Thermochronological Data and Denudation History Along a Transect Between Chañaral and Pedernales (≈26º S), North Chilean Andes: Orogenic Implications

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The Chilean Andes along the southern Atacama Desert (26°-27°S) include into five morphotectonic units: (Coastal Cordillera, Central Valley, Precordillera, Preandean depression and Western Cordillera). Uplift and denudation have produced a large amount of sediments during the Cenozoic but only in the Preandean depression, thick sequences of Tertiary sediments has been preserved, while in the Precordillera and Central Depression a thin blanket of Miocene Atacama Gravels infill paleovalley (Mortimer 1980; Riquelme, 2003; Gabalda et al., 2005). In this contribution we present a new set of thermo-chronologicals data that will allow us to establish the ages of main exhumation episodes, which can be tied to periods of erosion and Andean uplift along the western slope of the southern Central Andes. That regional exhumation occurred in three steps along the Chañaral-Pedernales transect: Mid-Cretaceous to Paleocene on the Coastal Cordillera, Eocene from the Central Valley to the Pedernales Basin, and Oligo-Miocene at Cordillera Claudio Gay. Data shows the eastwards propagation of the exhumation that is interpreted as propagation of the deformation. Only sediments originated during the Eocene Oligocene events seem to have been preserved in the compressive pre-Andean Pedernales basin. At the same time, withdrawal of material towards the ocean prevailed along the western Precordillera and Central Valley. These considerations indicate that topography is not the major factor controlling the amount of mass transfer during Andean uplift as the adjustments in the volume of mass transferred out of the system seem to track climatic changes towards semiarid-hyper arid conditions during the Miocene.

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