

Thermal event of Upper Triassic age revealed by $^{40}\text{Ar}/^{39}\text{Ar}$ dating on the Upper Sebtides metamorphic units (Internal Rif, Morocco): consequence on the timing and the model of the Beni Bousera peridotites emplacement

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In the Gibraltar Arc located at the western tip of the western Mediterranean, two large massifs of peridotite associated with crustal metamorphic units outcrop in the Ronda massif (Betic Cordillera, southern Spain) and in the Beni Bousera massif (Rif Belt, northern Morocco). The timing and the emplacement process of these peridotite bodies into the crust are still highly discussed.

Our study focuses on the Upper Sebtides metamorphic units (Federico units, Internal Rif), labelled Souk-el-Had units, located west of the Beni Bousera massif. They consist of a tectonic units stack with the repetition of the same lithostratigraphic sequence composed of Permo-Triassic metasediments overlaying Paleozoic basement. In this area, the Upper Sebtides units display a fan-structure pinched between the Dorsale Calcaire unit to the west and the Filali unit (Lower Sebtides) to the east.

$^{40}\text{Ar}/^{39}\text{Ar}$ dating performed on muscovite and biotite on the Paleozoic micaschists that form the basement of Permo-Triassic metasediments (Boured and Beni Mezala units) provides two groups of ages (1) at around 25 Ma and 21 Ma and (2) at around 206 Ma and 219 Ma.

At the thin-section scale, two generations of muscovite are identified in the analyzed samples. Syn-S₂ muscovite and biotite underline the main foliation. The syn-S₂ assemblage is quartz + plagioclase + biotite + white mica + ilmenite ± chlorite. Ante-S₂ muscovite occurs as large porphyroclast with undulose extinction, partially recrystallized. The ante-S₂ assemblage is quartz + plagioclase + biotite + white mica + garnet + sphene.

The Upper Triassic ages obtained on ante-S₂ muscovites are interpreted as resulting of a thermal event related to HT-metamorphism that affects a thinned continental crust. Thus, we propose a model of continental margin expansion in relation with exhumation of the mantle during the opening of the Tethysian ocean in a context of hyper-extension.

Mots-Clés : Western Mediterranean, $^{40}\text{Ar}/^{39}\text{Ar}$ dating, Rif belt, Upper Sebtides, hyper-extension