THE TAFILALT MAGMATIC CHECK-POINT (MOROCCO) AT THE BORDER OF THE "CAMP"

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The Southern Tafilalt Basin of easternmost Anti-Atlas contains abundant mafic bodies dominantly in the form of sills and dykes. The sills are mostly interleaved in the youngest Paleozoic formations (Famennian and Tournaisian; Fig. 1) and they are folded alike the sedimentary strata. The attribution of these mafic bodies, either to the Triassic or to the Devonian-Carboniferous, has been discussed recently (Benharref et al., 2014; Pouclet et al., 2017; Chabou et al., 2017). The scarce volcanic criteria are ambiguous, and the apparent folding of the sills may correspond to late emplacement within previously folded strata (Baidder et al., 2016). In the absence of isotopic dating, regional arguments would support a Triassic-Liassic age ("CAMP"). However, petrographical-geochemical data show that the Tafilalt mafic rocks present alkaline affinities contrasting with the classical continental tholeiites of the CAMP (Chabou et al., 2010). This is confirmed by using a discriminant diagram (Chabou, 2016) based on immobile elements (Zr/Ti vs. Nb/Y) (Fig. 2). Moreover, the Ti (>2 wt %) content of the Tafilalt mafic rocks do not match the low-Ti (< 2 wt %) of the CAMP-related tholeiites from North West Africa. Pouclet et al. (2017) suggest a Devonian-Carboniferous age for the Tafilalt mafic rocks. However, we observe that the only mafic intrusions of this age located far in the Sahara domain (4, 5; Fig. 3) or in Western Meseta present geochemical characters distinct from those of the Tafilalt rocks. Alternative correlations could be proposed (6-8), but result hardly pertinent (undated HK calc-alkaline gabbro and dolerites of Oumjrane, poorly dated Msissi teschenite of the Maidder syncline, or High Atlas Late Jurassic-Early Cretaceous alkaline-transitional basalts). In contrast, the Tafilalt mafic rocks could represent the Permian-Triassic (?) alkaline precursor of the CAMP magmatism itself as observed elsewhere (Spain, Nova Scotia). This tempting hypothesis clearly requires to be directly checked by robust isotopic datings.

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Pouclet A. et al., 2017. J. Afr. Earth. Sci. 129, 814-841.

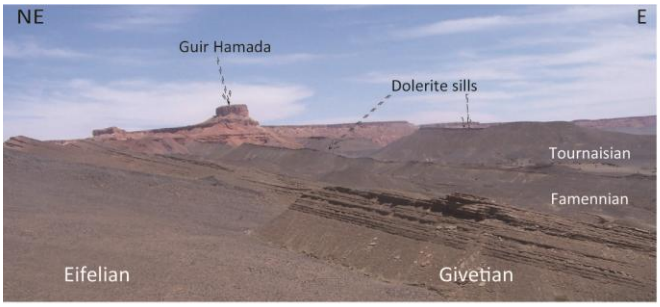

Fig. 1: Typical aspect of the Southern Tafilalt sills interleaved in the weakly folded Devonian-Carboniferous basinal series. Photo L. Baidder, 2010.

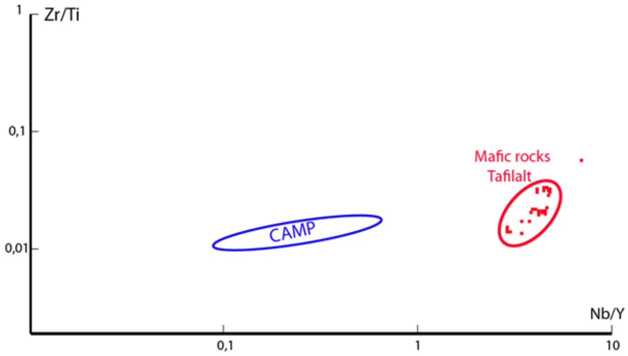

Fig. 2: Zr/Ti vs. Nb/Y compositions for Tafilalt mafic rocks, based on analyses from the literature (Benharref et al., 2014). Compositional field of CAMP tholeiites from North West Africa (Chabou et al., 2010) is reported for comparison.

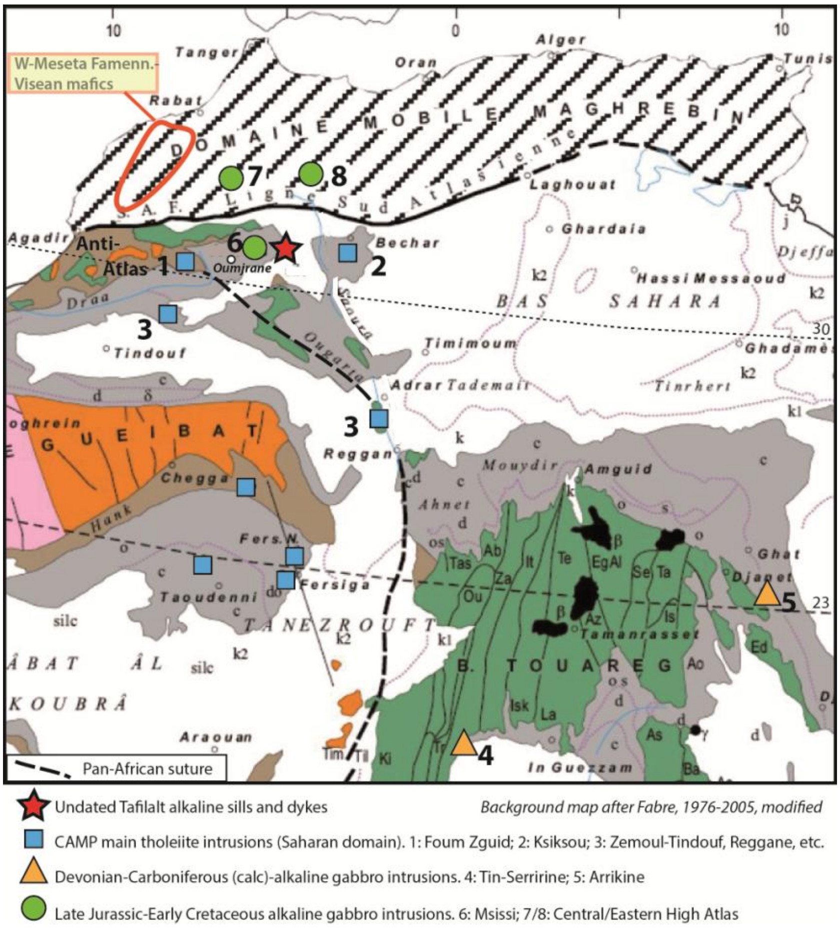

Fig. 3: Distribution of the gabbroic intrusions discussed here.