Paleomagnetic and magnetostructural study of Jurassic formations of Gara Djebilet (Tindouf Basin, southwestern Algeria)

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Recent geochemical analyzes and $^{40}Ar/^{39}Ar$ datings of dolerite sills and dykes and basaltic lava flows from southwestern Algeria (Tindouf, Reggane, Bechar and Hank Basins) have shown that these rocks are related to the Central Atlantic Magmatic Province (CAMP). The CAMP is one of the largest among the Mesozoic basaltic provinces identified and formed about 200 Ma ago as a preamble to the breakup of Pangea. These data were solid arguments for undertaking geological observations and sampling for paleomagnetic studies and magnetic fabrics on the CAMP formations. A network of three long doleritic dykes (198.9 ± 1.8 Ma) located in the Tindouf Basin were targeted to clarify the structural context of their emplacement (magnetic fabrics) and to determine a new reliable Mesozoic pole.

The magnetic fabric, in almost all the sections sampled, is defined mainly through grouping of k_1 and k_2 axes on the dyke plane whereas axis k_3 is almost perpendicular to the dyke plane. This fabric can therefore be interpreted as the magma flow direction. The new Jurassic paleomagnetic pole, of excellent quality, is very close to those obtained on detrital formations of the Algerian Sahara and close to those recently determined on igneous formations of Morocco. This new pole is also very close to the North African pole at 200 Ma. These results represent a new contribution for a better knowledge of the geodynamic context during this period.

Keywords: Jurassic dykes, CAMP, magnetic fabric, paleopole, geochemistry, Sahara