

Nobel House
17 Smith Square
London SW1P 3JR

Telephone 020 7238 1134
Fax 020 7238 5529
Out of hours telephone 020 7270 8960
Out of hours fax 020 7270 8125
Website www.defra.gov.uk



News Release

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BEE SCIENTISTS TO FORCE KILLER MITES TO SELF DESTRUCT

Scientists may be able to halt global honey bee losses by forcing the deadly Varroa mite, lethal in the freezing weather, to self destruct.

The blood-sucking Varroa is the biggest killer of honey bees world-wide, having developed resistance to beekeepers' medication. It is particularly destructive in winter as depleted colonies do not have enough bees huddling together to keep warm.

Now researchers from the Government's National Bee Unit and Aberdeen University have worked out how to 'silence' natural functions in the mites' genes to make them self destruct.

Dr. Alan Bowman from the University of Aberdeen said:

"Introducing harmless genetic material encourages the mites' own immune response to prevent their genes from expressing natural functions. This could make them self destruct.

"The beauty of this approach is that it is really specific and targets the mites without harming the bees or, indeed, any other animal."

Dr Giles Budge from National Bee Unit, part of the Food and Environment Research Agency (Fera), said:

"This cutting edge treatment is environmentally-friendly and poses no threat to the bees. With appropriate support from industry and a rigorous approval process, chemical-free medicines could be available in five to ten years."

Environment Minister Lord Henley said:

“Bees are essential to putting food on our table and worth £200m to Britain every year through pollinating our crops. This excellent work by UK scientists will keep our hives healthy and bees buzzing.”

The process uses the Nobel Prize-winning theory ‘RNA interference’, which controls the flow of genetic information. So far the ‘silencing’ has worked with a neutral Varroa gene, which has no significant effect on the mite. Scientists now need to target a gene with the specific characteristics that are perfect to force the Varroa to self destruct.

Tests by other scientists have shown the treatment can be added to hives in bee feed. The bees move it into food for their young, where the Varroa hides.

VARROA FACTS

- The Varroa mite, like a brown crab, is the biggest global killer of honey bees.
- It originally attacked the Asian honeybee but jumped to the European honeybee, which has a poor natural defence.
- The mite injects viruses, suppresses the bees’ immune system and feeds on blood.
- Beekeepers use chemical controls but can never eradicate it and over the past decade the Varroa developed resistance to some medication.
- If untreated, or given inappropriate chemicals, it can take just 1,000 mites to kill a colony of 50,000 bees.
- Honey bees are worth £200m to the UK economy a year through pollinating crops
- The Varroa mite entered the UK in 1992.
- Honey bee populations have dropped by 23 per cent since 1992, potentially costing the economy millions of pounds.
- In 1992 there were 23,767 beekeepers and 151,924 colonies. In 2010 there have been 21,000 beekeepers, and 116,500 colonies.
- In summer an average colony has 30,000 to 50,000 honey bees.

NOTES TO EDITORS

1. Photos of the Varroa mite are available from Defra Press Office.
2. The full report is available at: <http://www.parasitesandvectors.com/content/3/1/73>

3. RNA interference (RNAi) was discovered by Professor Andrew Fire who won the 2006 Nobel Prize in Physiology or Medicine for it: http://nobelprize.org/nobel_prizes/medicine/laureates/2006/press.html. For more information go to: <http://www.nature.com/focus/rnai/animations/index.html>.
4. The Food and Environment Research Agency supports and develops a sustainable food chain and healthy natural environment, and protects against biological and chemical risks. <http://www.fera.defra.gov.uk/>. The National Bee Unit advises beekeepers, supports industry, and controls serious pests and diseases to minimise economic and environmental impact. <https://secure.fera.defra.gov.uk/beebase/index.cfm>
5. In 2009 the Government launched the Healthy Bees Plan, a 10-year strategy to protect and improve the health of honeybees in England and Wales. To help start it, Defra and the Welsh Assembly Government (WAG) contributed £2.8million up to 2011.
6. In June 2010, Defra and WAG announced £2.5million of funding for the Insect Pollinators Initiative for research into understanding and mitigating the biological and environmental factors affecting insect pollinators.
7. In October Defra announced support for the British Beekeeping Association to increase the number of quality trainers for beekeepers across England and Wales. This is to teach amateurs the skills to care for bees and guard against pests and diseases.

Press enquiries 020 7238 6092; Public enquiries 08459 335577;

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