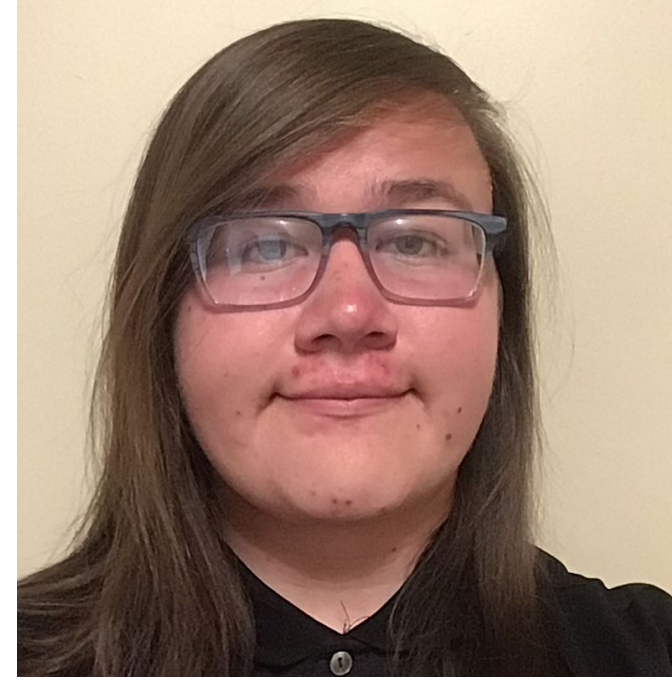
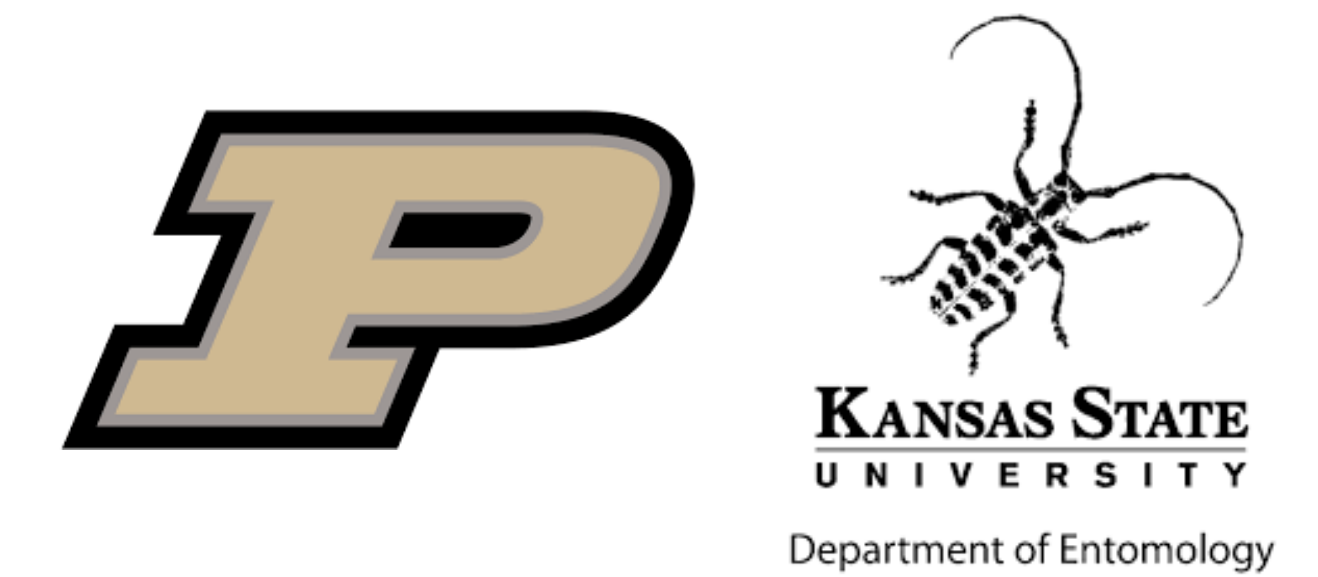


Cattle Grazing Does Not Alter Early Season Insect Community Composition in Tallgrass Prairies



Aster Barajas¹ and Dr. Tania Kim²

¹Purdue University Dept. of Entomology, College of Agriculture, West Lafayette, IN
²Kansas State University Dept. of Entomology, College of Agriculture; Manhattan, KS



Background

Cattle grazing is known to have a negative effect on arthropods in burned prairies.¹ Cattle change the environment by selectively feeding on plants, which causes insects to lose important resources essential to mating, predation, and development.²

Question: Does cattle grazing affect insect abundance, richness, and community composition?

Hypothesis: Insect communities in non-grazed land will have greater order richness and abundance



Materials + Methods

- 10 Sites in east Kansas were located and divided into 5 grazed and 5 not grazed.
- Sweeps were conducted by moving a net in a serpentine pattern along two 50-meter transects
- 18 sweep samples were processed in total for the dataset
- Arthropods collected were sorted into order by hand using microscopes
- Collected data was then processed in Microsoft Excel's data analysis tools to perform t-tests on abundance and order level richness



Surveying Insects using sweep sampling method (left) and preserved insect specimens in ethanol (below)

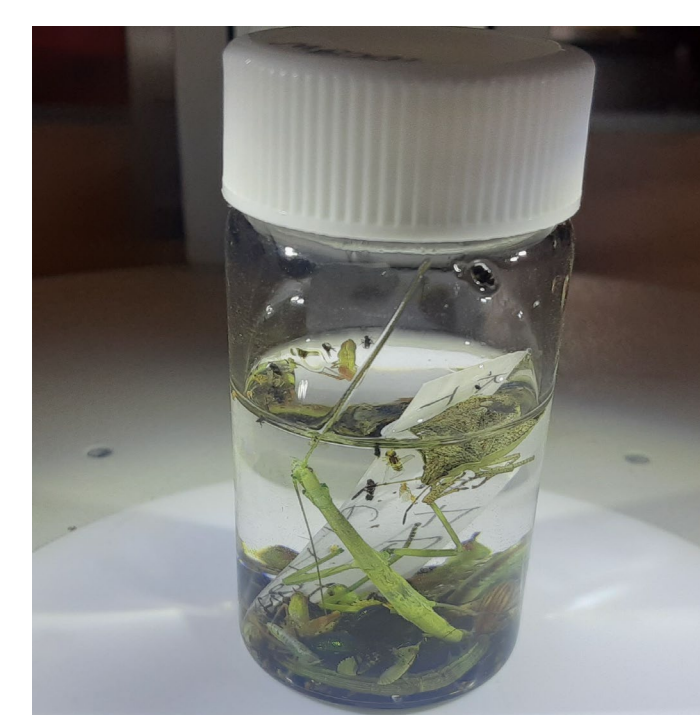


Fig 1. Grazing does not affect insect abundance (left) or order-level richness (right)

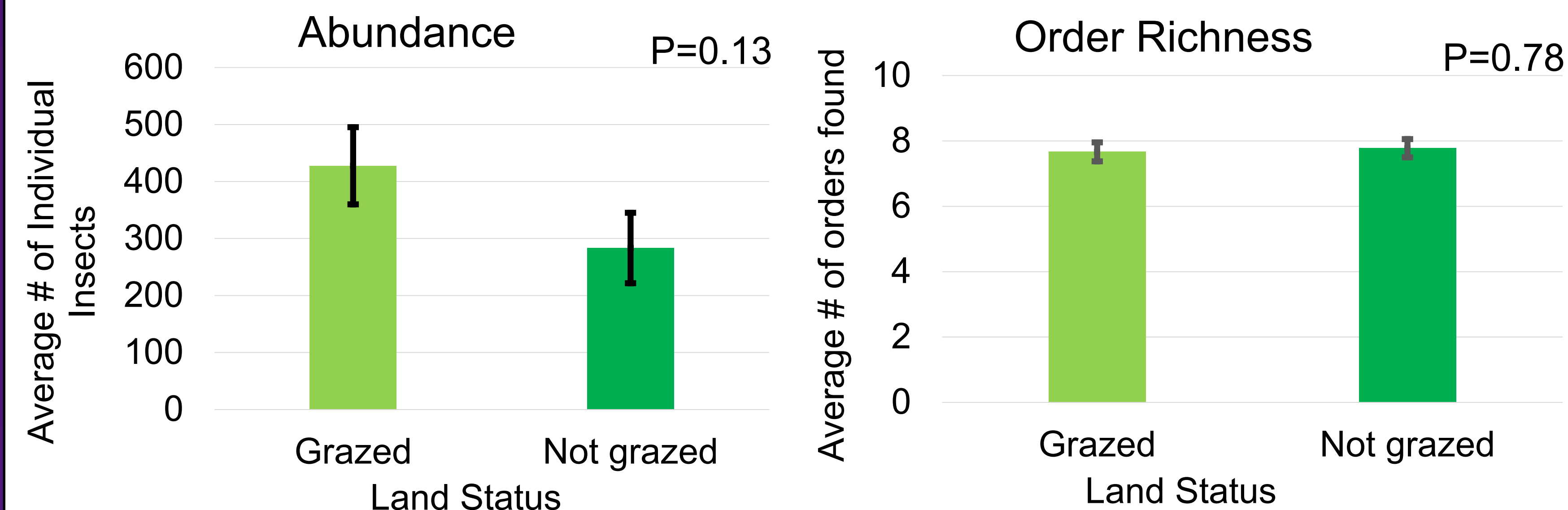
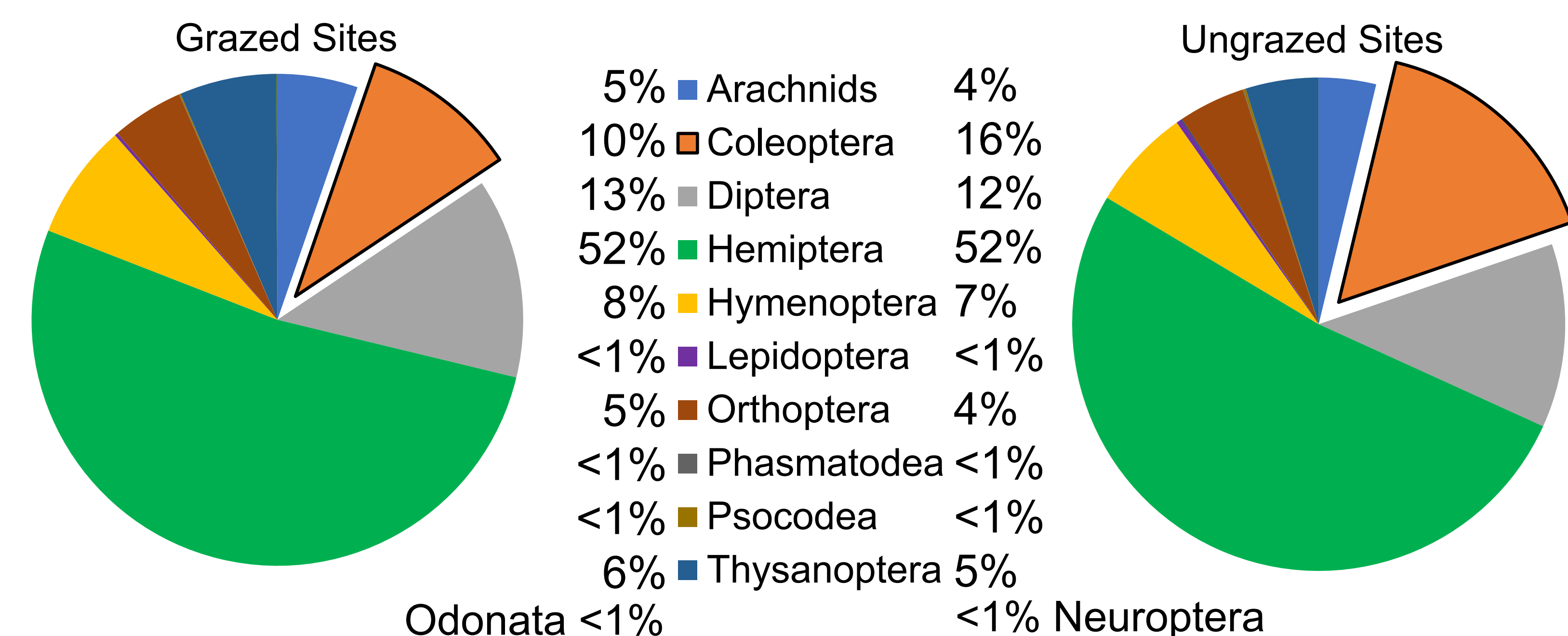


Fig 2. Pie charts showing that community composition does not differ between grazed (left) and ungrazed (right) sites.



Neuroptera was not found in grazed sites and Odonata was not found in ungrazed sites. The highlighted slice shows the difference in Coleoptera populations

Results

- Grazing did not affect insect abundance ($p=0.13$ Fig 1. left) or order level richness ($p=0.78$ Fig 1. right). Therefore, we do not see a significant difference between them.
- The majority of insects were identified as Hemiptera (hoppers) at 52% of the total of each community (Fig. 2)
- Community composition does not change much, except;
 - Coleoptera (beetle) numbers were higher in ungrazed (16%) compared to grazed sites (10%).
 - Neuroptera (lacewings) were not found in grazed sites
 - Odonata (dragonflies/damselflies) were not found in ungrazed sites.



Discussion + Future Work

- Processed Samples were only taken from the early season (late spring to early summer); grazing could impact later-season insect communities.
- Finer resolution of insect sorting (at family or species levels) could reveal more significant differences in species composition.
- However, some insect orders were found to be different (Coleoptera, Neuroptera, and Odonata), therefore further investigations and observations into differences among these specific groups can give deeper insight into cattle grazing impacts on insect communities.

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 Photos of insects courtesy of pixabay.com and shutterstock.com