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Does the ca. 942 Ma Bou Azzer gabbro constrain the timing of early Neoproterozoic rifting in the Anti-Atlas belt?

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The Anti-Atlas belt of Morocco exposes one of the principal Neoproterozoic orogenic systems along the northern margin of the West African Craton and preserves an exceptional record of Neoproterozoic tectonic evolution. In the Bou Azzer–Siroua inliers, remnants of Neoproterozoic oceanic lithosphere occur as highly sheared, allochthonous ophiolitic complexes assigned to the Bou Azzer Group. These ophiolites, representing fragments of ancient oceanic crust emplaced during basin closure, provide key constraints on the geodynamic evolution of the region. This study investigates a gabbroic body exposed in the Aït Ahmane area of the Bou Azzer inlier, previously interpreted as part of the Bou Azzer ophiolitic complex. New SHRIMP U–Pb zircon analyses yield a crystallization age of ca. 942 Ma, significantly older than the 777–763 Ma ages reported for the Bou Azzer–Khzama oceanic crust (Chaib et al., 2021 and references therein). This age discrepancy suggests two alternative interpretations: (1) the Bou Azzer ophiolite records an earlier, previously unrecognized phase of oceanic magmatism, or (2) the gabbro is unrelated to the main ophiolitic sequence and instead belongs to the older Tachdamt volcanic Formation exposed in the southeastern Bou Azzer inlier and assigned to the Lower Anti-Atlas Supergroup (Lkest–Taghdout Group). The Tachdamt Formation comprises basaltic lava flows and associated pyroclastic rocks linked to the 885–883 Ma Iguerda–Taïfast Large Igneous Province, interpreted as evidence of Rodinia-related rifting. To determine the tectonic affinity of the ca. 942 Ma gabbro and refine the timing and nature of early Neoproterozoic rifting along the northern margin of the West African Craton, we integrate new geochronological, isotopic, and whole-rock geochemical data.

Keyword: Neoproterozoic; Bou Azzer inlier; U–Pb zircon geochronology; Iguerda–Taïfast Large Igneous Province; Rodinia rifting; isotopic geochemistry

References:

Chaib, L., Ait Lahna, A., Admou, H., Youbi, N., El Moume, W., Tassinari, C. C. G., Mata, J., Stipp Basei, M. A., Sato, K., Marzoli, A., Bodinier, J. L., Gärtner, A., Boumehdi, M. A., Bensalah M. K., Soulaimani, A., Hefferan, K., Maacha, L., Bajddi, A. (2021). Geochemistry and geochronology of the Neoproterozoic Backarc basin Khzama ophiolite (Anti-Atlas Mountains, morocco): Tectonomagmatic implications. Minerals, 11(1), 56.