Genesis and evolution of the Late Mesozoic magmatism of the High Atlas (Morocco)

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Two main magmatic events occurred during the Mesozoic evolution of the Atlas System, the first one dated to Late Triassic-Early Liassic (200-195 Ma), tied to the opening of the Central Atlantic Ocean (CAMP - Central Atlantic Magmatic Province - Event), the second dated from Middle-Late Jurassic to Early Cretaceous (~ 165-110 Ma), within which K-Ar ages seem to cluster into two distinct groups, 175-155 Ma and 135-110 Ma. The post-Liassic magmatic rocks, possibly representing the last magmatic phases related to the CAMP event, are specific for the High Atlas domain, with the emplacement of (1) subvolcanic intrusive complexes, often cropping out in the cores of anticlinal ridges, and (2) basaltic lava flows, interbedded in the Middle-Late Jurassic to Early Cretaceous red beds. Their magmatic signatures, ranging from transitional basalt series to weakly/moderately alkaline series, are typical of continental intraplate magmatism and are usually considered as rift-related. In our work, we studied magmatic bodies (1) cropping at the core of anticlines and/or (2) interbedded in the red beds of the High Atlas, in the chain and at its southern front. The relationships observed between the magmatic products (2) and both the stratigraphic succession and structures, faults and folds, point to their possible emplacement as sills and to a development of the magmatism within an active, Jurassic-Cretaceous, compressive stress field. In particular, we present the first results obtained on two mafic magmatic bodies outcropping in correspondence of the South Atlas front. They are intruded at the core of anticlines folding Late Jurassic-Cretaceous rocks, or are interbedded within the vertical Late Jurassic-Cretaceous succession as a sub-effusive body. We present an important first radiometric ^{40}Ar-^{39}Ar dating obtained on a lava flow rock sample; the obtained age of 119 Ma, allows us to refer it to the second magmatic event of the High Atlas. We also present preliminary petrographic and geochemical compositional data of collected rock samples that display porphyritic and fluidal textures in the lavas and porphyroid textures with poikilitic crystals set in an ophitic matrix in dykes and sills. The studied rocks display a restricted compositional range, falling across the fields of basalts, trachybasalts and basaltic trachyandesites with alkaline to subalkaline affinity. We report here major and trace elements and isotopic compositions ($^{87}Sr/^{86}Sr$ and $^{143}Nd/^{144}Nd$) obtained on representative lava flow, dyke and sill rock samples.