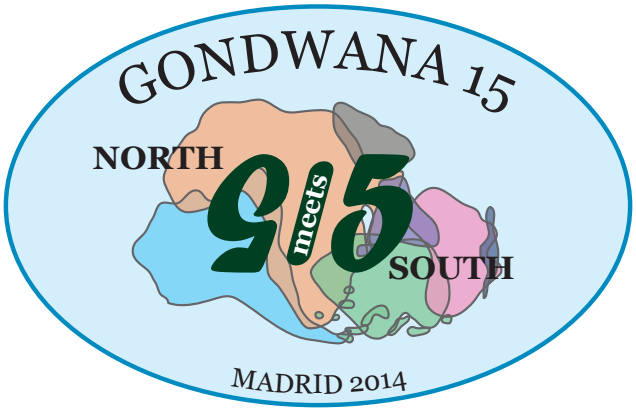
GONDWANA 15
North meets South



ABSTRACTS BOOK

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Geochronology of the southernmost part of the East African orogen, in western Mozambique, and its implications for the final amalgamation of Gondwana

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The southernmost part of the East African orogen (EAO) is adjacent to the northeastern corner of the Kalahari craton. In the cratonic area, 2.5–3.3 Ga TTG-type granitoids and gneisses are found, as well as the eastern termination of the Mutare-Odzi-Manica greenstone belt. This cratonic basement is overlain by the Umkondo volcanic-sedimentary sequence, cut by 1100 Ma dolerites. Detrital zircons of about 2000 Ma confirm the Mesoproterozoic age of this unit. Supracrustal rocks also include the Rushinga Group, with felsic metavolcanic rocks dated at 795 Ma (Hargrove et al., 2003), representing an early Neoproterozoic passive margin. To the east, entering the Mozambique Belt of the EAO, both sequences exhibit progressive regional metamorphism from greenschist to granulite facies.

The high-grade paragneisses, granulites and migmatites, characteristic of the Mozambique Belt, occur in close association with the pre-existing Mesoproterozoic granitic rocks of the Barue complex, dated at ca. 1050–1100 Ma. Metamorphic P-T conditions were estimated as 4–6 kb and 700–800°C. Detrital zircons of some paragneisses yielded Neoproterozoic maximum ages of deposition of 700–900 Ma. Moreover, many metamorphic overgrowths on zircon grains yielded Cambrian ages close to 500 Ma (Chaúque, 2012). Finally, K-Ar cooling ages below 500 Ma are widespread over the entire belt, and also across the eastern border of the Kalahari craton.

The metamorphic rocks are arranged into the Chimoio, Macossa and Mungari tectonic units, formed in a series of continental collisions and exhumed at different crustal levels. They are juxtaposed to the Kalahari craton by means of westward-thrust frontal nappes, representing the principal suture of the Mozambique Belt in the Manica region. The *Macossa-Chimoio Nappe,* in the south, is separated from a northern *Mungari Nappe* by a thrust zone with NW-trending tectonic transport. This could correspond to the prolongation of a long-lived tectonic boundary, the Lurio Belt of northeastern Mozambique, which formed during Neoproterozoic to Ediacaran continental collision between 600 and 550 Ma. It was later reactivated in the Cambrian, around 510 Ma, as a large and complex mega-shear zone (Ueda et al., 2012). The Pan-African tectonic units within the Lurio Belt, and especially those of the Nampula block (Macey et al., 2011), include Mesoproterozoic (ca. 1100 Ma) orthogneisses whose geological history closely corresponds to that of the studied region.

In conclusion, as indicated by Chaúque (2012), the final suturing of the Mozambique Belt at its southernmost part is Cambrian in age. This shows that the amalgamation of Gondwana was diachronous along the EAO, starting earlier in the north and finishing later in the south, coeval with the Kuunga orogeny of Australia and Antarctica.

Chaúque, F., 2012. PhD Thesis, Instituto de Geociências, USP, São Paulo, Brazil.
Hargrove et al., 2003. Precambrian Research 123, 159-186.
Macey et al., 2010. Precambrian Research 182, 124-148.
Ueda et al., 2012. Precambrian Research 196-197, 275-294.