EGU Galileo Conferences
GC5-Mass-46, 2019
Mass extinctions, recovery and resilience

Archives from the past: characterization of oolites deposited in the early aftermath of mass extinctions

Ingrid Urban and Sylvain Richoz
Department of Geology, Lund University, Lund, Sweden (ingrid.urban@geol.lu.se)

Ooids were intensively investigated both petrographically and sedimentologically in the past decades; but only recently, scientists concentrated on their potentialities as archives for the original chemical composition of the oceans where they formed. The deposition of ooids is atypically high in the direct aftermath of major and minor extinction events occurring during the evolution of Life. We used a morphological and geochemical approach to better understand peculiar seawater chemistry just after major biodiversity breakdowns, in particular the end-Permian and end-Triassic mass extinctions, and two Silurian events (Mulde and Lau events). Here, I will present the first results from an end-Triassic section from the Emirates and four end-Permian sections from Italy. Petrographic analyses provided a detailed morphological classification of coated grains. FE-SE-EDX imaging unraveled peculiar μm-scale features linked to diagenetic processes and microbial interaction in the cortex. LA-ICP-MS analyses were performed for specific major and trace elements. Post-extinction oolites show high variability in size and development of the cortex. They range from small ($\sim$ 300 μm) and superficial coating, to bigger (up to 800 μm) and well developed. The degree of micritization highlights different oxic conditions in the diagenetic environment. Moreover, LA-ICP-MS analyses give insights into seawater redox conditions during ooids formation, siliciclastic contamination and the role of bacterial strain in shaping the ooids. These first observations look promising to understand why oolites were so widespread in this geological context and to trace back some of the active factors during mass-extinction events.