8th International Meeting on Taphonomy and Fossilization

14-17 September 2017

Vienna, Austria

Programme and Abstracts

Editors: Martin Zuschin, Mathias Harzhauser & Susanne Mayrhofer

Taphonomy of brittle stars associated with a tempestite bed from the Lower Cretaceous Agrio Formation of the Neuquén Basin, west-central Argentina

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Exceptionally preserved brittle stars have been recently recorded from the Agrio Formation, Neuquén Basin, west-central Argentina. This basin extends between 32º and 40º S in the Andes foothills of west-central Argentina, covering more than 120.000 km^2 of surface and comprising a continuous Latest Triassic to Early Tertiary sedimentary succession. It holds one of the most complete records of Jurassic and Cretaceous marine invertebrates of South America. The studied ophiuroid specimens were recorded from a single stratigraphic level of the Pilmatué Member, and dated as early Hauterivian age, based on associated ammonoids. The unit has been interpreted as deposited in a mixed clastic-carbonate, storm-influenced shallow-marine setting and has a highly abundant and diverse fossil content including nannofossils, microfossils, palynomorphs and marine invertebrates and reptiles, but extremely scarce echinoderm records except for irregular echinoids, which are locally abundant. The ophiuroids belong to a monotypic association of *Eozonella* sp., which was a widespread group on the continental shelves from the Middle Jurassic to the Early Cretaceous. Specimens are placed at, or near, the base of a single tempestite sandstone bed (up to 5 cm thick), likely deposited in a proximal offshore setting. Two sandstone samples were collected for study and named A and B. Sandstone Sample A includes 6 articulated specimens, while sample B includes 3 articulated ones. Five of them are oriented oral side up while the remaining 4 are placed oral side down. There are also dispersed fragments of arms and isolated ossicles among the mentioned specimens. Dispersed small isolated bivalve shells are also recorded in the same bed in convex-up orientation. Based on thaphonomic evidence, the ophiuroids underwent in situ storm reworking while alive, and were rapidly (and permanently) buried during subsequent sand accumulation. In modern settings brittle stars typically disarticulate shortly after death due to decay of the connecting soft tissues, and thus they are only occasionally preserved articulated in the fossil record. This present finding is key to characterize the taphonomy of asterozoans associated to storm beds, but also provides an insight into Early Cretaceous ophiuroid paleoecology and evolution in the Southeastern Pacific.