# A Juvenile Aplodontid (Rodentia) Jaw From The John Day Formation of Oregon

**Eleanor Froehlich[1], Samantha Hopkins[1,2]**

[1]University of Oregon, [2]Department of Earth Science

## Introduction

Family Aplodontidae is a family of rodents that can be found as the extant Mountain Beaver. However, there were once many members of this family and many of them can be found in the fossil record of the John Day formation.

For ERTH 434/534 I was tasked with identifying a specimen, JODA 2942, for the final project. JODA 2942 is a left mandibular fragment containing a partial incisor, a complete deciduous fourth premolar, complete first molar, and complete second molar. This specimen is from the Turtle Cove Member of the John Day Formation and is therefore approximately 26 to 24 million years in age. The specimen is from a locality North of Dayville, Oregon.

## Methods

I compared JODA 2942 with many rodents from the John Day Formation and determined that it was most likely either *Sewelleladon predontia* or *Rudiomys mcgrewi* due to the morphology and the dating. To determine which of these two genera it was, I directly compared the occlusal surfaces and the measurements provided in the type descriptions with measurements of JODA 2942. These measurements were taken using the software "ImageJ".

## Result 1

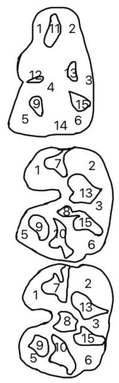
JODA 2942, anterior on the right, occlusal view, mm scale

JODA 2942, anterior on left, buccal view, mm scale

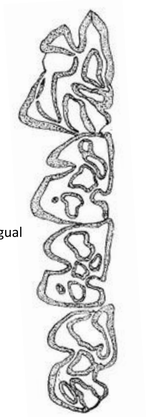
JODA 2942, anterior on right, labial view, mm scale

## Result 2


*a, Rudiomys mcgrewi*, left m1-2, UCMP105122, occlusal view
*c, Rudiomys mcgrewi*, left m1-2, UCMP105122, lingual view
White square = 1mm X 1mm




JODA2942; 1: Protoconid, 2: Metaconid, 3: Mesostylid (Mesostylid crest in molars), 4: Mesoconid, 5: Hypoconid, 6: Entoconid, 7: Anterior Fossettid, 8: Central Fossettid, 9: Posterior Labial Fossettid, 10: Posterior Fossettid, 11: Anterior Inflection, 12: Labial Inflection, 13: Anterior Lingual Inflection, 14: Posterior Inflection, 15: Posterior Lingual Inflection



*Sewelleladon predontia*, left p4-m3, UOMNH F-4734, occlusal view

| | ***Rudiomys mcgrewi*** | | **JODA 2942** | | ***Sewelleladon predontia*** | |
|---|---|---|---|---|---|---|
| | AP | BL | AP | BL | AP | BL |
| i | 1.9 | 1.6 | - | - | - | 1.8 |
| p4 | - | - | 2.51 | 1.753 | 3.4 | 2.6 |
| m1 | - | - | 2.326 | 1.855 | 2.3 | 2.2 |
| m2 | 2.2 | 1.9 | 2.28 | 1.763 | 2.4 | 2.1 |

All measurements given in mm; AP= Anteroposterior length; BL= Buccolingual length

## Conclusions

JODA 2942 can be positively identified to *Rudiomys mcgrewi* and demonstrates a better quality of preservation and more unworn occlusal pattern. Additionally, the presence of the deciduous p4 means that we may be able to view and describe a perfectly unworn unerupted fourth premolar in the future.

Future work could include the imaging of the unerupted p4. This could be done by micro-CT scanning the jaw to be able to see inside it. As the m1 and m2 are fully erupted, it is likely that the p4 occlusal surface was formed within the jaw, even if the roots are unformed. Other work could include reidentification of specimens from John Day to determine if there are more specimens of *Rudiomys* that are misidentified. Any new specimens can give us more details about the life of *Rudiomys* as well as their environment.

## References

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Shotwell, J. Arnold. "Evolution and Biogeography of the Aplodontid and Mylagaulid Rodents." *Evolution*, vol. 12, no. 4, 1958, pp. 451–484. *JSTOR*, www.jstor.org/stable/2405958. Accessed 15 May 2021.

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