The Hoggar swell and volcanism: Reactivation of the Precambrian Tuareg shield during Alpine convergence and West African Cenozoic volcanism

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Myth: A simplified picture, often illusory, that groups of humans elaborate or accept concerning a person or a fact and which plays a determining role in their behavior or their appreciation.
Translated from Dictionnaire Le Robert (1990)

ABSTRACT
We review the northwest African Cenozoic volcanic fields, including their regional geology. This provides a basis for understanding the relations between Hoggar volcanism and the Africa-Europe collision. Volcanic alignments are related to structural features, and no spatial age trend exists. In Hoggar, a close link is established between the volcanism and Pan-African structure. During the Mesozoic rifting period, the Hoggar area was already a topographic high well before any volcanism, which began at ca. 35 Ma, just after the initiation of the Africa-Europe collision at ca. 38 Ma. Hoggar volcanism continued episodically until now, as did the collision. We describe the Hoggar volcanic province based on available field, petrological, geochemical isotopic, and geophysical data, including data on gravimetry, heatflow, and seismic tomography. The latter suggests that northwestern African volcanism is linked to mantle structure down to 150 km but not deeper, implying a shallow mantle source. In Hoggar, lithospheric structures deduced from the seismic tomographic model and from geology are compatible when their respective resolutions are taken into account.

The considerations just stated cannot be reconciled with a plume model. We propose instead that intraplate stress induced by the Africa-Europe collision reactivated the Pan-African mega–shear zones mainly in metacratonic terranes, inducing linear lithospheric delamination, rapid asthenosphere upwelling, and melting due to pressure release. Edge-driven convection may contribute. The surface location of the volcanism is influenced by Paleozoic and Mesozoic brittle faults.