ABSTRACT

Outcrops of the Hell Creek Formation are exposed in the Little Missouri River Valley in southwestern North Dakota. The Hell Creek Formation in this area records the last two million years of the Cretaceous (latest Maastrichtian). A high-resolution stratigraphic and paleontologic framework of these fluvial deposits has been developed (Fastovsky, 1987; Hunter and Pearson, 1996; Johnson, 1992; Johnson et al., 2000; Pearson et al., 2001). This particular project reports on the small theropod dinosaur assemblage from these deposits, based on isolated teeth collected from microvertebrate sites. Theropod teeth were found by the second author by surface collecting (and screening one site) 20 microvertebrate sites at multiple stratigraphic levels from the Hell Creek Formation. All fossils are curated and repositioned in the Pioneer Trails Regional Museum. The sampled sites span the entire section exposed in the area and all sites have been measured to the palynologically-defined Cretaceous/Tertiary boundary (Pearson et al., 2001).

A total of 144 small theropod teeth were identified from the 20 sites. The assemblage includes 65 (45%) *Richardoestesia isosceles* Sankey (2001), 45 (31%) dromaeosaurs and undetermined teeth, 17 (12%) *R. cf. R. gilmorei*, 13 (9%) *Paronychodon*, 5 (3%) bird, and 2 (1%) troodontids. The taxonomy of late Maastrichtian theropod teeth has received less attention (ie Estes, 1964) than those from the late Campanian (Currie et al., 1990; Baszio, 1997; Sankey and Brinkman, 2000), so better identifications, especially of the dromaeosaurs, is in progress. Tyrannosaurs and caenagnathids (toothless theropods) were not included in this study, but are present in the fauna. Also, because these are surface collections and not screened (with one exception), teeth from bird and small *R. gilmorei* and troodontids are under-sampled. However, several interesting patterns are apparent. 1) Baszio (1997) found that *Richardoestesia* sp. (= *R. isosceles*) is rare (less than 5%) in most Late Cretaceous (Campanian and Maastrichtian) theropod assemblages. However, he
also found that *R. isosceles* had 45% relative abundance in the Lance Formation of Wyoming (correlative to the Hell Creek). *R. isosceles* was probably a fish-eater (Baszio, 1997; Sankey, 2001), so its high abundance in near coastal deposits like the Hell Creek and Lance Formations is not surprising. 2) The relative abundances of the other theropods in this Hell Creek assemblage also match those from the Lance (Baszio, 1997), especially in abundance of *Paronychodon* and rarity of troodontids. However, further taxonomic work on late Maastrichtian small theropod teeth, especially the dromaeosaurids, is necessary before detailed paleoecological patterns can be documented. 3) Within the sampled section, the abundance of theropods in relation to other microvertebrates could be calculated from eight sites. From these sites, theropods were 5% or less of the total assemblage. Low theropod relative abundance in these sites is due to high abundance of other vertebrates, especially fish. 4) Sample sizes are too small to determine if theropod relative abundances change within the sampled section. However, we plan to screen-wash multiple sites through out the section in order to study this.

REFERENCES CITED


