

New Australian stingless bee disease

This is a notification to the Australian stingless bee industry stakeholders that there have been several reported incidences of brood disease and colony deaths in the last two years. Reports of increased incidences have come to light in recent times. As a result of these reports, Jenny Shanks, from the University of Western Sydney, has released the following report based on her research work in this area.

Please be aware that this report is an interim notification to industry stakeholders in an effort to alert beekeepers of the need for caution and improved hygienic behaviour when working with stingless bees.

The development and submission of a short communication in a peer reviewed journal is planned, however, in the interest of informing stingless beekeepers in the immediate future, this communication is being shared.

Stingless bee bacterial infection

The isolated bacteria, sampled from symptomatic *Tetragonula carbonaria* and *Austroplebeia australis* hives, is **speculated** to be causing brood infection and colony deaths. The bacteria is a subspecies of the *Bacillus* group, a group that includes *Paenibacillus larvae* (American Foulbrood - AFB). It is stressed that this bacterial infection is **not** AFB, however symptoms are similar.

The suspect bacteria has been cultured from the majority of nest materials and therefore colony-level transmission is high.

Signs of disease are as follows

- Infected brood does not develop, cells can form sunken caps
- Infected brood becomes discoloured, first turning brown from the last segments of the abdomen eventually turning dark brown all over
- Larvae that have been removed from cells can be found singly or groups throughout hive

- Infected brood eventually degrades to a watery consistency
- Cells become darker in appearance as contents degrade
- Cell provisions discolouration of and/or dry
- Ammonia or decaying smell from infected cells
- Brood formation becomes scattered instead of in organised spiral discs (for *T. carbonaria*)
- Worker behaviour can initially be frenetic and disorganised, becoming lethargic over time
- These field symptoms are mainly for *T. carbonaria* hives, as Jenny has not had occasion to observed *A. australis* prior to advance infection. Symptoms in *A. australis* include a dried chalky-like brood cell / provision, and this bacteria may be a different strain or subspecies.



Figure 1 Brood cells showing discoloured larvae dispersed amongst normal larvae (Photo J. Shanks)



Figure 2 Discoloured larvae that have been removed by workers (Photo J. Shanks)



Figure 3 Diseased larva within a brood cell (Photo J. Shanks)

While many beekeepers may be of the opinion that they can manage such problems please be aware that attempts to manage this condition have been made. These include the removal of infected brood and supplementary feed; however, since the bacteria can reside in the honey stores, spores may be transmitted by adults. Therefore, this action is not an appropriate control measure, and the colony will most probably die. The addition of pupating brood cells, in the hope that emerging workers may assist in overcoming infection, does not work.

Since discovering the bacterial infections, and losing many of her own colonies, Jenny has devised a strategy to minimise the spread of the infection. The following guidelines are recommended to all stingless bee beekeepers who manipulate their nests. It is stressed here that if it is not necessary to open your colonies, DON'T.

The current recommended strategies for control of this new bacterial infection are as follows

- Isolate the nest and workers. That is, block the hive entrance when all nest mates have returned
- Burn the entire colony and box. This is a drastic measure, however, is performed with highly infected colonies
- Minimise chances of cross contamination between colonies. Beekeepers should sterilise equipment with bleach. Sterilisation should take place between working with boxes and when sampling (including being vigilant with all hive tools and the reuse of boxes).
- Spore longevity is unknown thus it is recommended to large-scale colony producers that they consider the radiation of equipment,

as is the case with AFB infection in *Apis* colonies

- DO NOT leave boxes or stores out for other colonies to rob. This increases the chances of infection into neighbouring colonies
- The transfer of brood between colonies, to aid in population or recovery, is NOT RECOMMENDED. The bacteria takes 22 days from infection to first observed symptoms and the spores would have to be present in the provision before egg is laid and cell capped. Therefore the transfer of “healthy” young brood may still be infected and not showing symptoms. Infected larvae do not progress to pupal stage, therefore, to date it is believed that older developing brood should be okay.
- DO NOT supplementary feed with *Apis* honey.

Ongoing actions

In light of this information and concerns beekeepers may have, it is suggested that any questions or queries be formerly directed to Bob Luttrell. Bob is currently assisting stakeholders with potentially infected colonies and with information provided for field identification. Bob may be able to assist in the identification of suspect brood. If, when you open a hive, you become concerned about your colony please obtain **good quality photographs** which show developing larvae. Check for queen-right status if possible. Bob is unable to take brood specimens for lab analysis, but can help with identification through photographic evidence. You can contact Bob at (robertb.luttrell@bigpond.com). Please provide the location of your hive and number of hives in your meliponary with the photo.

Important

DO NOT OPEN YOUR HIVES JUST TO CHECK FOR THE DISEASE. If you have no symptoms, such as discoloured larvae being removed from the nest, reduced worker activity at the nest entrance or other, do not open the hive.

Don't panic

It is important that stingless beekeepers don't start to panic in light of this information. If you manipulate your hives please follow the recommended protocols listed above. Also, keep records of what is happening with your colonies.