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Biostratigraphical, paleoecological and paleobiogeographical interest of Guembelitria species across the Cretaceous-Paleogene transition at Atlantic realm (Bidart, SW France) and comparaison with Tethys realm

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At the Bidart section, the extinction rate at the K/Pg boundary reach about 95 % of the planktic foraminiferal species; whereas the Cretaceous survivors persisting along the Danian could be restricted to opportunist species as G. cretacea and G. cf. trifolia, and probably some generalist species of Hedbergella and Heterohelix. The Guembelitria cretacea species, present a biostratigraphical interest, and define the Guembelitria cretacea biozone of the lower Danian interval.

This biozone is marked by the presence of Guembelitria cretacea, G. trifolia, Hedbergella holmdelensis, H. monmouthensis, Heterohelix punctulata, H. glabrans, H. labellosa, H. planata, H. pulchra, H. globulosa, and H. navarroensis.

The ecological opportunist or disaster species Guembelitria cretacea (>63 μm) is present in very low frequencies (<2.5%) in late Maastrichtian faunal assemblages of normal open marine environments in the Bidart section but more abundant at the lower Danian Gt. Cretacea biozone.

During this early Danian biozone (Gt. cretacea and Pv. eugubina zone), the relative abundance of Guembelitria increased. They reached about 40%. This high Guembelitria abundance compared with the frequencies of the other species at the lower Danian of Bidart section is marked-contrasts with the very high abundances (80%) generally found in the basal Danian throughout the Tethys (El Kef GSSP and Ellès sections in Tunisia). There are several possible explanations for this difference of abundance of the Guembelitria genera in the Bidart section: this section located at the Atlantic realm, represents a post-K/Pg environment with less biotic stress than observed throughout the Tethys realm. Consequently, the Guembelitria blooming at the lower Danian is related to two conditions: the post K/Pg environment stress conditions throughout the Tethys, the Atlantic or the Antarctic realm and the biozone thickness related to the sedimentation rate deposits. Therefore, these taxa were really survivors and could play a significant role in the phylogeny of the pioneer Danian taxa. They were opportunists adapted to environmental stress conditions and provided species that thrived during the K/Pg boundary event. Moreover, Guembelitria species were the only long-term Cretaceous survivors. This disaster opportunist is adapted to stress ecological conditions. This Guembelitria blooming was compensed by Heterohelix decrease which did not exceed 10 % in the lower Danian biozone. Such a Heterohelix decrease was also observed at the El Kef and Ellès sections, Agost section and Caravaca sections (Spain).

Like the guembelitrids, the hedbergellids species and perhaps few heterohelicids could be possible survivors.