The Mesoproterozoic "Kibaran Event" in Central Africa: a 1375 Ma intracratonic emplacement of a Large Igneous Province (LIP)

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The Kibaran belt is often portrayed as a 1500 km long continuous orogenic belt, trending NE from Katanga (Democratic Republic of Congo, DRC) to SW Uganda. The "belt", however, consists of two segments, separated in the DRC by a Palaeoproterozoic (Rusizian) basement rise in continuity with the NW-SE trending Ubendian shear belt further south in Tanzania. We define the two segments of the "Kibaran Belt s.l." on either side of the rise as 1) the "Northeastern Kibaran Belt (NKB), spanning Rwanda and Burundi, SW Uganda and NW Tanzania as well as the Kivu-Maniema region of the DRC and 2) the "Kibaran Belt s.s." further SW including the Kibara Mountains type area in Katanga, DRC. Previous attempts at reconstructing the history and geodynamic evolution of the NKB (and of the Kibaran Belt s.l.) relied on a few bulk zircon ages and lots of Rb-Sr or K-Ar data, often on two-mica granitoid rocks. These studies, based on various criteria adopted by various authors at various times in various countries, have led to confusing and mutually excluding terminologies, as well as to the concept of a protracted Kibaran orogeny, with distinct melting batches and successive intrusive phases. We document 10 new zircon U-Pb SHRIMP magmatic ages, $^{40}Ar/^{39}Ar$ and laser ablation zircon Hf data, all of them obtained from previously already isotopically "dated" rock specimens. Results are spectacular: within the NKB, a prominent coeval bimodal magmatism is emplaced at 1375 Ma, marked by: 1) the 350 km long Kabanga-Musongati (KM) alignment of mafic and ultramafic, Bushveld-type, layered complexes and 2) voluminous S-type granitoid rocks with accompanying subordinate mafic intrusive rocks. The 1375 Ma magmatic event, together with the occurrence in SW Rwanda of Palaeoproterozoic basement as well as the lack of remnant oceanic crust, ophiolites and juvenile volcanic arc type magmatic rocks in the NKB, are indicative of the intracratonic emplacement of a Large Igneous Province (LIP). Both aeromagnetism and gravimetry suggest a thermal anomaly in the mantle to be at the origin of the NKB-LIP. This zone of anomaly is located along a fundamental lithospheric weakness zone, i.e. the rheological boundary between the Archaean Tanzania craton (with specific indentor palaeomorphology) to the east, and the adjacent Eburnean-aged mobile belt to the west. The magmatic event, triggered from the neighbouring Ubendian shear belt under a transtenstional regime, resulted in mantle upwelling, crustal thinning and large-scale crustal melting of the mobile belt during attempted continental breakup. The debate on the origin of LIPs has intensified in recent years: ascent of an asthenospheric plume *versus* intra-lithosphere scenarios, but falls out of the scope of this paper. It is worth noting that the independent, bimodal and coeval Kunene Anorthosite Complex was emplaced in the same time-span at the margin of the Congo craton in southern Angola at a distance of ca. 2500 km of the NKB-LIP. Renewed intracratonic activity in the NKB is evidenced at 795 Ma, leading to the emplacement of the adjacent Kabuye-Gagwe CFBs, i.e. a new LIP. In Katanga, the Kibaran Belt s.s. has also been the subject of recent detailed field and laboratory work. Emplacement of coeval S-type granitoid rocks (5 SHRIMP-ages) and associated, subordinate, mafic-intermediate igneous rocks occurred at 1.39-1.38 Ga (Kokonyangi et al., 2005). In contrast to the NKB, no mafic and ultramafic layered complexes were recognised. For decades the term "Kibaran" has been used to name the orogenic "cycle" and/or orogeny occurring in (central) Africa in "late" Mesoproterozoic times (1.4-1.0 Ga), which was considered to have a protracted character (Fernandez-Alonso et al., this meeting). Here, we propose to restrict the term "Kibaran" only to the prominent tectono-magmatic "event", giving rise to the 1375 Ma LIP emplacement, which corresponds to a punctual intraplate "anorogenic" event rather than a collisional event as often proposed in the past. Consequently, the "Kibaran Event" also does not relate to the "global" collisional events that led to the amalgamation of Rodinia at the end of the Mesoproterozoic Era (1.0 Ga).