Spotted Banana Slugs, *Ariolimax columbianus*, and Canopy Cover

By: Sasha Milstein

Department of Wildlife and Fisheries, Cal Poly Humboldt, 1 Harpst St, Arcata, CA 95521
sm751@humboldt.edu

Introduction

Numerous animal species display diverse colorations as a means of performing cryptic coloration, which protects them from predation. In the case of banana slugs, some individuals exhibit monochromatic hues, while others display spots.

Hypothesis

Ariolimax columbianus are spotted due to cryptic coloration as a means of anti-predator defense.

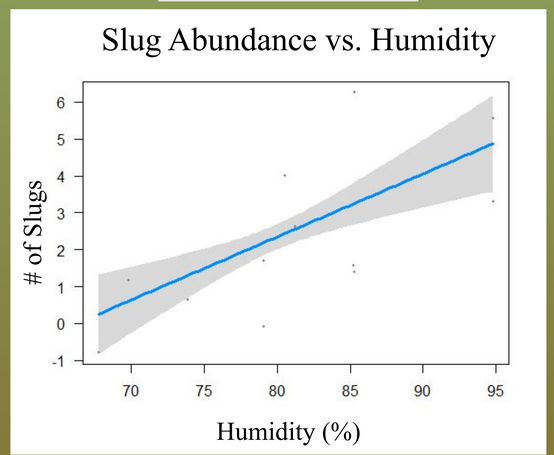
Predictions

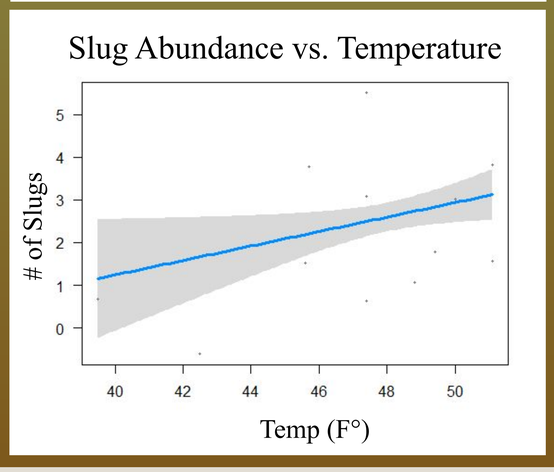
- Banana slugs will be more abundant in areas of high canopy cover
- Banana slug abundance will be positively correlated with temperature and humidity
- Banana slug abundance will be negatively correlated with wind speed
- % spotting will have a positive correlation with % canopy cover

Methods

1. 12 study sites, half high and half low canopy cover were selected based off information collected from banana slug sightings.
2. Two-mile transects, consisting of equal parts on- and off-trail, were surveyed at each location for 4 hours.
3. Every half mile of each transect, canopy cover was recorded.
4. When a slug was found, a picture was taken, as well as GPS coordinates and canopy cover of the slug's home range.

Results





72 banana slugs were found, and 13 of these were spotted. Slug abundance is negatively correlated with low canopy cover (p-value = 9.21e-11). Slug abundance is positively correlated with temperature (p-value = .0357) and humidity (p-value = .7.08e-05). This supports the prediction that slug abundance is positively correlated with humidity, canopy cover, and temperature. The results of the linear regression to test percent spotting on individuals against canopy cover yielded a slight negative correlation, however results were not significant (p-value = .37). The binomial test that compared abundance of spotted slugs at high and low canopy sites yielded a possible relationship, however the test was insignificant (p-value =.23).

Discussion

- Significant correlations were found between slug abundance and temperature, humidity, and canopy cover. Spotting data did not support the hypothesis due to a lack of significant findings, and a potential bias towards low canopy sites was noted. Future banana slug surveys should be conducted within the season.
- Spotted slugs are rare and further research is needed to examine their correlation with canopy cover. When spotted slugs were discovered, they were in proximity to other spotted slugs, which may suggest that spots are genetic. If spots are genetic, natural selection could be acting on them and perhaps cryptic coloration is giving some slugs better chances at survival.
- The results offer valuable insight into the habitat preferences of banana slugs and can inform conservation plans. Additionally, studying these decomposers can provide solutions for forest ecology issues and potential pest control methods for farmers.

Acknowledgements

I would like to thank professors David Sinn, Frank Fogarty, and Rob Blenk for guidance throughout my project. I'd like to thank Madison Richardson for assistance with statistical analysis. I'd also like to thank Jake Glasser, Ana Sofia Velarde Chong, Molly Swartwout, and Travis Manning for assistance with data collection.

Cal Poly Humboldt.