
Tehuacán Rift Basin in Southeastern Mexico: Magmatic and Stratigraphic Evidence for Barremian Rifting of the Gulf of Mexico

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ABSTRACT

Tectonostratigraphic information from geochemical and stratigraphic data in central southeastern Mexico allowed us to propose a proto-oceanic rift that might have been the inland extension of the Gulf of Mexico Rift. The volcanic-sedimentary sequence of the Chivillas Formation is the easternmost exposure of Mesozoic marine volcanism in Mexico. Basaltic lavas are alkaline with rift/hot spot affinity, similar to signatures of CAMP and the PAAP. The Chivillas Formation consists of pillow lavas interbedded with turbidites and debrites, all accumulated in the hanging-wall block on the Tehuacán Rift Basin. Clast composition and detrital zircon U/Pb ages indicate a south provenance. Late Jurassic zircon ages suggest that the Sierra de Juárez Complex was exhumed and eroded during the time of deposition of the Chivillas Formation. The youngest zircon ages of ~126 Ma are interpreted as its maximum depositional age. Provenance of sedimentary rocks, as well as the petrotectonic affinity of its alkaline basalts indicate that Tehuacán Basin is the record of a ridge-transform intersection, associated with the rifting process of opening of Gulf of Mexico. We suggest that the Tehuacán Rift Basin might be the last jump of the Gulf of Mexico Ridge. Thus the Sierra de Juárez Complex was a transform fault that accommodated the right-lateral displacement in relief of the Western Main Transform. In this model, the last stage of extension for the Gulf of Mexico might have been as young as Barremian in age.

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