Geophysical Research Abstracts
Vol. 16, EGU2014-16938, 2014
EGU General Assembly 2014

Micropaleontology and chemostratigraphy of the Neoproterozoic Mbuji-Mayi Supergroup, Democratic Republic of Congo.

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The Mbuji-Mayi Supergroup, deposited between 1170 $\pm$ 22 Ma and ca. 800 Ma [1], outcrops in the eastern Oriental Kasai Province and western Katanga Province of the Democratic Republic of Congo. It is the youngest Precambrian unit of the Kasai block and was deposited in the SE–NW trending failed-rift Sankuru-Mbuji-Mayi-Lomami-Lovoy basin filled with siliciclastic and carbonate sediments. In the northern part of this basin (Oriental Kasai Province), the Mbuji-Mayi Supergroup rests unconformably upon the Archean Dibaya Granite Complex, but in the southern part (northeastern Katanga Province), it overlies the Mesoproterozoic Kibaran Supergroup. The Supergroup is divided into two groups: the lower, $\sim$ 500-m thick siliciclastics-rich BI Group and the upper, $\sim$ 1000-m thick carbonate-rich BII Group. Our own and previous sedimentological observations [2] indicate facies ranging from subtidal, low-energy stromatolitic environments to overlying intertidal to supratidal evaporitic settings of lagoon and sabkha.

In order to characterize the diversity of microfossil assemblages, their paleobiology and paleoecology as well as redox conditions in their depositional setting, we have sampled three drill cores (KAFUKU 15, B13 KANSHI, and S70 LUBI) from the collections of the Royal Museum for Central Africa (RMAC). Our biostratigraphic and chemostratigraphic data also provide further constraints on the age of the Mbuji-Mayi Supergroup.

Here we present preliminary data on microfossil diversity from the Kanshi drill core and carbon isotope chemostratigraphy for all three drill cores. The well-preserved and diverse assemblage of acritarchs and filamentous forms includes prokaryotes and eukaryotes, and is similar to other coeval assemblages described worldwide outside of Africa. The presence of the acanthomorph acritarch Trachyhystrichosphaera aimika is significant as it is indicative of the late Meso- to early Neoproterozoic age elsewhere, and is reported for the first time in Central Africa. So far, 52 species belonging to 31 genera were identified, dramatically increasing the previously reported diversity [3, 4]. Chemostratigraphy based on δ13Ccarb values for 290 samples, records, for the BI Group, predominantly negative values down to -8 to -9 ‰ VPDB with few samples having more positive, up to +3 ‰ values. Although the siliciclastics-rich sediments in the lower part of the BI Group likely record early diagenetic signal, carbonates in the upper part of the BI Group show similar patterns in both the Lubi and Kafuku drill cores with the sharp fall from +1 to +3 ‰ values to -8 to -7 ‰ and recovery back to +1 ‰ values over 40 to 70 m of section. The BII Group shows a less dramatic rise from -1 ‰ to +4 to +5 ‰ over more than 150 m of section. These large-scale variations differ from the steady-state carbon cycle of the late Mesoproterozoic [5] and are typical of the Neoproterozoic record leading to the Cryogenian [6], specifically the Bitter Springs Stage [1]. The project is supported by the EU FP7 ERC Stg ELITE.

References: [1] Delpomdor et al., 2013, Palaeogeog. Palaeoclimat. Palaeoecol. 389, 35–47. [2] Delpomdor et al., 2013, J. of Afr. Earth Sciences 88, 72–100. [3] Maithy, 1975, The Paleobotanist 22, 2, 133-149. [4] Baudet, 1983, Geol. J., 22, 121-137. [5] Bartley & Kah, 2004, Geology, 32, 129-132. [5] Halverson et al., 2010, Prec. Res., 182, 337-350.