The Late Cretaceous Duarte complex and Siete Cabezas Formation (Hispaniola): Caribbean oceanic plateau

V. Dupuis — UMR-6526 CNRS, Université de Nice-Sophia-Antipolis, Rue A.Einstein, 06560 Valbonne and Université de Lausanne, Institut de Minéralogie et Pétrographie, BFSH2, CH-1015 Lausanne, France

H. Lapierre — UPRES-A 5025 CNRS, Université J.Fourier, 15 rue Gignoux, 38031 Grenoble, France

M. Polvé — UMR 5563-CNRS, Université P. Sabatier, 38 rue des 36 Ponts, 31400 Toulouse, France

D. Bosch — UMR 5567 CNRS, Université Montpellier II, Place E. Bataillon, 34095 Montpellier, France

J. Hernandez — Université de Lausanne, Institut de Minéralogie et Pétrographie, BFSH2, CH-1015 Lausanne, France

B. Mercier de Lépinay — UMR-6526 CNRS, Université de Nice-Sophia-Antipolis, Rue A.Einstein, 06560 Valbonne, France

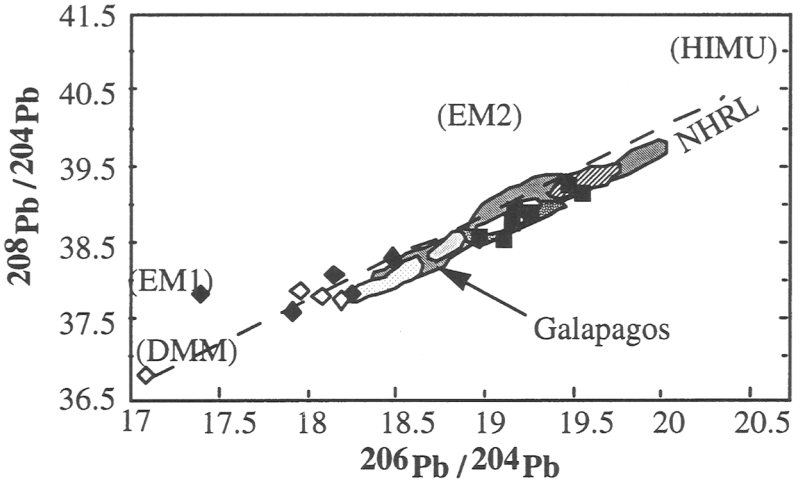
R. Maury — UMR 6538 CNRS, Université of Bretagne Occidentale, B.P. 809, 29285 Brest, France

M. Tardy — UPRES-A 5025 CNRS, Université of Savoie, B.P. 1104, 73011 Chambéry, France

The Core of the Central Cordillera in Dominican Republic is composed of oceanic crustal fragments which form three distinct assemblages: the Duarte complex, the Siete Cabezas Formation and the serpentinized ultramafic belt. Three units are recognized in the Duarte complex: (i) basalts interbedded with Late Jurassic ribbon cherts; (ii) picrites and ankaramites, (iii) amphibolites and gneissic amphibolites. The Siete Cabezas Formation is composed of pillow basalts and pillow breccias associated with Upper Cretaceous pelagic sediments. Finally, the serpentinites are intruded by deformed diabase dykes.

The Upper Jurassic pillow basalts and diabase dykes have major, trace element and lead isotopic compositions that are consistent with those of N-MORB. However, the basalts differ from typical N-MORB by lower εNd ratios which plot within the range of Ocean Island Basalts (OIB). The basalts and massive diabase of the Rio Verde complex are geochemically similar to the Upper Jurassic basalts and dykes. Thus, these rocks likely represent remnants of the Caribbean Jurassic oceanic crust formed from an oceanic ridge possibly close to a hotspot.

The Duarte picrites and olivine-free ankaramites are generally intensely deformed and metamorphosed to greenschist facies. When devoided of any deformation, these rocks show preserved igneous textures and mineralogy with augite-diopside sometimes rimmed by Mg-hastingsite. Ar-Ar ages on separate Mg-hastingsite gave 86 ± 1.4 Ma. This age is perfectly consistent with those of the basalts drilled from the Caribbean floor. The Duarte rocks are enriched in Nb-, Ta-, Ti-, and *LREE* like the Dumisseau tholeiites (Haïti) and the enriched basalts of Gorgona. Their $\varepsilon Nd_{(T = 86Ma)}$ ratios range from +5.7 to 8.3 and are similar to those of OIB. Their εSr ratios (−17.7 to −4.6) are less homogeneous due to the hydrothermal alteration. Finally, their Pb isotopic ratios [$(^{206}Pb/^{204}Pb)i$ = 18.966−19.537] reflect the contribution of an HIMU-like enriched component. These isotopic ratios show that the Duarte picrites and the ankaramites are isotopicallyt similar to mafic lavas from previously described occurences of the Caribbean plateau (Costa Rica, Haït, Curaçao and Gorgona). The amphibolites and gneissic amphibolites are composed of hornblende + plagioclase ± epidote ± quartz. Most of the rocks have flat



picrites and ankaramites of Duarte Complex

deformed diabases dykes of El Aguacate formation

Upper Jurassic basalts

komatiites of Gorgona (Dupré and Echeverria,1984)

k-tholeiites of Gorgona (Dupré and Echeverria,1984)

tholeiites of Gorgona (Dupré and Echeverria,1984)

basalts from Dumisseau Fm (Sen et al., 1988)

tholeiites of Costa Rica (Hauff et al., 1996)

lavas from Galapagos islands (White et al.,1993)

patterns. However, some few samples are *LREE*-enriched like the picrites and ankaramites. The $\varepsilon Nd_{(T = 86Ma)}$ ratios of these metamorphic rocks are homogeneous (+6.1 to +7.9) while their εSr ratios (-6.3 to +4.9) are higher than those of the picrites and ankaramites.

Relative to N-MORB, the Upper Cretaceous Siete Cabezas basalts are enriched in *LREE*, Ta, Nb, Th and Pb and are geochemically similar to the amphibolites. Their $\varepsilon Nd_{(T = 86Ma)}$ ratios are similar to those of the Duarte rocks.

The Upper Cretaceous metamorphosed or not basalts of the Duarte Complex and Siete Cabezas Fm. represent the remnants of the Caribbean oceanic plateau originated from a large Galapagos plume-type.