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U-Pb ISOTOPIC SYSTEMATICS OF THREE LAYERED COMPLEXES IN THE BRASÍLIA BELT, CENTRAL BRAZIL.

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The age and tectonic significance of three large layered complexes and associated volcano-sedimentary sequences have been a matter of debate for decades. These are the Barro Alto, Niquelândia and Canabrava complexes, and their corresponding volcano-sedimentary counterparts are the Juscelândia, Indaianópolis and Palmeirópolis sequences. The controversy is due mostly to: (i) parts of these complexes are strongly contaminated with older continental crust with consequent inheritance of older zircon grains, and (ii) they have been submitted to amphibolite to granulite facies metamorphism. Therefore, the use of different isotopic systematics has, over the years, produced contrasting age values for their crystallization and metamorphism. In previous studies they were initially considered to be Archaean complexes, then were later assigned a Paleoproterozoic age (Correia et al., 1997, SSAGI 1, Campos do Jordão, SP. Extended Abstracts), and more recently, they have been described as composite intrusions comprising a younger layered body dated at ca. 0.79 Ga and an older one, of Mesoproterozoic age (1.2 Ga) (Ferreira Filho et al., 2010, Precambr. Res.). In the study of Correia et al. (2012, Lithos), however, a single Neoproterozoic age of ca. 800 Ma was assigned for the Niquelândia Complex. In the present work, a detailed geochronological study of the Barro Alto and Canabrava intrusions were carried out using ID-TIMS, LA-ICPMS and SHRIMP analyses on zircon, monazite and titanite in order to better understand the behaviour of the U-Pb systematics in such complex geological situations. The complexity of the processes which originated the original magmas of these rocks is evident from the new isotopic data, showing a combination of strong Mesoproterozoic (and minor Paleoproterozoic) inheritance, Neoproterozoic igneous crystallization and high to medium grade metamorphism almost coeval with the igneous ages. Our study demonstrates that all 27 rock samples investigated crystallized during the Neoproterozoic between ca. 780–800 Ma, and some of them have abundant 1.25 Ga inherited zircon grains which has led to some geochronological misinterpretations in previous studies.