

Interpreting the last molluscan Unionoidea from the Cretaceous of North Dakota

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Arguably, the best-sampled and constrained Cretaceous-Paleogene (K/P) continental mollusk-bearing strata anywhere are in the Williston Basin of Montana and North Dakota. Even so, few unionoid mussels are known within a few meters below or tens of meters above the K/P boundary. The Hartman base-level change hypothesis is that sedimentological conditions changed decidedly prior to the K/P boundary and persisted into the Paleocene. A corollary to this hypothesis is the loss of highly sculptured continental taxa just prior to the K/P impact event, thus contradicting the likely survival of unionoids according to the Robertson et al. sheltering hypothesis. A low-diversity assemblage (Locality L6516, Section M8608) dominated by anodontine unionoids and a Viviparidae species is documented in a 7-cm-thick layer, 90.5 cm above the base of the Ludlow Member (Fort Union Formation) and 63 cm below the K/P boundary (identified on the basis of a well-preserved and diverse suite of angiosperm pollen). Extant anodontines are thin-shelled and most often found in shallow, quiet-water environments. L6516 mussels are preserved as external molds in pale yellowish-brown (10 YR 6/2) silty, very fine-grained sandstone, rich in plant debris. Most are found with their valves closed or in butterfly-open position, indicating that subsequent transport was limited to nonturbulent conditions. This locality raises specific questions: 1) Is this type of preservation more common than previously suspected? Can anodontine or other mussels be located by a systematic search of specific likely lithologies? and 2) Does the presence of an anodontine morphology in this stratigraphic interval indicate a shift in depositional regime as expected by the base-level change hypothesis? The five described Late Cretaceous "*Anodonta*" taxa currently shed no light on the problem; they are without sedimentological context, and three are based on poor material. This record of interesting end-Cretaceous taxa raises far more questions than it answers.



**World Congress of Malacology
Antwerp, Belgium
15-20 July 2007**

ABSTRACTS

edited by

Kurt Jordaens, Natalie Van Houtte, Jackie Van Goethem & Thierry Backeljau

