

Quiescence in fore-arc region after volcanism, sedimentation and subduction-related deformation: the case of Antigua, Lesser Antilles.

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Antigua is an Oligocene extinct volcanic island that stands in the fore-arc of the curved Lesser Antilles subduction zone. Few cartographic, petrological and stratigraphic works were undertaken, mainly from the 70's to the 90's, and showed that the island belongs to the ancient Lesser Antilles arc. However, the tectono-stratigraphic evolution of the island is still uncertain and Antigua remains an unknown part of the Lesser Antilles fore-arc.

In this work, we present new Ar-Ar dating of the volcanic part of the island and revised biostratigraphic data from the sedimentary part. We show that Antigua 1/ emerged after an intense period of volcanism between 35 and 29 Ma that was associated with Rupelian continental deposits, 2/ subsided during the Chattian after the cessation of magmatism allowing the development of a Chattian carbonate platform and 3/ finally re-emerged during Miocene. We also performed the first complete mapping of the structures of the island and a kinematic analysis using paleotensors and anisotropy of the magnetic susceptibility analysis. We show that during the Rupelian, a syn-sedimentary and syn-volcanic NE-SW, perpendicular to the trench, extension is accommodated by N150 to N90 trending normal faults. During the Chattian, there is a change in strain orientation from NE-SW to E-W. This change is accommodated by the implementation of N40 trending normal fault and could be associated with a regional switch in deformation style from the opening of Kalinago back-arc basin (Eocene to Late Oligocene) to the V-shape basins development (Late Oligocene to Miocene) probably accommodating the fore-arc curvature. Surprisingly, after the Miocene event, no more tectonic or volcano-sedimentary activity is recorded in Antigua.

This work highlights that even in active fore-arc, such as the northern Lesser Antilles one, there is local areas that do not show any evidence of deformation or sedimentation and this over a long period of time. This raises the question of how we interpret the absence of such evidences in active of formerly active convergent regions.

Mots-clés : Antigua, Forearc evolution, Upper plate strain partitioning, Arc cessation, Subduction dynamics.