Reconnaissance SHRIMP U–Pb zircon geochronology of the Tanzania Craton: Evidence for Neoarchean granitoid–greenstone belts in the Central Tanzania Region and the Southern East African Orogen

Author(s)
J.M. Kabete, N.J. McNaughton, D.I. Groves, A.H. Mruma

Abstract
Reconnaissance U–Pb sensitive high-resolution ion microprobe (SHRIMP) zircon dating of gneisses, granitoids and greenstones from well-documented study areas within the Tanzania Craton indicates that: (1) ~2815–2691 Ma greenschist-amphibolite facies greenstones and associated granitoids are confined within extensive >3600 Ma granitoid–gneisses in the Central Tanzania Region; (2) greenschist-amphibolite facies greenstone rocks from the Singida-Mayamaya Terrane in the south-eastern Lake Nyanza Superterrane, Lake Victoria Region are older than 2681 Ma; (3) greenschist to lower-granulite facies granitoid–greenstone belts from the Kilindi-Handeni Superterrane, within the largely Neoproterozoic Southern East African Orogen are older than 2670 Ma; and (4) the granitoid–greenstone belts within the Dodoma Basement Superterrane, Central Tanzania Region and Kilindi-Handeni Superterrane, Southern East African Orogen are broadly coeval with ~2823–2671 Ma granitoid–greenstone belts in the Lake Nyanza Superterrane, in the Lake Victoria Region.
The basement to juvenile greenstone rocks in the Central Tanzania Region includes E-W-trending orthogneisses. These comprise largely >3140 Ma diorite to granodiorite gneisses with rafts and/or tectonic enclaves of supracrustal rocks, including ~3600 Ma fuchsitic sericite quartzite, which forms part of the ~25 km by 5 km Simba-Nguru Hills in the Undewa-Ilangali Terrane. This quartzite contains detrital 4013–3600 Ma zircons that define ancestral cycles of protracted magmatism in their as yet undetected source terranes.

In addition to the ~2815–2670 Ma granitoids and greenstones in the >3000 Ma gneisses and granitoids within the widely accepted marginal zone of the Tanzania Craton, the Lake Nyanza Superterrane extends east into the Kilindi-Handeni Superterrane, in the largely Neoproterozoic Southern East African Orogen. In this Superterrane, Neoarchean igneous and sedimentary rocks in the Mkurumu-Magamba Terrane record ~620–603 Ma amphibolite-granulite facies metamorphism, ~585–575 Ma partial-melting, and emplacement of enderbitic-charnockitic granitoids. They also record a short-lived, but significant, 570–560 Ma period of exhumation and emplacement of high-grade metamorphic rocks on to basement rocks of the proto-Archean craton within the Central Tectonic Zone in the Southern East African Orogen.

Keywords

Lake Nyanza Superterrane;
Central Tanzania Region;
Mazoka Greenstone Belt;
Southern East African Orogen;
Mkurumu-Magamba Terrane;
Magambazi