

Comparing the Cana Brava and Niquelândia complexes: large mafic-ultramafic intrusions in the lower crust and contamination processes.

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Mafic-ultramafic complexes offer a unique opportunity to study how intrusions of mantle-derived melts grow into the deep crust and interact with the country rocks. The Cana Brava and Niquelândia complexes are two mafic-ultramafic bodies which outcrop within the Brasília Belt (Goias, central Brazil) and that intruded the metavolcanic-metasedimentary sequences of Palmierópolis and Indaianópolis during a Neoproterozoic continental rifting. The two complexes are parts, together with the Barro Alto complex, of a ~350 km NNE-trend belt of layered bodies which were exhumed during the Gondwana formation.

New field, geochemical and isotopic data give new constraints on the model of growth of these complexes and the interactions between parent melts and the lower crust.

Field evidences suggest that the complexes grow via multiple-melt intrusions under hyper- to sub-solidus shear conditions. During the complex growth, the upper metavolcanic-metasedimentary sequence was delaminated and xenoliths were incorporated and deformed within the crystal mush. The increase of the $^{87}\text{Sr}/^{86}\text{Sr}_{(790)}$ along the complex stratigraphy, coupled with a decrease of the $\epsilon\text{Nd}_{(790)}$, provides evidences of strong crustal contamination by the embedded xenoliths. The enrichment in most incompatible elements (e.g. K, Ba and LREE) and hydrous phases (biotite and amphibole) in rocks containing more xenoliths supports also the crustal contamination. The almost linear trend of isotopic contamination suggests that this process involved all the magma column, similarly to AFC. However, the increase abundance of incompatible elements and H_2O contents toward xenoliths-rich bands provide for a local effect of contamination.

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