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CAMBRIAN POST-TECTONIC GRANITOID MAGMATISM IN NORTHERN MADAGASCAR

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The island of Madagascar lies in the centre of the Late Neoproterozoic–Early Palaeozoic East African–Antarctic Orogen (EAAO). The basement geology of Madagascar comprises a number of Neoproterozoic and Archaean terranes that collided as the EAAO was formed. Voluminous granitoid plutons that post-date the collision intrude most of the Madagascan basement terranes, and we present new field, petrographical, geochemical and geochronological data for these granitoids, which are termed the Maevarano Suite.

The Maevarano Suite plutons are chiefly granitic, but some charnockitic, syenitic and more mafic types are also found. The plutons are variable both in size and shape, typically with irregular, sheeted margins and abundant enclaves of the country rocks. They are unfoliated to weakly foliated and appear to post-date the main collisional events; however, they are very abundant in some basement terranes yet almost absent in others, suggesting some form of crustal control on their emplacement. Geochemically, they are mildly alkaline and many, but not all, can be classified as A-type granitoids.

Four late-tectonic granitoids and charnockites of the Maevarano Suite were dated in this study and gave U-Pb zircon SHRIMP dates between 537 ± 5 and 522 ± 6 Ma. Previously published dates for late-tectonic granitoids in both North and South Madagascar fall within this range, as do dates for metamorphism. As described by Thomas et al. (this conference), the late tectonic history of much of the southern part of the EAAO is characterized by the emplacement of similar, voluminous, high-temperature A2-type granitoids and charnockites. The magmatism in northern Madagascar may be broadly coeval with early mafic magmatism in East Antarctica, but is somewhat older than the granitic magmatism in both

Antarctica and Mozambique, indicating a possible magmatic progression from north to south along the orogen.

The presence of broadly coeval post-collisional magmatism along the length of the southern part of the EAAO indicates the possibility of an orogen-scale tectonomagmatic process such as lithospheric delamination. However, smaller-scale regional controls are indicated both by the variations in abundance of post-collisional plutons in different basement terranes, and by local differences in age and chemistry of the plutonic rocks. The area is ripe for further study to investigate the influence of different crustal terranes on the emplacement of post-collisional plutons.

Keyword: Madagascar, Post-tectonic granitoids, East African – Antarctic Orogen