

Subducting the Mozambique Ocean: Cryogenian arc formation throughout the east African Orogen

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The Mozambique Ocean separated Neoproterozoic India from the continents that now make up Africa in the Neoproterozoic transition from the supercontinent of Rodinia to that of Gondwana. New U-Pb geochron data, coupled with both Hf and O isotopic data from zircons from both Cryogenian igneous rocks and Cryogenian detritus from metasedimentary rocks, allows the ancient tectonic geography of this hemisphere-scale ocean to begin to be reconstructed, allowing a full-plate geographic evolution of the region to be developed.

New data from southern India, Saudi Arabia, Ethiopia and Madagascar forms the core of this dataset. These data illustrate periods of subduction initiation and the timing and evolution of the subduction systems around the Mozambique Ocean. When integrated with palaeomagnetic, sedimentary, metamorphic and thermochronological data, the palaeogeography of the region is reconstructed. A key to interpreting the closure history of this ocean has been the identification of a pre-Neoproterozoic continent— independent of both Neoproterozoic India and the Congo-Tanzania-Bangweulu Block of central Africa. This continent, known as Azania, appears to have rifted off the CTB in the Tonian and lay in a Japan-like position, later to reamalgamate with Africa in the latest Cryogenian/Ediacaran, whilst the Mozambique Ocean remained open to the east of Azania until the latest Ediacaran-Cambrian.