

Origin and tectonic significance of the metamorphic rocks associated with the Darvel Bay Ophiolite, Sabah, Malaysia

Abstract

Banded hornblende gneiss, foliated amphibolite, hornblende, chlorite and siliceous schist form lenses in an 8 km wide belt within the Darvel Bay Ophiolite Complex. Foliation in the belt is generally steep to vertical, striking parallel to the trend of the belt and lineations are sub-horizontal. Mineral and geochemical studies show that the metamorphic rocks represent banded and isotropic gabbros, plagiogranites, doleritic and basaltic dykes, basaltic volcanics and cherts formed at a spreading ridge in a supra-subduction zone environment, which were deformed at high temperatures but low pressures along a transform fault. Incorporation of supracrustal cherts indicates that the transform extended for hundreds of kilometres between spreading centres. Garnet pyroxenites and amphibolites found as clasts in Miocene volcanic agglomerates formed at high pressures, and temperatures are interpreted as derived from a metamorphic sole underlying the complex, formed during subduction of ocean crust and the emplacement of the ophiolite complex on Sabah.