

**Research Proposal For**

**Graduate Student Research and Professional Development Fund**

To the  
School of Graduate Studies  
Western Illinois University  
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**Title: THE HUNT FOR WHITE NOSE SYNDROME IN ILLINOIS**

**Background**

Bats are fundamental ecosystem components for insect suppression, pollination and seed dispersal (Jones et al. 2009). White Nose syndrome (WNS) is a new disease that has been affecting bat populations in the United

## Objectives

**1) The primary goal of this research is to document the psychrophilic fungi associated with Illinois bats such as Indiana bats (*Myotis sodalis*) and little brown bats (*Myotis lucifugus*).**

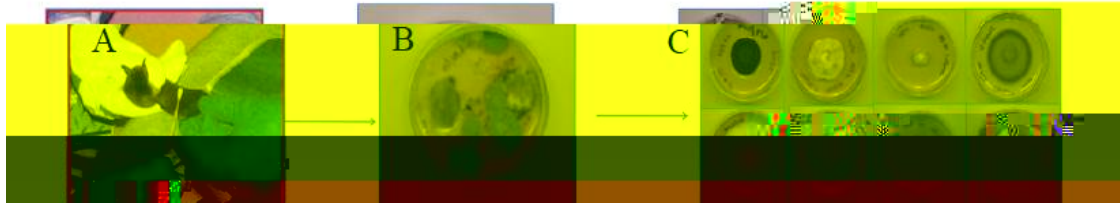
My hypothesis (based on preliminary studies) is that bats carry a high diversity of psychrophilic fungi and these fungi are not pathogenic. These isolated fungi could also potentially be used as biocontrol agents for *G. destructans*.

**2) The secondary goal of this study is to document the appearance of *G. destructans* within Illinois since the spread of WNS is nearing the state. We will use *Geomyces* specific primers and culturing techniques to accomplish the goal of identifying the psychrophilic fungi.**

## Methodology

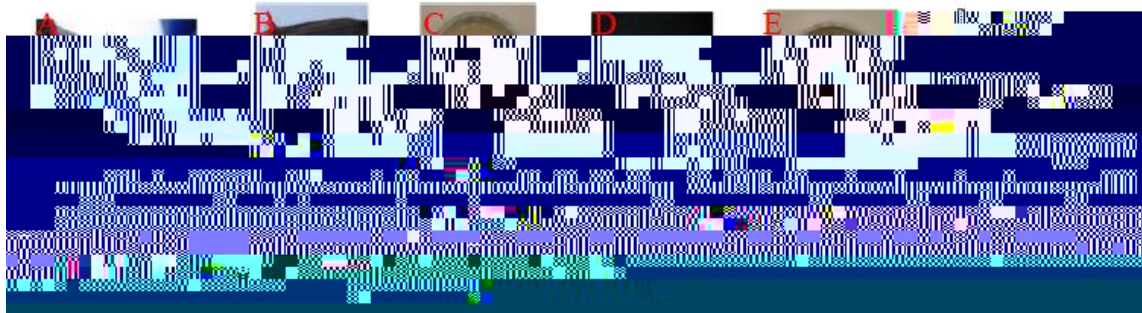
Forest Service personnel, the Illinois Department of Natural Resources (IDNR) and University of Florida (Dr. Robert McCleery) are supporting all fieldwork of this research project. I collected all the samples of this research project with the support and under the permits of our collaborators during the summer and fall of 2010. We currently have more than 200 samples from 10 caves in southern Illinois.

Using bat-trapping and sampling techniques outlined by the USGS National Wildlife Center to limit bat-to-bat transmittance of WNS, the bats will be swabbed and samples will be inoculated *in situ* on petri plates. Samples will be incubated at 6 °C to only isolate psychrophilic fungi. As Figure 2 shows this technique was tested last semester and it was very successful producing about 200 pure cultures of cold-loving fungi.



**Figure 2. Bat swabbing technique to isolate psychrophilic fungi that are on bats. A: Swabbing of bat wing. B: Swabbed petri plate showing fungi cultured from bat wing. C: Plates of isolated fungus from plate swabbed from bat.**

Direct isolations from wing biopsy will be conducted. In a preliminary study, last semester, this technique was also evaluated (see Figure 3).



DNA techniques such as PCR and sequencing will be used to identify psychrophilic fungi using fungal internal transcribed spacer (ITS) rRNA primers (Gargas et al. 2009).

## **Benefits of Research**

This research is of fundamental importance to monitor the presence of WNS in the state of Illinois. My research will also increase the knowledge of psychrophilic fungi associated with bats, being the first study of its kind in Illinois to my knowledge. The study will catalog the fungi bats had before the appearance of WNS and changes in community structure after the arrival of *G. destructans*.

## **References**

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Gargas, A., Trest, M.T., Christensen, M., Volk, T.J. & Blehert, D.S. 2009. *Geomyces destructans* sp. nov. associated with bat white-nose syndrome. Mycotaxon, 108, 147-154.

Jones, G., Jacobs, D.S., Kunz, T.H., Willig, M.R. & Racey, P.A. (2009) Carpe noctem: the importance of bats as bioindicators. Endangered Species Research, 8, 93-115.

