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Geomorphology of alluvial terraces along the Tena River in the Eastern Flank of the Andes of Ecuador

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The Tena river located on the Eastern Flank of the Andes of Ecuador, has its source in the Cordillera Oriental at ~2400 m s.n.m. This river descends for around 16 km to ~500 m s.n.m where it joins the Misahualli River in the Eastern Basin of Ecuador. When the Tena River leaves the high relief and slopes of the Cordillera Oriental and enters in the foothills of the Andes developed an extensive alluvial plain where a fluvial terraces staircase is preserved. Geomorphological and sedimentological observations of these terraces combined with an obtained 14C age allow us to identify at least 7 (T6 – T0, from oldest to youngest) river terraces probably formed in the last 200 ka. In general, the terraces are well preserved and present extended surfaces (> 3000 m2) with slopes that vary between 2 and 12°, being the older terraces that presented the higher slopes. Most of the remnants of the terraces are preserved towards the beginning of the foothills (medium slope area), while only the youngest terraces are present towards the outlet of the river (low slope area). The terraces are frequently composed for two main sedimentary units. A basal unit constituted for 2-8 m of clast supported conglomerate which is overlies for ~1-2 m of clays and silts. Into the upper units different levels of volcanic ash are identified. T1 is the more extended terrace, its surface is located ~5 above the river and its abandonment has been dated in 2.50 14C ka BP, then an incision rate of ~2 mm/a is estimated for this terrace. Taking into consideration the geological and geomorphological features of the zone where T1 was dated, this value of the incision rate could be converted as a maximum value of the uplift rate for the Eastern Flank of the Ecuadorian Andes. Finally, several archaeological pieces and features have been recognized in one remnant of T1 terrace. The cartography proposed in this work could contribute in the identification of new human settlements.