

Skeletonized microfossils from the Lower-Middle Cambrian transition of the Cantabrian Mountains, northern Spain

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Acta Palaeontologica Polonica 51 (2), 2006: 223-238

Two different assemblages of skeletonized microfossils are recorded in bioclastic shoals that cross the Lower-Middle Cambrian boundary in the Esla nappe, Cantabrian Mountains. The uppermost Lower Cambrian sedimentary rocks represent a ramp with ooid-bioclastic shoals that allowed development of protected archaeocyathan-microbial reefs. The shoals yield abundant debris of tube-shelled microfossils, such as hyoliths and hyolithelminths (*Torelrella*), and trilobites. The overlying erosive unconformity marks the disappearance of archaeocyaths and the Iberian Lower-Middle Cambrian boundary. A different assemblage occurs in the overlying glauconitic limestone associated with development of widespread low-relief bioclastic shoals. Their lowermost part is rich in hyoliths, hexactinellid, and heteractinid sponge spicules (*Eiffelia*), cancelloriid sclerites (at least six form species of *Allonnia*, *Archiasterella*, and *Chancelloria*), cambroclaves (*Parazhiinites*), probable eoconchariids (*Cantabria labyrinthica* gen. et sp. nov.), sclerites of uncertain affinity (*Holoplicatella margarita* gen. et sp. nov.), echinoderm ossicles and trilobites. Although both bioclastic shoal complexes represent similar high-energy conditions, the unconformity at the Lower-Middle Cambrian boundary marks a drastic replacement of microfossil assemblages. This change may represent a real community replacement from hyolithelminth-phosphatic tubular shells to CES (cancelloriid-echinoderm-sponge) meadows. This replacement coincides with the immigration event based on trilobites previously reported across the boundary, although the partial information available from originally carbonate skeletons is also affected by taphonomic bias.

Key words: Skeletonized microfossils, cambroclavids, cancelloriids, hyoliths, hyolithelminths, sponges, benthic replacement, Cambrian, Cantabrian Mountains, Spain.

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