



Tectonothermal history of the Kaourera Arc, northern Zimbabwe: implications for the tectonic evolution of the Irumide and Zambezi Belts of south central Africa

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Received 28 August 2002; accepted 31 October 2003. Available online 16 January 2004.

Abstract

The Chewore Inliers are a group of isolated metamorphosed basement inliers located in the Zambezi Rift Valley of northern Zimbabwe close to the triple junction between the Irumide, Zambezi and Mozambique belts of south central Africa. Four contrasting litho-tectonic terranes have been recognised in these basement inliers, namely the Granulite, Quartzite, Zambezi and Ophiolite Terranes, with a protracted geological history ranging from the Mesoproterozoic to Neoproterozoic. The southernmost terrane comprises a suite of bodies that define an ophiolite (the Chewore Ophiolite, previously dated at 1393 ± 22 Ma) and an island arc (the Kaourera Arc). We provide a detailed account of the lithological variation and structural evolution of the Kaourera Arc. We also present new U---Pb zircon ages of 1082 ± 7 Ma and 517 ± 5 Ma from a meta-dacite, which we interpret to record arc magmatism and subsequent metamorphism. The crystallisation age of the Kaourera Arc is thus ~300 million years younger than the adjacent Chewore ophiolite, but is similar to U---Pb 1080 Ma ages from orthogneisses in the Granulite, Quartzite and Zambezi terranes. The geochemistry of these orthogneisses indicate that they may have formed in a continental margin arc, active in a similar time frame to the Kaourera Arc. Neoproterozoic tectonometamorphism, dated here at ~517 Ma, was dominated by crustal-thickening and northeast (present-day coordinates) tectonic transport. This tectonothermal episode most likely resulted from the final collision between the Congo and Kalahari cratons, with the cryptic suture and orogenic root zone located between the Chewore Inliers and the Zimbabwe Craton, underneath the Karoo deposits of the Zambezi rift basin.

Author Keywords: Author Keywords: Chewore Inliers; Irumide Belt; Kaourera Arc; Mesoproterozoic; Neoproterozoic; Zambezi Belt

