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Physiological Section

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Identification and Effects of Necrotrophic Fungal Pathogens on Indiangrass (*Sorghastrum nutans*)

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Indiangrass (*Sorghastrum nutans*) is a perennial warm-season bunch grass susceptible to a number of fungal pathogens. The purpose of this investigation was to compare symptomatic and asymptomatic cultivars of indiangrass obtained from the East Texas Plant Materials Center, Nacogdoches, TX using a three-pronged approach: 1) evaluate the physiological effects of fungal infection through studies of photosynthesis, light saturation, and chlorophyll quantity, 2) examine the host/pathogen relationship through various forms of microscopy, and 3) determine fungal presence using a polymerase chain reaction (PCR) assay. Symptomatic and asymptomatic leaf samples were tested for photosynthetic response under decreasing light intensities and separately under established light saturation using a LI-COR 6400XT Portable Photosynthesis System. Symptomatic leaves consistently exhibited decreased physiological activity. Through microscopic analysis acervuli of the fungal pathogen *Colletotrichum* were identified on 16.7% of symptomatic leaves. Epifluorescence light microscopy and transmission electron microscopy revealed limited growth of intercellular/intracellular hyphae and extensive disintegration of plant cells, consistent with the necrotrophic phase of *Colletotrichum* infection. Three distinct fungal phenotypes were cultured from infected tissues. Molecular DNA studies verified the presence of fungal DNA in both symptomatic and asymptomatic samples using a primer pair specific for ascomycetes and basidiomycetes. This study was part of a capstone graduate course for the Master Science Teacher Program at Stephen F. Austin State University.

Broader Impacts:

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