



New geochronological history of the Mbuji-Mayi Supergroup (Proterozoic, DRC) through U-Pb and Sm-Nd dating

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The Mbuji-Mayi Supergroup, DRC is located between the Archean-Paleoproterozoic Kasai Craton and the Mesoproterozoic Kibaran Belt. This sedimentary sequence, unaffected by regional metamorphism, preserves a large diversity of well-preserved acritarchs (organic-walled microfossils), evidencing the diversification of complex life (early eukaryotes) for the first time in mid-Proterozoic redox stratified oceans of Central Africa (Baludikay et al., in review).

This Supergroup is composed of two distinct lithostratigraphic successions (i) BI Group: a lower siliciclastic sequence (ca. 1175 Myr to ca. 882 Myr or ca. 1050 Myr (Cahen, 1954; Holmes & Cahen, 1955; Delpomdor et al., 2013) unconformably overlying the ca. 2.82-2.56 Gyr granitoid Dibaya Complex to the North (Cahen & Snelling; recent notice on DRC geological map); and (ii) BII Group: a poorly age-constrained upper carbonate sequence with sparse shales. Basaltic lavas (including pillow lavas) overlying the Mbuji-Mayi Supergroup were dated around 950 Myr (Cahen et al., 1974; Cahen et al., 1984).

To better constraint the age of this Supergroup in the Meso-Neoproterozoic limit, we combine different geochronological methods, in particular on diagenetic minerals such as monazite (Montel et al., 1996; Rasmussen & Muhling, 2007) and xenotime (McNaughton et al., 1999) but also on detrital zircons. For the BI Group, results of in situ U-Pb dating with LA-ICP-MS on monazite, xenotime and zircon (Laboratoire Magmas et Volcans, Clermont-Ferrand) provide ages between 2.9 and 1.2 Gyr for zircons and between 1.4 and 1.03 Gyr for monazites and xenotimes. New results of in situ U-Th-Pb dating of well-crystallized monazites and xenotimes with Electron MicroProbe (Camparis, UPMC, Paris), highlight that some crystals display zonations with an inherited core older than 1125 Myr and diagenetic rims around 1050-1075 Myr. This suggests that the diagenesis of BI Group is younger than 1175 Myr (Delpomdor et al., 2013) and probably around 1030-1075 Myr, coherent with an age on 2 syngenetic galenas around 1055 Myr for the top of BI Group (Cahen, 1954; Holmes & Cahen, 1955).

Sm-Nd datings on basaltic pillow lavas overlying the Mbuji-Mayi Supergroup (previously dated around 950 Myr (Cahen et al., 1974; Cahen et al., 1984) are in progress (Laboratoire G-Time, ULB, Bruxelles) to precisely limit in time the end of deposition of this Supergroup.