

Two stages of granitoid formation in HU Sverdrupfjella, Western Dronning Maud Land

Burger EP¹, Grantham GH², le Roux P³, Roberts RJ¹

1 Department of Geology, University of Pretoria, Pretoria, South Africa.

2 Department of Geology, University of Johannesburg, Johannesburg, South Africa.

3 Department of Geological Sciences, University of Cape Town, Cape Town, South Africa.

emuburger@gmail.com

There are several different granitoids in the HU Sverdrupfjella; in Western Dronning Maud Land, Antarctica (between 72° S, 73° S and 00° 35' W, 01° 45' E), with a large proportion consisting of relatively thin (~5cm to <10m thick) granitoid sheets. The granitoid sheets in question occur predominantly as two types; the Dalmatian Granites (as defined by Grantham *et al.* 1991) and an older suite of pegmatite (denoted P2 and P1 in this study, respectively). These two represent two different granitisation events, implying an extended period of orogenesis in the area. The first difference noted in the field is that P1 sheets are crosscut by P2 sheets, and the P1s are therefore older. The two suites also differ in appearance; P1 sheets are white (due to a prevalence of perthite) and are very course grained, whereas P2 sheets are pink and have a variable grain size. The other difference noted in the field is that P1s are steeply dipping (on average) and show some ductile deformation; whereas the average dip of P2 sheets is relatively shallow.

The geochemical differences are that P1's have a more variable A/CNK while P2's have more variable maficity. P1s have a higher average ¹⁴³Nd/¹⁴⁴Nd ratio and give a younger Sm-Nd age (550-500 Ma) than P2s, in contrast to field relationships. Finally P1s tend to have significantly lower concentrations of REEs than P2s. The differences presented show that the two types of granitoid sheets are distinct and thus magma generation took place under different conditions, as evident from different degrees of partial melting indicated by the differences in REE content. Different sources are required to produce the different mineralogy and isotope ratios. Finally the emplacement environments were different (likely different stages of orogeny) as evident from the difference in orientation and appearance.

1. Grantham, G. H., Moyes, A. B. and Hunter, D. R. (1991). The age, petrogenesis and emplacement of the Dalmatian Granite, H.U. Sverdrupfjella, Dronning Muad Land, Antarctica. *Antarctic Science*. 3:197-204