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Trevor Zimmerman  
*Andrews University*

H. Thomas Goodwin  
*Andrews University*, [goodwin@andrews.edu](mailto:goodwin@andrews.edu)

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# Field documentation of summer and fall diet in thirteen-lined ground squirrels, *Ictidomys tridecemlineatus*

Trevor Zimmerman<sup>1</sup> and H. Thomas Goodwin<sup>2</sup>

<sup>1</sup> Department of Medical Laboratory Sciences, Andrews University

<sup>2</sup> Department of Biology, Andrews University

## Abstract

Prior work has shown a shift in stable carbon isotope values of *Ictidomys tridecemlineatus* incisors and fecal pellets late in the active season (Jang et al., 2012 and Chacko, 2013).

The purpose of this study was to find out if the diet of *I. tridecemlineatus* shifts from C3 to C4 plants during the late part of the active season through direct observation of feeding activities. Observations were made at the Andrews University Airpark in SW Michigan from July to late September, 2013.

Representative samples of plant and insect material fed on were collected and analyzed for stable carbon and nitrogen isotopic composition. We found no shift from C3 to C4 plant diet. However, there was a C<sup>13</sup> enrichment of plant and insect material over the course of the active season.

## Methodology

- Observations were taken for ≤30 minutes with a spotting scope from an elevated scaffold of a mowed lawn containing a 900m<sup>2</sup> grid (Fig. 1).
- GPS locations were recorded for observations.
- Representative foods consumed were collected.
- Plant samples were identified, dry pressed, and preserved (Woodland, 2009). Some were sent to SIRFER lab (University of Utah) for isotopic analysis ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ).
- ArcGIS 10.1 was used to map feeding locations and SPSS 21 was used for statistical analysis.

## Acknowledgements

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- Adam Sutherland, Bernardo Martinez, and Devin Zimmerman for assistance with field study and laboratory analysis

## Results

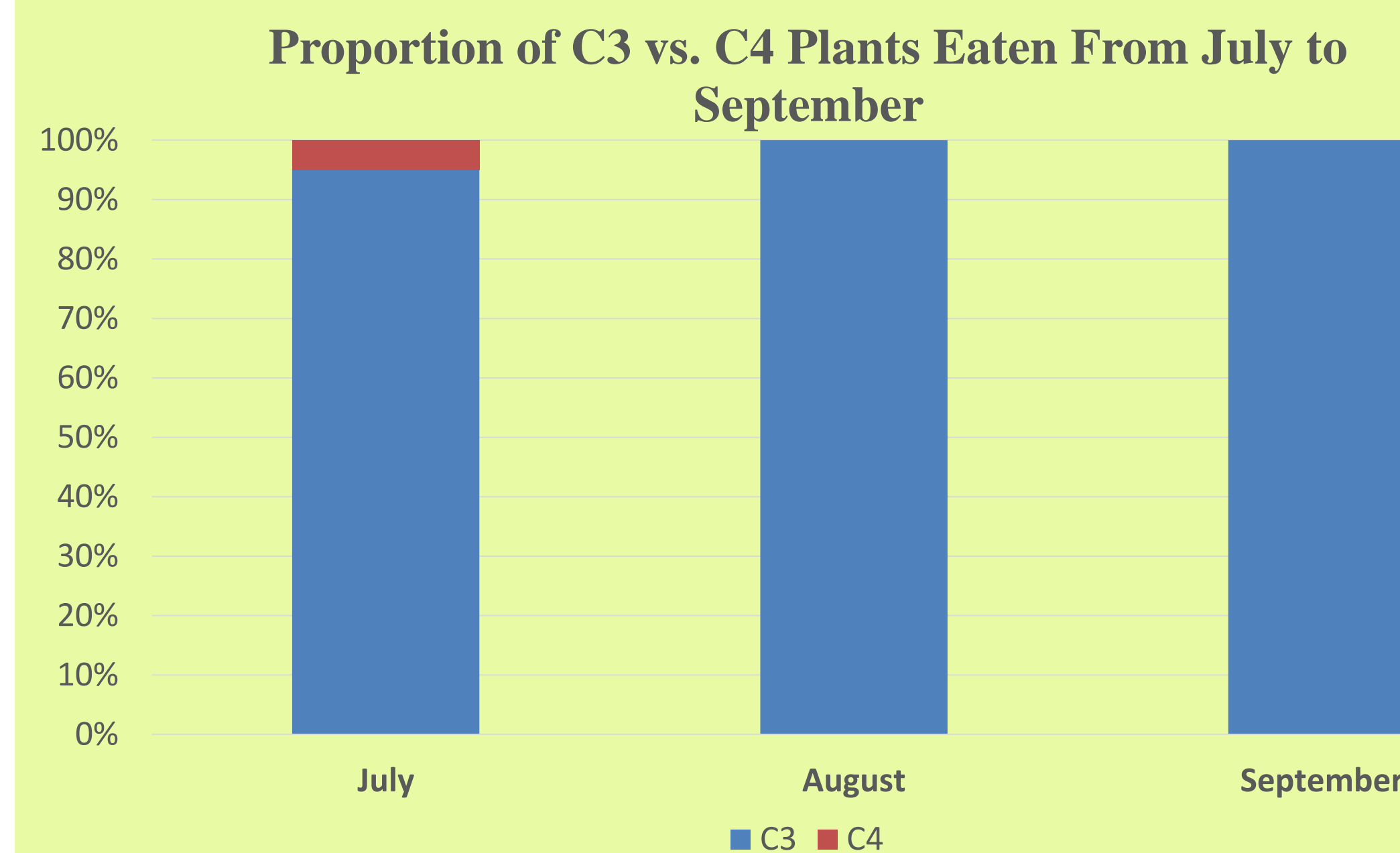


Fig. 2 C3 and C4 Foods Consumed During Study Period

- Almost all foods consumed were C3 (Fig. 2).
- There was a significant ( $p < 0.05$ ) positive correlation between  $\delta^{13}\text{C}$  and time, with an enrichment of 4 ppm of carbon-13 (Fig. 3).
- No significant change in  $\delta^{15}\text{N}$  was observed.



Fig 1. Elevated platform looking over the grid at AU Airpark

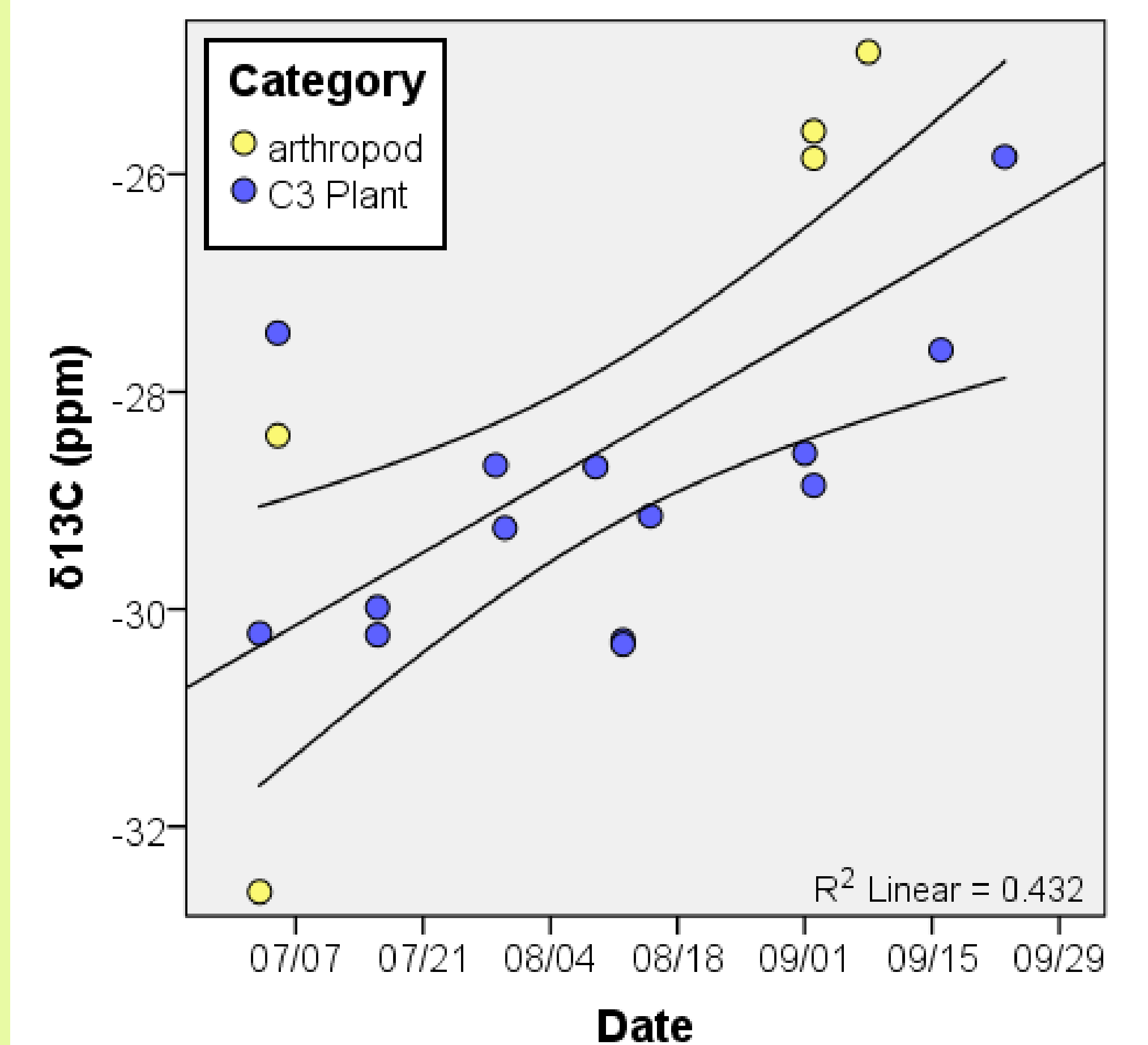


Fig 3. Food Source  $\delta^{13}\text{C}$  Values Over Time

## Conclusions

- No shift from C3 to C4 diet was observed during the active season.
- There was a carbon enrichment of C3 plants over the course of the active season.

## Bibliography

- Chacko, A. E. (2013). Spatial and seasonal variation in the stable isotopic composition of thirteen-lined ground squirrel fecal pellets as an estimate of variation in diet. *Honors Thesis*. Andrews University: Biology department
- Jang, W. J., H. T. Goodwin, B. H. Passey, and B. Kissler. 2012. Stable isotope analysis of incisor enamel in thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*). *Michigan Academy of Science, Arts Letters, Alma College, Alma, MI.*
- Woodland, D. (2009). *Contemporary Plant Systematics 4th ed.* Berrien Springs, MI: Andrews University Press