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## Carbon and nitrogen isotope stratigraphy of the Cambrian SPICE record in the UK

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Carbon isotope fluctuations have been determined globally within the late Cambrian with particular focus on the Steptoean Positive Carbon Isotope Excursion (SPICE) and the negative Hellnmaria-Red Tops Boundary/Top of the Cambrian Excursion (HERB/TOCE). These events correspond to global anoxia/euxinia, increased global weathering of organic rich material and a shift in dissolved inorganic carbon availability. We have extended our knowledge of SPICE and HERB/TOCE in the UK by conducting coupled carbon and nitrogen isotope analysis of cores (Merevale 1, 3) and quarry samples from Warwickshire (Oldbury Quarry). Our organic  $\delta^{13}\text{C}$  record replicates the changes previously published for SPICE in other global records. The bulk sediment  $\delta^{15}\text{N}$  record reveals a rapid positive excursion at the start of SPICE followed by a gradual decline through the remaining SPICE interval. We interpret the  $\delta^{15}\text{N}$  record as reflecting expansion of the oxygen minimum zone into the upper water column and replacing nitrification with denitrification processes. Denitrification is also supported during the SPICE interval from previously published iron-speciation data from the same cores. The negative  $\delta^{13}\text{C}$  HERB/TOCE record is coupled with a more subtle  $\delta^{15}\text{N}$  positive excursion. There is a paucity of organic carbon isotope records through this time interval, and hence a lack of global comparability is possible. The shift in  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ , coupled with changes in redox conditions in Cambrian oceans may also reflect biological shifts between red and green phytoplankton superfamilies making up the upper water column community. Additional research on organic carbon, nitrogen and redox proxies are required to ascertain the link between phytoplankton superfamily dominance, species richness, diversity and/or the onset of the Phytoplankton Revolution and the Great Ordovician Biodiversity Event.