

Oral Defense Announcement

University of Missouri – St. Louis Graduate School

An oral examination in defense of the dissertation for the degree
Doctor of Philosophy in Biology with an emphasis in Ecology, Evolution, & Systematics

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B.Sc. in Biology, May 2016, College of William & Mary

The Effects of Prescribed Fire on Ant-mediated Seed Dispersal in Missouri

Date: August 17, 2022

Time: 1:00 p.m. to 2:00 p.m.

Place: 121 Research Hall

Abstract

Many aspects of animal-mediated seed dispersal are vulnerable to disturbance, including partner identity and dispersal quantity and quality. This dissertation explores ant-mediated seed dispersal of the herb *Sanguinaria canadensis* in Missouri Ozark oak forests, where prescribed fire is a common land management tool. In Chapter 1, I test the definition of a keystone seed disperser using absolute and relative contributions of different ant species to the quantity and distance of seed dispersal, based on field observations of *S. canadensis* seed dispersal. I demonstrate that the ant *Aphaenogaster rudis* is better described as a numerically dominant rather than keystone seed disperser, while other species in the genera *Formica* and *Camponotus* provide higher quality dispersal in the form of longer dispersal distances. In Chapter 2, I explore the effects of prescribed burning and physical litter removal on the number of seeds dispersed, dispersal distances, and disperser identity, using field observations of *S. canadensis* seed dispersal in burned, litter removal, and control plots. The overall seed-dispersing ant community and different species therein responded differently to burning and litter removal between two field seasons. Burning increased dispersal distance in 2020, but reduced dispersal distance in 2021. Finally, in Chapter 3, I consider the effects of burning and litter removal on ground-foraging and litter-dwelling ant communities, using three rounds of pitfall traps in 2020 (April, July, and September), and one round of pitfall and Berlese litter extraction in 2021. In 2020, overall ant abundance was higher in burn compared to control plots in September, but diversity peaked in July and was negatively affected by burning when weighting species by their relative abundances. Although both burning and litter removal reduced leaf litter cover in 2021, litter removal increased ground-foraging ant abundance but decreased litter-dwelling ant abundance on an area basis, and only affected ant diversity when considering ant abundance in 2020 pitfall traps and 2021 Berlese samples. These results suggest Missouri Ozark ant communities and their seed dispersal services are either positively affected by or recover from prescribed burning within a few months.

Defense of Dissertation Committee

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