

Plant Pathology Seminar Series

“FUNGAL COMMUNITIES ASSOCIATED WITH CAMASSIA POPULATIONS GROWING IN FRESHWATER WETLAND HABITATS IN THE PACIFIC NORTHWEST”

Gretchen Marie Freed

Camassia (camas) populations are a distinctive component of native plant communities in wetland prairie ecosystems of the Pacific Northwest (PNW). Camas bulbs and seeds produced by native plant nurseries provide planting material for restoring prairie wetlands. Camas bulbs do not store well after removal from the ground, and camas seeds sown in restoration sites often fail to survive long enough to reproduce. Fungi are important for plant health, but fungal community composition and diversity associated with camas have not been explored. Samples were taken from camas populations in wetland habitats of garden, meadow, savanna, serpentine, swale and mitigation habitats in Washington, Idaho and Oregon. Fungal taxa and communities associated with camas root, tunic, leaf, seed, rhizosphere, and proximal soil samples were identified with culture-based and culture-independent DNA sequencing techniques (Illumina MiSeq). 734 fungal isolates were cultured from bulb, seed, root and leaf tissues with isolates of *Penicillium* (36%), *Fusarium* (12%), yeasts (12%), *Trichoderma* (8%) and Zygomycetes (8%) obtained in the highest frequencies. 2,984 operational taxonomic units affiliated with at least 200 fungal families were detected using culture-independent analyses. Habitats and plant/soil sample types were significantly associated with diversity among fungal communities. Edaphic characteristics (% clay and silt, C:N ratio and pH) collectively contributed to 30% and 9% of the variance among the habitats in the camas rhizosphere and root fungal communities, respectively. At least 50 fungal families were represented by 127 OTUs detected in camas seeds sampled. Seed-associated taxa contained genera of known plant pathogens such as *Rhizoctonia*, *Fusarium*, *Botrytis* and *Leptosphaeria*. Pathogenicity testing of isolates obtained from bulbs or seeds identified five bulb rot pathogens: *Fusarium sporotrichioides*, *Aspergillus niger*, *Botrytis* cf. *paeoniae*, *Colletotrichum dematium* and *Trichoderma viride*. Cold storage (5°C) reduced incidence of *A. niger* and symptom severity caused by *C. dematium* and *T. viride*, but less so with *F. sporotrichioides* and *B. cf. paeoniae*. This research established an understanding of the fungal community composition and diversity associated with camas plant tissues, seeds and associated soils that may have a detrimental impact on camas bulb production and seedling establishment in PNW wetland prairie restorations.

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PhD Exit Seminar



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