

Sulfur sedimentary processes and fossilization

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Fossils are unique witnesses of ancient organisms, opening windows into the diversity of ancient life on Earth. Involved into both organic and inorganic preservation of organisms, sulfur is a key element in fossilization. Replication in pyrite (FeS_2) is a common process of mineralization; in addition, the organic matter of carcasses can be sulfurized, increasing the preservation potential of the molecules. However, the controls and mechanisms of these reactions are incompletely understood. To address this issue, we experimentally degrade crustacean in various controlled laboratory conditions during several months. Preliminary experiments have shown that sulfates initially present in the water are effectively consumed by sulfato-reducing microorganisms within a few weeks, while sulfur content increases within the sediment. Py-GC-MS, performed on untreated and decayed crustaceans, evidences some structural modifications. Differences in sulfur distribution were imaged through SEM-EDS. For comparison, fossil crustaceans will also be analyzed to compare the results with the fossil record, so as to obtain a comprehensive view of the organic and mineralogical modifications.

Sulfur content obtained after 2 and 5 weeks of decay

