hemipelagic environment. The second section from Umbria-Marche area is constituted by mudstones and cherts deposited in a pelagic environment.

Geochemical data acquired include $\delta^{13}\text{C}_{\text{org}}$, $\delta^{15}\text{N}_{\text{org}}$, $^{87}\text{Sr}/^{86}\text{Sr}$ $\delta^{11}\text{B}$. Results suggest an acidification of oceanic water concomittant with the carbon isotope excursion, while primary productivity appears perturbed with no evidence of anoxic event.

References

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