Carabid Beetle Distribution by Microhabitat

A Field Study at the Blue Wall Preserve in Landrum, SC
Luke Hetherington and Haley Clevenger

Abstract

Ground beetles (Family Carabidae), one of the most diverse and influential components of terrestrial ecosystems, are useful bioindicators due to their sensitivity to a wide range of environmental factors, both natural and anthropogenic. The goal of this study was to describe small scale differences in carabid beetle communities. Carabid beetles were captured in a site in the Furman forest in northeast Greenville County, SC from June through August 2013. Beetles were collected from two plots per transect every three days. A weak negative correlation between soil moisture and beetle abundance was found. The most beetles were found in wooded habitat and the least in the ecotone, likely due to an edge effect. Findings were visually represented with ArcMap and ArcScene.

Results and Discussion

The Carabidae have a high species diversity representing different morphologies and habitat preferences. This makes them useful bioindicators for habitats ranging from forested, grassland-associated species, forest generalists, forest specialists, and edge-associated species (2001). The majority of Carabidae are classified as habitat generalists, implying their distribution results from bottom-up factors such as temperature, soil moisture, and vegetation. Habitat heterogeneity, abundance, and environmental and temporal sensitivity, Klabund argues that beetle are sensitive to bottom-up factors in ecosystems and absence consideration in biodiversity (2001). The goal of this study was to describe small scale differences in carabid beetle communities. The calculation of species diversity indices would improve upon the current habitat classification system.

Future Research

The Carabid Beetle Distribution by Microhabitat study provides an opportunity to examine beetle distribution in a site in the Blue Wall Preserve. This study included three habitat types: wooded, ecotone, and field. The dominant species at each plot throughout the summer was different. Ground beetles prefer drier, wooded habitats. Of these wooded regions, C. sigitallus appear to be a grassland-associated species and forest specialists respectively.

Acknowledgments

We sincerely thank Dr. Wade Whithen and Mike Whiten for their continuous support in the completion of this project. We would also like to thank Nature Conservancy for providing us with use of the Blue Wall Preserve. Finally, we would like to thank Furman Advantage for funding this research project.

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This study was conducted in a field site within the Blue Wall Preserve in Landrum, SC from June through August 2013. The study site was situated adjacent to a road and was approximately 200 meters long and 80 wide, including field, ecotone, and wooded habitats. Six transects were established throughout the field site, each consisting of eight plots at 10-meter intervals. Two transects were placed in wooded habitats, two in field habitats, and two in ecotone habitats. A weak negative correlation between soil moisture and beetle abundance was found. The most beetles were found in wooded habitat and the least in the ecotone, likely due to an edge effect. Findings were visually represented with ArcMap and ArcScene.

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