Chronic Bee Paralysis: Past, Present and Future

Dr Giles Budge, senior lecturer at Newcastle University and crop and bee health lead at Fera Science Ltd, with an update on research initiatives

Chronic bee paralysis has a long history with honey bees, going back millennia. Indeed, the first record of hairless black bees that may have described this disease has been attributed to Aristotle from 350 BC(1). The disease became known by many different names, including ‘black robbers’ and ‘little blacks’ in Britain; schwarzucht (black addiction), maladie noire (black disease) and mal nero in continental Europe; and ‘hairless black syndrome’ in the United States of America. It took the efforts of a brilliant British bee scientist in the 1960s, Leslie Bailey, to relate these various meladises to a single causative organism – chronic bee paralysis virus (CBPV).

Chronic bee paralysis is found on every continent where honey bees are kept. In the UK, eight per cent of colonies were reported to be showing ‘paralytic’ symptoms in 1947, reducing to two per cent of colonies by 1960(2). A large-scale survey completed by the National Bee Unit (NBU) between 2009 and 2011 suggested that the virus was not commonly detected when random apiaries were tested – only seven in 1000 apiaries tested positive. Interestingly, the prevalence was found to be far higher when apiaries suffering from chronic bee paralysis. This funding. The consortium includes:

- Newcastle University (Dr Giles Budge, principal investigator; Professor Steve Rushton, biological modeller)
- University of St Andrews (Professor David Evans, virologist)
- The Bee Farmers’ Association (members opting to participate)
- National Bee Unit, Animal and Plant Health Agency (Mike Budge)
- ANSES (French agency for food, environmental and occupational health and safety), European Union Reference Laboratory for Honey Bee Health (Dr Magali Ribière)
- additional support from Dr Jay Evans, USDA (US Department of Agriculture), USA, and Dr Joachim de Miranda, SLU (Swedish university of agricultural sciences), Sweden.

Objectives

The chronic bee paralysis research project is divided into four objectives.

Objective 1: modelling the epidemiology and drivers of chronic bee paralysis

We will gather new information on what stressors are associated with colonies suffering from chronic bee paralysis and will consider pathogens in adult bees, pesticide exposure in adult bees, weather, local land use and apiary management practices. As such, we will be collecting samples from healthy and diseased colonies, along with husbandry information from bee farmers this year and next year, we will set up field trials with bee farmers on apiaries that are suffering from recoccurring disease to monitor the dynamics of disease spread in adult bees, pestidose exposure in adult bees, and next. We will work closely with the BFA and NBU to develop evidence-based colony and apiary management practices.

Objective 2: CBPV evolution, transmission and virulence

We will assess whether the recent emergence of chronic bee paralysis is the result of shifts in the transmissibility or virulence of modern CBPV strains. We will investigate co-stressors of chronic bee paralysis disease, assessing the impact of these factors on disease spread and virulence. One 18 July this year, I received a letter confirming the consortium had won this funding. The consortium includes:

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