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Recovery of the benthos after the Cretaceous/Paleogene boundary event: the benthic foraminiferal record from the Loya section (Basque-Cantabric basin)

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Upper Cretaceous and Lower Paleogene sediments are well exposed at Loya section (Loya Bay, SW France), and constist of a deep-water grey to reddish marly sequence that becomes more calcareous towards the Danian. The Cretaceous/Paleogene (K/Pg) boundary is located at the base of a 5-cm-thick grey clay layer (commonly known as the boundary clay layer) that contains an anomalous concentration in iridium. Benthic foraminifera are abundant and well preserved throughout the section, and are an important tool to infer the paleoenvironmental turnover across the K/Pg boundary impact event. In order to determine the paleoenvironmental consequences of such an event, we analysed the benthic foraminiferal turnover across the K/Pg boundary, especially the pattern of recovery just after the boundary.

Benthic foraminiferal assemblages indicate mesotrophic conditions during the uppermost Maastrichtian and a strong decrease in the food supply to the sea floor in coincidence with the K/Pg boundary, as indicated by a sudden drop in the percentage of infaunal morphogroups and in the diversity of the assemblages. This drastic change in the trophic regime has been related to the collapse of the food web, which was triggered by the mass extinction of calcareous primary producers in coindicence with the K/Pg boundary. Samples from the boundary clay layer contain high percentages of opportunistic taxa that indicate stressful conditions during the lowermost Danian, probably due to the fact that primary productivity was dominated by blooms of non-calcareous primary producers. The recovery of the benthic foraminiferal assemblages through the lower Danian may be linked to the recovery of primary producers, as documented in other sections from the Basque-Cantabric basin (e.g., Bidart section) and from Southeastern Spain (e.g., Agost section). These similarities suggest a unique

cause of the faunal changes, which are compatible with an asteroid impact occurred at the K/Pg boundary.