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PATTERNS OF ANDEAN GROWTH IN THE ECUADORIAN ANDES

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RESUMO: Reconstructing the exhumation history of accretionary orogens is essential for understanding the mechanisms and rates of tectonic deformation that shape complex structures. In the frontal Andean margin of northeastern Ecuador, the Napo Uplift (NU) is associated with slip along a deep mega-thrust system. Despite evidence of exhumation since the Late Cretaceous has been found west of the NU, particularly in the Cordillera Real in Ecuador, exhumation patterns in the region remain poorly constrained. Our study aims to evaluate spatiotemporal trends of rock uplift by employing two approaches. First, we report 8 new apatite fission track (AFT) Ages (17-145 Ma), 4 new apatite U-Pb Ages (70–185 Ma), and 5 (U-Th)/He (AHe) Ages (5-32 Ma) from Jurassic magmatic rocks and Lower Cretaceous-Paleogene sedimentary rocks within the NU. New vitrinite reflectance data in interlayered Cretaceous mudstones document maximum temperatures lower than 80°C ($R_o < 0.55\%$), which agrees with partial thermal resetting of the AFT system. The LA-ICP-MS analyses for AFT yield simultaneously U-Pb data and a range of multi-elemental data useful for provenance approaches. Overlapping apatite and zircon U-Pb ages in Jurassic plutons document post-magmatic cooling and place constraints on maximum exhumation. Multi-elemental apatite geochemical data reveal that Upper Cretaceous sandstones were at least partially sourced from a coeval magmatic arc in the west. Young AFT ages along the hanging-wall block of the Abitagua block indicate out-of-sequence slip along the Ecuadorian orogenic wedge, most likely favored by the inherited structural grain. Young AHe ages (<20 Ma) throughout the NU associated with the last uplift show higher spatial resolution than AFT ages limited to the west of the NU, in areas adjacent to the Abitagua fault. Second, thermochronological that integrates the new and published thermochronological data allowed for estimating exhumation rates.

PALAVRAS-CHAVE: APATITE; LA-ICP-MS; DEFORMATION; ROCK UPLIFT.