

Refining the stratigraphy of the Tizi n'Taghatine Group via U-Pb Geochronology of the Ifzwane Suite and detrital zircons of sedimentary rocks (Zenaga and Bou Azzer-El Graara inliers, Anti-Atlas, Morocco)

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The Precambrian stratigraphy of the Anti-Atlas comprises several groups, some of them with poor age constraints. The Tizi n'Taghatine Group (Taghdout or Lkest Group,) of the Anti-Atlas (Morocco, northern portion of the West African craton, WAC) consists essentially of basalts, quartzites, and stromatolitic/oolitic carbonates and represents a passive margin sequence, deposited during the break-up and rifting of the northern margin of the WAC. The rifting culminated with the creation of an oceanic basin between the northern edge of the WAC and an unknown terrane at ca. 760 Ma (U-Pb zircon age). The age of the Tizi n'Taghatine Group has been poorly constrained. It was previously thought to be c. 1000-800 Ma based on (1) the presence of stromatolites that point to a Neoproterozoic age, i.e. younger than 1000 Ma, and the (2) age of the contact-metamorphosed walls of the associated mafic dykes (Rb/Sr, 789 ± 10 Ma, Clauer, 1976). However, with the U-Pb dating of numerous dyke swarms in the Anti-Atlas Inliers at 2040 Ma, 1750, 1650, 1416-1380, and c. 870, Youbi et al. (2013) suggested that the Tizi n'Taghatine Group could be Mesoproterozoic in age, with a preference for an age of about 1750 Ma. In order to test this idea, a mafic sill within the Tizi n'Taghatine Group in the Zenaga inlier has been dated by the U-Pb SHRIMP (Sensitive High Resolution Ion Microprobe) method, yielding an age of 1639 ± 34 Ma. This age confirms that the lowermost part Tizi n'Taghatine Group is nearly 1.0 Ga older than previously thought. Similar result were obtained on the Ighrem dyke that cross-cut the Tizi n'Taghatine Group in the Ighrem Inlier dated at 1706 ± 7 Ma (U-Pb on baddeleyite; Ikenne et al., 2017). The maximum depositional age and the provenance of the Tizi n'Taghatine Group is constrained by new detrital zircon ages from the lower, middle and upper part of this sedimentary succession in Zenaga and Bou Azzer El Graara inliers and which indicate the source provenance from the WAC (i.e. Reguibat shield, Anti-Atlas and Meseta Block) and possible others Cratons such as Amazonia.

Key Words: Morocco, Anti-Atlas, Proterozoic, Tizi n'Taghatine Group, Taghdout sill, detrital zircon, U-Pb geochronology

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