

Sea-level changes across the PETM in the Pyrenees, part 2: evidence from a platform interior setting

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The Paleocene and lower Ilerdian are represented in the south-western Pyrenees by the Gallinera Group, a ca. 300 m thick unit of platform interior, shallow marine carbonates rich in algae and larger foraminifera. In the extensive outcrops of this unit, the PETM is generally recorded by a comparatively thin (<2 m) interval of nummulite-rich marls located at the base of the Ilerdian succession. However, in the Ordesa-Monte Perdido National Park of Spain, the PETM is represented by an up to 25 m thick siliciclastic unit, named La Pardina Formation after its best outcrop, interpreted as a deltaic accumulation (Robador et al., 2009, *Geogaceta* 46, pp111-114). The outstanding exposures of the National Park offer a continuous cross-section of this ancient delta, in which three main facies can be differentiated, sketched in Fig. 1.

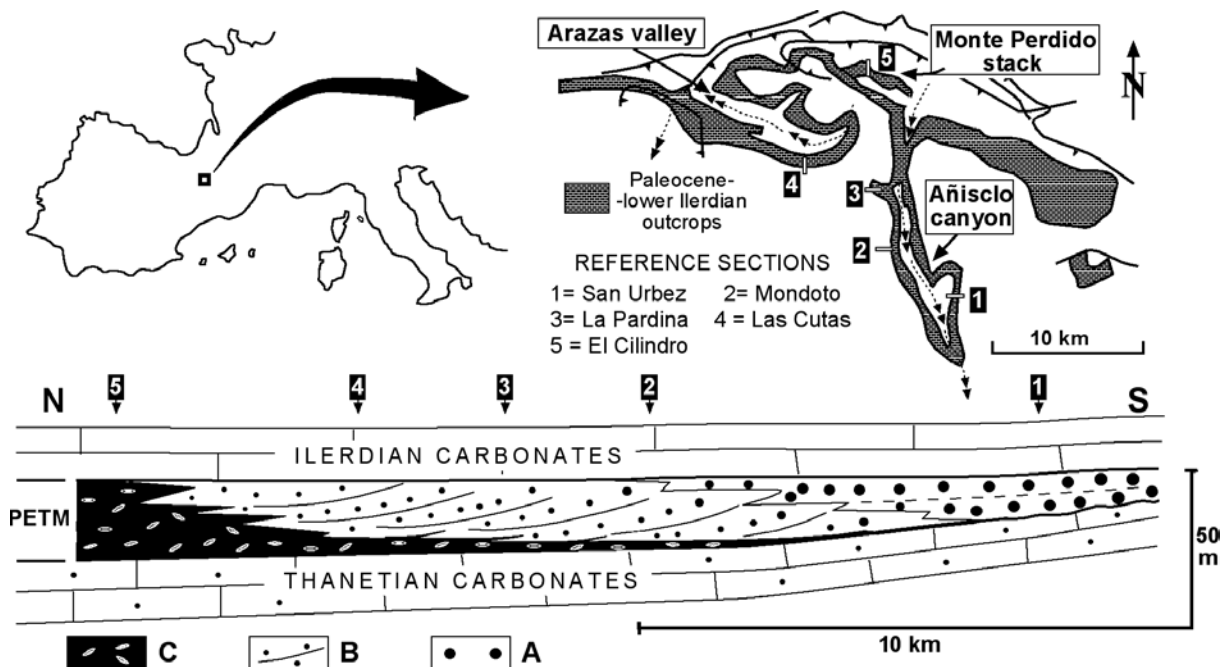


Figure 1.: Location, outcrop map, reference sections and cross-section across the Thanetian-Ilerdian boundary in the Ordesa-Monte Perdido National Park (Spain)

Facies A consists of unfossiliferous pebbly quartz sandstones, arranged in a fining-up sequence, and is interpreted as delta-plain distributary channel fill. Facies A abruptly overlies an irregular erosional surface carved in marine Thanetian sandy limestones, a facies shift that clearly indicates a sea level fall. Facies B is also made up of unfossiliferous quartz sandstones, now disposed in a coarsening-up sequence that, in proximal outcrops, is capped by facies A (Fig. 1). In favourable outcrops (e.g., La Pardina) large-scale foresets or clinofolds can be clearly perceived, recording the progradation of the delta front. Since other data demonstrate that the sea-level rose during the PETM (Pujalte et al. part 1, this volume), such progradation implies a massive clastic supply. Facies C is composed of nummulite-rich marls and marly limestones, interpreted as prodelta deposits. Facies C can be confidently ascribed to the PETM based on both biostratigraphic determinations and isotopic data, its vertical and lateral interfingering with facies B being the main evidence linking La Pardina delta and this thermal event.