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The plain of Lleida-Monzón: more than one million years of megaflooding in the eastern South-Pyrenees Drainage Basin.

F. Xavier Castellort¹, Rafael Rodríguez², J. Carles Balasch³, Jordi Cires⁴, Ferran Colombo⁵, and Josep M. Parés⁶

¹Universitat de Lleida, ETSEA, Environment and Soil Sciences, Lleida (xavier.castellort@gmail.com)

²Universitat de Lleida, ETSEA, Environment and Soil Sciences, Lleida

³Universitat de Lleida, ETSEA, Environment and Soil Sciences, Lleida

⁴Institut Cartogràfic i Geològic de Catalunya, Barcelona

⁵Universitat de Barcelona, Barcelona

⁶CENIEH, Burgos

The Lleida-Monzón Plain, with an area of 7.700 km², is the largest transfer and storage zone in the central-eastern South Pyrenees source area outlet. It drains four main South-Pyrenean rivers: the Cinca River, the Noguera Ribagorçana River, and the Segre River joined to the Noguera Pallaresa River. The source area covers about 13.600 km² forming part of the Pre-Pyrenees and the Pyrenees.

In the Lleida-Monzón Plain, we differentiate three groups of staircase terraces: upper, middle, and lower terraces. The upper flight of terraces outcrops near and above the Cinca and the Segre Rivers confluence. It is a flight of at least four terraces located between 230 and 285 m above the current channel. The middle terraces also form a flight of at least three terraces outcropping between 120 and 190 m above the current channel. Finally, the flight of the six lower terraces lies between 5 and 90 m above the current channel.

The uppermost terrace, 285 m above the riverbed, is an eroded remnant of Pyrenean polygenetic, sub-rounded, and boulder-rich unsorted clasts. Laterally, at the headwaters of two small tributary valleys of the Cinca River, three other terraces (260, 250, and 230 m) of sorted polygenetic gravels are found.

The three middle terraces are the most extensive in the Lleida area. They are elongated, several meters thick, gravel sheet bodies near 40 km long. They are made up of sub-rounded polygenetic and boulder-rich unsorted Pyrenean clasts. Usually, terraces are built up a one-storey layer; occasionally, they are two-storey deposits.

The lower flight of terraces located in the fluvial valleys incised into the middle accumulations. Deposits are up to ten meters thick, and they are poor in sedimentary structures, as much, horizontal, and tabular cross-stratification. Gravel accumulations are composed of sub-rounded polygenetic clasts from the Pyrenees, boulder-rich and unsorted.

Remnants and gravel sheets made up of Pyrenean boulder-rich unsorted clasts can be interpreted as glacial-lake catastrophic outburst flood deposits. When leaving the intramontane confined river courses, floods spread at the plain storage area and form gravel sheet deposits. Accumulations show scarce sedimentary structures, at most some imbrications, and they are characterized by a wide grain-size distribution with boulders in an ungraded and disorganized fabric. Floods can flow up into lateral tributaries where bedload and suspended load are sorted and deposited some kilometers upstream.

The upper flight of terraces correlates with a deposit (250 m above the current riverbed) with an ESR age of 1.276 ± 104 ka (Duval et al., 2015). The lower flight of terraces of the Segre River has been dated with TCN (^{10}Be), showing exposure ages between 202 ka and 62 ka for the upper four terraces of the flight (Stange et al., 2013).