

Chemostratigraphy and U-Pb age constraints of Mesoproterozoic carbonate successions of the Río de la Plata Craton, Uruguay

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A belt consisting of volcanosedimentary successions exhibiting greenschist-facies metamorphism is exposed in the Nico Pérez Terrane, eastern Río de la Plata Craton (RPC) in Uruguay. The Parque UTE Group (PUG) consists of basic volcanics and gabbros at the base (1492±4 Ma, U-Pb on zircon), carbonates in its middle part, and interbedded carbonates, shales and acid volcanics (1429±21 Ma, U-Pb on zircon) at the top. The overlying Mina Verdún Group (MVG) is made up of rhyolites and acid pyroclastics at its base and top, and *Conophyton*-bearing limestones and massive dolostones in the middle (Poiré and Gaucher, 2009). Lapilli-tuffs at the base yielded a U-Pb LA-ICP MS zircon age of 1433±6 Ma, showing that the MVG immediately post-dates the PUG (Gaucher *et al.*, in press). A $\delta^{13}\text{C}$ curve obtained for the whole succession is characterized by steady and moderately positive values around +1 to +2‰ VPDB, punctuated by two negative excursions. The lower negative excursion (-1.8‰) occurs at the base of the PUG and immediately post-dates basic rocks dated at 1492±4 Ma (Chigliano *et al.*, in press). The upper negative $\delta^{13}\text{C}$ excursion, down to -3.5‰ VPDB, encompasses the top of the PUG and base of the MVG. Two U-Pb ages around 1430 Ma confidently define the absolute age of this negative excursion. A positive $\delta^{13}\text{C}$ plateau around +2‰ VPDB characterizes the remainder of the MVG. Geochemical discriminant criteria, such as Mn/Sr vs. $\delta^{13}\text{C}$, $\delta^{13}\text{C}$ vs. $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ vs. Sr concentration indicate that isotopic signals represent near-primary values (Chigliano *et al.*, in press). The chemostratigraphic and U-Pb data help constrain the global $\delta^{13}\text{C}$ curve of marine carbonates, showing that oscillations of modest amplitude begun already at ca. 1.5 Ga. Carbonates of the Mataojo Formation of the Nico Pérez Terrane show $\delta^{13}\text{C}$ invariance around 0‰ (Chigliano *et al.*, in press) and are younger than 1802±59 Ma (U-Pb age of youngest detrital zircon). Thus, the transition from isotopic stasis to modest secular variations must have occurred between 1.8 and 1.5 Ga. Deformation and metamorphism of Mesoproterozoic successions of the RPC occurred between 1.25 and 1.20 Ga, as shown by K-Ar, Ar-Ar and U-Pb ages. This tectonic event affected most of the RPC, and led to the accretion of the Nico Pérez Terrane to the remainder of the RPC along the Sarandí del Yí megashear. In a broader context, these ages strongly suggest the involvement of the RPC in the tectonic collage ultimately leading to the accretion of Rodinia (Gaucher *et al.*, 2009).

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