The American Burying beetle (Nicrophorus americanus) could be the unlikely hero of your summertime picnic. Professor Hoback of Oklahoma State University is on a journey to reveal the hidden habits of the American burying beetle (Nicrophorus americanus). Alongside a primary focus of teaching students, Professor Hoback has conducted research into the distribution of American burying beetle populations in North America. His research explores reasons for the beetle’s decline and teaches the importance of tailoring conservation methods to each isolated population in order to protect this useful insect.

The American Burying beetle (Nicrophorus americanus) could be the unlikely hero of your summertime picnic. The American Burying beetle is known for its unique habit of burying small dead animals, which is why it has declined when a closely-related species is declining. In his latest work, Professor Hoback sought to understand more about the responses of different isolated populations of American burying beetles to the same environmental factors. His work aims to determine if it is essential to tailor techniques to suit different regional populations when considering conservation actions. One of the mysteries associated with the beetle is why it has declined when a closely-related and ecologically similar species has remained.

Hypotheses for the decline of the American burying beetle include increased pesticide exposure, habitat loss, the effects of night-time lights, and increased competition with vertebrate scavengers. Each hypothesis to date has been largely countered by the fact that the 15 or so other North American burying beetles have not suffered dramatic declines. In order to save the American burying beetle from further population decline, it was first important to understand their current distribution. Professor Hoback and his team used baited pitfall traps in the states of Oklahoma and Nebraska, areas known to still support relatively large populations of American burying beetles, to capture the beetles and record their numbers.

Hoback and Leasure found impacts to the American burying beetle populations from agricultural conversion of habitat and from neemness to large human populations. The finding led Hoback and his collaborators to investigate reasons why another closely related burying beetle was still common in these changed habitats. Specifically, they tested if both species are affected by light pollution. Traps were checked daily with two key pieces of data recorded each time. Firstly, the number of American burying beetles was established. Each burying beetle found in the trap was marked using a numbered bee tag to identify it and then released. Secondly, all other Nicrophorus beetles (including the similar species – the roundneck burying beetle) were counted and their numbers were also recorded. Environmental data was monitored throughout the course of the study to investigate whether factors such as moon phase or overnight temperatures affected the number of beetles caught in the traps.

BLAME IT ON THE CITY LIGHTS
After analyzing their data, the team found that the number of American burying beetles caught in Oklahoma was lower when moon illumination increased. Interestingly, on nights with noticeable cloud cover, the effect of lunar light intensity was overridden and fewer beetles were caught despite the reduction in natural light. City lights are reflected from artificial light and American burying beetles were caught on both moonless and cloudy nights.

In contrast, there was a slight positive correlation between the levels of illumination and the number of roundneck burying beetles recorded.

Unfortunately, despite the health and environmental benefits the American burying beetle provides, their population is declining.
Research Objectives

Professor Hoback’s research focuses on the interaction of closely-related organisms as it influences their physiology, ecology, and behaviours and the conservation of rare and endangered species, including the American burying beetle, *Nicrophorus americanus.*

Detail

W. Wyatt Hoback  
Assistant Professor  
Department of Entomology and Plant Pathology  
127 NRC  
Oklahoma State University  
Stillwater, OK 74078  
USA

Bio

W. Wyatt Hoback is an assistant professor of Entomology at Oklahoma State University after serving as a professor of Biology for 15 years at the University of Nebraska. His primary focus is teaching, and he instructs more than 700 students per year about the interactions between insects and humans.

Collaborators

- Doug Leasure  
- Jillian Wormington

References


Personal Response

"Have you been surprised by any of the reactions to your work?"

"When people first hear that I study an endangered insect, their reaction is usually "why". Once they learn about its amazing lifecycle, benefits in reducing flies, and potential as a source of antibiotics, people want to keep the insect around. Our research showing greater artificial light effects on the American burying beetle in part explains why it disappears around cities while the roundneck burying beetle remains. Each new discovery hopefully brings us closer to being able to allow this amazing species to recover."