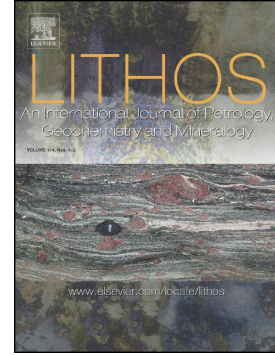


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**Tectonic control on the genesis of magmas in the New Hebrides arc (Vanuatu)**

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**ABSTRACT**

We present here new bathymetric, petrological and geochemical whole rock, glass and mineral data from the submarine Epi volcano in the New Hebrides (Vanuatu) island arc. The structure has previously been interpreted to be part of a larger caldera structure but new bathymetric data reveal that the volcanic cones are aligned along shear zones controlled by the local tectonic stress field parallel to the recent direction of subduction. We aim to test if there is an interaction between local tectonics and magmatism and to what extent the compositions of island arc volcanoes may be influenced by their tectonic setting. Primitive submarine Epi lavas and those from the neighbouring Lopevi and Ambrym islands originate from a depleted mantle wedge modified by addition of subduction zone components. Incompatible element ratios sensitive to fluid input (e.g., Th/Nb, Ce/Yb) in the lavas are positively correlated with those more sensitive to mantle wedge depletion (e.g., Nb/Yb, Zr/Nb) amongst the arc volcanoes suggesting that fluids or melts from the subducting sediments have a stronger impact on the more depleted compositions of the mantle wedge. The whole rock, glass and mineral major and trace element compositions and the occurrence of exclusively normally zoned clinopyroxene and plagioclase crystals combined with the

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