

Permit 2020-005

Name:

Alissa Coonfield

Department or Organization:

Biology (Integrated Bioscience)

Email Address:

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Are you requesting renewal of a previously approved permit applicaton?

No

Type of activities at The University of Akron Field Station and Bath Nature Preserve
Research

Title of project or class name and course number:

Hydrophobicity of Spider Egg Sacs (IB 703)

Date/Dates requested:

05/23/2020 - 11/01/2020

Number of people in group:

3

I am requesting permission to use a Research Area.

Yes

I am requesting permission to use a Sensitive Area.

No

I am requesting permission to use areas outside of the designated Research or Sensitive Areas.

No

I would like to use the Martin Center for Field Studies and Environmental Education for this prop...

No

Will the activity involve destructive sampling/collecting?

Yes

Which Research Areas?

18 Acres

Beefy's Woods

Garden Pond
Grandview Alley
Round Top
South Woods

Please explain how the material will be collected (including equipment), and an estimate of how m...

This project will involve the collection of female spiders and any egg sacs that they have produced. They will be collected in glass or plastic vials and brought to The university of Akron to be housed in the lab for the duration of the season. We plan to collect at least 40-60 individuals of four different species.

Provide a brief description of (1) your proposed activities, (2) goals, and (3) impacts of your u...

In an attempt to better understand spider silk and the structures that spiders use this fascinating material to build, we propose to conduct a variety of tests on egg sacs produced by several spider species, including the banded garden spider (*Argiope trifasciata*), the Western black widow (*Latrodectus hesperus*), the furrow spider (*Larinioides cornutus*), the common house spider (*Parasteatoda tepidariorum*), and a species of ray spider (*Theridiosoma gemmosum*), most of which will be collected from Bath Nature Preserve. In a series of laboratory-based tests, we plan to examine the three-dimensional structure as well as the density and arrangement of silk strands in these structures. We will also examine the hydrophobicity, or wettability, of these egg sacs to better understand how the silk used to build these structures (known as tubuliform silk) coupled with the fibre arrangement aid in maintaining constant humidity/moisture level for the enclosed eggs. Further, we plan to compare the hydrophobicity of the egg sacs (made primarily of tubuliform silk) to that of "egg-sac proxies". These proxies will consist of dragline silk (also known as major ampullate silk) which will be collected from the spiders and spooled together to form egg-sac-like structures. This, coupled with analysis of amino acid sequences, will allow us to investigate the properties of both egg sac and dragline silks and determine potential similarities and differences between the two. Upon completion of this research, we intend to present our results to the public both at a national conference and via publication in a scientific journal. By completing this research, we intend to highlight the importance of Bath Nature Preserve as a pivotal resource for local wildlife research and public education.

By checking this box, I agree to the above terms and state that all of the above information is c...

I agree