

NEOTECTONIC STRUCTURES AND PALEOSTRESS IN SOUTH-CENTRAL HISPANIOLA

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ABSTRACT

The Azua area in southern Hispaniola is located where the NNE trend of the Beata Ridge meets the NW structural trend of rocks in Hispaniola. Regional structural investigations, marine seismic reflection studies and paleostress analyses have been conducted to investigate the hypothesis that the Beata Ridge is acting as an indenter into Hispaniola. Regional and seismic studies indicate regional, sinistral shear in the area west of Ocoa Bay and compression north of the bay. A large, helicoid-shaped, left-lateral strike-slip model is proposed in which the northern extremity of the Beata Ridge acts as a northeast moving indenter that impinges the mainland. Sinistral strike-slip motion on the Trans-Bay fault may be effectively widening the indenter's tip and complicating stress distribution in the indented area. The Beata structure acts, however, only as a "half-indenter" because seismic profiles show that the eastern boundary of the indenter is being overridden along a shallow, west-dipping thrust fault.

Paleostress determinations were made using data from (1) slickenside striations on minor fault planes; and (2) striations on planar surfaces of pebble facets in the Trichera (late Miocene), Arroyo Blanco (early Pliocene) and Via (late Pliocene) Formations. These studies may indicate that both a relatively rectilinear, orthogonal stress field associated with thrusting that has σ_1 oriented NE and σ_3 oriented NW, and an indenter-generated stress field (curving stress trajectories, but with σ_1 trending NW, σ_3 trending NE in the area northwest of the indenter) may have affected the area since middle Miocene time. It is very tentatively suggested that the orthogonal shear-stress field may have prevailed until the late Pliocene and that the indenter field was re-activated in post-late Pliocene time.