Prehistoric Mountain Beaver Identification From Eastern Oregon

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Introduction

The Oligocene was filled with diverse mammal life, including rodents, which began to diversify, especially in the Aplodontiidae family. The Aplodontiidae family is primarily made of Prosciurinae, Ansomyinae, Allomyinae, Meniscomyinae, and Aplodontiidae sub families. While the diverse members of the derived Allomyine and Meniscomyine clade have been used to subdivide the John Day Formation stratigraphy, the lower Turtle Cove member has only a single known aplodontiid species, *Haplomys liolophus*, described exclusively from teeth. . *Haplomys liolophus* samples have been collected throughout the Oligocene and the Eocene in the John Day formation; however, this is the first time that a *Haplomys* specimen of such quality is being figured and analyzed in public literature. Dental patterns including worn cusps on the upper and lower molars indicate that this animal chewed abrasive materials excessively in a grinding motion, such as grasses. This study has given way to a deeper understanding of the ecological role for *H. liolophus* and other aplodontiid rodents.

Research Question

What defining features in the rodent family Aplodontiidae contribute to identification and variation among aplodontiid species and the Rodentia superfamily as a whole?

Methods

Specimens were collected in Logan Butte, Oregon and were cleaned, then photographed at the University of California Museum of Paleontology. Identification of the fossil down to the species was carried out through extensive online research on the Paleobiology Database and scientific articles. Further examination and cross referencing between other Aplodontiid species in the family allowed for a deeper understanding of *H. liolophus* and its environment in which it lived.

Results

Analysis of skull and dental morphology has given way to new insights on molar mesostyle and lower premolar cusp structures, dental size variation within the species, and basicranial and postcranial anatomy. The wear patterns on the upper molars of the specimen indicate that *H. liolophus* ate very fibrous foods. Additionally, measurements suggest that *Haplomys liolophus* is substantially larger than other species and genus of the Aplodontiidae family. This specimen reveals the close morphological similarity of the cranial anatomy of prosciurine aplodontiids and early members of the Sciuridae, striking given the significantly specialized cranial morphology of *Meniscomys* less than five million years later.

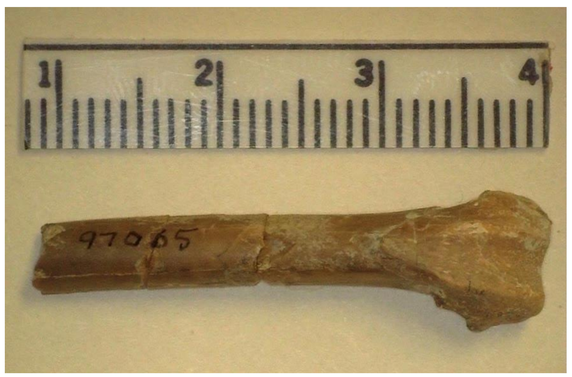

Figure 1. *H. liolophus* femur fragment that provides a general size for how large the specimen was while alive

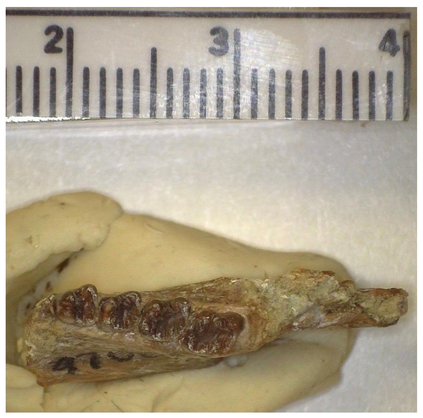

Figure 2. Caudal view of *H. liolophus* mandible and dental structures. Wear patterns are more prevalent on molars 3 and 2 than on molar 1 and premolar 4, giving insights on the specimen's diet and chewing methods

Conclusions

After extensive research, the dental morphology is closely aligned with *Haplomys liolophus*, and indicates that this Aplodontid was a terrestrial herbivore. Post-crania of this specimen, such as the auditory bulla, indicate that H. liolophus has exceptional hearing for its size. No post-crania have been documented for the *Haplomys* genus, and this new specimen shines light on morphological origins of the Aplodontiidae.

Figure 3. Cranial view of *H. liolophus* skull and dental structures. Wear patterns on the upper molars can be seen as well as defined cusp morphology

References

Vianey-Liaud et al. "Early Adaptive Radiations of Aplodontoidea (Rodentia, Mammalia) on the Holarctic Region: Systematics, and Phylogenetic and Paleobiogeographic Implications." (2013): 83-120

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