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**Multi-dating approaches applied to the Proterozoic Mbuji-Mayi Supergroup, (D.R. Congo) to constrain the diversification of early eukaryotes in Central Africa**



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The Mbuji-Mayi Supergroup in the Democratic Republic of Congo (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 microfossils, evidencing the evolution of complex life (early eukaryotes) for the first time in Meso-Neoproterozoic record of Central Africa [1].

The lithostratigraphy of the Supergroup consists of two Groups: (i) BI Group: a lower siliciclastic sequence poorly constrained (ca. 1174 Ma to ca. 1055 Ma [2, 3, 4, 5, 6]) unconformably overlying the ca. 2.82-2.56 Ga granitoid Dibaya Complex [7, 8, recent notice on DRC geological map] and (ii) BII Group: an unconstrained upper carbonate sequence intercalated with sparse shales. Basaltic lavas overlying the Mbuji-Mayi Supergroup were dated around 950 Ma [5, 8].

In order to better constrain the age of this Supergroup in the Meso-Neoproterozoic limit, we used a combination of different geochronological methods. For the BI Group, results of *in situ* U-Pb dating with LA-ICP-MS (Laboratoire Magmas et Volcans, Clermont-Ferrand, France) provide <sup>207</sup>Pb/<sup>206</sup>Pb ages between 2911 and 1284 Ma for zircons and between 2783 and 1029 Ma for monazites and xenotimes.

New results of *in situ* U-Th-Pb chemical 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 Ma and diagenetic rims around 1040-1065 Ma. This suggests that the diagenesis of BI Group is younger than 1175 Ma [6] and probably around 1030-1065 Ma, coherent with ages on two syngenetic galenas with a model age around 1055 Ma for the top of BI Group [2, 3, 4, 5]. Re-Os datings (Laboratoire Géochimie des enveloppes externes, IPGP, Paris, France) are underway to constrain the age of fossiliferous shales, in particular from the unconstrained BII Group.

We also re-evaluate the age of basaltic lavas overlying the Mbuji-Mayi Supergroup (previously dated around 948 ± 20 Ma [5, 8] with Sm-Nd and Rb-Sr techniques (Laboratoire G-Time, ULB, Bruxelles, Belgium) to constrain the end of deposition of this Supergroup.

**References:**

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