

The Upper Triassic to Lower Jurassic sedimentary succession in southern Portugal: -a stratigraphical framework for CAMP*-related magmatism

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The onshore geological record of Late Triassic to Early Jurassic in the Western Iberian Margin may be studied in three different basins: the Lusitanian Basin (to the North), the Alentejo Basin (to the SW) and the Algarve Basin (to the South). The CAMP event, largely recorded in Morocco and Western Canada, is also present in these basins.

In the Lusitanian Basin, this magmatic event is present only at its most southern part, the Arrabida Chain (30 km S of Lisbon). Around 20 meters of weathered basaltic layers occur over Hetangian red clays with gypsum (Dagorda Formation) and Platty Dolomites, being covered by Sinemurian massive dolomitic layers (Sesimbra Formation). 60 km to the South, the Alentejo Basin shows 50 meters thick volcanics in the same stratigraphical position, between the Platty Dolomites and the massive dolomitic layers (Fateota Formation). 100 km more to the South, at the western part of the Algarve Basin, the magmatic event is part of the 50 meters thick Volcano-Sedimentary Complex, including mainly extrusive basaltic rocks intercalated with red clays. The stratigraphic position is very similar, following clays with gypsum (Silves Complex) and being covered by Sinemurian massive dolomites (Espiche Formation).

From a stratigraphic point of view, this event is coeval with important paleoenvironmental changes in the basins. It occurs always between the sabkha-like continental to peritidal deposits, and the shallow marine massive dolomites with the first Sinemurian fossils. At the Algarve Basin, however, the intense magmatic intumescence seems to have prevented the regional development of peritidal Platty Dolomites.

After the magmatic extrusive event, subsidence in the Western Iberian Margin has been quite heterogeneous. In the South, shallow dolomitic facies were maintained all along the Lower Jurassic, whereas to the North (where there is no volcanic record), deeper marly facies were deposited in a highly subsident ramp, opened to the NW.

This magmatic event is increasingly expressive southwards, towards Morocco, disappearing northwards. This fact can be attributed to the crucial role of the Central Atlantic opening (between Morocco and Nova Scotia) in the CAMP development. Considering the short temporal extension of the CAMP event (around 1 M.y ?), it may be used as an isochronal time-line allowing correlation between different on-shore and off-shore sub-basins, not only in Western Iberia, but also in Morocco and Western Canada.

*(Central Atlantic Magmatic Province)