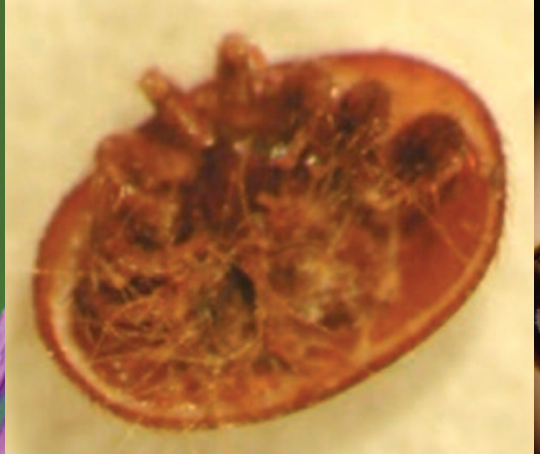

Insect Pollinators Initiative

Unravelling the impact of the mite *Varroa destructor* on the interaction between the honeybee and its viruses

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Introduction of the parasitic mite *Varroa* to the UK around 20 years ago had a major impact on honeybee health and beekeeping practice. Without regular control, *Varroa* levels rise significantly causing a decline in colony fitness and excessive winter losses. While feeding on honeybee 'blood' *Varroa* transmits viruses between bees. Previous studies by this team have shown that two of these viruses, Deformed Wing Virus (DWV) and *Varroa* Destructor Virus-1 (VDV-1), can combine to form a new sort of hybrid virus that current diagnostic methods cannot correctly identify. Susceptibility to *Varroa* and bee diseases is known to vary; for example, beekeepers breed in desirable traits such as hygienic behaviour that can help lower the risk of disease. However, the basis for honeybee resistance to *Varroa* and these viral diseases remains poorly understood – it is thought that it may be due to the genetics of different bees. This project will look at the natural genetic variation within the hive to study how honeybees respond to *Varroa*, to VDV-1, DWV and the new hybrid viruses. This will make it possible to show how some honeybees' own cells posess the ability to limit the severity of a viral infection. The team will identify molecular markers for resistance that will make it possible to select and breed bees with reduced susceptibility to *Varroa* and honeybee viruses. These will benefit beekeepers, farmers, and gardeners who rely upon honeybees for pollination, and could influence UK policies relating to bee health and queen importation.

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