Geophysical Research Abstracts
Vol. 20, EGU2018-7078, 2018
EGU General Assembly 2018

Ichnological analysis in suevite of IODP-ICDP Expedition 364 (Site M0077): assessing macrobenthic community before K-Pg impact event

Francisco Javier Rodriguez Tovar (1), Jens Ormö (2), Joanna Morgan (3), Sean Gulick (4), Michael Whalen (5), Heather Jones (6), Chris Lowery (7), and Jan Smit (8)

(1) University of Granada, Stratigraphy and Palaeontology, Granada, Spain (fjrtovar@ugr.es), (2) Centro de Astrobiologia INTA-CSIC, Torrejon de Ardoz, 28850, Spain, (3) Department of Earth Science and Engineering, Imperial College London, SW7 2AZ, UK, (4) Institute for Geophysics, Jackson School of Geosciences, University of Texas at Austin, TX 78758-4445, USA, (5) Department of Geosciences, University of Alaska Fairbanks, Fairbanks, AK, 99775, (6) Department of Geosciences, The Pennsylvania State University, USA, (7) Institute for Geophysics - Jackson School of Geosciences, University of Texas at Austin, 10100 Burnet Rd., Bldg 196, R2200, Austin, TX 78758-4445, (8) Faculty of Sciences, Vrije Universiteit Amsterdam, De Boelelaan 1085, Amsterdam, 1081 HV, Netherlands

Suevites observed in craters worldwide offer significant information about cratering processes and pre- and post-impact conditions. However, the fossil record included in suevites is comparatively scarce, and consequently paleontological studies are limited. This scarcity is especially relevant with respect to the ichnological information; to our knowledge, there are no detailed reports of trace fossils in suevitic material anywhere, other than sparce general information on bioturbation. Yet the ichnological record could prove useful in documenting pre-impact ecosystems if the suevite contains sedimentary clasts in which trace fossils can be recognized. Ichnological data have proven to be a proxy in the interpretation of major environmental changes associated with bio-events, such as those of the K/Pg boundary.

From April to May 2016, the joint International Ocean Discovery Program (IODP)/International Continental scientific Drilling Program (ICDP) Expedition 364 recovered around 829 m of core, between 505.70 and 1334.69 mbsf (meters below the sea floor). A ∼130m interval, between 617 and 747 mbsf (meters below the sea floor) of suevite and impact melt rock was recovered. The so-called Unit 2 of this suevite is a ∼104 m thick (617.33 mbsf to 721.61 mbsf) and composed of melt clasts and lithic fragments deom both the lower crystalline and upper sedimentary target. Sedimentary lithologies in the suevite include fine- to coarse-grained carbonates, chert (in many cases visibly associated with and derived from the carbonates), and red siltstone.

Unit 2 has here been studied for ichnological features through a detailed visual examination of digital images, including Core overview, Line Scan, and CT (CT, CTA, and CTD) images, using a high-resolution digital image treatment. Ichnological analysis reveals the presence of numerous burrowed clasts, allowing differentiation of biogenic sedimentary structures and bioerosion structures. Biogenic sedimentary structures are quite common and relatively diverse, of which the most abundant trace fossil is Planolites, but other ichnotaxa such as Asterosoma, Chondrites and Teichichnus have been locally observed. Some traces can be assigned to bioerosion, e.g. Gastrochaenolites-like structures.

A high diversity in the trace fossil assemblage may be associated with paleoenvironmental conditions favorable for a trace maker community at pre-impact times, here related to environmental diversity. The obtained ichnological information may open up new aspects in the study of suevites, providing new data for the analysis of the impact event.