

TCD Meeting Abstract

Project Title: Fungus – bark/ambrosia beetle interactions on girdled black walnut

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Results of previous work

- Developed split sample assay methodology (serial dilution plating for viable propagules; molecular assay for fungal DNA) for detecting fungal taxa present on emerged walnut twig beetles, ambrosia beetle species, and other bark beetles from girdled trees or branches, [co-investigator: Mark Banik]
- Documented frequencies of fall emerging *Pityophthorus juglandis* carrying viable propagules and DNA of *Geosmithia morbida* for four bark beetle populations (CA, CO, TN and VA), [Co-investigator: Mark Banik; Cooperators from the different states]
- Determined other fungal taxa associated with *P. juglandis* from the same sample as above, [Co-investigator: Mark Banik]
- Co-investigator with Sharon Reed, Postdoctoral Scientist, U of Missouri-Columbia, on study that determined assemblages of bark and ambrosia beetles and weevils colonizing girdled black walnut in numerous sites in Indiana and Missouri (2011). Companion study funded for girdled branches of black walnut in Knoxville, TN, area [TN State University and Univ. Tennessee-Knoxville investigators]

Objectives of current studies

- Currently determining assemblages of fungi associated with the bark and ambrosia beetles obtained from 2011 black walnut girdling project in Indiana and Missouri (includes *G. morbida*-specific detection methods) [Co-investigators: S. Reed and M. Banik]
- Determine assemblages of fungi associated with discoloration and cankers (insect or non-insect associated) on girdled black walnut branches in TCD and non-TCD areas (TN, IN, MO), [Co-investigators: Sharon Reed, Mark Banik; Cooperators: numerous]
- Determine mycobiota on *P. juglandis* and other bark and ambrosia beetles colonizing the same girdled branches (see above) and compare the assemblages of bark and insect-derived fungi [Co-investigators: Sharon Reed, Mark Banik; Cooperators: numerous]
- Conduct bio-prospecting (limited) for entomopathogens associated with *P. juglandis* in TCD areas. [Co-investigators/cooperators: TBD]

Future Direction

- Molecular-based protocol for detecting *G. morbida* in groups/batches of ambrosia and bark beetles [Co-investigators: Mark Banik; Sharon Reed]
- Investigate biocontrol potential of entomopathogens found on *P. juglandis* emerged from girdled black walnut branches in TCD areas as well as naturally infected/infested TCD black walnut. [Co-investigators: to be determined]

Estimated Duration

Funding for the previous and current work limits duration of studies to 12 to 18 months.