

CRETACEOUS METAMORPHIC EVOLUTION OF THE ISLE OF PINES, NW CUBA: TECTONIC IMPLICATIONS

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The Isle of Pines, NW Cuba, is a coherent metamorphic terrane that probably represents a southern portion of the continental margin of the Yucatan Block during Mesozoic times. Metamorphism in this terrane records two steps: a) Prograde metamorphism spanning low- to high-grade conditions that developed at pressures of 8-12 kbar and is contemporaneous with early fabrics (D1). b) A decompression plus cooling step, contemporaneous with the main deformation in the area ($S_{main}=2$) and accompanied by fluid infiltration. Metamorphism terminated in the Uppermost Cretaceous (68 ± 2 Ma, $40\text{Ar}/39\text{Ar}$ dates on muscovite and biotite). The P-T evolution of metamorphism in the Isle of Pines suggests shortening (D1) and crustal thickening due to the collision of the passive continental margin with the Cretaceous island arc of Cuba, rather than to subduction of the margin under the island arc. The decompression step is compatible with tectonic extension (D2) during the late Cretaceous, rather than with a separate thermal pulse or the thermal relaxation accompanying erosion of a thickened crust. This tectonic extension can be correlated with the initial development of the Yucatan Basin during the late Cretaceous. In spite of having developed almost contemporaneously with them, the metamorphism of the Island of Pines terrane is not easily correlated with that of other neighboring high pressure (e.g. Escambray) and low pressure (e.g., Mabujina) terranes, and is likely to represent a distinct tectonic element in the development of the Cretaceous Cuban orogenic belt.