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Media Relations

October 24, 2013

UNH Researcher: Bees Underwent Massive Extinction When Dinosaurs Did



A small carpenter bee. Credit: Sandra Rehan.

Xylocopinae, or carpenter bees, at the end of the Cretaceous and beginning of the Paleogene eras, known as the K-T boundary.

Previous studies have suggested a widespread extinction among flowering plants at the K-T boundary, and it's long been assumed that the bees who depended upon those plants would have met the same fate. Yet unlike the dinosaurs, "there is a relatively poor fossil record of bees," says Rehan, making the confirmation of such an extinction difficult.

Rehan and colleagues overcame the lack of fossil evidence for bees with a technique called molecular phylogenetics. Analyzing DNA sequences of four "tribes" of 230 species of carpenter bees from every continent except Antarctica for insight into evolutionary relationships, the researchers began to see patterns consistent with a mass extinction. Combining fossil records with the DNA analysis, the researchers could introduce time into the equation, learning not only how the bees are related but also how old they are.

"The data told us something major was happening in four different groups of bees at the same time," says Rehan, of UNH's [College of Life Sciences and Agriculture](#). "And it happened to be the same time as the dinosaurs went extinct."

While much of Rehan's work involves behavioral observation of bees native to the northeast of North America, this research taps the computer-heavy bioinformatics side of her research, assembling genomic data to elucidate similarities and differences among the various species over time. Marrying observations from the field with genomic data, she says, paints a fuller picture of these bees' behaviors over time.

"If you could tell their whole story, maybe people would care more about protecting them," she says. Indeed, the findings of this study have important implications for today's concern about the loss in diversity of bees, a pivotal species for agriculture and biodiversity.

"Understanding extinctions and the effects of declines in the past can help us understand the pollinator decline and the global crisis in pollinators today," Rehan says.

The article, "First evidence for a massive extinction event affecting bees close to the K-T boundary," was published in the Oct. 23, 2013 edition of [PLOS ONE](#) (click to link to the article). Funding for the research was

provided by Endeavour Research Fellowships (Rehan) and Australian Research Council Discovery Grants (Schwarz).

The [University of New Hampshire](#), founded in 1866, is a world-class public research university with the feel of a New England liberal arts college. A land, sea, and space-grant university, UNH is the state's flagship public institution, enrolling 12,300 undergraduate and 2,200 graduate students.

Photographs available to download:

<http://www.unh.edu/news/releases/2013/10/images/ceratina-6236.jpg>

Caption: A small carpenter bee.

Credit: Sandra Rehan

http://www.unh.edu/news/releases/2013/10/images/rehan_beehunt-3942.jpg

Caption: UNH assistant professor of biological sciences Sandra Rehan searching for bees.

Credit: Sandra Rehan

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