

THE TECTONIC EVOLUTION OF MADAGASCAR AND YEMEN IN THE NEOPROTEROZOIC AND THEIR ROLE IN THE ACCRETION OF EAST GONDWANA

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Madagascar and Yemen lie approximately along strike close to the eastern margin East Gondwana. In Madagascar a N-S suture zone (paragneisses containing lenses of mafic-ultramafic rocks, fuchsite quartzites, graphite schists) separates an Archaean craton (older than 2.6 Ga) on the east from the high-grade Antananarivo block of the Pan-African orogen to the west (zircon ages 900-560 Ma). A shelf sequence overlies gneisses of the Antananarivo block on a major extensional detachment. The shelf is overlain tectonically by a thrust sheet of Archaean granulites and gneisses. Within the orogen in central Madagascar tonalitic granulites and gabbros (780-800 Ma zircon ages) resulted from subduction activity in a continental margin (Handke et al., 1999; and our data). The suture zone and age of collision are undated. Extensional collapse occurred at 640 Ma with emplacement of abundant sheets of syntectonic alkaline granite (Nédélec et al., 1995). High-grade metamorphism at 550-565 Ma is interpreted to reflect final continental collision and amalgamation of East Gondwana. The 680-640 Ma Nabitah suture of Arabia extends into NW Yemen, east of which are two Early Precambrian gneiss terranes (1.7-2.3 Ga Sm-Nd model age and 2.55-2.95 Ga U-Pb zircon) separated by a Pan-African island arc (715 Ma, $^{40}\text{Ar}/^{36}\text{Ar}$, minimum age). A widespread 760 Ma event may relate to assembly of the gneiss terranes. The Nabitah suture probably extends southwards through the Adola-Moyale area in Ethiopia to southern Somalia and continues as the main suture zone in Madagascar, from where it extends into southern India within the Palghat-Cauvery shear zone.