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New Mesoproterozoic age constraints for the Taghdout Group, Anti-Atlas (Morocco): Toward a new lithostratigraphic framework for the Precambrian in the NW margin of the West African Craton

M. Ikenne¹, A. Ait Lahna², U. Söderlund³, C.C.G Tassinari⁴, R.E. Ernst⁵, Ch. Pin⁶, N. Youbi², EH. El Aouli¹, A. Hafid⁷, H. Admou², J. Mata⁸, EH. Bouougri² and M.A. Boumehdi²

¹ Department of Geology, Faculty of Sciences, IbnouZohrUniversity, Morocco m.ikenne@uiz.ac.ma

² Department of Geology, Faculty of Sciences-Sémlalia, Cadi AyyadUniversity, Marrakech, Morocco

³ Department of Geology, Lund University, Lund, Sweden

⁴ Centro de Pesquisas Geocronológicas, Instituto de Geociências, Universidade de São Paulo- Brazil

⁵ Department of Earth Sciences, Carleton University, Canada

⁶ Département de Géologie, CNRS & Université Blaise Pascal, Clermont-Ferrand Cedex, France

⁷ Department of Geology, Faculty of Sciences & Technics, Cadi AyyadUniversity, Marrakech, Morocco

⁸ Instituto Dom Luiz, Faculdade de Ciências, Universidade de Lisboa, Portugal

It is conventionally interpreted that the Precambrian series of the Anti-Atlas are composed of a Paleoproterozoic basement, unconformably overlain by a Neoproterozoic to Cambrian cover groups. The Paleoproterozoic basement, consists of a siliciclastic series intruded by granitoids emplaced around 2 Ga. The Neoproterozoic cover group has been divided into three lithostratigraphic units: (1) The quartzite and limestone series of Taghdout group (in Taghdout, Lkest, Tachdamt and Bleida) is attributed to the Cryogenian, based on the Rb/Sr, 789 ± 10 Ma age of the contact-metamorphosed host rock walls of mafic dykes (Clauer, 1974). In the Bou Azzer inlier, the Tachdamt-Bleida series and the associated ophiolitic complex were attributed to the passive margin, oceanic and island-arc formation stages of the Pan-African orogenic cycle. The other two groups are (2) the Tidilline and Anezi Series, and (3) the volcanic and the volcanoclastic series of the Ouarzazate group.

Mafic sills within the Taghdout Group in the Ighrem (Ikenne et al., 2016) and in the Zenaga inliers (Ait Lahna et al., 2016) have been dated by the U-Pb SHRIMP method at 1706 ± 7 and 1639 ± 34 Ma, respectively. These dates throw into question the Cryogenian age conventionally assigned (as discussed above) to the quartzites and calcareous series and instead suggest that the Precambrian in the Western Anti-Atlas is composed of both Paleoproterozoic and Mesoproterozoic series. The rocks of the Assif n'Bougmane gneiss complex, in the southern part of Bou Azzer, were previously considered as Palaeoproterozoic, but are now suggested to have been formed at 755- 675 Ma (SHRIMP U-Pb zircon ages, Blein et al., 2014). This indicates the absence of Palaeoproterozoic rocks in the Central Anti-Atlas. In the Eastern Anti-Atlas, on the basis of the detrital zircons (Liégeois et al., 2006; in Walsh et al., 2012; Abati et al., 2010), the Saghro series must be younger than the Taghdout Group, and would be correlative with the Anezi series in the South Western Anti-Atlas and Tidilline and the Bou Salda series in the central Anti-Atlas. These correlations indicate the basement of the Eastern Anti-Atlas consists only of the Upper Neoproterozoic series. This interpretation is corroborated by the recent results of Baidada et al. (this volume).

On the basis of these new data we suggest a new lithostratigraphic framework with the recognition of three different domains: (1) the Paleo-Mesoproterozoic domain in southwestern Anti-Atlas, (2) the Panafrican domain in the central Anti-Atlas, and (3) the Post Panafrican domain, in the northeastern Anti-Atlas. The three terranes were assembled during the postcollisional stage of the Panafrican orogen, that is manifested by the volcanics series of the c. 570 Ma Ouarzazate supergroup common to all parts of the Anti-Atlas.

Keywords: Anti-Atlas, Morocco, Mesoproterozoic, Taghdout, lithostratigraphic framework.