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## **The terraces staircases of Douro River at the Pocinho and Barca D'Alva sectors (NE Portugal) – records for the interpretation of the evolution of W Iberia during Quaternary**

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In the Iberia Peninsula, the process leading to the drainage of the Douro basin towards the Atlantic at the latest Cenozoic remains a major geomorphological challenge (Pereira et al., 2000; Anton et al., 2012), particularly understanding the connection between the geomorphological evolution of the trunk river and its tributaries in the Portuguese sector, that captured the drainage of the previously endorheic Douro Cenozoic basin (in Spain). However, geomorphological and sedimentological data are available to interpret the ongoing incision stage punctuated by episodes of valley enlargement and aggradation leading to the formation of fill and rocky terraces (Cunha et al., 2010). These terraces are well individualized at confined areas of the Douro and Sabor valleys, as well as on other tributaries rivers of the Portuguese part of the basin.

This contribution is focused on the Douro River terrace staircases in two reaches, Pocinho and Barca D'Alva. Geomorphological mapping and luminescence dating, of the lower terraces (with sedimentary deposits), are also presented and discussed. Furthermore, the control of river evolution by climate, tectonics and eustasy is also interpreted.

The fluvial staircases on both reaches are similar for the lower fill terrace, located just above the actual alluvial plain (T1 = ±10/15m). It comprises mainly fine sands that give quartz-OSL of 24 to 14 ka. For the upper terraces, significant differences between the fluvial staircases were identified: a) more levels of fill terraces exist at the Barca D'Alva reach (4-5 levels at Quinta da Canameira site and 2-3 at Barca D'Alva site) than for Pocinho reach (2); b) also differences in sedimentary architecture and lithology can be identified: the second fluvial terrace above actual alluvial plain (T2), tends to be coarser and was explored, at Barca D'Alva, by the Romans for gold. For the T2 terrace, the quartz-OSL dates obtained are minimum ages (>122 ka). However, using the pIR-IRSL method (K-feldspar), ages up to >360ka (+47.5m; terrace T3) were obtained. The differences between the studied fluvial staircases, despite of local geological/geomorphological conditions, seem to reflect regional tectonic

conditioning, since these fill terraces are well preserved in small NNE-SSW elongated depressions. The faults that bound these depressions are also responsible for the preservation of Paleogene-Pliocene sediments along these small sinistral strike-slip basins, which support the hypothesis of a reactivation of Variscan strike-slip faults that are well impressed on the relief of the area, particularly for the Pocinho staircase where one of the lower terraces (the T2) are thrust by the basement (granite).

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