



ICG2022-212

<https://doi.org/10.5194/icg2022-212>

10th International Conference on Geomorphology

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



First ESR chronology of the Duero River terrace system in Northern Spain

Davinia Moreno and Alfonso Benito-Calvo

Centro Nacional de Investigación sobre la Evolución Humana (CENIEH), Spain (davinia.moreno@cenieh.es; alfonso.benito@cenieh.es)

Intraplate basins potentially preserve the most complete record of tectonic, geomorphic, and climatic evolution within the interior of continents. In the Iberian Peninsula, most of the largest Cenozoic sedimentary basins show a change from aggradation to degradation. Determining the cause of the transition from aggradation to degradation and how this was linked to tectonic, climatic, and geomorphic events hinges on the chronology of the fluvial network incision and excavation of the basins fill. Fluvial terrace staircases provide a direct record of exorheic river incisions and are known to be controlled by base-level changes, climatic changes, and tectonic uplift.

The incision of most of the Iberian Peninsula basins appears to have initiated in the Quaternary but the precise timing of its initiation is actually poorly known and constrained. In order to overcome the lack of chronologies for these basins, in the following study, we studied the Duero basin and its terrace system. It is a major intracratonic basin bounded by Cenozoic structures and characterized by a maximum of 16 terrace levels from +141-144 m to +8-10 m, with the present alluvial plain at +4-5 m (*Pérez-González et al., 1994*). During the last decade, some tributaries (e.g. Arlanzón, Arlanza, or Esla) and the Duero itself have provided a few ages obtained by Electron Spin Resonance (ESR) (*Moreno et al., 2012; 2016*), Luminescence (*Cunha et al., 2019*) and Cosmogenic Nuclides dating (*Rodríguez et al., 2020; Schaller et al., 2016; Antón et al., 2012*), shedding some light on the chronological framework of the Duero basin.

In this work, ESR was systematically applied to the main river, the Duero River, dating 4 different fluvial levels spanning from the high to the medium levels: T2 (+135m), T3 (+114m), T5 (+90m), and T10 (+41m). ESR dates are coherent with the analyzed terrace system and allow defining the onset and development of the Duero valley in the center of the basin. Additionally, these results also allow the reconstruction of the incision response of the tributary system, comparing these ESR results with those previously published.