

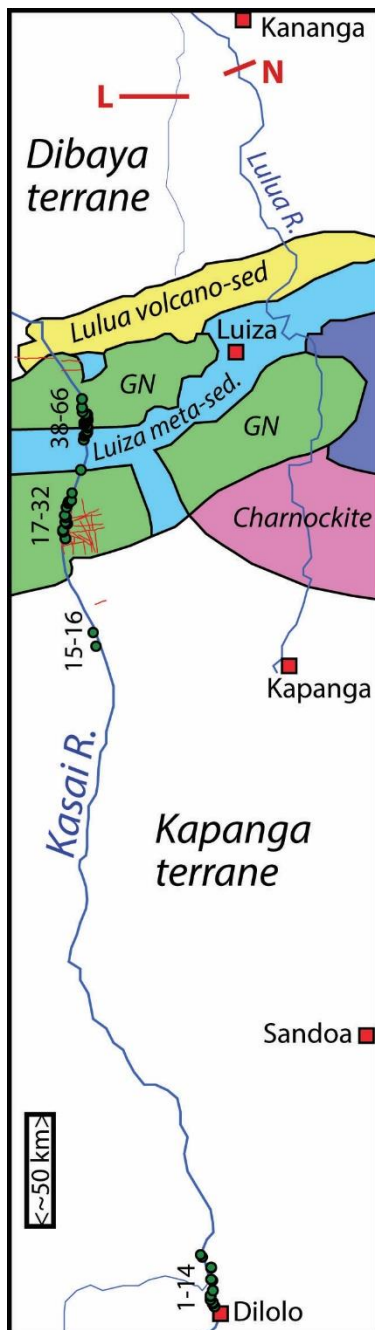
Mafic rocks along the Kasai River (DRC/Angola)

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Few details are known about the geology of the Kasai Craton. A joint field trip venture between Stellenbosch and Lubumbashi Universities in July-August 2015 resulted in five days along a 35 km long southern (10.4-7°S) river transect across the Kapanga gneiss-granite terrane and a 90 km long northern (7.2-8.4°S) Kasai River transect through the Lueta gabbro-norite ("GN" on map) complex, providing unique field observations and samples from the southern part of the craton.



Amongst mafic rock units, a first-order distinction is made from 60 hand specimens and 29 thin sections, between (1) postorogenic samples with obvious igneous textures, and (2) pre- to synorogenic samples that typically are more foliated (garnet) amphibolites. CIPW norm calculations on 56 bulk rock geochemical analyses identify 1 harzburgitic, 3 peridotitic, 4 anorthositic & 5 troctolitic cumulate samples, as well as 4 olivine gabbro, 5 olivine gabbro-norite and 34 gabbro-norite samples. The southernmost section, near Dilolo, hosts peridotites as well as moderately LILE/HFSE-enriched gabbro-norites with flat REE-patterns. One U-Pb age baddeleyite age for a presumed SW-NE trending gabbro-noritic dyke (KRD-06) will be presented. Farther north – along a section for which DeBeers/AngloAmerican kindly provided a dyke map (thin red lines on map) based on locally derived geophysical data – samples may be correlated with a greater confidence to an orthogonal pattern of N-S and E-W trending aeromagnetic anomalies. However, only 2 garnet amphibolites were sampled from one N-S trending anomaly, and these have flatter REE-patterns compared to other garnet amphibolites, exclusively found along that river transect. In addition, 1 peridotite, 3 troctolites and 3 anorthosites (one of which coincided with a WSW-ENE trending aeromagnetic anomaly) presumably represent cumulate layers within the southern part of the Lueta gabbro-norite complex (cf., Bingen et al., 1984, *Bull. Minéral.*, 107, 665-682). This complex appears to be separated by a metasedimentary zone, to the north of which fewer plg-cumulates were sampled. Instead, our northernmost river-transect exposes a geochemically distinct group of relatively fresh dolerites, which must represent a relatively young dyke swarm derived from a more enriched asthenosphere. Our transect also intersected amphibolites with more depleted signatures, some of which exhibit

especially low Th-U that also characterize our more plagioclase-rich samples.

Figure: Geological map showing coloured members of the Kasai - Lomami Supergroup, inside the Kasai Craton's granitoid terranes. GN = gabbro-noritic. L-N = Lutshatsha-Nkonko mafic-ultramafics.

