

GROWTH OF THE PATAGONIAN ANDES IN MIOCENE TIMES AT THE LATITUDES OF THE TRIPLE JUNCTION POINT BETWEEN ANTARCTICA, NAZCA AND SOUTH AMERICAN PLATES, USING U/PB DATING IN SYNOROGENIC STRATA

Folguera, A.¹; Encinas, A.²; Echaurren, A.¹; Gianni, G.¹; Navarrete³, C., Fernández, L.¹; Litvak, V.¹

¹Universidad de Buenos Aires. Conicet. Instituto de Estudios Andinos; ²Universidad de Concepción; ³Universidad Nacional de la Patagonia San Juan Bosco

RESUMO: The Andes extend for ~4,000 km along the Chilean-Peruvian margin, being the longest and highest orogenic system associated with a subduction setting. This orogenic system shows remarkable latitudinal differences in height, width, shortening amounts, magmatism and tectonic evolution. A particularly interesting segment along this system is the North Patagonian Andes, since it shows contrasting differences in comparison with the Central Andes to the north including a lower elevation (1–2 km), width (~300 km), reduced crustal thickness (~40 km), and low shortenings (12–25 km). Aridity of northern and central Patagonia is thought to have occurred lately since ~10 Ma and therefore in a way not directly connected to Drake Passage opening and initial conformation of Antarctica ice cap, such as happened in other southern land masses. On the contrary, local processes, in particular the uplift of the Southern Andes, seem to have played a major role in biota changes. Previous works have considered that the Patagonian Andes uplifted between 22 and 14 Ma, reaching a threshold elevation at which the orographic rain shadow effect became stronger at 15-14 Ma. After this, increased erosion on the western Pacific Andean slope and consequent lubrication of the plate interface at the trench and subduction channel were thought to have reduced the coupling effect between the convergent plates inhibiting Andean uplift. This work dates through U/Pb method three trends of synorogenic strata that show growth structures indicating their deposition over the frontal orogenic wedge, filling a narrow foredeep that overlapped against a Cretaceous - Paleogene to Early Neogene foreland deformed zone: one of 18.5-16.6 Ma cannibalized in the western sector of the fold and thrust belt corresponding to Meseta de Guadal and Jeinemeni sections, another in the Alto de Río Cisnes with 14.8 Ma and a younger corresponding to the Chalía and Guenguell sections of 13.7-12.2 Ma in the eastern orogenic front of the Patagonian Andes, showing that i) the Patagonian Andes continued growing in spite of the conformation of the rain shadow effect and that ii) biota changes associated with aridity of central Patagonia are temporally related to the exhumation of the eastern structures incorporated in the Main Andes. This work provides evidence on an out of sequence Andean uplift respect to older deformations described in the plate interior as a main factor linked to middle to late Miocene biota changes in Central Patagonia, a process that continued at least up to ~12 Ma. This out of sequence uplift of the Patagonian Andes is linked to the accretion of the Traiguén block during the Traiguén Basin closure, as proposed in previous studies.

PALAVRAS-CHAVE: Syn-orogenic sedimentation; out-of-sequence growth; Patagonian Andes; Miocene