

**SUBMARINE STRUCTURES OF THE CARIBBEAN LARGE IGNEOUS PROVINCE: AGE AND GEOCHEMISTRY OF THE BEATA RIDGE AND HESS ESCARPMENT**

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R/V Meteor cruise M81/2 mapped and sampled two prominent submarine structures of the Caribbean Plate: the Beata Ridge and the Hess Escarpment. While the Beata Ridge is commonly believed to be part of the Caribbean Large Igneous Province (CLIP), no comprehensive survey of the Hess Escarpment exists and thus its origin remains unclear. We present major element, trace element and Sr-Nd-Hf-Pb isotope data as well as <sup>40</sup>Ar/<sup>39</sup>Ar age data including the first representative geochemical dataset for the Hess Escarpment. Unlike the proposition that the Hess Escarpment is part of the continental Chortis Block, our results show that the structure is of volcanic origin and most likely also belongs to the CLIP. The volcanic nature is also confirmed by its morphology. The Hess Escarpment represents a large fault zone but, including the area north of the Escarpment, it also consists of seamounts, guyots and ridges often located on huge plateau-like structures.

Our preliminary age determinations of Beata Ridge samples yield an age range from 94 to 86 Ma lying well within the assumed main CLIP event at 89±6 Ma that is commonly believed to be formed by large degrees of melting of a starting plume head. However, three analyses with younger ages of 79, 63 and 51 Ma question the hypothesis that large igneous provinces are the result of catastrophic short-termed magmatic events and instead support the model of prolonged volcanism over tens of millions of years with several magmatic pulses. The geochemical data show that the Beata Ridge has compositions typical for the CLIP with flat chondrite-normalized rare earth element (REE) patterns (average (La/Yb)<sub>N</sub> = 1.15) and intermediate radiogenic isotope ratios, but enriched and depleted signatures are observed as well. The Hess Escarpment, in contrast, displays mainly depleted compositions partly more depleted than normal mid ocean ridge basalt (MORB) compositions and similar to the highly depleted komatiites of Gorgona Island. The results imply that the mantle source is heterogeneous and contains two components: a highly depleted component, in our data represented in samples from the Hess Escarpment, and an enriched component trending towards HIMU compositions, which we found only on the Beata Ridge. The typical CLIP isotopic compositions can be generated by mixing of melts from the two components. We further show that these heterogeneities can occur on a small scale of only tens of kilometers within the CLIP.