

Lithospheric thickening during protracted Ediacaran supercontinent assembly was dissipated in various ways along the "Pan-African" East African-Antarctic Orogen. In NE Mozambique, late tectonic extension and plutonism south of the Lúrio Belt has been modelled in terms of lithosphere delamination, although rigorous testing of the hypothesis by structural analysis has not yet been undertaken. This study presents the first analyses of late tectonic structures in both the Mesoproterozoic basement and the Cambrian cover sequences in the Nampula Complex, NE Mozambique, supported by, and integrated with, new geochronological data. Both late extensional and compressional fabrics overprint the main Pan-African collisional structures to a variable degree in identified structural domains. The long-lived northern boundary of the Nampula Complex, the Lúrio Belt high-strain zone, initiated in the Ediacaran, was reactivated during these later phases, with boundary-parallel shortening. U-Pb SIMS ages from selected latest-tectonic units in the Nampula Complex and the Lúrio Belt give consistent ages between 518 ± 2 and 514 ± 5 Ma. They are coeval with migmatization and granitoid plutonism in the Nampula Complex. U-Pb titanite (471 ± 9 Ma) and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite (431 ± 3 Ma) data suggest subsequent slow cooling rates in the Nampula Complex, consistent with basal heating by asthenosphere uprise following lithosphere delamination. Consequently, we believe the new data suggest that the observed intense late polyphase deformation has preferentially occurred where the delaminated lithosphere was doubly weakened by loss of the mantle root and the resulting long-lived elevated temperature regime.