

Preliminary results on the tectonic genesis of the Cura Mallín Formation in the Southern Central Andes (36° - 39°S)

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The Cura Mallín Fm comprises Oligo-Miocene (24-12 Ma) volcanosedimentary rocks covering the axis of the Southern Central Andes of Argentina and Chile (36°-39°S). The tectonic mechanism for deposition of this unit is still matter of debate. There are two contradictory proposals: while some authors have proposed an extensional regime (Jordan et al. 2001; Burns et al. 2006) others suggested a compressional tectonic context (Cobbold et al. 2008).

In this work we discuss the Cura Mallín Fm subsidence mechanisms, based on new field work, two U-Pb dating of detrital and tuff zircons and a compilation of geochronological, structural, geochemical, thermochronological and subsidence data (33-44°S, 40-5 Ma).

Cura Mallín rocks of 24-18 Ma are characterized by low La/Yb ratios (Kay et al. 2005; Profeta et al. 2015) which are interpreted as indicative of a thin crust. These strata show wedge-like geometries associated with inverted normal faults in the vicinities of the Sierra Velluda volcano dated by Flynn et al. (2008) in 19.4 Ma. Growth strata associated with the back-limbs of the inverted anticlines were dated by Flynn et al. (2008) in 17-14 Ma.

Compiled, isotopic data for arc-related volcanic rocks suggests crustal thickening coupled with rapid exhumation, evidenced by thermochronological data, at 20 Ma, which is consistent with the age of synorogenic strata in the foreland basins (Horton 2018). New U-Pb isotopic ages for a tuff and sandstone in growth strata of the Cura Mallín Fm at Cerro Piedra Parada and Cerro Rucañanco (Lonquimay area, Chile) have yielded 12.1 and 12.4 Ma respectively.

According to our observations and previous data, while the basal section of the Cura Mallín Fm (24-18 Ma) was deposited under extensional conditions, the uppermost half (17-12 Ma) was deposited synchronously with the growth of the Andean range, as a series of hinterland basins associated with out-of-sequence thrusting that reconfigured the entire western fold and thrust belt.

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