

Soft tissue and protein fragments in dinosaur fossils – facts, interpretations and open questions

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Fossils are excavated hints of organisms which lived in the past. They open a window to the history of the earth. Therefore dinosaurs are very popular examples.

Dying organisms generally decay on a short timescale and no sign of their existence is left. In certain circumstances organisms sometimes are buried in sediments, isolated from decaying processes and fossilized. That means, some structures are conserved.

In 2005 a team of paleontologists led by Mary Schweitzer published a paper about the recovery of flexible soft tissue, parts of vascular systems from fossils of a dinosaur. Later chemical structures from proteins like collagen were analysed. They had been isolated from dinosaur fossils. Radiometric dating of the fossil deposit gave an age of tenth of millions of years. Scientists started an intensive and controversial discussion. In the laboratory proteins are labile and decay by hydrolysis and other break down processes. No one expected to find parts of bio-macromolecules in fossils of the indicated age.

Today the results are reproduced on the same fossils and on other ones by different working groups but the discussions are still going on. Critics remind on the danger of contamination in the field and the laboratory. But there is good evidence for the hypothesis of endogenic protein fragments in dinosaur fossils.

But mechanisms for the conservation of the labile bio-macromolecules are still missing! Most scientists are speculating about unknown chemical processes for conservation. The idea that radiometric dating doesn't result in legal years may also lead to a possible explanation for the conservation of flexible soft tissue and fragments of proteins: compression of time! Maybe the fossils are not millions of years old but in fact a few thousand years.