Paleo to Neoproterozoic history, of high-pressure Egéré domain (Central Hoggar, Tuareg Shield, Algeria), U-Pb dating, P-T-t path and geodynamic implication

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The Egéré domain (Egéré-Aleksod terrane, Central Hoggar, South Algeria) is composed of an amphibolite-facies Arechchoum Group and an eclogite-facies Egéré Supergroup (subdivided into the Lower Egéré and Upper Egéré groups). We show hat (1) the Arechchoum Group is a large alkaline felsic volcanic system of Siderian age (c. 2.3 Ga) that has been intruded by Rhyacian (c. 2.2 Ga) garnet metagabbro, and Statherian (c. 1.75 Ga) metarhyolites. (2) The Lower Egéré Group consisted of marbles and quartzites interlayered with a large volume of bimodal magmatism during the Rhyacian (c. 2.2 Ga) and the Orosirian (c. 2.0 Ga). The Rhyacian episode is marked by coeval felsic volcanic rocks (now garnet-free orthogneisses) and intracontinental subalkaline high-Fe- tholeiitic basalts (now eclogite) with E-MORB affinity. The Orosirian episode associates differentiated mantle-derived mafic melts (garnet-free amphibolites) and crust-derived granitic magmas (biotite-garnet−bearing orthogneisses). (3) The Upper Egéré Group consists of paragneiss, metaquartzite and marble deposited between 1.17 Ga and 1.00 Ga. During the Calymmian, intrusion of mafic dykes (now eclogite) with E-MORB chemical signature indicate a new extensional event at c. 1.56 Ga. This means that an important Calymmian event occurred in the Tuareg shield, which is major and unexpected news.

The Pan-African orogeny in the Egéré terrane is manifested by a regional metamorphism of high-pressure up to eclogite conditions in the Egéré Supergroup and of Barrovian character in the Arechchoum Group. All Pan-African zircons (often as rims) are metamorphic (Th/U<0.05) and ranging from c. 675 Ma to 580 Ma. The eclogite facies peak pressure in the Egéré Supergroup have been dated at c. 677 Ma (M1 = 20±1 kbar and 650±50 °C), followed by post-peak decompression heating at c. 655–645 Ma (M2= 14±1 kbar and 800±50 °C) and by decompression form c. 630 Ma to c. 580 Ma (from M2 to M3 = 8.0±1 kbar and 690±50 °C then M4 = 6±1 kbar and 610±50°C). During the Pan-African orogeny, the Egéré-Aleksod terrane was subducted (680–660 Ma), exhumed thanks to a slab breakoff (655–630 Ma) before being incorporated in the general northerly Tuareg tectonic escape (630–580 Ma) that induced an additional but limited exhumation.