CALCIFIED CYANOBACTERIA FOSSILS FROM THE MICROBIALITIC BIOHERMS IN CAMBRIAN SERIES 3 AND FURONGIAN OF SHANXI PROVINCE, NORTH CHINA PLATFORM

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Abstract

This study examines the sedimentary features of the fossilized calcimicrobes and the development of the microbialitic bioherms in response to relative sea-level changes within Series 3 Gushan Formation and Furongian Changshan and Fengshan formations. Abundant *Lithocodium* fossils developed in the ground mass of micrite and microspar in Gushan Formation of Cambrian Series 3, which constitute the major composition of the bioherms. The Furongian bioherms developed as dense undifferentiated microbial boundstones known as leiolites in response to forced regression during third-order relative sea level fall. These bioherms have well-preserved calcified cyanobacteria fossils of *Epiphyton*, *Girvanella* and *Renalcis*, which define the recovery phase of microbial carbonate and the first episode of cyanobacteria calcification event during the Phanerozoic in the absence of metazoans reef builders. The fossilized calcimicrobes are the calcification product of the cyanobacteria dominated microbial mats, which provide a clue of microbial activities and show that the microbialitic bioherms might be a product of the cyanobacterial refined precipitation together with other calcimicrobes. The presence of chambered-shaped *Epiphyton* thalli from Furongian bioherms in the North China Platform refutes the theory of *Epiphyton* extinction at the end of Cambrian series 3. This study offers significant implications towards the features associated to the sedimentation pattern in the shallow skeleton-deficient sea during Furongian before the metazoan radiation of the Middle Ordovician. The sedimentary composition and particular sequence stratigraphic position of the microbialitic bioherms from Series 3 and Furongian series of Shanxi Province provide significant information for the future understanding of the formation mechanism of bioherms during "the first episode of the Cyanobacteria Calcification Events in the Phanerozoic" or "a resuscitate period of microbial carbonate from Cambrian to the Early Ordovician".