



Mesoproterozoic geology of the Nampula Block, northern Mozambique: Tracing fragments of Mesoproterozoic crust in the heart of Gondwana

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ABSTRACT

The Nampula Block covers over 100,000 km², making it the largest Mesoproterozoic crustal segment in northern Mozambique and an important component of the Neoproterozoic to Cambrian (Pan-African) East African Orogen. It is bounded in the north by the WSW–ENE trending Lúrio Belt. The oldest rocks (Mocuba Suite) are a polydeformed sequence of upper amphibolite-grade layered grey gneisses and migmatites associated with intrusive trondhjemite-tonalite-granodiorite and granitic orthogneisses. A banded gneiss, interpreted as a meta-volcanic rock, yielded a U–Pb SIMS zircon date of 1127 ± 9 Ma. Metamorphic rims, dated at ca. 1090 Ma, probably grew during a later magmatic phase, represented by the tonalitic Rapale Gneiss, two samples of which were dated at 1095 ± 19 and 1091 ± 14 Ma, respectively. The earliest (D₁) deformation that took place at approximately this time, was associated with high grade metamorphism and migmatization of the Mocuba Suite. The geochemistry of these rocks suggests that they were generated in a juvenile, island-arc setting. The Mocuba Suite is interlayered with extensive belts of meta-pelitic/psammitic, calc-silicate and felsic to mafic meta-volcanic paragneisses termed the Molócuè Group. U–Pb data from detrital zircons from a calc-silicate paragneiss gave a bimodal age distribution at ca. 1100 and 1800 Ma, showing derivation from rocks of the same age as the Mocuba Suite and a Palaeoproterozoic source region. The age of the Molócuè Group has been directly determined by dates of 1092 ± 13 and 1090 ± 22 Ma, obtained from two samples of the leucocratic Mamala Gneiss (meta-felsic volcanics?), one of its major constituent components. The final phase of Mesoproterozoic activity is represented by voluminous plutons and sheet-like bodies of foliated megacrystic granite, augen gneiss and granitic orthogneiss of the Culicui Suite, which have A-type granite geochemical characteristics and are interpreted to have been generated in a late tectonic, extensional setting. Three samples from the suite gave identical ages of ca. 1075 Ma. The Nampula Block was extensively re-worked during the major (D₂: Pan-African) collision orogen in Late Neoproterozoic to Cambrian times, when the major regional fabrics were imposed upon the Mesoproterozoic rocks under amphibolite-facies metamorphic conditions. In the dated samples, this orogenic event is represented by metamorphic zircon

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