

Reworking crustal between the Hadean-Archean-Paleoproterozoic in the Sassandra-Cavally (SASCA, SW of Ivory Coast): Constraints of U-Pb and Lu-Hf isotopes

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The SASCA domain located east of the Sassandra Fault in southwestern Ivory Coast contains evidence of interaction between Archean and Paleoproterozoic crusts. We present new data from this area by coupling U-Pb and Lu-Hf techniques carried out on zircon grains of grey gneiss and intrusive potassic granite. Our objective is to show the crustal growth and the recycling since Hadean to Archean and interaction with the juvenile Paleoproterozoic crust. Indeed, the grey gneiss belonging to the TTG series has essentially Archean ages from 2826 to 3236 Ma, whose $\epsilon_{\text{Hf}}(t)$ values are below the CHUR with TDM model ages between 3.6 and 4.2 Ga. However, potassic granite shows values of $\epsilon_{\text{Hf}}(t)$ that lie on both sides of the CHUR between -13.1 and +2.2 with model ages of 3.5 and 2.5 Ga and a magmatic age of ca. 2100 Ma. Our data suggest the existence of a very early mafic protocrust differentiating without any mantle material from the Hadean to Archean, thus forming an Archean crust, protolith of SASCA grey gneiss. The recycling of this Archean crust with the addition of juvenile magmas from the mantle resulted in the formation of a new crust very potassic ca. 2100 Ma during the Eburnean orogeny. It is the first time that the implication of this Hadean period in the growth and recycling of the ancient crust is demonstrated in the West African Craton.

Keywords: Metamorphism, U-Pb on monazite, Ivory Coast, Paleoproterozoic

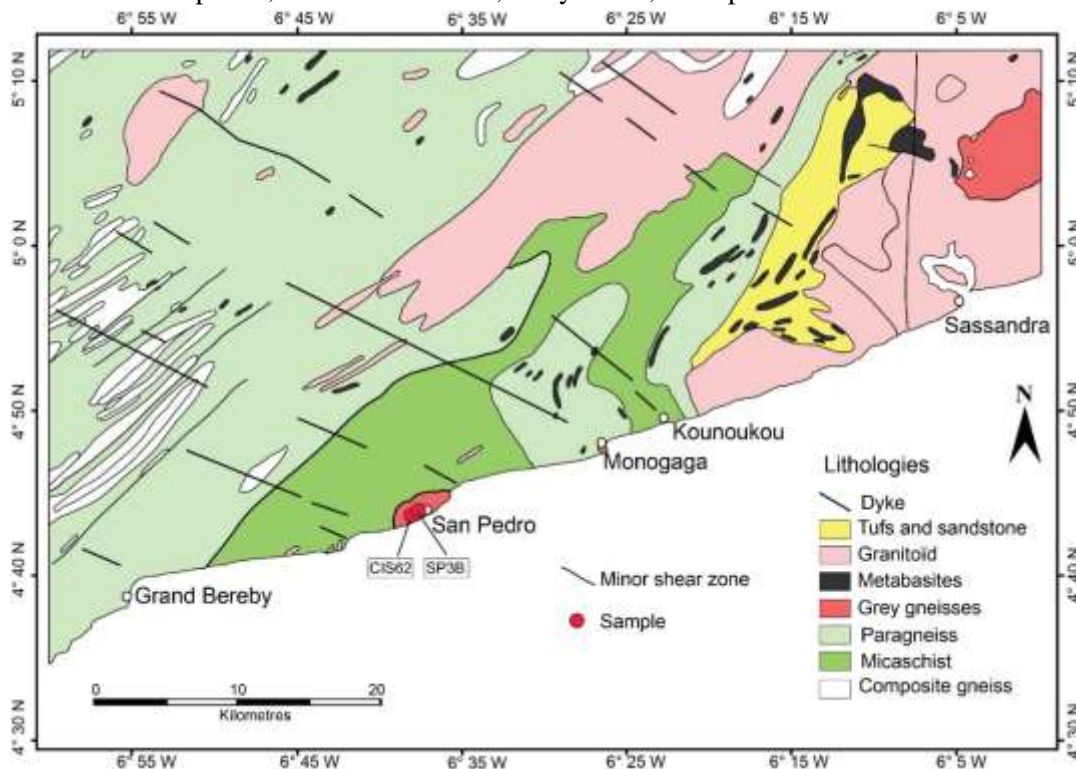


Fig.1: Geological map of the study area. Red circle shows the location of the studied samples (after Papon, 1973).