

7th International Symposium on the Cretaceous

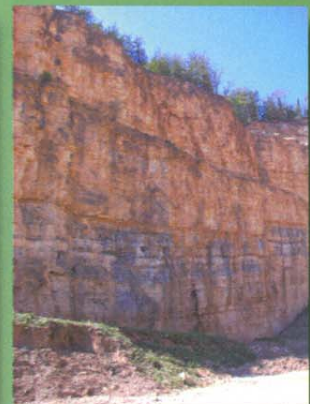
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Conveners: Karl B. Föllmi and Thierry Adatte

Scientific Program and Abstracts

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Cretaceous Hell Creek Formation in the Williston Basin (Montana and North Dakota, USA) is known for its high taxonomic diversity and high morphological disparity. Up to now, more than 20 species are described. These species cover the whole morphospace from trigonal to elongate shell outlines and sculptured to unsculptured shells. In addition, unionoid bivalves are very abundant and very well preserved. To date, altogether 180 shellbeds are known, yielding many thousands of gastropods and mussels. All these traits and conditions makes them suitable for quantitative studies of palaeoecology. Presence-absence and abundance data of species, shell morphology, and sedimentological data are analysed in order to provide a more detailed palaeoenvironmental reconstruction of the Williston Basin during the Maastrichtian (Lancian North American Land Mammal Age). The analysis of shell morphology was conducted using elliptical Fourier analysis of the entire shell outline of the bivalves. Multivariate methods such as principal component analysis, hierarchical cluster analysis, and discriminant function analysis were applied to all data.

Two faunal assemblages can be separated in the Hell Creek Formation. Both assemblages differ significantly in taxonomic diversity and morphological disparity. The *Proparreyisia* assemblage is characterized by 19 species, including all trigonal and many elongate morphotypes, together with all sculptured morphotypes. The three species of the *Pleurobema* assemblage are all characterised by elongate and smooth shells. Both assemblages, which are predominantly preserved in crevasse splay deposits, have only one species in common. This is the only species, which is considered as autochthonous for the lacustrine setting where the crevasse splays were deposited. All other species are transported from riverine habitats, as concluded from the analyses of their shell morphology. These riverine habitats are in the midreach of a palaeodrainage system draining the early phase of the Laramide uplift into the Western Interior Seaway. The Hell Creek Formation represents the deposits of that palaeodrainage system, which is considered to be a meandering river system with different orders of channels, tributaries, oxbow lakes, and ponds. The long-term stability of that ecosystem during the Lancian and the high habitat heterogeneity are considered as mainly responsible for the high taxonomic diversity and high morphological disparity of the unionoid bivalves of the Hell Creek Formation.

NORTH AMERICA IN THE LATE CRETACEOUS: UNIONOID BIVALVES AS PALAEOENVIRONMENTAL INDICATORS

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The unionoid bivalve fauna of the Upper