

Paleo-environmental study sediments related to CAMP volcanism (Trias-Jurassic boundary, Central Atlas, Morocco)

Contact persons: *mentionner deux personnes (dont au moins un professeur/MER)*
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Context

The following project is focused on the CAMP (Central Atlantic Magmatic Province), in Central Atlas, Morocco. This research project is a collaborative work with Prof E. Font (Coimbra University) and Prof. Nasrddine Youbi (Marrakech University). It consists of a multidisciplinary project combining a geochemical, sedimentological and biostratigraphical approach which will focus on Trias-Jurassic mass extinction and particularly on the sediments deposited between the lava flows in Morocco, considered as the main trigger of this extinction event. These sediments consist of paleosols (red beds) and lacustrine deposits including spectacular stromatolithes directly developed on basalts.

Objectives and Methods

The master student will conduct a detailed study of the intertrappean sediments with the main objectives to: (1) Evaluate the depositional environment of the intertrappean sediments based on sedimentology, mineralogy, geochemistry, microfacies and microfaunas (2) Determine climatic and environmental conditions based on clay mineralogy and stable isotopes. (3) Evaluate the stratigraphy and age control based on a review the paleomagnetic signals and volcanic chemostratigraphy sequence in the area of planned sections, which permit placement of the T-J boundary in the sequences and its correlation to the global marine biostratigraphic record. In the different studied sections, the sediments located under and between the trapps will be compared also to determine the paleoenvironmental changes induced by the CAMP activity. The study will also focus on stromatoliths including In situ Fe isotopes analyses by SIMS performed in micrometric pyrites in order to better understand local and/or environmental conditions associated with pyrite precipitation. This will help to constrain the part of primary, possibly microbial induced, and secondary-late diagenetic influences that affect sulfides.

Literature

Marzoli and 15 others (2004) Synchrony of the Central Atlantic magmatic province and the Triassic-Jurassic boundary climatic and biotic crisis. *Geology*, 4, 973-976
Verati et al. (2004) $^{40}\text{Ar}/^{39}\text{Ar}$ ages and duration of the Central Atlantic Magmatic Province volcanism in Morocco and Portugal and its relation to the Triassic-Jurassic boundary. *Palaeogeography, Palaeogeography, Palaeoclimatology, Palaeoecology*, 244, 308-325
Van de Schootbrugge, B. et al (2009) Floral changes across the Triassic/Jurassic boundary linked to flood basalt volcanism. *Nature Geosciences*, 2, 589-594.



Sites WEB

<http://www.unil.ch/Jahia/site/iste/op/edit/pid/91749>

Choice of orientation : (supprimer les orientations qui ne conviendraient pas)

Sedimentary, Environmental and Reservoir Geology