

PALEONTOLOGY OF THE MEDORA SITE (PALEOCENE: SENTINEL BUTTE FORMATION), BILLINGS COUNTY, NORTH DAKOTA

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The Medora site is located in highly dissected badland terrain on an isolated knoll about 3 km east of Medora, Billings County, North Dakota. Vertebrate, invertebrate, and trace fossils are entombed in a thin < 5 cm thick black to rust colored carbonaceous (lignitic) mudstone within the Paleocene Sentinel Butte Formation. The bone bed is 6.5 m above the top of a reddish clinker (HT Butte Bed) that marks the contact between the underlying Bullion Creek and Sentinel Butte Formations (Ft. Union Group).

Several thousand fossils of a diverse vertebrate fauna have been recovered through excavation and screen-washing of sediments. This fossil assemblage consists mostly of disarticulated remains, although two partial semi-articulated skeletons of *Champsosaurus gigas* have been recovered. Teeth, vertebrae, limb bones, and scutes of the crocodile *Borealosuchus* are abundant. Fossil size indicates that some of the crocodiles were large, perhaps up to about 4 m in length. Skull parts, teeth, spines, vertebrae, and scales document the presence of several fish taxa including bowfin (*Amia*), gar (*Lepisosteus*), and pike (*Esox*). Freshwater turtles, at least two species of birds, and the giant salamander *Piceorpeton* were also members of this freshwater community. Teeth and jaws of several species of mammals have also been collected at the site including *Titanoides*, *Neoplagiaulax*, and *Palaeoryctes cruoris*. Collectively these mammals indicate a Tiffanian (Ti₃) lineage zone for the site. Abundant crocodile and fish coprolites are also preserved. Freshwater bivalve and gastropod remains are found with the vertebrate fossils.

The sedimentology of the Medora site indicates initial deposition in a paludal environment that later became a ponded water habitat. Paleobotanical evidence from other nearby sites indicates that the setting was in a subtropical forest. Abundant bones and numerous, large, well preserved coprolites indicate that this was a feeding ground for crocodiles. Numerous depressions in the bone bed, interpreted to be crocodile foot prints, and broken bones in the site indicate that these large animals trampled and bioturbated the swampy area while scavenging for food.