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アンダマンオフィオライトの形成場
Paleogeodynamic setting of the Andaman ophiolite

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Dismembered bodies of Cretaceous ophiolite slices occur in the eastern part of the Andaman Island and continues further south in the Rutland Island. The mantle tectonites of this ophiolite suite are represented by a broad spectrum of variably depleted peridotitic rocks that hosts impersistently developed podiform chromite and records a systematic variation from north to south. The restitic peridotite in middle- and north-Andaman mostly belongs to less-depleted, lherzolite dominated mantle that occasionally grades to clinopyroxene bearing harzburgite with development of thin layers and lenses of olivine-rich dunitic pods showing features of melt-rock interaction and irregular margins with the harzburgite. On the contrary, the mantle sequence in Rutland Island is characterized by depleted harzburgite to clinopyroxene-bearing harzburgite.

The chemistry of the disseminated residual chrome-spinels suggests that the mantle peridotites in the Rutland Island towards south are akin to arc peridotites of suprasubduction zone whereas those of north-Andaman are akin to less depleted peridotites. The massive chromitites of Andaman Island show bimodal distribution of Cr2O3 content. The high-Cr pods (54-60 wt.% Cr2O3) are documented from north-Andaman as well as in Rutland Island whereas the low-Cr pods (39-42 wt.% Cr2O3) are restricted only to north-Andaman. The coexistence of both the types of chromitites, high- and low-Cr in the same area from north-Andaman possibly reflects the spatial and/or temporal variations of separate melt intrusions produced through specific melting stages and emplaced in different sub-arc mantle domains during the opening of a back-arc basin in a suprasubduction zone environment. In the late Mesozoic, therefore, a replica of the present day geodynamic features with an arc-back arc setting existed along the eastern periphery of the Indian subcontinent and we infer that an arc setting of that paleogeodynamic configuration occurred towards south which might have gradually shifted away from the trench towards north and gave rise the back arc setting. This behavioural change in subduction kinematics may have a direct link with the rotation of the plates in response to oblique subduction in the Andaman region. Therefore, this directional change in chrome-spinel composition may reflect the spatial and/or temporal variations linked to the melting history where the same sliver of oceanic mantle underwent different styles of melting in different tectonic settings at different points in time.

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