For Immediate Release

Bumblebee mystery continues: the main suspects behind decline are only part of the story

Summary: A new study is the first to show a link between the use of artificially-reared bumblebees in greenhouses and the decline of wild bee populations, but the link is weaker than expected. Neither pesticides nor habitat loss are behind recent reductions in bee populations.

(April 30, 2012)

Disease spread from commercial greenhouses, pesticides and habitat loss are not as important in recent bumblebee declines as previously suspected, according to a new study published in the journal Conservation Letters.

A yellowbanded bumblebee (photo by Leif Richardson)

Using more than 65,000 bumblebee records, University of Ottawa biologists looked at changes in the ranges of three bee species: the rusty-patched bumblebee, the yellowbanded bumblebee and the American bumblebee. They then examined agricultural census data from Canada and the US to determine if declines observed over the last three decades are linked to areas with a high density of vegetable greenhouses. Using bumblebees to pollinate greenhouse tomatoes became popular in North America in the 1990s, and scientists have speculated that the artificially-reared pollinators may be behind recent declines. The artificially-reared bees often carry more pathogens and frequently escape from greenhouses, potentially spreading disease to their wild counterparts.

The researchers found a connection between greenhouse density and population decline in two of the three bumblebee species. However, there was no connection for the rusty-patched bumblebee, which has almost completely disappeared. “This is the first evidence linking disease spread from greenhouses directly to the declines of some bumblebee species,” says Nora Szabo, a PhD student at the University of Ottawa who led this research. “But it only partially explains their patterns of decline. There are still other factors at play.”

To unravel what those other factors might be, the researchers also looked at levels of pesticide use and habitat loss across the bees’ ranges. Surprisingly, they found no significant relationship between pesticide use or habitat loss and recent changes in bee distributions. “We know that habitat loss and pesticides have a negative impact on bumblebees. But when you consider their impact across the entire ranges of these three species, neither appears to be driving the current range shrinkage,” says Szabo.

The study, say the authors, is a call to arms for more research. "We have seen major losses of some of our pollinator species and our results indicate that those losses cannot be explained adequately," says Jeremy Kerr, also of the University of Ottawa and the principal investigator for the project. "We can only speculate about why we're losing some of these species, but we can say with certainty that we need to solve the riddle of their declines quickly. We cannot do without their services."

Researchers from the York University, the University of Connecticut and Yale University were additional co-authors on the study. The project was supported with funds from the Natural Sciences and Engineering Research Council of Canada, and a NSF DBI grant. The study is contribution #52 to the Canadian Pollination Initiative (NSERC-CANPOLIN).

Nora D. Szabo, Sheila R. Colla, David L. Wagner, Lawrence F. Gall, Jeremy T. Kerr. 2012. Do pathogen spillover, pesticide use, or habitat loss explain recent North American bumblebee declines? Conservation Letters (first published online: 10 APR 2012; DOI: 10.1111/j.1755-263X.2012.00234.x)

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