

# Newcastle University experts test bee friendly pesticide

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Newcastle University researchers are pinning their hopes on a bee friendly biological pesticide



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Jon Sullivan

A bee gathering pollen

Decline-threatened bees are set to benefit from a biological pesticide which is being tested in the North East.

The bio-pesticide has been created using spider venom and snowdrop extract and has been found to be safe for honeybees - despite being highly toxic to a number of key insect pests.

New research led by Newcastle University has tested the bio-pesticide – a combination of a natural toxin from the venom of an Australian funnel web spider and snowdrop protein.

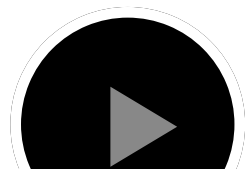
Feeding acute and chronic doses to honeybees - beyond the levels they would ever experience in the field - the Newcastle team found it had only a very slight effect on the bees' survival and no measurable effect at all on their learning and memory.

This means the compound has huge potential as an environmentally-benign, bee-safe bio-pesticide and an alternative to the chemical pesticides which have been linked to declines in pollinator populations.

Honeybees perform sophisticated behaviours while foraging that require them to learn and remember floral traits associated with food.

Disruption to this important function has profound implications for honeybee colony survival, because bees that cannot learn will not be able to find food and return to their hives.

By pollinating some key crop species, honeybees make a vital contribution to food security. Their decline raises significant concerns about our ability to feed a growing population.





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Professor Angharad Gatehouse, based in Newcastle University's School of Biology and one of the supervisors on the project, said that the findings suggest that the bio-pesticide is unlikely to cause any detrimental effects on honeybees and offers a safe alternative to some currently on the market.

The project is part of the Insect Pollinators Initiative, jointly funded by the Biotechnology and Biological Sciences Research Council, Defra, the Natural Environment Research Council, the Scottish Government and the Wellcome Trust.

This research, involving academics from Newcastle and Durham Universities and the Food and Environment Research Agency, was funded by the UK's innovation agency the Technology Strategy Board.

During the study, the bees were exposed to varying concentrations of the spider/snowdrop bio-pesticide over a period of seven days.

Throughout the study period, the team carried out a series of memory tests and recorded any changes in behaviour.

Research lead Erich Nakasu, a PhD student at Newcastle University, said: "This is an oral pesticide so unlike some that get absorbed through the exoskeleton, the spider/snowdrop protein has to be ingested by the insects."

He said that although the bio-pesticide was carried to the brain of the honeybee, it had no effect on the insect. The larvae were also unaffected by the substance, which they were able to break it down in their gut.

Dr Geraldine Wright, one of the authors on the paper, heads Newcastle University's Honeybee Lab. Last year she led the research which highlighted the damaging effect of some pesticides on bees' ability to learn and remember and communicate to their hive mates.

"Around 90% of the world's plants are directly or indirectly reliant on pollinators to survive," she said. "If we destroy the biodiversity of pollinators then it will be irrelevant how effective our pesticides are because we won't have any crops to protect."



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