



National Bee Unit

Chronic Bee Paralysis Virus

Chronic Bee Paralysis Virus (CBPV) readily infects the European honey bee, *Apis mellifera* and has been found to have a widespread distribution. Colonies may carry CBPV without showing symptoms and it is not until the colony is put under stress that the symptoms start to show. The virus appears to infect older bees more frequently and foragers are often found to have a higher virus burden. Unlike other honey bee viruses such as Deformed Wing Virus (DWV), CBPV has so far not been associated with the parasitic mite *Varroa destructor*. Although our understanding of this virus is increasing, there is still relatively little information about it and it is not clear what other viruses it is related to.

How is CBPV spread?

CBPV appears to survive in colonies at low levels throughout the year. Outbreaks are reported to occur at the peak of spring and summer. It is thought that a combination of large population sizes and periods of confinement in the colony, due to bad weather, cause crowded conditions which exacerbate the spread of infection through bodily contact between bees. In laboratory experiments it is clear that direct contact with infected individuals causes spread of the virus, body hairs are rubbed away through repeated contact and, as a result, the virus is able to penetrate the cuticle and establish infection.

From research on CBPV spread in honey bee queens, the role of trophallactic exchange of food is thought to be significant, and can aid transmission through the colony. The virus is also known to spread through faeces of infected bees which contain high levels of infective virus. Faecal - oral transmission with infected faeces and bees on nurse duties has also been reported. It is suggested that the use of pollen traps may increase the likelihood of an outbreak of CBPV. This could be due to traps damaging returning foragers, or the rubbing off of hairs on bees passing through the trap.

What are the symptoms of Chronic Bee Paralysis Virus (CBPV)?

The symptoms of CBPV can be quite severe and devastating for a colony. Symptoms have been confused with chemical poisoning due to the similarity in their characteristics. Currently

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the symptoms have been classified into two groups termed Type 1 (most common in Britain) and Type 2 syndrome.

Type 1 syndrome:

- Abnormal trembling motion of adult bees' wings;
- Wings may be spread or dislocated;
- Paralysis of adult bees' bodies;
- Adult bees are unable to fly and so are often found crawling in large numbers on the ground;
- Adult bees often have bloated abdomens due to swelling of the honey stomach;
- "Dysentery" like symptoms;
- Infected individuals die within a few days following the start of symptoms;
- Heavily infected colonies may collapse, particularly seen at the height of the season;
- Collapsed colonies may be found to contain only a few adult bees and the queen.

Type 2 syndrome:

- Adults appear hairless, looking very darkly coloured and almost black;
- Adults take on a shiny, "greasy" appearance in bright light;
- Infected bees are subject to "nibbling" attacks by other healthy members of their colony, and are often barred entry to the hive, making them appear to be robber bees.

Treatment and control of CBPV

CBPV will spread more rapidly when bees are in greater contact with each other. Beekeepers can reduce the pressure on a colony from overcrowding by giving the bees more room, adding brood chambers or supers, thereby decreasing the transmission of the virus by reducing bee to bee contact. Reducing the general bee population in an area may reduce transmission through robbing and drifting of foragers, and also prevent food limitation acting as an additional stress on colonies. Moving affected colonies to an isolation apiary can help prevent the spread of disease within an apiary. Feeding colonies with sugar syrup has also been reported to help, especially when there is no nectar flow, or if colonies have been confined due to bad weather.

Good husbandry and hygiene is crucial and should not be underestimated. Beekeepers should try to reduce the movement of frames and supers between colonies and apiaries and ensure dead material is cleaned up and safely destroyed. This will prevent robbing and/or contact of healthy bees with the virus. Hive boxes that contained infected material will benefit from being fully cleaned or, if very old and difficult to clean, replaced. The same is true for comb; as the virus can be transmitted through faeces and contact, fresh wax and foundation may be a good preventative tool to stop reoccurrence of symptoms. This is particularly important for disease control as currently we still do not know how long CBPV can exist outside of its' bee host, on combs or equipment, and still be infective.

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