

Chalkbrood disease

What is chalkbrood disease?

Chalkbrood disease is caused by the fungus *Ascosphaera apis*. The fungus produces spores which are swallowed by honey bee larvae when they are fed by nurse bees. The spores germinate in the honey bee's gut and ultimately cause the larvae to die of starvation. Chalkbrood is present throughout Australia and its incidence is generally higher when the colony is under stress due to cool wet weather or poor nutrition. It is more common in the spring when the brood nest is rapidly expanding and a smaller adult workforce cannot maintain brood nest temperature.

What should beekeepers look for?

Infected hives show a scattered brood pattern with perforated cappings. Larvae infected with chalkbrood disease usually die after capping and the fungus grows to fill the cell. The larval body dehydrates creating diagnostic 'mummies' – hard, shrunken and chalklike. The fungal mycelium infiltrates the larval tissue and fruiting gives the mummies a white-grey colour.

The cappings of cells containing dead larvae may be chewed away by the honey bees and the mummies removed to the hive entrance, dropped to the bottom board, or on the ground outside the hive.

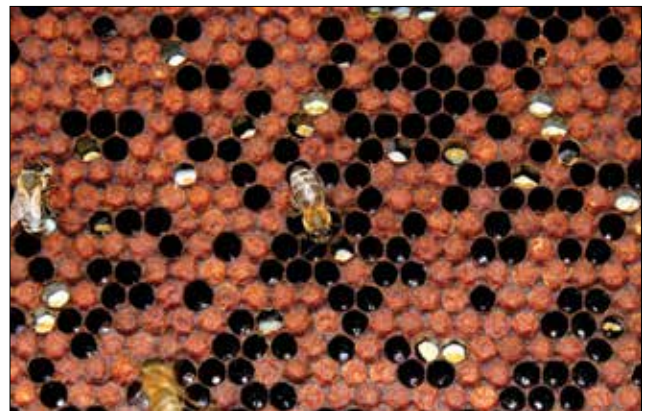
What can it be confused with?

Chalkbrood disease symptoms of scattered brood with perforated cappings could be confused with either American foulbrood (AFB), European foulbrood (EFB) or sacbrood virus. However, the presence of mummies in the cells, the hive entrance and bottom boards, together with no rosy thread when conducting the ropiness test, would suggest chalkbrood disease is the cause.



The chalkbrood fungus starting to envelop a developing pupa

Rob Snyder, www.beeinformed.org



Comb infected with chalkbrood disease showing a scattered brood pattern with mummies in cells

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Dead larvae in cells that have turned white due to fungal growth

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How does it spread?

Chalkbrood disease can be easily spread between hives through the drifting behaviour of drones and worker bees, as well as the robbing behaviour of worker bees. Once inside a hive, fungal spores are quickly spread throughout the hive from mummies. It can also be transferred between apiaries on contaminated equipment, pollen and in water. The chalkbrood spores may remain viable for 15 years.

Where is it now?

Chalkbrood disease is present throughout Australia; however, it has not been reported or confirmed in the NT.

How can beekeepers protect their hives from chalkbrood disease?

Beekeepers should replace diseased combs which can act as a reservoir for chalkbrood disease spores, as well as cleaning away mummified larvae from the bottom boards and around the entrance of the hive. These activities will remove the main source of infection within a hive, and assist in preventing reinfection of the disease. Hives should also be placed in a well-ventilated, dry area with the sun facing the entrance of the hive to reduce conditions that favour the disease.

Honey bee stocks differ in susceptibility to chalkbrood disease, so beekeepers should replace the infected colony's queen bee with one supplied by a reputable breeder. This variation in susceptibility is mainly due to differences in the hygienic ability of the honey bees to uncap and remove diseased brood. By selecting queen bees or obtaining honey bees from hives that show this trait, the effects of chalkbrood disease can be reduced.



Mummies on the hive floor

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Mummies are moved from the infected cells or hive floor by nurse bees to the hive entrance

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For more information about chalkbrood, go to www.beeaware.org.au/chalkbrood. The BeeAware website contains extensive information on chalkbrood, including:

- Life cycle
- Appearance
- Similar pests
- Spread and distribution
- Management options
- Additional fact sheets

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