

STRUCTURAL EVOLUTION OF DRONNING MAUD LAND (EAST ANTARCTICA) AND SIGNIFICANCE FOR LINKS WITH THE EAST AFRICAN AND KUUNGA OROGENS

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In Dronning Maud Land (DML), East Antarctica, a ca. 620-500 Ma mobile belt dissects the continent. This ca. 1000 km wide orogen has been linked to the East African Orogen on the one hand and relationships to the Kuunga orogen were suggested on the other. The mobile belt reworks mainly Grenville-age crust. The foreland/hinterland boundaries are clearly defined in the Heimfrontjella (western DML) and in eastern DML (Sör Rondane), both as major dextral transpression zones. The mobile belt is characterized by medium to high-grade metamorphism between ca. 620 – 500 Ma. No suture zone has so far been unequivocally indentified, although Late Neoproterozoic ophiolites are described from the Shackleton Range. New geochronological data from central DML point to remnants of Neoproterozoic metasedimentary rocks. DML is now covered by a major aerogeophysical survey covering an area of 1.2 million km² and 100,000 km of survey lines. These new data show a major NE-trending linear magnetic anomaly in the middle of the mobile belt and the question is whether this anomaly could represent a suture zone. The anomaly projects into the southern Kurze Mts. in central DML, where a major shear zones was mapped. When rotating DML back into its Gondwana position this anomaly appears collinear with the N-S trend of the East African Orogen. The mobile belt can be correlated with very similar rocks in northern Mozambique. In northern Mozambique, the mobile belt is obliquely dissected by the Lurio Belt. South of this lineament, the orogen is characterized by large volumes of high-T A2-type granitoids, dated between 530-490 Ma. Granitoid emplacement is associated with polyphase extensional deformation. The granitoids that include charnockites have mantle signatures and most probably resulted from delamination of a thickened root. We interpret the Lurio Belt as an accommodation zone between two thermo-mechanically very different parts of the same orogen, separating an area to the south in which the orogeny underwent delamination of the orogenic root, and an area to the north (the East African Orogen), where the orogenic keel is possibly still present. In general, we see little support for relating the structural evolution of Dronning Maud Land to an E-W trending Kuunga Orogen. The lateral variation in a combined East African/Antarctic Orogen can be explained by partial delamination of the orogen root south of the Lurio belt, resulting in strongly contrasting rheologies on either side.