
Primary composite-texture granite of the Main Range Province, Peninsular Malaysia — origin and implications

K.R. CHAKRABORTY
Department of Geology
University of Malaya, 59100 Kuala Lumpur

Granitoids of the Main Range Province of Peninsular Malaysia display a variety of textures. Most of the textural variations occur due to an interplay of various factors that include (i) fluctuation in physical conditions, (ii) fluid relocation, (iii) deformation of crystal-melt system, (iv) subsolidus recrystallization and (v) post-crystallization deformation.

This note is addressed to a particular textural variant termed here as "primary composite texture" (PCT). Rocks with this texture appear to be an intimate mixture of coarser granite and microgranite in varying proportions where coarser granite seems to have crystallized earlier and subsequently infiltrated by the microgranite. PCT-granite should not be confused with recrystallized protoclastic/cataclastic granite.

The origin of PCT is not very clear and amenable to alternative interpretations. It is possible that the host coarse granite was invaded by pressure-quenched residual liquid. But this mode of origin of PCT cannot be reconciled easily with several field, petrographic and chemical observations such as (i) occurrence of microcline in the microgranitic portions or PCT, and (ii) presence of aplitic dykes, representing residual liquid, with sharp contacts in PCT-granite and other granites. It is proposed that influx of water, possibly of meteoric origin, into relatively dry hot granite caused localised partial fusion and remobilization of the earlier granite. Crystallization of this remobilized mass gave rise to PCT-granite. This is consistent with the features mentioned earlier.

The proposed remelting of granite does not imply a second thermal event. This is because no reheating is necessary as the relatively dry solidus would have higher temperature than the wet solidus (or even higher than the wet liquidus depending on the "dryness" of the earlier granite). The subsolvus mineralogy of the microgranitic portion of the PCT-granite suggests a minimum pressure of crystallization of about 2.5 kb P_{H_2O} . In presence of the other volatiles this limit would be still lower as the wet solidus would shift towards lower temperature.