German-Chinese Research Co-operation 1: Environmental changes across the Precambrian/Cambrian boundary

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Summary

The Precambrian-Cambrian transition is a key period to understand the evolution of life and its relationship to biogeochemical changes. Widespread ocean anoxia has been suggested as a contemporaneous global phenomenon at the Precambrian-Cambrian boundary. Our new geochronological data on lowermost Cambrian ash beds within a black shale succession on the Yangtze Platform of China indicate that the fundamental changes in the evolution of life at the Precambrian-Cambrian boundary preceded a global ocean anoxia event and thus cannot be the consequence of a proposed change in world ocean circulation patterns at that time. Organic molecular geochemical and isotopic studies conducted on the hosting black shale units provide information on the source of the abundant carbonaceous matter in the black shales. The origin of extreme metal enrichments locally associated with the black shale deposits have been a matter of controversy. This study also aims at contribution towards solving this conflict. In particular, the possible role of volcanism activity having contributed towards the anomalous enrichment in platinum-group-elements is being evaluated.

Publications

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