



## **Geodynamic implications of Collo-Bougaroun Miocene magmatic complex (Eastern Algerian margin): a review of U-Pb, K-Ar chronology and geochemistry**

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The “Petite-Kabylie” comprises all eastern Algerian coastal magmatic chain outcropping from Jijel to the west, up to the plain of Annaba, to the east. At the western part of this area, the Kabylie of Collo stretches between 6° and 7° E and 36° 30' and 37° 06' N towards Skikda.

The Bougaroun magmatic complex form a large elliptical batholith oriented ENE-WSW over 20 km that intrudes serpentinized peridotites and kinzigites of the Bougaroun basement to the east. This granitic pluton gives time constraints as it induces deformation and contact metamorphism of the Oligo-Miocene Kabyle sedimentary cover which are well observed at “Collo-Oued Zhou” basin in the south.

The Collo-Bougaroun volcano-plutonic complex, of ca. 300 km<sup>2</sup>, comprises (1) granular rocks, mainly cordierite bearing peraluminous granites (Bougaroun pluton to the north, the BeniToufout to the south and the Filfila to the east), (2) gabbros that occur at the northern and southern parts of Cap Bougaroun pluton where they are associated with ultramafic (3) microgranular rocks, mainly microgranites, that outcrop at the eastern part of the Bougaroun pluton, in Collo basin and El Milia, microdiorites in Bouserdoum and some doleritic or microgabbroic metric veins at Cap Bougaroun and (4) of lava in the Kef Cheraïa rhyolitic complex.

Rocks from Collo-Bougaroun sites belong either to low-K, medium-K or high-K calc-alkaline series. The geochemistry of basic rocks (gabbros and dolerites) places strong constraints on their origin. Their LREE-depleted patterns, enrichment in LILE and slight depletion in HFSE are discussed in the very particular geodynamic context of the northern Algerian margin. Indeed, such depleted magmas could hardly have been emplaced over the African basement without experiencing any contamination imprint.

Whole rock K/Ar ages were performed on 150-300 μm grains from a set of representative magmatic rocks from Collo-Bougaroun region. The mafic rocks ages show a probable rejuvenation from (21.25 ± 6.01 (large error linked to the K<sub>2</sub>O wt% of 0.04) to 16.45 ± 0.52 Ma). This feature is attributed to a late K-gain during hydrothermal processes. This interpretation is supported by the occurrence of low temperature minerals (Adularia) in microgabbros and fine grained gabbros (microprobe analyses).

The granite ages scatter between 20.85 ± 0.51 and 17.88 ± 0.5 Ma. The latter is consistent with <sup>206</sup>U–<sup>238</sup>Pb age of 16.96±0.09 Ma obtained from 28 laser ablation spots analyses performed on zircon grains. Microgranites usually outcropping in Langhian “post-nappes” basins, yield ages ranging from 14.17 ± 0.35 to 13.59 ± 0.33 Ma.