

ABSTRACT SUMMARY

Two novel disease symptoms in a tall fescue (*Festuca arundinacea* Shreb.) breeding nursery were observed at the University of Georgia, Griffin campus. Symptoms on leaf blades included reddish brown lesions and dark purple lesions, characteristic of anthracnose and Nigrospora blight diseases, respectively. Microscopic examination showed characteristic conidia morphology of anthracnose and Nigrospora blight, and genetic analysis revealed 98-100% and 82.7-99.8% similarity with *Colletotrichum graminicola* which causes anthracnose, and *Nigrospora sphaerica* which causes Nigrospora blight, respectively. Pathogenicity tests were conducted to confirm the Koch's postulate. Plants displayed symptoms analogous to those found in the original field samples for anthracnose; however, Nigrospora blight still requires further validation.

Keywords: Tall fescue, anthracnose, *Colletotrichum graminicola*, Nigrospora blight, *Nigrospora sphaerica*

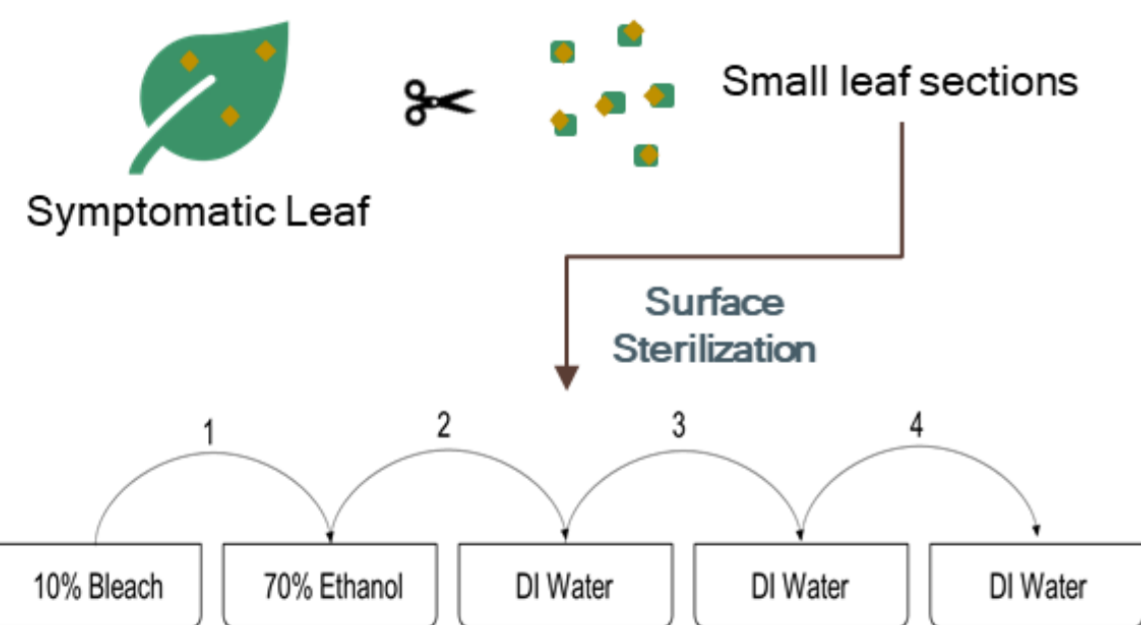
INTRODUCTION

Tall fescue (*Festuca arundinacea* Shreb.) is a cool season perennial turfgrass species in the United States. In August 2021, two diseases showing symptoms of anthracnose and Nigrospora blight, were observed in a tall fescue breeding nursery at UGA Griffin campus. Anthracnose caused by *Colletotrichum* spp. affects many economically important plants such as fruits, vegetables, staple crops, and ornamentals. In the US, the occurrence of anthracnose on tall fescue was first reported in Alabama in 1958, with several other reports of this disease on other *Festuca* species in different states of USA. There are no reports of Nigrospora blight in *Festuca* species; however, it is a common disease problem on Kentucky bluegrass (*Poa pratensis*) and perennial ryegrasses (*Lolium perenne*).

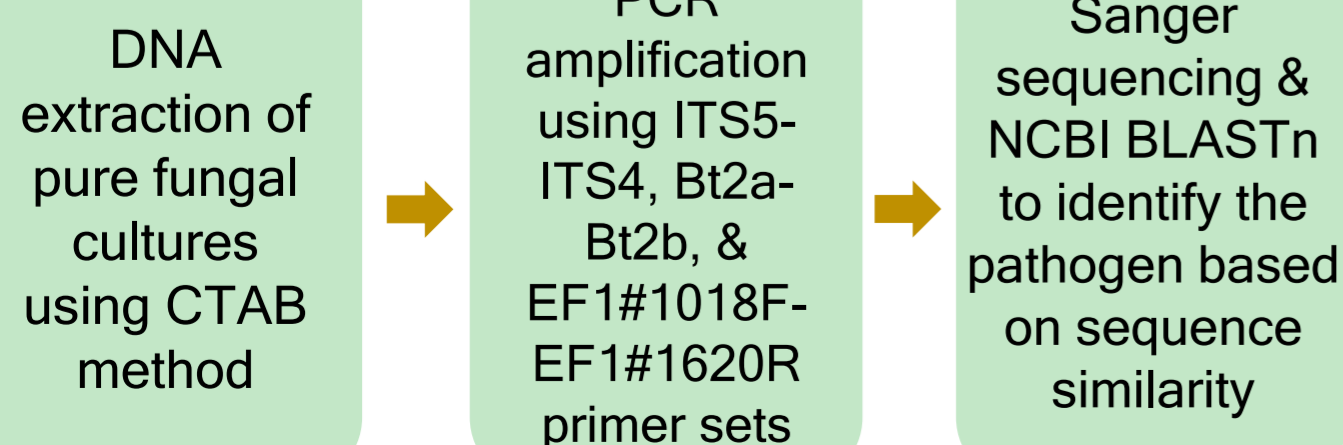
METHODOLOGY

Pathogen isolation

Symptomatic leaves were examined under the microscope to observe the disease morphology. Leaves were surface-sterilized as follows and isolated on potato dextrose agar (PDA).

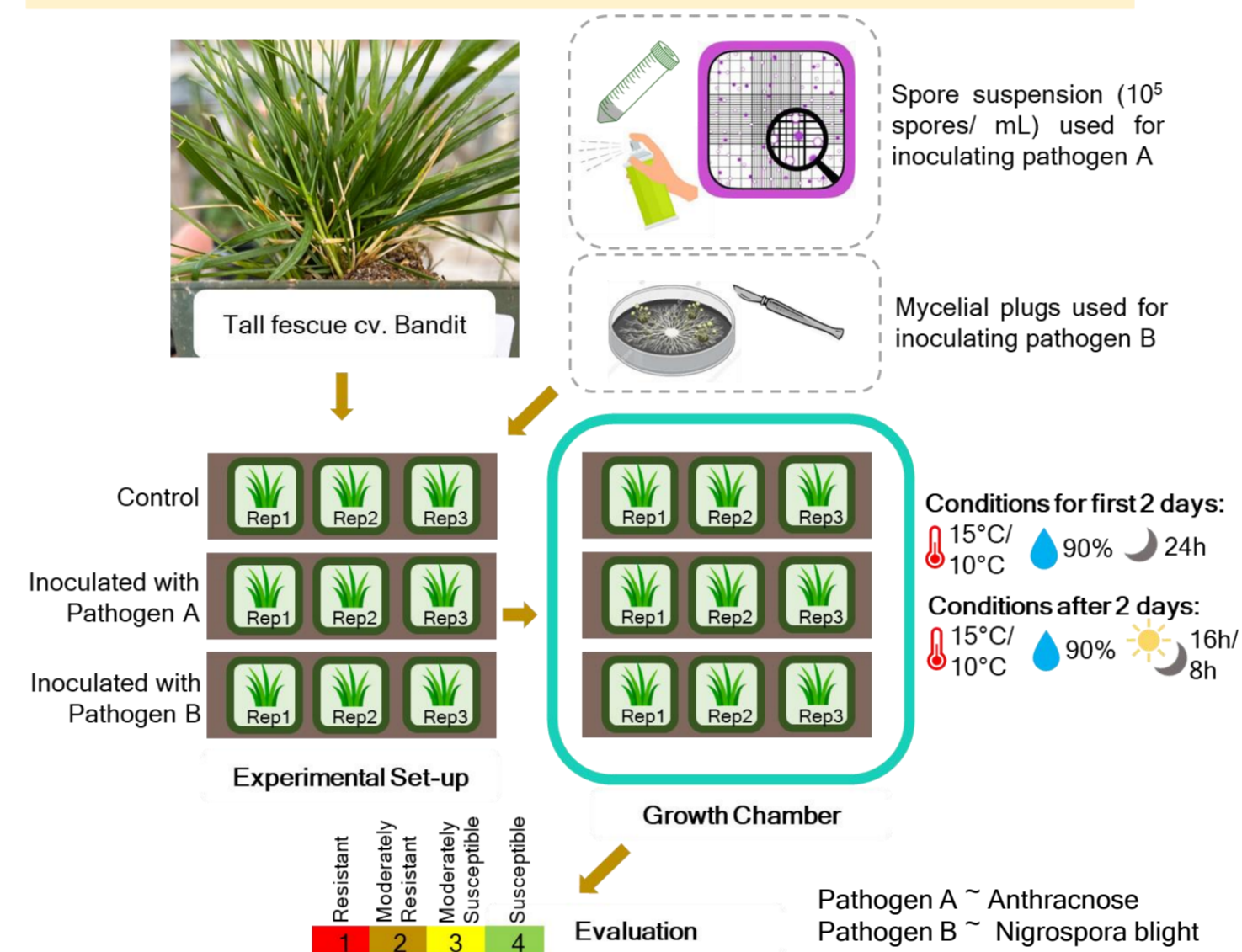


Confirmation at Molecular Level



ITS- Internal Transcribed Spacer; Bt- β -tubulin; EF- elongation factor

Koch's Postulates & Pathogenicity Tests



RESULTS



Figure 1: Symptomatic leaf samples from the tall fescue breeding nursery in UGA, Griffin, showing anthracnose (a) and Nigrospora blight symptoms (b). Observation under a dissecting microscope shows setae (black hair-like fungal structures) characteristic of anthracnose (c), and blighted leaf with a tan colored lesion outlined by a dark purple colored boundary (d).

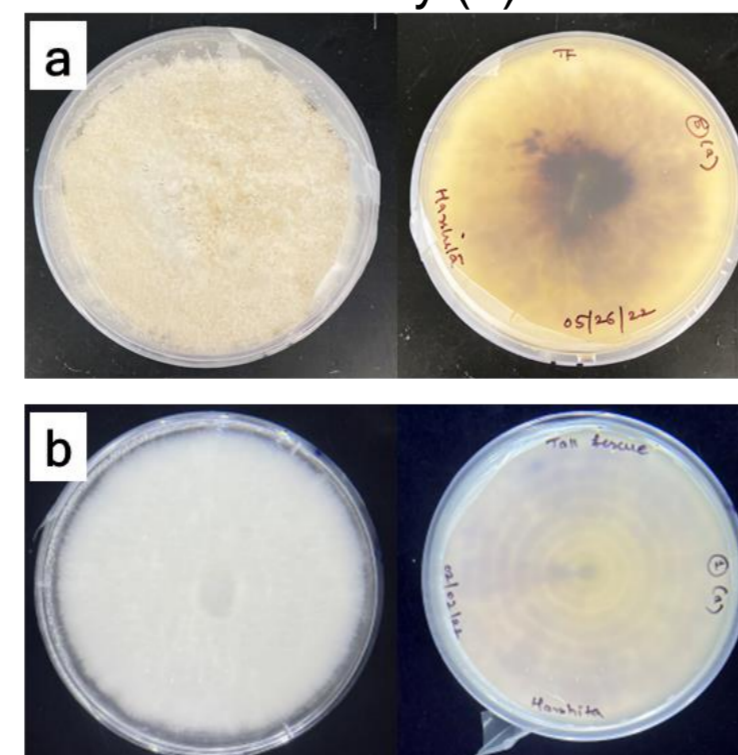


Figure 2: Potato Dextrose Agar (PDA) cultures showing isolated pathogen A for anthracnose and pathogen B for Nigrospora blight.

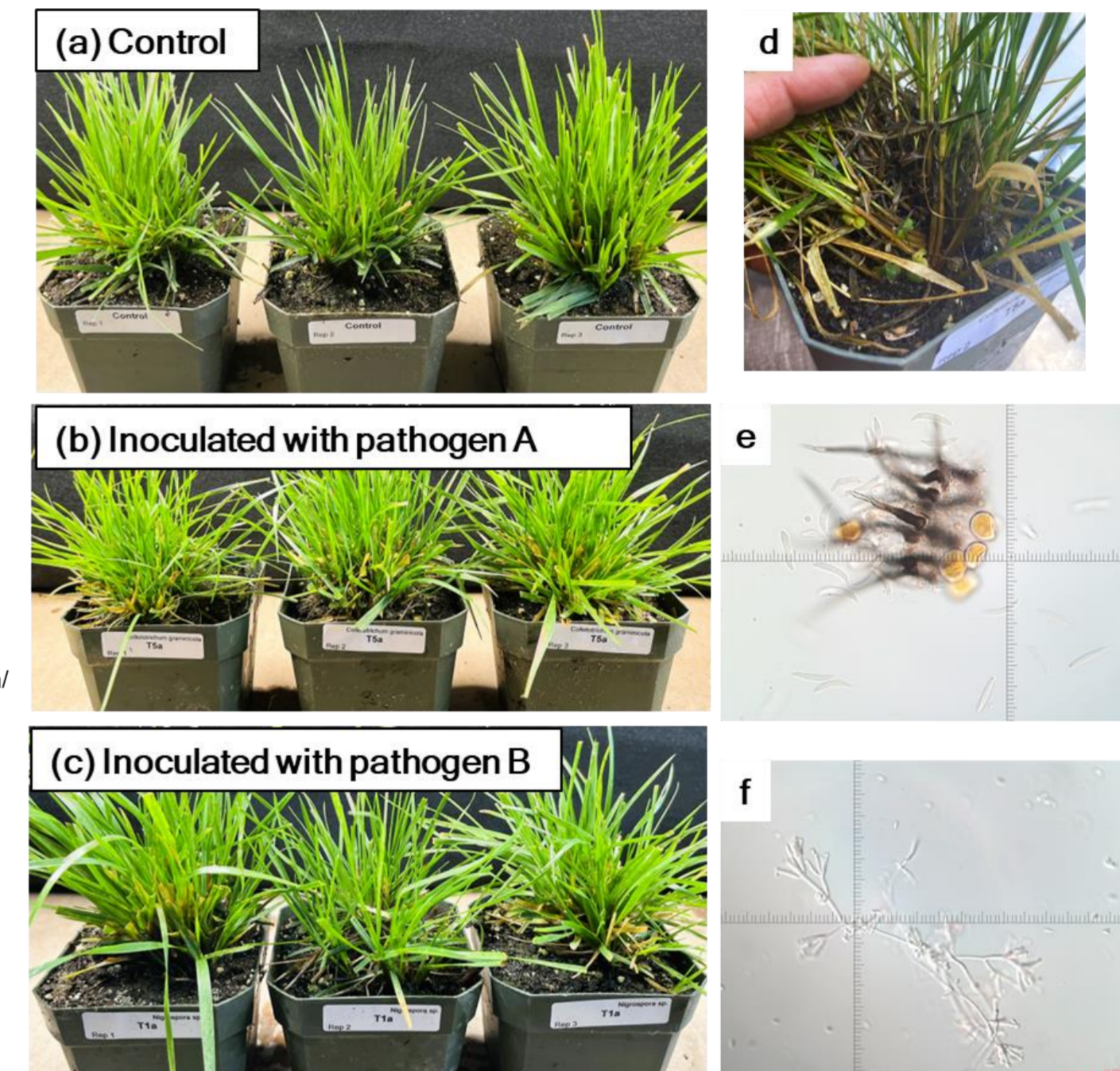


Figure 3: (a) Control plants showed no symptoms 21 dpi. (b) and (d) Plants inoculated with pathogen A showed yellowing and basal rot 21 dpi and 35 dpi, respectively. (c) Plant inoculated with pathogen B showed no visible symptoms. Leaves infected by pathogen A were observed under a microscope at 40x magnification and showed hyaline crescent-shaped (e) and oval-shaped (f) conidia.

CONCLUSIONS

- Crescent-shaped or falcate, hyaline, single-celled conidia typical of Anthracnose as well as light tan-colored lesions half-way down from the leaf tip, surrounded by margins of brown or dark-purple color, characteristic of Nigrospora were observed under a microscope.
- BLASTn revealed that the isolate sequences had 98-100% and 82.7-99.8% similarity with *Colletotrichum graminicola* and *Nigrospora sphaerica*, respectively.
- After inoculation, symptoms such as water-soaked leaf blades, chlorosis (yellowing) and curling, along with basal rot were observed in plants inoculated with *C. graminicola*.
- Hyaline, oval conidia were observed under the microscope. We are currently corroborating these results and exploring the bi-modal conidial production.
- No lesions appeared on the leaves after inoculating the plants with the putative *N. sphaerica*. Further validation is required to confirm the Koch's postulates.