

Abstract

Paleontologist, geologists and biologists use fossil records to learn about the past history of the earth. Through fossils, we gain the knowledge of the biodiversity and geological processes which still continue today.

Fossils from the Precambrian phosphorite rocks of the Doushantuo Formation in Southwest China have an age of ~580 million years ago. Analysis of the preservation of the fossils suggests that creatures were buried alive by catastrophic sediment incursions. Since the preservation of the morphological details of the soft tissues is so well, it triggers our interests in deciphering the mechanism of fossilization. We selected the *Xenopus laevis* oocytes as the subject in the study of mineralization simulation experiments.

Based on the theory in Taphonomy, we tried to create a sedimentary system in laboratory of different conditions, including temperatures, pH and time scales, in order to approach the situation which came extensive mineralization inside the oocytes. The results indicated the importance of cell membrane permeability in introducing sufficient minerals into the oocytes to protect the soft tissues.

Calcium phosphate usually involves in preservation of spectacular three-dimensional details of soft tissues. We also tried to demonstrate whether repeated sedimentation processes could increase the amount of crystals and lead to a higher preservation potential. The results showed that the content of crystals increased dramatically through the process. We suggest that the formation of Wengan fossils may be either the consequences of bio-permeability alternation, or evidences remaining in highly condensed and reworked deposits on ancient phosphorite rocks.