Research Methods for Plant STD: Anther Smut

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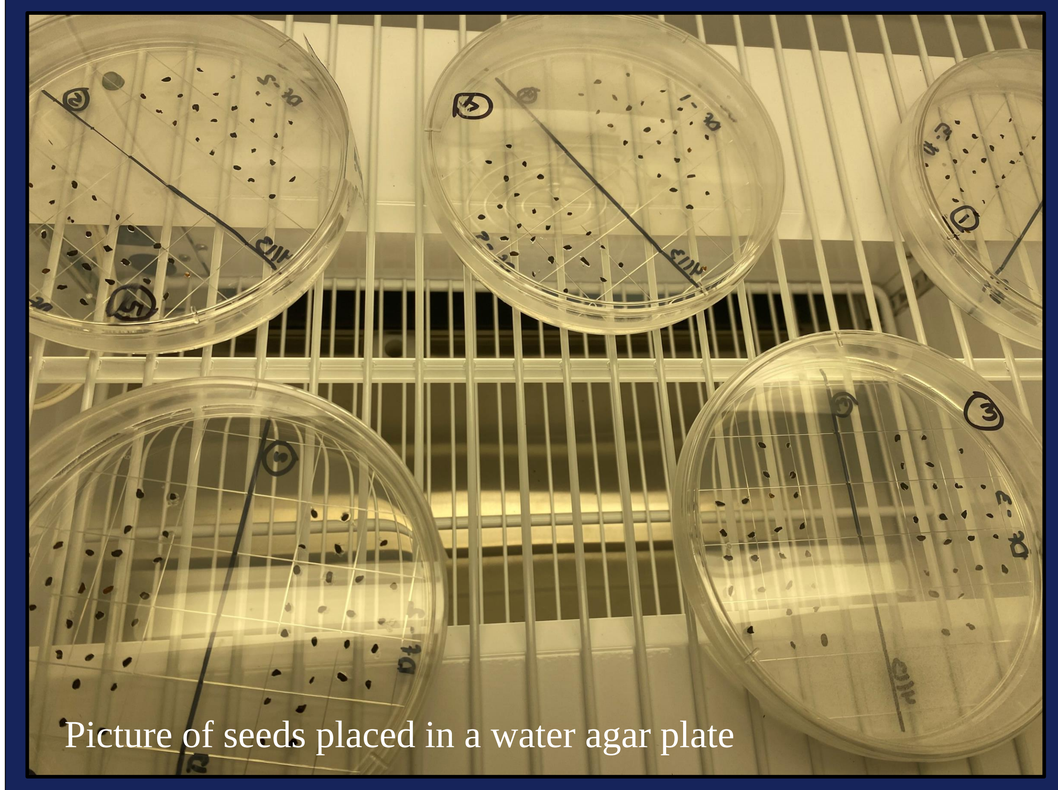
College Park Scholars Academic Showcase, May 6, 2022

Introduction

Anther-smut disease is caused by the plant-parasitic genus Microbotryum.The smug fungus bears teliospores as dispersal agents. Seedings and flowers of Dianthus pavionius were inoculated with teliospores, and this research observes its infection and possible conjugation under a microscope.



Picture of seeds placed in a water agar plate

Materials:

Water Agar for mating + seeds; Potato Dextrose Agar plates, seeds from Italy, potting materials (soil, trays), hemocytometer, micropipettes, microscope, DNA extraction kit, PCR kit, tweezers

Methods:

Spent the first few months in research ways to investigate the system. In the lab, Potato Dextrose Agar is used for fungus growth and Water agar is used for seeds, with agar acting as a solidifying agent.

For plants,

- Open a water agar plate and insert seeds into the agar using tweezers
- Prepare a diluted smut mixture of Anther-smut and water
- Use a micropipette to dispense a drop of the smut mixture onto each seed, allow seeds to grow in the plate and observe results

For seeds,

- Perform serial dilutions of smut mixture
- Use micropipette to insert drops of each mating type on a plate
- Observe results under a microscope

Site Information:

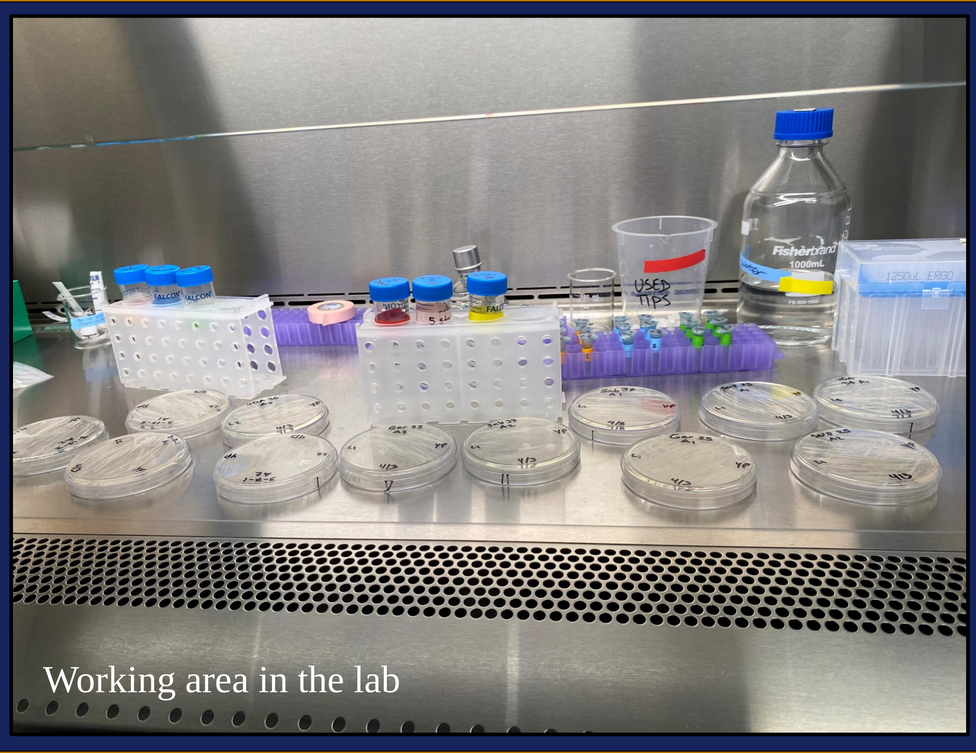
Bruns Lab

On Campus Biosciences Research Building

Supervisor: Yanelyn T Perez

Research is focused on understanding the effects of infectious disease in natural populations and how they intersect with the evolution of pathogenic traits!

Current research focus on evolutionary dynamics of age-specific disease resistance



Working area in the lab

Results:

Under the microscope, some of the compatible cells mated.

Seeds infected with smut grew to produce spores instead of pollen.

Discussion:

Cell conjugation (mating) is indicative of teliospore germination. Teliospores germinate by producing a basidium, during which time meiosis occurs. A basidiospore develops and a haploid nucleus migrates into the spore. The plants reproductive system is affected, the spores are produced in place of pollen. Future work would entail conducting a mating experiment.

Acknowledgments:

I would like to acknowledge Yanelyn, my supervisor, my lab manager Emily Bruns and Dr. Merck and Dr. Holtz for our amazing Scholars program.