

A new carpet shark from the Hell Creek Formation increases latest Cretaceous freshwater biodiversity

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Freshwater habitats during the Late Cretaceous were occupied by diverse vertebrate taxa including lissamphibians and varieties of bony fish. These habitats also contained an unappreciated number of sharks belonging to the Orectolobiformes. These sharks are generally small-bodied and have a complex dentition for feeding on a variety of prey. In recent years, extinct orectolobiform species have been identified in increasing numbers from continental deposits throughout western North America (KIRKLAND et al., 2013) including the Maastrichtian-aged Hell Creek Formation (COOK et al., 2014). The new species described here from the Sue locality—bringing the total species richness of orectolobiform sharks known from the Hell Creek Formation to four—is diagnosed currently with 11 traits observed on 24 teeth from throughout the dental row. Of the four autapomorphies identified, the most apparent is a large swelling on the lingual tooth crown that forms a constricted neck at the crown-root interface. Other unique features include labial crown ornamentation, angulation of the medial and distal heels, as well as morphology of the central basal foramen.

This collection of teeth may represent the most complete orectolobiform dentition collected from North America. Even though our dental suite is not articulated, it seems likely that they derive from a single individual because all teeth are quite similar in size, represent teeth from across the jaw, and none of the other orectolobiform species known from the Hell Creek Formation are present in the collection from this site. Flooding of North America by the warm Western Interior Seaway provided an ideal environment for the diversification of orectolobiform species, especially those tolerant of estuarine to completely freshwater habitats. Given the abundance of such fossiliferous units in the Late Cretaceous of North America, the diversity of carpet sharks will likely grow allowing studies of phylogenetics and evolutionary diversification.

COOK, T.D. et al., 2014. In: HARTMAN, J. et al. (Eds.), *The Hell Creek Formation and the Cretaceous-Tertiary Boundary in the Northern Great Plains*, 229–246.

KIRKLAND, J.I. et al., 2013. In: TITUS, A.L. et al. (Eds.), *At the Top of the Grand Staircase: The Late Cretaceous of Southern Utah*, 153–194.