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Research of Precambrian silicified spheroidal fossils' preservation mechanism: fish egg silicified simulation experimental taphonomy

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Abstract

Silicified spheroidal fossils have been found in the Ediacaran Doushantuo Formation in South China. Their organic material was exceptionally well-preserved, thus important to understanding early biological evolution. But the preservation mechanism of the silicified spheroidal fossils was unclear. As a result, research on the preservation mechanism at primal mineralization process was necessary. For this paper, *Megalobrama amlycephala* eggs were inserted into jars with different silicified concentration solutions. The eggs were immersed in the concentrated solutions for a period of two weeks and were removed afterwards for observation. Once extracted, the fish eggs were found to be separated into various shapes and sizes and rapidly preserved. The experiment showed that the metasomatism and coating were two different kinds of preservation. Upon closer examination of the fish eggs, not all the nuclei were silicified. Additionally, the surface of these eggs was covered by specks of tiny mineral crystals, particularly a tiny mineral that grew vertically in a special form of special biological texture. These tiny minerals helped protect the egg framework and preserved the delicate surface ornamentation. The taphonomy experiment had an important impact and was beneficial to learn more about silicified spheroidal fossils.

Keywords: experimental taphonomy; Precambrian silicified spheroidal fossil; fish eggs; preservation mechanism

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