

The Orsten-type Fossils of Possible Arthropoda Eggs and Larvae Preserved in a Neoproterozoic black Phosphorite, in South China

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Multi-cellular and complex life and animals with skeletons have diversified in the Ediacaran time. Although there are many reports of Ediacaran fossils, their biological interpretation remains controversial. The study of haemoglobin sequences, DNA molecular-clock analyses and biomarkers suggests that metazoan diversification had already occurred in the Late Neoproterozoic. Recently, many geologists and biologists have been attracted to the phosphatized embryos from the Late Neoproterozoic which preserve the earliest stages of embryology of metazoans. However, the phylogenetic relationships of these fossils remain controversial because they are too simple in form to convey significant morphological information. Here we report new phosphatized eggs and the larvae of early Arthropoda preserved in the lower black facies of the phosphorite deposited in the Doushantuo Formation (575 Ma) in Weng'an of the Guizhou province, South China. Compare with the microfossils reported before, our fossils are small (about 100 μ m in diameter) and intriguing because both the pre-hatching stages and larva stages of embryology of animals were conserved perfectly. Especially, the head, segments with appendages and alimentary canal or coelom were preserved in the larva stages of embryology of animals. The fossils share a number of characteristics with the Arthropoda, including head with mouth and eyes, segments with appendages and digestive tube through body. Three-dimensional visualizations of embryos from pre-hatching stage to larvae stage not only resolve outstanding questions about the the phylogenetic relationships of the phosphatized embryos from the late Neoproterozoic but also provide insight into the diversification of Arthropoda.

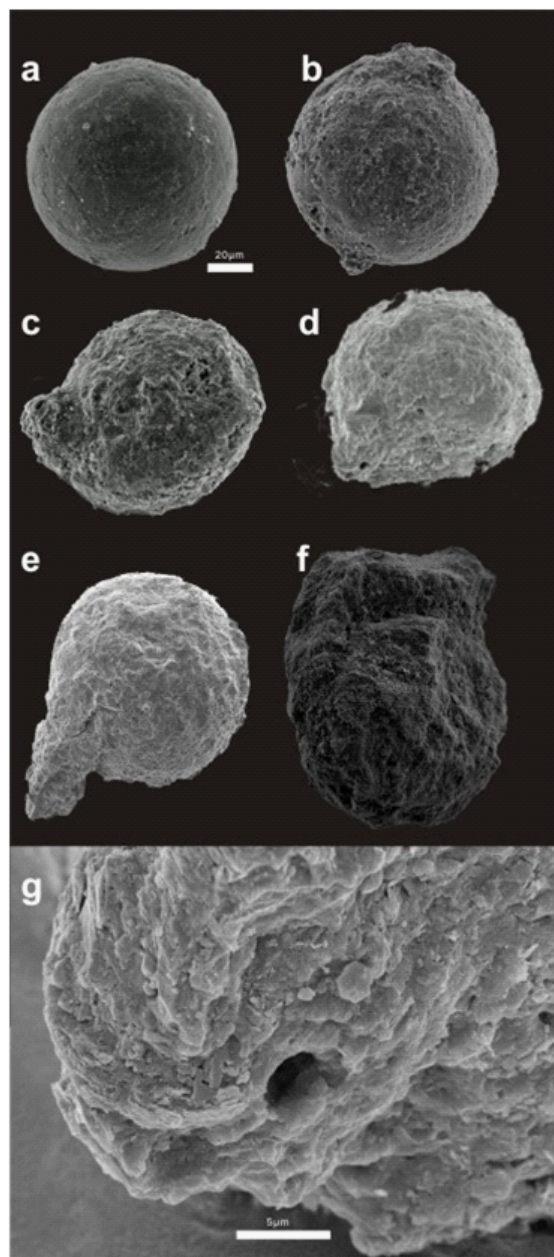


Fig. phosphatized embryos and larvae from the Ediacaran Doushantuo Formation in Weng'an, Guizhou, southern China. (a) Complete embryo with the outermost smooth thin shell layer. (b and c) The elongated embryo with a tuber in organogenesis stage. (d) The pre-hatching of embryo with head and eye. (e) The pre-hatching of embryo with one part of larva body. (f) A hatched larva body and its shell. (g) Detail of (d), showing the head of the larva with mouth and eye.

次回のお知らせ

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