Origin and tectonic significance of the serpentinites in the Escambray complex, Central Cuba: Geodynamic implications

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Serpentinites in Cuba occur in two main locations; in the north they form an ophiolite belt whereas as to the south they outcrop in the Escambray Complex in tectonic contact with metasediments (non-melange serpentinite) and/or forming a melange containing HP blocks (melange serpentinite). The tectonic setting in the latter complex is controversial with some workers considering it is related to the northern belt. In order to resolve this issue we collected a suite of samples from Escambray for geochemistry to compare with published data from the northern ophiolite belt. In addition, boron isotopes from the Escambray samples were analysed to further evaluate the tectonic setting. All samples are classified as harzburgites with approximately equal proportions of orthopyroxene and olivine in the protolith. They show strong Sr depletion, a feature previously, recognized from the Escambray, and interpreted as indicating derivation from a subducted slab [1]. Antigorite is the dominant serpentine polymorph based on Raman spectroscopy with some samples also containing chrysotile. Boron isotopic signatures show positive $\delta^{11}B$ in the melange type serpentinite and negative $\delta^{11}B$ in the non-melange serpentinite. Despite a clear distinction between these two types, they all fall within the field defined by the Guatemala Suture Zone [2] to the south of Cuba. These results are consistent with a setting where abyssal peridotites are mixed with subduction zone peridotites and exhumed in an accretionary setting.

[1] Deschamps et al., 2012, Chem.Geol. 312–313, 93–117; [2] Martins et al., 2016, Geology. 44, 899-902.