
Sandstone Provenance and U/Pb detrital zircon ages from the Huayacocotla and Xaltipa Formations, Veracruz State, and their Tectonic Meaning

Elena Centeno-García, Ángeles Verde-Ramírez, Gilberto Silva-Romo, Emiliano Campos-Madrigal, and Claudia C. Mendoza-Rosales

Universidad Nacional Autónoma de México

ABSTRACT

The Huayacocotla Formation, exposed at the limits between Veracruz and Hidalgo states, is made up of a thick clastic succession deposited in marine, shallow marine, and subaerial environments. It lies unconformably on Permian volcanic-sedimentary rocks and is unconformably covered by redbeds of the Xaltipa Formation or limestones of the San Andres Formation. Ammonites indicate a Hettangian-Pliensbachian age. Sandstones of the Huayacocotla Formation are mainly quartzarenites, with few feldspar and lithic fragments. Their detrital zircon ages show a main cluster at 290 Ma, and a wide range of ages from 258–364 Ma. Other minor peaks are 540–690 Ma, 1.1 Ga, and 1.4 Ga. The Xaltipa Formation is made up of alluvial fan conglomerates, related to active faulting. Its depositional age is unconstrained but is covered by Kimmeridgian limestone. Clasts are made up of lithic volcanic fragments, sandstone clasts derived from Huayacocotla Formation, gneiss, and quartz. Their detrital zircon ages show a narrow age peak at 267 Ma, a second cluster at 800 Ma to 1.2 Ga, and a minor cluster at 558 Ma. Ages of detrital zircons from the Huayacocotla Formation are similar to metamorphic ages reported in eastern Mexico and the northeastern part of Gondwana. In contrast, zircons from the Xaltipa Formation show influence of local sources, including some reworked zircons from the Huayacocotla Formation.