



Picky or adventurous eaters? Stable isotopes reveal *Oryzomys palustris sanibeli* diet preferences



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Introduction

The Sanibel Island rice rat (SIRR) is a semiaquatic subspecies endemic to Sanibel Island, Florida¹. Little is known about their ecology, including diet. Diet is important because it determines their trophic level and may be impacted by anthropogenic change. We used stable isotopes to examine relationships between dietary breadth, trophic niche, and seasonality.

Objectives

- Investigate if SIRR dietary breadth varies seasonally
- Determine SIRR seasonal trophic ranking
- Determine if isotopic values vary between hair samples collected in different vegetative communities



Fig. 1: Joelle Carbonell, Tre'nard Morgan, and Alexandra Seelig, taken while sampling macroinvertebrates

Methods/Materials

- Collected SIRR hair samples and diet items from 3 vegetative communities (freshwater marshes, buttonwood shrublands, and mangrove swamps),
- Analyzed seasonal variance and trophic niche breadth using Levene's test of homogeneity of variance²
- Employed generalized linear models to determine if seasonality explained variation in isotopic $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values
- Investigated whether vegetative community explained variation in isotopic $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ values using a Tukey-Kramer adjustment for pairwise comparisons³



Fig. 2: *Oryzomys palustris sanibeli*⁴

Results

- SIRR isotopic ratios partially overlapped with an animal prey base ($\delta^{13}\text{C}$ $p=0.062$, $\delta^{15}\text{N}$ $p=0.014$), but not at all with a plant food base ($\delta^{13}\text{C}$ $p=0.0003$, $\delta^{15}\text{N}$ $p=0.004$)
- Hair $\delta^{15}\text{N}$ varied significantly between summer and winter ($p=0.018$; Fig. 3)
- Vegetative sampling community was significantly correlated with $\delta^{13}\text{C}$ ratios (Fig. 4)

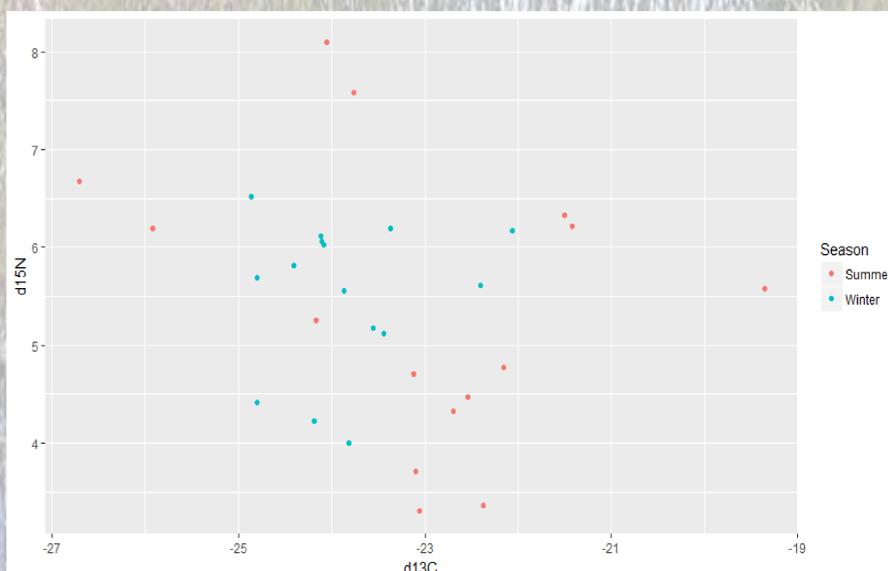


Figure 3: Hair sample isotopic ratios sorted by the season in which they were collected.

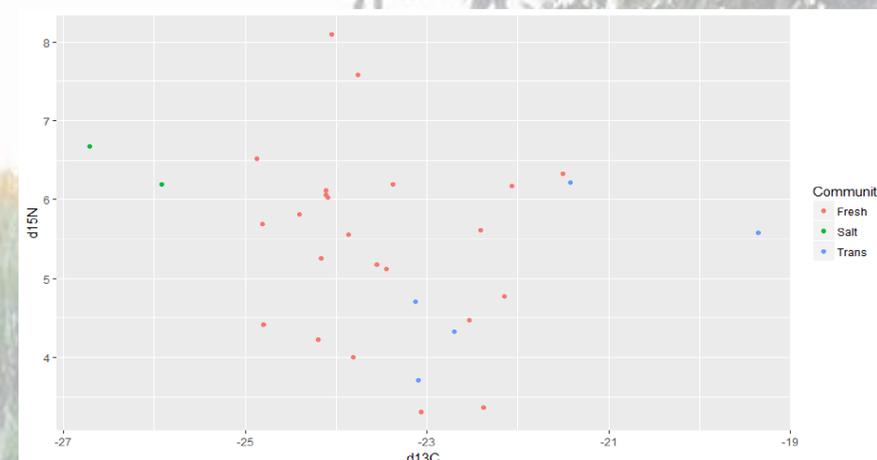


Fig. 4: Hair isotopic ratios sorted by the vegetative community in which they were collected.

Conclusions

- SIRR diet primarily composed of animals instead of vegetation
- SIRR diet was significantly more diverse in summer months than winter
- SIRR isotopic ratios indicated little seasonal movement between vegetative communities

Acknowledgements

We thank University of Florida's University Scholars Program and Undergraduate Honors Program, U.S. Fish and Wildlife Service, and Florida Fish and Wildlife Conservation Commission for funding this research. We thank J.N. "Ding" Darling National Wildlife Refuge, Sanibel-Captiva Conservation Foundation, the City of Sanibel, and The Sanctuary Golf Club for their collaborative efforts and property access. We thank the Ding Darling Wildlife Society for providing housing throughout our research. Individually, we would like to thank Audrey Albrecht, Jennifer Bernatis, Gianna Browne, Joelle Carbonell, Nate Caswell, Mark Clark, Jeremy Conrad, Jason Curtis, Sarah Lathrop, Chris Lechowicz, Holly Milbrandt, Birgie Miller, Tre'nard Morgan, Kyle Sweet, Paul Tritaik, and Toni Westland.

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