



# Morphology and ecology of *Meniscomys hippodus* based on an upper jaw from the John Day formation

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## Introduction

Aplodontiidae (mountain beavers) enjoyed a high level of diversity throughout North America, Europe, and Asia, particularly in the Oligocene and Miocene.<sup>2</sup>

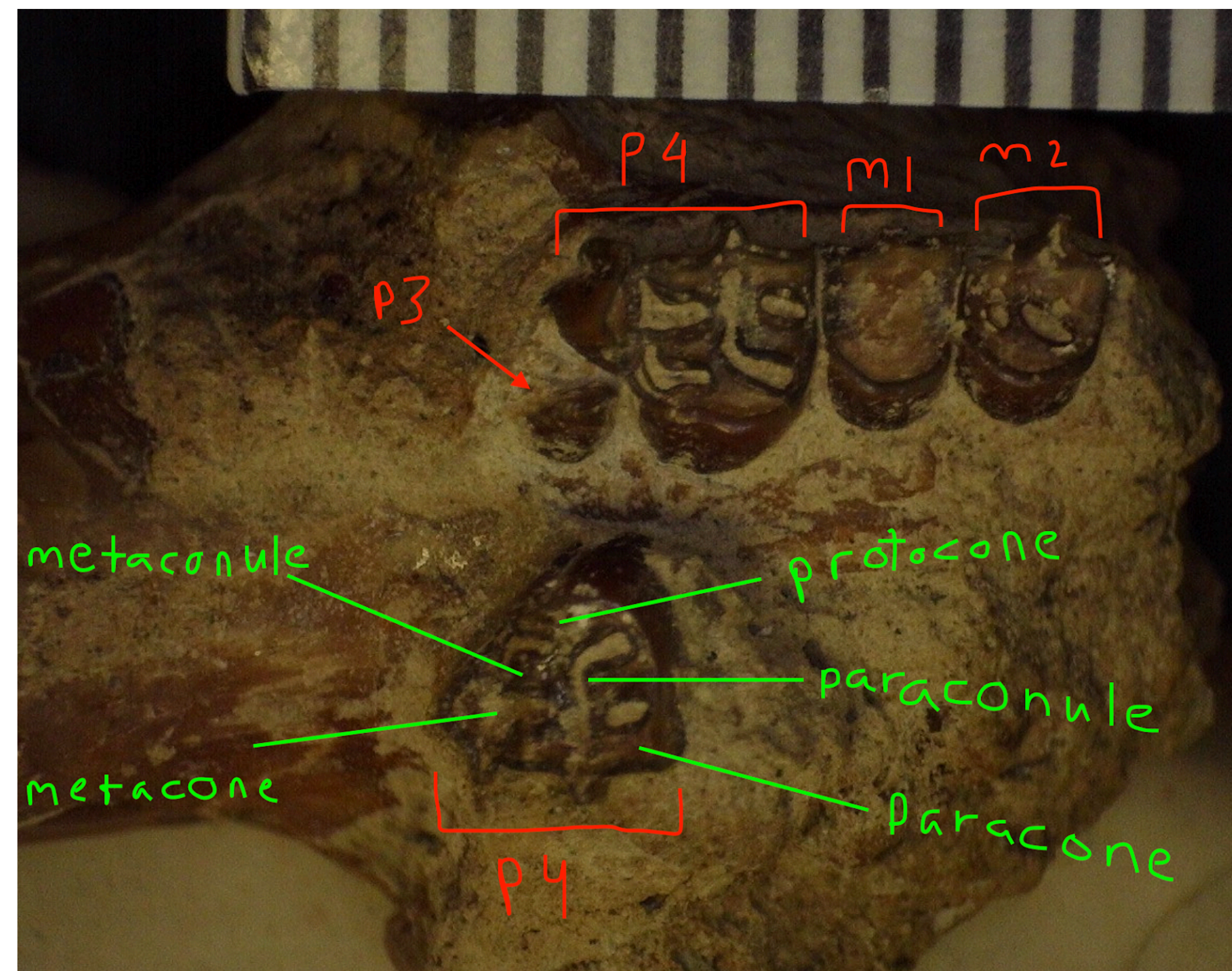
Considered to be one of the most primitive rodents alive, they often have tribosphenic molars, as well as an additional premolar not often seen in other rodents.

## Research Question

What is the systematic paleontology for the unidentified fossil, and what about the ecology of this specimen can be inferred from the tooth morphology?

## Methods

The specimen examined in this paper is an upper jaw of the member of the family Aplodontiidae, *Meniscomys hippodus*. Comparing this fossil to the descriptions of morphology provided in Rensberger (1983), allows for a diagnosis of genus and species.<sup>3</sup> Then, the morphology of the teeth of this skull are examined and identified in detail, and then analyzed to provide an ecological overview of this species.



## Results

Systematic Paleontology:

Kingdom Animalia

Phylum Chordata

Class Mammalia Linnaeus, 1758

Order Rodentia Bowdich, 1821

Family Aplodontiidae Brandt, 1855

Genus *Meniscomys* Cope, 1879

Species *hippodus* Cope, 1879

Extant (living) Aplodontiidae have a distinct projection on the cheek side of the molars and premolars. Their teeth are high-crowned, and possess two premolars on the upper jaw, rather than the one that is present in most extant rodents. *Meniscomys* genus is more crested than others of Aplodontiidae, and possesses a 4<sup>th</sup> premolar that is significantly larger than their 1<sup>st</sup> molar.<sup>2</sup> The species has an intermediary cusp height between two other species in the genus, *Meniscomys editus* and *Meniscomys uhtoffi*.<sup>3</sup>

## Conclusions

Based on location and geologic range, this specimen is likely from the Middle-Late Oligocene. It is likely an adult, because its crown height is fairly high and the enamel is worn down to the dentine.

This specimen likely had an entirely herbivorous diet. The worn-down enamel indicates that this species grinded down plant matter, and over time this wore down its teeth. This species most likely lived in a forested area. Extant Aplodontiidae live in forested areas, and the John Day formation represents a time when forests were still dominant.<sup>1</sup>

With only one extant species, Aplodontiidae provide a lens through which the steps of rodent evolution can be seen, as they contain many primitive features associated with early rodent evolution.

## References

- <sup>1</sup> Famoso, N.A. 2017. John Day Fossil Beds National Monument Paleontology and Geology Summary.
- <sup>2</sup> Hopkins, S.S.B. 2006. Morphology of the skull in *Meniscomys* from the John Day Formation of central Oregon. *PaleoBios* 26:1-9.
- <sup>3</sup> Rensberger, J.M. 1983. Successions of meniscomyine and allomyine rodents (Aplodontiidae) in the Oligo-Miocene John Day Formation. *University of California Publications in Geological Sciences* 124:1-157.

## Acknowledgments

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