
NEW RADIOISOTOPIC DATES REVEAL A MIDDLE TRIASSIC AGE FOR LACUSTRINE SUCCESSIONS IN SW GONDWANA

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Abstract

Fluvio-lacustrine basins in western Argentina potentially preserve some of the most complete non-marine Triassic successions in Gondwana, with abundant datable horizons and diverse fossil assemblages. The Triassic Peñasco Group of the Santa Clara subbasin in the Cuyana Basin of central-west Argentina is one such example, however, it has long lacked an accurate chronostratigraphic framework making correlations and constraints on the tempo of recorded events challenging. The upper section of the Group comprises a fluvio-deltaic-lacustrine succession of the Santa Clara Abajo and overlying Santa Clara Arriba formations. The paleolake has been interpreted as a stratified-balanced-fill lake basin with different hydrological stages of opening and closing through time based on carbon and oxygen stable isotope geochemistry. Previous palynostratigraphic analysis had inferred a Late Triassic (Carnian-early Norian) age for the Santa Clara Arriba Formation. For both units, however, new U-Pb CA-TIMS zircon ages from tuffs suggest an earlier depositional age (ca. 244 Ma for the base of Santa Clara Abajo Formation, and ca. 243 Ma for the upper Santa Clara Arriba Formation) and constrain the deposition to less than ~ 2 my if maximum uncertainties are considered. These radioisotopic ages indicate the Santa Clara subbasin is one of the few localities globally preserving non-marine Anisian deposits with a precise chronostratigraphic framework. Moreover, our results illustrate the potential for constraining the relationship between Triassic Gondwanan palynomorph assemblages, paleogeography, and explain the spatiotemporal effects of biogeography on palynostratigraphy.

Keywords: Anisian, chronostratigraphy, correlations, palynostratigraphy

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