

## Thermal Evolution of the Proterozoic crust during the Eburnean Orogeny, Kedougou Kenieba Inlier, Eastern Senegal

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The metamorphic formations of the amphibolite facies (T=500-660°C) located in the Kedougou Kenieba Inlier in the Diale-Dalema Supergroup are affected by Proterozoic thermomechanical crustal evolution between 2.5 and 2.0 Ma. We have studied this deformation and metamorphism in surrounding of the Saraya pluton, which represents the middle crust (4-9 kbar). While some authors attribute this metamorphism to the contact aureole of the Saraya pluton (Ndiaye et al., 1989); thermodynamic calculations identified an early stage HP/MT relics preserved in a form relict garnet cores. We have studied a series of metasediments in the vicinity of the Saraya pluton, located at variable distances from the pluton. The metamorphic assemblage is garnet-staurolite-plagioclase-biotite-white mica-quartz at 2-4 km from the pluton and garnet-staurolite-plagioclase-sillimanite-cordierite-biotite-white mica-quartz at the contact between the metasediments and the granite intrusion. The P-T conditions calculated using a P-T pseudo-section (de Capitani and Petrakakis, 2010) suggest a multiphase metamorphic evolution in eastern Senegal during the Proterozoic with a first regional phase M<sub>1</sub> HP/MT (8-9 kbar, 520-560°C) and a second post-thickening stage M<sub>2</sub> related to the thermal maturation and partial melting of the upper crust (5-7 kbar, 600-630°C). The U-Pb geochronology data obtained on metamorphic monazite range between 2040 to 2060 Ma for the metamorphism M<sub>2</sub>.

By combining a study of field data, thermodynamic modeling of metamorphic equilibria, modeling of the thermal evolution of the crust and geochronology, we have investigated the geological and geodynamic conditions that took place during the polyphase Eburnean Orogenesis.

### Reference

de Capitani C., Petrakakis K., 2010. The computation of equilibrium assemblage diagrams with Theriak/Domino software. *American Mineralogist*, 95, 1006-1016.