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Tectonometamorphic evolution of the North Ouaddaï Massif (Am Zoer area, E. Chad).

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The Saharan metacraton was assembled during pre-Neoproterozoic to Neoproterozoic times and highly remobilised during the Pan African stages. The Ouaddaï massif in Eastern Chad represents the core of the Saharan metacraton but our knowledge of the geological history is still poorly documented. We here present the combination of field data with a petrological study and geochronological constraints to decipher the different events that builded up the Ouaddaï massif. The study area is located in the surroundings of Am Zoer at the northern tip of the massif. It mainly corresponds to high-grade gneissic metagranite or metasediments, sometimes migmatitized containing rare mafic granulite. All these metamorphic rocks are intruded by an undated granitic series. Mafic granulites interbedded with the migmatite give Pressure-Temperature conditions of formation around 1.2 GPa and 850°C. Sillimanite-garnet bearing migmatites give contrasting lower Pressure-Temperature conditions of formation around 0.8 GPa and 700°C and graphitic schist gives temperature of at least 640°C. We dated samples using the U/Pb method on zircon. Granitoids yield ages clustering during the Panafrican stage (ca. 620-585 Ma). We also document the inheritance of Paleoproterozoic (ca. 1815 Ma) and Archean (ca. 2810 Ma) events in both granitoids and from detrital zircon in sandstones. The lack of Mezoproterozoic age is coherent with a Gondwanian origin for the sediments. Using our data, we discuss the timing of assembly of the Saharan craton and compare with the nearby massif (Darfour, Tibesti, Mayo Kebi). We also discuss the remobilization of the Saharan Craton during the Neoproterozoic and the associated collisional processes.