Subduction-related lavas sampled from the Hunter Ridge: Melt inclusion insights into subduction and spreading ridge interaction

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The Hunter Ridge is located between Hunter Island and Fiji and intersects the junction between the Vanuatu arc and the southward propagating spreading centre of the North Fiji Basin (NFB). The 1994 Profeti cruise of R.V. *Alis* was one of the first to venture to the southernmost part of the NFB system. It was during this cruise that two samples with primitive mineralogy were dredged from the southern termination of the Hunter Ridge. More recently, during the SS10/2004 cruise on the R.V. "Southern Surveyor" this area has been revisited. Bathymetric surveys indicate that the first sample (D2-1) was dredged from a rifted wall of the Hunter Ridge and the second sample (D3-1) was dredged from a nearby active submarine volcano.

D2-1, a picrite, and D3-1, a low-Ti tholeiitic basalt, are rich in forsteritic olivine phenocrysts. The entire range (Fo_{83-93}) of olivine phenocrysts carries many quenched and/or glassy melt inclusions trapped during crystallisation. Geochemical compositions of these melt inclusions illustrate that both host samples are influenced by the complex interactions taking place between the North Fiji spreading centre and the zone of subduction of the Australian plate along the Vanuatu arc. Melt inclusions from both samples have typical subduction-related compositions. General compositional characteristics mirror those of the whole rocks and include high LILE/LREE, LILE/Th and LILE/HFSE ratios relative to N-MORB. Accompanying these traits are low HFSE/LREE ratios.

Despite these similarities there are significant variations between D2-1 and D3-1 melt inclusions. Inclusions trapped in the low-Ti tholeiite are more enriched in the highly incompatible elements than those sampled from the picrite. These distinctions imply varying contributions of subduction-related components or local heterogeneities within the mantle wedge. The results presented here are part of a larger study aiming to address the origin of mantle sources, determine temperature and pressure conditions and identify volatile budgets associated with primary magma generation.