



New $^{40}\text{Ar}/^{39}\text{Ar}$ and planktonic foraminiferal dating prove a KPB age for the Chicxulub-linked spherule bed at Gorgonilla Island, Pacific of Colombia

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Bathyal sediments previously dated biostratigraphically to approximately Cretaceous-Paleogene boundary (KPB) age at Gorgonilla, Colombia, include a 20 mm-thick bed composed almost exclusively of glassy spherules (Bermudez et al., 2016). The spherule bed displays clear normal grain size sorting indicating settling from the water column with minimal subsequent disturbance.

Local soft-sediment deformation and some post-depositional faulting are evident, but the relationship of the spherule bed to surrounding sediments is unambiguous. The stratigraphic position of the Gorgonilla spherule bed coupled with preliminary biostratigraphic and geochemical data (Bermudez et al., 2016) suggest that these spherules are correlative with those found in many circum-Caribbean locations closely associated with the KPB and ascribed to impact melt produced by the Chicxulub impact.

For micropaleontological analysis, 73 disaggregated samples were studied. Planktonic foraminifers are absent in Cretaceous deposits, except for scarce specimens identified in two samples, which includes the Maastrichtian index-species *Pseudoguembelina palpebra*. Planktonic foraminifers are more abundant in the first Danian meter above the spherule bed, whose assemblages belong to the Zone P α (basal Danian). The first Danian biozone (Zone P0) is absent, suggesting a small hiatus of no more than 10 kyr (Arenillas et al., 2006).

To test whether the Gorgonilla spherules are Chicxulub-derived tektites, we employed $^{40}\text{Ar}/^{39}\text{Ar}$ methods to date them. Incremental heating of 25 individual spherules in 9 to 15 steps yielded plateau ages for all spherules, with 19/25 yielding 100% concordant plateaux and the remainder comprising >85% of the ^{39}Ar released. The weighted mean of all plateau ages is 66.051 ± 0.031 Ma (1 sd, analytical uncertainties only). This age is indistinguishable from that (66.038 ± 0.025 Ma) determined by three independent $^{40}\text{Ar}/^{39}\text{Ar}$ studies of the Haitian tektites, and from the age (66.043 ± 0.010 Ma) of the KPB (Renne et al., 2013). Thus we conclude that the Gorgonilla spherules are tektites produced by the Chicxulub impact at the KPB.



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