The southern Kasai shield: a metacratonic boundary of the Congo craton?

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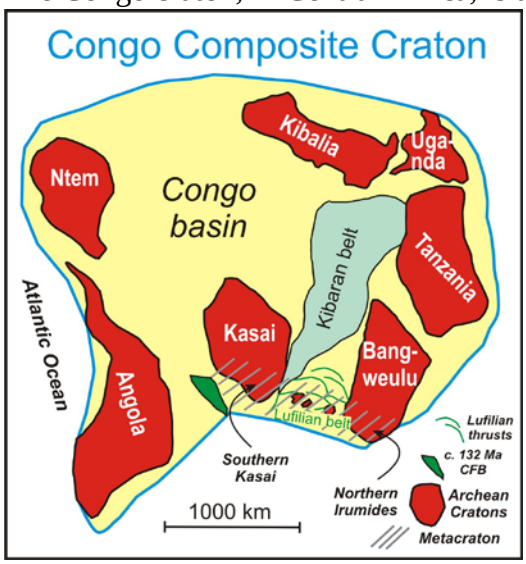
The Congo craton, in Central Africa, is a composite craton surrounded by late Neoproterozoic Pan-African belts and still largely poorly understood. It comprises a central Phanerozoic circular cratonic sedimentary basin and several Archean / Paleoproterozoic cratons, among which is the Kasai Craton, to the south. The Kasai craton is separated from the Tanzania craton (TC) and the Bangweulu craton (BC) by the enigmatic Mesoproterozoic intracratonic Kibaran belt (KB) and from the Angola craton by a major structure delineated by a c. 132 Ma CFB (fig). The Kasai craton (KC) has been built during Archean times (3.0 to 2.65 Ga). It has been reactivated, especially its southern margin, during Eburnean times (2.1-2.0 Ga), affected by Kibaran events (1.4-1.2 Ga) and overthrust in its eastern part by Pan-African nappes (0.6-0.55 Ga, Lufilian belt, Katanga). Our current study relies on a rich RMCA-Tervuren sample collection and on a 2010 field investigation within a fairly unexplored area extending west of Kolwezi (DR Congo) over 3 square degrees, together with basement samples retrieved from drillings made by de Beers within the northern KC.



Published geochronological data for the Kasai shield, preliminary U-Pb SHRIMP zircon dating results on various gneiss and granites from the southern KC and new U-Pb laser ICP-MS ages on zircons from drilled gneiss and granites from northern KC are reported here. The northern KC is a granulitic basement composed of metasedimentary rocks, abundant mafic rocks and minor felsic rocks. This Charnockitic Complex is late Mesoarchean (2.9-2.85 Ga; Delhal et al. 1976), partly reactivated during the Neoarchean (Dibaya cycle; c. 2.65 Ga; Delhal et al. 1975). The southern KC comprises an unmetamorphosed Mesoarchean granitic complex of limited extent (ca. 3.0 Ga SHRIMP zircon ages) surrounded over large areas by migmatitic series and granitoids of Eburnean age (c. 2.0 to 2.1 Ga SHRIMP zircon ages). This Eburnean reactivation produced abundant N-S trending gabbro-anorthosites, dikes extending in SW Angola and WSW-ENE subsiding basins filled by siliciclastic sedimentary sequences. Subsequent Kibaran (1.4-1.2 Ga), Grenville (c. 1 Ga) and Pan-African (c. 0.6-0.55 Ga) events occurred to the east and propagated as brittle reactivations within the KC itself. Each of these reactivations poorly affected former lithologies, did not induce lithospheric thickening and any juvenile rocks, features typical of a metacratonic process, i.e. a partial reactivation of a craton belonging to the lower subducting plate during the collision process (Abdelsalam et al., 2002; Liégeois et al., 2003). Similar observations lead to a similar model in the northern Irumides belt in Zambia (De Waele et al., 2006), which is interpreted as the eastern prolongation of the southern KC through the Lufilian domes in Katanga (fig). In that case, the northern KC can be correlated with the Bangweulu craton. Such metacratonic reactivations are favourable for mineralization enrichments (Ennih and Liégeois, 2008).