Brood Diseases

Abby Rogers
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Period 4

Overview

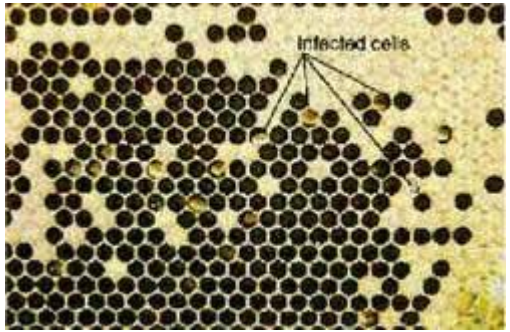
- Brood diseases are conditions which affect the developing eggs, larvae, and pupa in a hive
- These conditions can be caused by bacteria, fungi, or viral infections which spread through and affect a hive in different ways
- There are many of these diseases that plague hives around the globe, but i have chosen to focus on three ~ Chalkbrood disease, Foulbrood disease, and Deformed Wing Virus

Chalkbrood disease

- The causative factor is a fungus called *Ascosphaera apis*
- Bees come in contact with this bacteria when they ingest it with the nectar they eat
- Infected larvae show no symptoms until they are capped, when they will die from the disease
- Chalkbrood rarely wipes out entire colonies, instead weakening them against other bacteria or parasites
- Hives are more susceptible when under stress or undergoing a temperature change
- There are no chemicals available to remove chalkbrood

How Chalkbrood Develops

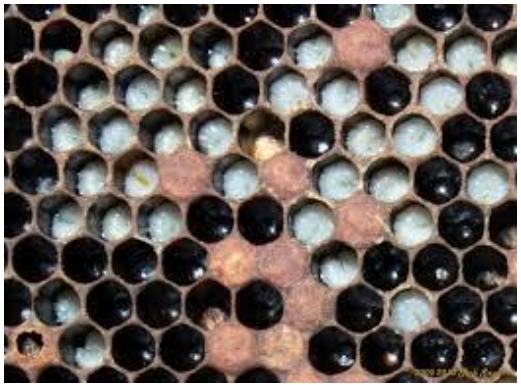
- This fungus grows inside of the larva’s stomach, producing long fibers which puncture the stomach and absorb all of the nutrients that the larva eats
- With no food actually reaching the digestive system of the larva, the fungus starves it to death
- The fungus continues to grow inside of the dead body, swelling it until it bursts out of the back end of the larva, enveloping it in a cottony white film
- The cell fills with the fungus, which then hardens into a chalky white substance, hence the name



How Chalkbrood Spreads

- Once the cell is filled, and the larva mummy, the fungus will turn dark brown or black
- This signifies the end of the fungi’s life cycle, and that new spores are being produced from the dead host
- Millions of spores can be formed from one chalkbrood mummy, and the spores can stay active for almost 20 years

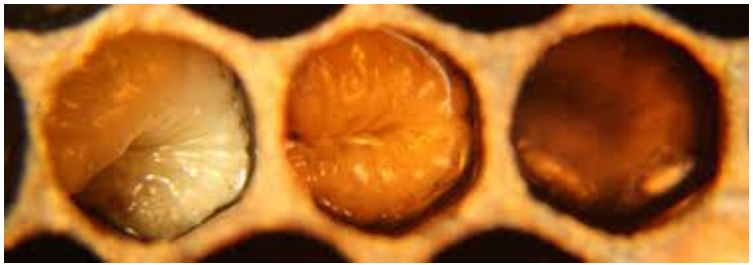
European Foulbrood Disease



- Bacterial disease
- Affects larvae before the capped stage
- Caused by *Melissococcus plutonius*
- The bees ingest this bacteria and bring it back to the hive
- The bacteria competes with the larva for food, killing it before the cell is capped
- The dead and dying bees are brownish yellow, and spread almost melted, and curled up
- This bacteria is usually more effective when there are only a few nurse bees in the hive caring for the larvae

European Foulbrood Disease

- Later in the season when nectar is more abundant, and there are more nurse bees per larva, the larva will have enough food to grow into adult bees, and the hive will bounce back from the infection
- In certain cases, the hive cannot recover on its own, and the hive will die off
- Combs and equipment can retain the infection, so that hive may contract it repeatedly from contaminated equipment
- European foulbrood has a sour scent, and the larva are rubbery and brown in color

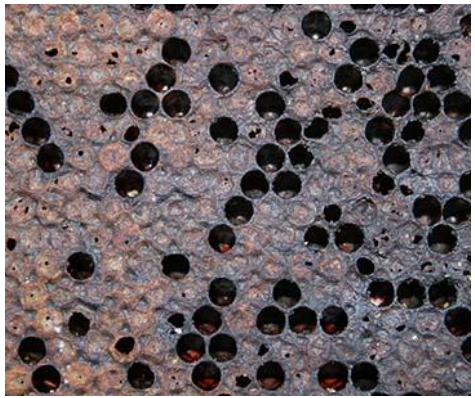


American Foulbrood Disease

- American Foulbrood disease, not to be confused with european foulbrood, is considered to be the most deadly of all bee brood diseases
- This fatal disease is caused by the spore forming *Paenibacillus larvae*
- Unlike other brood diseases, stress is not a factor to whether a hive will be affected or not, so the disease is very widespread
- Spores in the air catch onto the mouths of bees as they fly around, and are transferred to the developing bees when fed
- The bacteria kills the bees at the pre pupa stage, producing billions of spores that spread around the hive when worker bees remove the corpse form the hive
- There is currently no remedy or treatment for this disease

American Foulbrood Disease

- Dark colored, greasy looking cells are a sign of AFD, and if probed with a toothpick, the decomposing larva are ropey and hard to remove
- A sulphurous odor emits from the infected hive
- The comb will look like dark scales, which are brittle, and deeply sunken



Deformed Wing Virus

- Deformed wing virus is one of a few viral diseases that plague beehives globally
- The presence of this disease has been linked to the varroa mites in a beehive
- These mites are carriers for this virus, and spread it to developing uncapped pupas
- The bees can die from this, or will emerge with various defects, the most noticeable being short, wrinkled wings

Deformed Wing Virus

- Bees with these defects are not strong enough to survive, and will at some point die off prematurely
- DWV is one of the major factors which can contribute to CCD, although scientists do not known exactly how yet
- As with most other brood diseases, there is no cure available at the moment
- This virus is virtually undetectable until the deformed bees emerge
- Recently there has been concern as DWV seems to have begun to affect bumblebees as well, which means that it has mutated, and now harming a wider variety of species

Citations

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