

Characterisation of enclaves at Mount Kinabalu as a geological heritage

[Pencirian enclave yang terdapat di Gunung Kinabalu sebagai warisan geologi]

Abstract

Mount Kinabalu is the highest mountain in Malaysia. The uniqueness of the Mount Kinabalu's rocks is the existence of varieties of enclaves with scientific and esthetic features of geological heritage value for Malaysia. Enclave refers to any country rock or mineral that was engulfed by a genetically unrelated host rock. In Mount Kinabalu, hornblende granite contains enclaves of metasedimentary rocks from Trusmadi Formation, whereas porphyritic granite contains the same Trusmadi Formation's rock and serpentinite. In addition, andesitic dykes contain xenoliths of hornblende granite, while aplite dykes contain xenoliths of Trusmadi Formation and the porphyritic granite. The unique feature of the hornblende granite is the existence of both types of enclaves, viz. xenolith and schlieren. The outcrop, found near the top of the Mount Kinabalu shows that the rotation of the enclave has produced schlieren and finally the xenolith. This feature shows the movement of magma and how the country rock was carried by magma and became xenoliths. For enclave type xenolith in the porphyritic granite, obvious lineation of alkali feldspar also can be found adjacent to the contact with the xenolith, indicating semi-molten magma has been deflected by the xenolith. Xenoliths which occur close to intrusion contact are also larger in size and more angular, indicating cooler magma and limited melting of the xenoliths. In terms of relative age, the relationship between rock types and enclaves suggests that the youngest rocks are aplite dyke and andesitic dyke, followed by porphyritic granite, serpentinite, hornblende granite and the metasedimentary rocks of the Trusmadi Formation. Apart from scientific and esthetic values, the enclaves in Mount Kinabalu also possess recreational value and its existence at the height of 5-8 km from the Timpohon gate, facilitates its potential as a geological heritage.