The CAMP Controversy, New Data from the Argana Basin, Morocco

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The Central Atlantic Magmatic Province (CAMP) formed during the pre-rift stage of the Atlantic Ocean. The amount of flood basalts is of the same order of magnitude as the outflow during the Deccan and Siberian Traps. The timing of the CAMP basalts falls within error with the age of the Triassic/Jurassic extinction event implying a causal relation. However, a palynological turnover event associated with the Tr-J boundary predates the lavas in all sections in eastern North America. This palynological event coincides with a modest iridium anomaly, which led to the proposal for a bolide impact as the cause for the TR-J mass extinction. More recently, studies showed, by comparing the geochemical composition, that the oldest basalts from the High Atlas (Morocco) are absent in North America, implying that the CAMP event does coincide with the palynological Tr-J boundary.

We selected the Argana Basin in west Morocco to solve the CAMP controversy using a multidisciplinary approach on the T-J sequences. Cyclostratigraphic and magnetostratigraphic research is being used to investigate the astronomical forcing of the Argana sediments, which would allow a direct correlation to the Newark sequences (USA). In addition, we analysed the Argana CAMP basalts for trace element data. Furthermore, we sampled the basalts for paleomagnetic directions to investigate the magnetostratigraphic correlation of the different CAMP units.

Geochemical results indicate that the CAMP basalts from Argana fit the lower and intermediate basalt units of the High Atlas. The oldest basalts in Newark resemble the composition of the intermediate unit which implies that the lower unit is missing. However, the oldest basalts in Fundy basin, Canada, do match with the composition of the lower unit found in Morocco. While the paleomagnetic study is still in progress, we can already conclude that both basalt units erupted in a short timespan (<20 kyr) and that the onset of volcanism was most probably synchronous with the palynological T/J boundary.