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Testing Azania: Using Detrital Zircon U-Pb Ages and Hf Isotopic Record to Constrain Tectonic Affinities Within the East African Orogen

Collins, A. S.[1], Archibald, D.[1], Brick, R.[1], De Waele, B.[2], Plavsa, D.[1,3], Patranabis-Deb, S.[4], Foden J.[1], Payne, J. L.[5], Clark, C.[3], Glorie, S.[1], Blades, M. L.[1]

[1]Centre for Tectonics, Resources and Exploration (TRaX), Department of Earth Sciences, The University of Adelaide, Adelaide, SA 5005, Australia. alan.collins@adelaide.edu.au
[2]SRK Consulting, Level 1 10 Richardson Street West Perth, Western Australia 6005 Australia PO Box 943 West Perth, WA 6872 Australia
[3]Department of Applied Geology, West Australian School of Mines, Curtin University, Perth, WA, Australia.
[4]Indian Statistical Institute, Kolkata, WB, India.
[5]Centre for Tectonics, Resources and Exploration (TRaX), School of Built and Natural Environments, University of South Australia, Australia.

Azania was proposed as a Neoproterozoic continent that consisted of rocks now lying in southern India, central Madagascar, East Africa and Arabia. The continent was hypothesised to have originated against eastern Africa in the earlier Proterozoic, but to have rifted off it by Tonian times when it was separated from East Africa by oceanic crust. The original model had this continent then reassembling with the Congo-Tanzania-Bangweulu Block at ca. 640 Ma and then Neoproterozoic India colliding with the resulting amalgam at ca. 550 Ma. A variation of this model was later published where Azania collided first with India and then later with African Gondwana. What these models share is an 'African' origin for central Madagascar and its corollaries and the presence of a cryptic suture that separates Azanian rocks from those of Neoproterozoic India in eastern Madagascar; a feature named the Betsimisaraka Suture.

Other workers developed competing models where Azania did not exist as a separate continent, but formed in the Neoarchaean to Palaeoproterozoic and accreted immediately after formation to the Dharwar Craton of India to form a 'Greater Dharwar' continent that remained an accretionary margin through much of the Proterozoic to eventually collide with African Gondwana in the Ediacaran along one ocean suture. Other models have proposed hybrids where Azanian Madagascar is part of Greater Dharwar, but additional enigmatic microcontinents occur in southern Madagascar/southernmost India, or that the whole of Madagascar forms a number of discrete small Neoproterozoic microcontinents that progressively accreted to India.

The original arguments for the existence of Azania are based on the origin and tectonic affinity of the voluminous Palaeoproterozoic detritus found within pre-orogenic metasedimentary rocks in Madagascar (and subsequently southern India). These studies were initially based on U-Pb SIMS and LAICPMS zircon ages alone and showed that regions assigned to 'Azania' had detritus with ages consistent with rocks known from eastern Africa but absent in southwestern India. Subsequently, other workers proposed that these apparently diagnostic sand grains may have been transported across much

of India from east and northeast Indian sources as there are basins in India of the right age (the so-called Purana Basins), but at that time with no information of the age of the detritus filling the basins. New U-Pb and Hf isotopic data suitable for this fingerprint-like analysis has recently been published from many of the Purana basins of India and from 'Azanian' terranes in southern India and Madagascar, but until now comparable Hf isotopic data has been missing from eastern Africa. Here we present the first results from an on-going project to collect these data and use these multi-proxy isotopic fingerprints to test the 'Out-of-Africa' model for Azania.