

Permian detrital zircons in Triassic (?) marbles above the Beni Bousera peridotite-granulite unit; implications for the western Tethys opening.

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The Gibraltar Arc is famous for its subcontinental peridotites that extend widely in Spain (Ronda) and Morocco (Beni Bousera). The age of exhumation of these mantle rocks is considered either basically as syn-orogenic (Alpine) or partly pre-orogenic. Here we report on marbles that crop out on top of the granulitic envelope (kinzigites) of the Beni Bousera peridotites. These calcite-dolomite Beni Bousera marbles (BBMs) have been regarded for years as interbedded in the granulites. However, we demonstrated recently (*Farah et al., 2021*) that they form lenticular outcrops restricted to the mylonitic shear zone between the granulites and the overlying gneiss unit (Filali–Beni Bousera Shear Zone). We also showed that the BBMs did not suffer the HP-HT metamorphism of the underlying granulites, but a HT-LP metamorphism comparable to that of the gneiss unit above. We focus here on the SHRIMP results we obtained on 157 detrital zircon grains extracted from 3 BBM samples. Most grains exhibit rims dated at ~21 Ma (Alpine recrystallization), whereas their cores yield ages from 270 to 3000 Ma. The well-marked ~270 Ma younger age cluster corresponds to the age of rhyolites and shallow crustal, sub-alkaline plutons emplaced in or next to the trans-tensional Permian basins of Morocco and Europe. Paleozoic peaks at ~460 and ~340 can be linked to the Cambro-Ordovician and Carboniferous magmatism of the Variscan orogen of the same area. Proterozoic and Archean dates are compatible with Gondwana sources, either primary (magmatic) or secondary (sedimentary cover). Our detrital zircon study establishes for the first time a post-Permian, likely Triassic age for the BBMs protoliths, which emplaced either by sedimentation or by sliding as extensional allochthons upon the granulites of the Beni Bousera unit. Thus, the Beni Bousera mantle rocks were exhumed at shallow depth in the framework of the southern margin of the Alboran domain during the Triassic-Early Jurassic rifting responsible for the birth of the Maghrebian Tethys. During the Alpine orogeny, the Beni Bousera unit and the overlying Triassic sedimentary rocks were affected by tectonic burial, thrusting, and metamorphism before their final exhumation.

Mots-Clés: SHRIMP U-Th-Pb dating/ Triassic rifting / mantle exhumation/ western Tethys/ Gibraltar Arc / Morocco.

Reference: Farah, A et al., 2021. The Beni Bousera marbles, record of a Triassic-Early Jurassic hyperextended margin in the Alpujarrides-Sebtides units (Rif belt, Morocco). BSGF - Earth Sci. Bull. 192. <https://doi.org/10.1051/bsgf/2021015>