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Paper No. 7-3

Presentation Time: 8:30 AM-4:30 PM

CLIMATIC AND PALEOENVIRONMENTAL CHANGES ASSOCIATED WITH THE EVOLUTION OF THE FIRST MAMMALIAN MEGAHERBIVORE *CORYPHODON* DURING PALEOGENE HYPERTHERMAL EVENTS, BIGHORN BASIN, WYOMING

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The terrestrial Carbon isotopic record has long been used for chemostratigraphic correlation, and to infer paleo-environmental information about terrestrial habitats during geologic history. Carbon isotope records aid in the identification and correlation of major biogeochemical events, commonly associated with massive climate changes, and help in reconstructing how organisms evolved and adapted during such events. One such event is the Paleocene-Eocene Thermal Maximum (PETM; approximately 55.5 Ma), an interval of abrupt and dramatic worldwide temperature increase of 5–8 °C, followed by a long-term warming trend that culminated with the Early Eocene Climatic Optimum. Among many biotic effects proposed as consequences of the Paleocene-Eocene climate change, dwarfing has been documented in one or more mammalian lineages. Such morphologic changes characterize warmer periods, and they have been demonstrated in the first mammalian megaheerbivore *Coryphodon*. *Coryphodon* is a large-bodied, semiaquatic animal known from thousands of specimens collected from Paleocene and Eocene strata across the northern hemisphere.

Although the trend in body size is documented, little is known about whether shifts in habitat preference accompanied the dwarfing events. The presence of a rich *Coryphodon* fossil record in the Bighorn Basin, WY, provided the opportunity to integrate carbon isotope data with mammalian body size changes. The basin is home to two key geologic units: the Fort Union (Paleocene) and Willwood (late Paleocene to early Eocene) Formations. Sediment samples (93) were collected from 14 stratigraphic columns that were trenched in the field. Carbon isotope samples were collected from all subfacies. The stratigraphic columns spanned 5 mammalian biozones (CF-2, CF-3, Wa-1, Wa-2, and Wa-3), and each profile focused on strata containing *Coryphodon* specimens. These biozones are known to span the PETM record and therefore should record the presence of dwarfism within the fossil record. Carbon isotopic analysis of the sediment samples is still ongoing, but we hypothesize that a prevalent excursion in the $\delta^{13}\text{C}$ record will confirm the presence of the PETM and help constrain the exact location of *Coryphodon* specimens relative to its onset.

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Ballroom A (Utah Valley Convention Center)

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