

The relationship between pre- and syn-Pampean orogeny metasedimentary rocks in the Eastern Sierras Pampeanas

C. Casquet¹, C.W. Rapela², E. Baldo³, R. Pankhurst⁴, C. Galindo, S. Verdecchia³, J. Murra³ and J. Dahlquist³

¹*Departamento de Petrología y Geoquímica, IGEO (Universidad Complutense, CSIC), 28040 Madrid, Spain*

²*Centro de Investigaciones Geológicas (CONICET-UNLP), 1900 La Plata, Argentina*

³*CICTERRA (CONICET-UNC), 5000 Córdoba, Argentina*

⁴*Visiting Research Associate, British Geological Survey, Keyworth, Nottingham, NG12 5GG, UK*

Two series of pre-to syn-Pampean orogeny metasedimentary rocks can be distinguished in the Sierras Pampeanas on the basis of U-Pb SHRIMP detrital zircon ages. On one hand the Ancaján series consists of meta-siliciclastic rocks (metapsammites and metapelites) and marbles. These have a Grenville Zr age pattern (1.0–1.3Ga) with contributions from the trans-Laurentian granite province (~ 1.3–1.5 Ga) (Rapela et al., 2014; this symposium). They are stratigraphically associated with Ediacaran marbles (540–630 Ma) in both Western and the Eastern Sierras Pampeanas. New U-Pb SHRIMP detrital zircon age data further show that the Ancaján series has a previously unknown extension into the Sierras de Córdoba. The second series crops out only in the Eastern Sierras Pampeanas and corresponds to the well-known Puncoviscana Formation, a thick siliciclastic succession that was deposited before and during the Pampean orogeny (530–570 Ma): it contains major detrital zircon age peaks at 960–1100 Ma (Grenvillian) and 570–680 Ma, and lacks grains derived from the nearby Rio de la Plata craton (2.02–2.26 Ga). This formation crops out over a large area in northern Argentina (Cordillera Oriental and Sierras Subandinas).

The sedimentary precursors of these two series were deposited on opposite margins of an open sea (the Puncoviscana–Saldania–Clymene ocean), which separated large continental masses – Laurentia–MARA on the west and Kalahari+RPC on the east, which collided obliquely with each other during the Pampean–Saldanian orogeny between ~ 540 and 520 Ma (Casquet et al., 2012). No evidence of significant Pampean overprint is recognized in the Western Sierras Pampeanas, but the easternmost part of the Ancaján series (Sierras de Córdoba) was underwent syn-metamorphic folding and ductile shearing between 530 and 520 Ma. The marbles and meta-siliciclastic rocks of the Ancaján series were affected by major shear zones (e.g., Martino, 2003), suggesting that the latter constitute the boundary between the Ancaján series and the Puncoviscana Formation. A dismembered mafic–ultramafic igneous complex is also located within these shear zones (Bonalumi and Gigena, 1987); this has been interpreted as an ophiolitic complex embracing tracts with oceanic-ridge and probably back-arc chemistry that were tectonically emplaced into a suture (e.g., Ramos et al., 2000). The age of the complex remains poorly constrained.

The evidence provided here that the Ancajan series is also present in the Sierras de Córdoba further strengthens the idea that the Pampean suture occurs there.

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