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Rocky Mountain Section - 72nd Annual Meeting - 2020

Paper No. 7-8

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

ESTIMATING THE MASS OF THE LARGE PALEOGENE MAMMAL *CORYPHODON* THROUGH PALEOGENE HYPERTHERMAL EVENTS

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Coryphodon is an abundant large-bodied Paleogene mammal with a holarctic distribution. It is among the first mammalian megaherbivores to evolve. Based on tooth area, it has been inferred that *Coryphodon* underwent dwarfing during the Eocene, similar to many other mammalian lineages. In this analysis, the hypothesized presence of dwarfing in *Coryphodon* is tested using a larger sample size of teeth and mass estimates based on limb bone circumferences. The original inference of dwarfing in *Coryphodon* was based on a small fraction of its available fossil record, which comprises thousands of specimens. These specimens were usually surface collected opportunistically rather than quarried and mostly consist of just one or a few limb elements or teeth. In order to incorporate more of the *Coryphodon* fossil record into a study of its body size evolution, we developed a large dataset of skeletal elements ($N > 1000$ specimens), collected from the Bighorn Basin and various institutions and museums. Regression models were then utilized to predict the size of missing elements to better estimate body mass. We found that limb bone circumferences can be readily predicted from articular end size and vice versa, that limb bone circumferences scale tightly with one another, and that tooth area underestimates body mass in *Coryphodon*. These results will allow us to estimate body mass in a prodigious sample of *Coryphodon*, which, coupled with new intensive fieldwork, will allow us to examine its body size evolution in fine stratigraphic resolution through the multiple hyperthermal events of the Paleogene.

Session No. 7--Booth# 44

[T17. Undergraduate Research II \(Posters\)](#)

Monday, 4 May 2020: 8:30 AM-4:30 PM

Ballroom A (Utah Valley Convention Center)

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