



A new hope in the battle against *Varroa*-associated honey bee colony collapse

A honey bee colony in England which has survived a disease that killed its neighbours, may provide a clue to the future management of these important pollinators.

Widespread honey bee colony death over the past 25 years has been attributed to a virus (deformed wing virus, DWV) carried by the parasitic mite, *Varroa destructor*. However, colonies in Swindon, in the south of England, appear to survive despite high levels of viral infection.

Scientists at the Marine Biological Association (MBA) used new methods of DNA sequencing to reveal a unique viral landscape in which a non-lethal DWV variant is dominant. Bees from the surviving colonies in Swindon showed infestation with *Varroa* mites carrying both lethal and non-lethal variants of DWV. However, only the non-lethal type was detected in the bees themselves. The scientists suggest that infection by the non-lethal DWV prevented the more virulent variant from becoming established.

Viruses play an extremely important role in controlling host populations. DWV is closely related to a marine virus studied by the [MBA's Schroeder Research Group](#). DWV particles are not all identical, but made up of a swarm of three major variants (one of which was recently discovered by the authors). However, advances in sequencing technology have enabled the discovery of a unique viral dynamic in Swindon where a less deadly variant of DWV seems to prevent the entry of a more harmful variant, which may explain how these honey bees have survived.

The MBA's Gideon Mordecai, lead author of the research said "It was great to see that through the process of natural selection, honey bees, *Varroa* and DWV were able to reach a stable state, with honey bee colonies able to survive without the use of a chemical *Varroa* treatment."

The research appears in The ISME Journal (International Society of Microbial Ecology). Samples used in this research were provided by Ron Hoskins of the [Swindon Honeybee Conservation Group](#). Gideon Mordecai is a PhD student with the University of Reading, based at the Marine Biological Association.

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Figure 1 Honey bee with deformed wings, and a *Varroa* mite.



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The Marine Biological Association (MBA) is a professional body for marine scientists with some 1,400 members world-wide. Since 1884 the MBA has established itself as a leading marine biological research organization contributing to the work of several Nobel Laureates and over 170 Fellows of the Royal Society. In 2013, the MBA was awarded a Royal Charter in recognition of its long and eminent history and its status within the field of marine biology. The award strengthens the Association's role in promoting marine biology as a discipline and in representing the interests of the marine biological community.

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