

# **Pelagic sediment incorporation in the Upper Cretaceous-Eocene island arc magmas of the Macuchi Unit (Western Cordillera, Ecuador)**

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The Macuchi Unit, Western Cordillera of Ecuador, is an ocean island arc sequence of Upper Cretaceous-Eocene age. While its lower part is dominated by basaltic magmatism, in the upper levels appear intermediate and acid rocks. Isotope data indicate lead derivation from two reservoirs, MORB and a s.l. upper crustal source (high radiogenic end member). In the absence of continental crust underneath the Macuchi island arc, the high radiogenic end-member can be represented by pelagic sediments subducted with the oceanic plate. Significant correlations of the  $^{207}\text{Pb}/^{204}\text{Pb}$  ratios of the basalts with compatible elements (Ni, Cr) and incompatible element ratios (Y/La, Y/Nd, Y/Zr) suggest their derivation from a magma enriched in subduction-related radiogenic lead that has assimilated variable amounts of a depleted mantle with a MORB-type lead isotopic composition. Thus, the lead isotopic variability of the Macuchi basalts is not due to assimilation of different amounts of pelagic sediments into the primary magma but rather to various degrees of interaction of the radiogenic Pb-spiked primary magma(s) with MORB-type mantle. The acid terms of the upper levels of the sequence display isotopic signatures similar to the stratigraphically lower basic rocks suggesting their derivation from the latter by fractional crystallisation without further assimilation of depleted mantle. This process was possibly favoured by the initial formation of a thickened, hot and buoyant basaltic crust making up the island arc (lower part of the sequence), within or underneath which the rising magmas were trapped and resided for a time sufficiently long to allow their chemical fractionation.