



## **Stratigraphy and sedimentology of the Cambrian base (La Herrería Formation) in the area of Los Barrios de Luna (N of Spain)**

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La Herrería Formation comprises the base of the Cambrian in the Cantabrian Zone (ZC), the external part of the Variscan Orogen in the NW Iberian Peninsula (Spain). In other zones of the Iberian Massif, comparable stratigraphic formations are found overlying the Precambrian basement: La Herrería Formation lays with angular unconformity over the Narcea-Mora Formation. Previous studies have proposed a variety of interpretations for the Herrería Formation. Based on the identified facies and facies associations, in this study it is interpreted in terms of progradation and abandonment of a braidplain delta system, in agreement with some of the previous investigations. Due to its particular location within a foreland fold-and-thrust belt, the formation appears dismembered so that relatively distal sections are currently found displaced towards the NE. Through the analysis of previously investigated and newly identified outcrops, the present study aims to provide a better insight into the features of the sedimentary environment, as well as a detailed characterization of the entire formation, something that would facilitate its mapping in the complexly deformed study area. The study supports a previously proposed subdivision of the Herrería Formation in three informal members, and has identified a 5 m-thick level of fine-grained reddish and mica-rich sandstones proposed as the boundary between the lower and middle members, which has also been utilized as a marker bed for correlations among the different sections. The lower member is formed by shaly to sandy facies associations of pro-delta and delta front, and can include shallow-water carbonates deposited during delta lobe temporal abandonment. Within the middle member, the lower part is composed by coarse- to moderately-sorted feldspathic reddish sandstones of the delta plain, defining the top of a large-scale progradational sequence which starts at the lower member. Towards the upper part of this member, the sandstones turn into quartzarenites with glauconite, reflecting costal reworking by sea waves and then, the beginning of retrogradation. Finally, in the upper member, fine-grained-quartzarenites and shales are found, indicating a stronger marine influence interpreted as a consequence of a retrogradational trend that would culminate with the onset of carbonate deposition as shown by the limestones of the overlying Láncara Formation. Paleocurrent distribution analysis, based on cross-laminated sandstones, indicates that sedimentary supply was directed towards the SSW and that sediment redistribution occurred along a WNW-ESE trending paleoshore. Sedimentation would be linked to one of the graben basins created during the rifting that the northern margin of Gondwana was experiencing at that time.