



Analysis of Rocky Mountain snail (*Oreohelix* sp.) dietary preference

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Abstract

Rocky Mountain snails in the genus *Oreohelix* go mostly unnoticed beneath layers of leaf litter in the western Mountain ranges. These snails are most common in rocky foothill habitat that consists of high-density deciduous groves of maple and oak. It is in this habitat where a great number of unobserved feeding behaviors occur. While some research indicates that terrestrial snails may prefer to feed on living plants, it is thought that *Oreohelix* are detritivores, feeding primarily on decomposing plant matter. In this study we investigated *Oreohelix* diet by designing a food preference experiment. We provided two food sources (Boxelder maple leaf litter and fresh Romaine lettuce) to groups of 10 snails. Dietary preference was determined by collecting and examining fecal matter. Our results indicate that *Oreohelix* preferred leaf litter over fresh greens. This study provides an insight into the lesser-known ecology of *Oreohelix* snails and may aid in future conservation efforts as their habitat continues to be threatened by development.

Introduction

- Rocky Mountain Snails are pulmonate terrestrial gastropods in the genus *Oreohelix*. They belong to the Phylum Mollusca: Class Gastropoda: Order Stylommatophora: Family Oreohelicidae. Due to the lack of recent studies of the group, the current taxonomy of the genus is in need of revision.
- Similarly, little is known about the life history of these snails, despite their commonality and abundance in the foothills of western mountain ranges (Fig. 1).
- It is often assumed that terrestrial snails, like *Oreohelix*, are detritivores (Fig. 2), feeding on microscopic fungi, plants, and animals, and occasionally on live plant tissues (Martin and Bergey, 2013)
- Studies of other terrestrial snails that were thought to be detritivores found that they often prefer to feed leafy greens (Henderson, 1924), but no studies of *Oreohelix* diet have been done.
- **We investigated the following question: do *Oreohelix* exhibit a dietary preference?**



Figure 1. *Oreohelix* shells in habitat from Salt lake County, Utah.



Figure 2. Close up photo of an *Oreohelix* snail on decaying log.

Materials and Methods

- To address our question, we set up a choice experiment providing snails with two food sources: Romaine lettuce (*Lactuca* sp.) and dry leaf litter of Boxelder maple (*Acer negundo*).
- Three groups comprised of 10 snails each were placed into separate aquariums containing the two food sources.
- At the conclusion of a three-week trial period, all of the snail's fecal material was collected and dried in an incubator.
- Fecal material from each trial was then sorted using coloration to differentiate the food sources being fed upon (Fig. 3).
- Samples were weighed to the nearest milligram using an Ohaus pioneer balance.
- Significance of the weight differences between fecal type from each trial were tested using a t-test in Microsoft excel.



Figure 3. *Oreohelix* fecal samples showing color differences of food sources.

Results

- The analysis of fecal materials clearly demonstrate that *Oreohelix* significantly preferred to feed on leaf litter ($p = 0.049$ Fig. 5).
- Although there was a clear preference for leaf litter, snails in all trials also fed periodically on leafy greens, indicating that live plants may constitute a small portion of the dietary needs of *Oreohelix*.

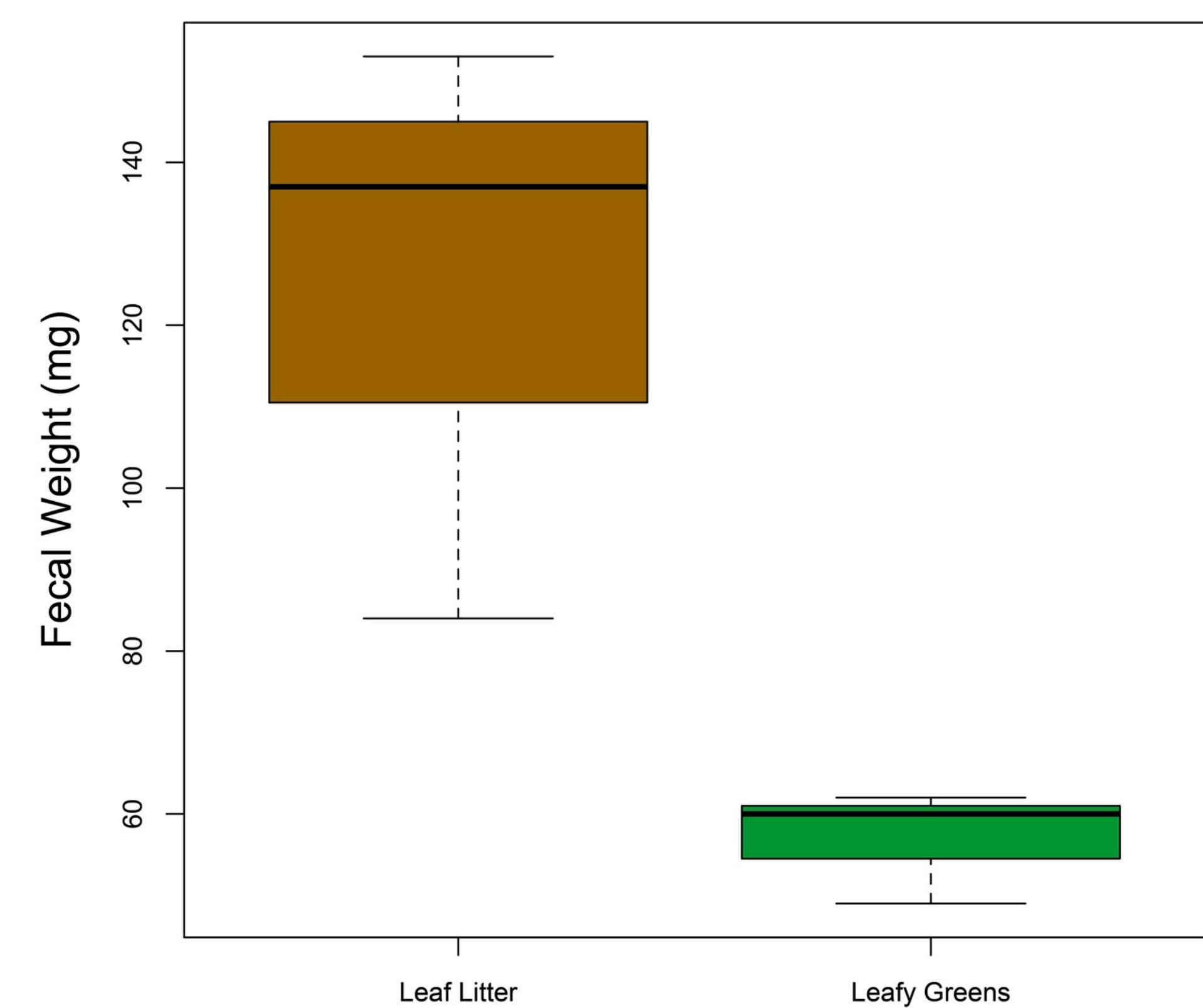


Figure 5. Graph showing the differences in weight of sorted fecal samples.

Discussion and Future Directions

- These results provide the first evidence that, unlike other terrestrial snails, *Oreohelix* does not prefer leafy greens.
- Because, like other land snails, *Oreohelix* is often considered a species of concern by land managers, our results can inform future management decisions.
- In order to obtain a more comprehensive picture of the *Oreohelix* diet, further investigations should be performed focusing on other potential natural food sources (i.e., fungus).
- The dietary preferences of different life stages should also be investigated to further understand the needs of these snails (Fig. 6).



Figure 6. Image showing the size differences of an adult snail and a < 1 week old snail.

References

- Martin, R. J., & Bergey, E. A. (2013). Growth plasticity with changing diet in the land snail *Patera appressa* (Polygyridae). *Journal of Molluscan Studies*, eyt033
- Henderson, J. (1924). Mollusca of Colorado, Utah, Montana, Idaho, and Wyoming. Library of the University of Colorado, Boulder, CO.