

BROOD DISEASES



IMAGE BY MARGARITA LOPEZ-URIBE

AMERICAN FOULBROOD (*PAENIBACILLUS LARVAE* = *BACILLUS LARVAE*)

American foulbrood (AFB) is an infectious brood disease caused by a spore-forming bacterium. It is the most widespread and destructive of the brood diseases, afflicting queen,

drone, and worker larvae alike. Adult bees, however, are not affected by AFB. This disease occurs in two forms: vegetative (rod-shaped bacterial cells) and spores. The spore stage is unique to this type of bacteria, as it may persist for 70 years or more.



IMAGE BY ROBYN UNDERWOOD

EUROPEAN FOULBROOD (*MELISSOCOCCUS PLUTON*)

European foulbrood (EFB) is a bacterial brood disease. It is considered a stress disease and is most prevalent in the spring and early summer. It is less serious than AFB, and colonies can recover from infections. EFB

does not form spores, but it often overwinters on combs. It gains entry into the larva in contaminated brood food and multiplies rapidly within the gut of the larva.



IMAGE BY ROBYN UNDERWOOD

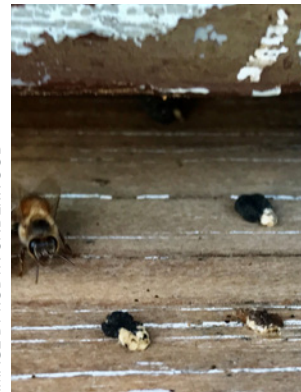


IMAGE BY ROBYN UNDERWOOD

CHALKBROOD (*ASCOSPHAERA APIS*)

Chalkbrood, a fungal brood disease of honey bees, is caused by a spore-forming fungus. Worker, drone, and queen larvae are susceptible. Spores of the fungus are ingested with the larval food. The spores germinate in the hind gut of the bee larva, but mycelial (vegetative) growth is

arrested until the larva is sealed in its cell. When the larva is about six or seven days old and sealed in its cell, the mycelia break through the gut wall and invade the larval tissues until the entire larva is overcome. This process generally takes two to three days.



IMAGE BY ROBYN UNDERWOOD

SACBROOD

Sacbrood is a disease caused by a virus and usually does not result in severe losses. It is most common during the first half of the brood-rearing season. It often goes unnoticed since it usually affects only a small percentage of the brood. Adult bees typically detect and remove infected larvae quickly. Often, if sacbrood

is widespread enough for the beekeeper to observe the symptoms, the disease may be so severe that the adult worker population is reduced.

BEE PARASITIC MITE SYNDROME

Bee parasitic mite syndrome (BPMS) is a complex of symptoms associated with varroa mites, viruses, or a combination of both. Brood combs of affected colonies show uncapped pupae, some with their heads chewed off; sunken, snot-like larvae; workers with deformed wings; and a high mite load. The adult population of bees is also generally small and dwindling.

ADULT DISEASES



IMAGE BY ROBYN UNDERWOOD

PARALYSIS

Bald, shaking honey bees relegated to the outer frames of the hive are suffering from paralysis. Two different viruses, chronic bee paralysis virus (CBPV) and acute bee paralysis virus (ABPV), have been isolated from paralytic bees. Other suspected causes of paralysis include pollen

and nectar from plants such as buttercup, rhododendron, laurel, and some species of basswood; pollen deficiencies during brood rearing in the early spring; and consumption of fermented stored pollen.

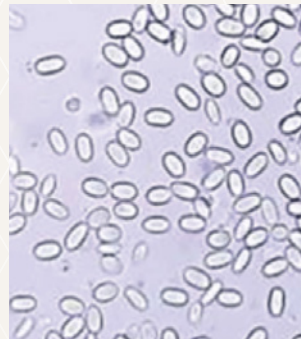


IMAGE BY ROBYN UNDERWOOD

NOSEMA (*NOSEMA APIS*)

Nosema ceranae and *N. apis*, now *Vairimorpha ceranae* and *V. apis*, respectively, are microsporidian parasites that cause infections in honey bees. The primary route of infection is oral-fecal when workers pick up spores while cleaning or from ingesting

contaminated food/water. The spores germinate and replicate within the honey bee gut and are then shed through the feces. *N. apis* can aggravate dysentery, while *N. ceranae* does not have overt symptoms.

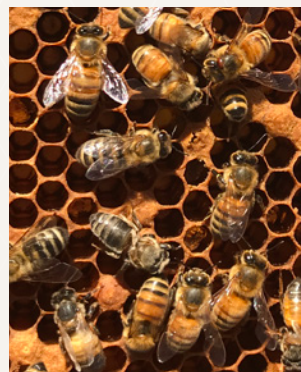


IMAGE BY ROBYN UNDERWOOD

DEFORMED WINGS

Adult bees with deformed wings are common in honey bee colonies with high infestation levels of varroa mites. These deformities are caused by deformed wing virus (DWW), which is transmitted and activated by varroa mites and sometimes called "string wing."

MAAREC/PENN STATE EXTENSION MATERIALS

ONLINE COURSE

BEEKEEPING 101

<https://extension.psu.edu/beekeeping-101>

PUBLICATIONS

BEEKEEPING BASICS

<https://extension.psu.edu/beekeeping-basics>

A FIELD GUIDE TO HONEY BEES AND THEIR MALADIES

<https://extension.psu.edu/a-field-guide-to-honey-bees-and-their-maladies>

ARTICLES AND FACT SHEETS

"BEE DISEASES AND THEIR CONTROL"

https://canr.udel.edu/maarec/wp-content/uploads/sites/18/2010/03/Diseases_of_Honey_Bees_PM.pdf

"BEEKEEPING: HONEY BEES"

<https://extension.psu.edu/beekeeping-honey-bees>

"HONEY BEE DISEASES—AMERICAN FOULBROOD"

<https://extension.psu.edu/honey-bee-diseases-american-foulbrood>

"METHODS TO CONTROL VARROA MITES: AN INTEGRATED PEST MANAGEMENT APPROACH"

<https://extension.psu.edu/methods-to-control-varroa-mites-an-integrated-pest-management-approach>

"AN ORGANIC MANAGEMENT SYSTEM FOR HONEY BEES"

<https://extension.psu.edu/an-organic-management-system-for-honey-bees>

"SMALL HIVE BEETLE"

https://canr.udel.edu/maarec/wp-content/uploads/sites/18/2010/05/SMALL_HIVE_BEETLE_FACT_SHEET_1-29.pdf

"VIRUSES IN HONEY BEES"

<https://extension.psu.edu/viruses-in-honey-bees>



A QUICK REFERENCE GUIDE TO

HONEY BEE

PARASITES, PESTS, PREDATORS, AND DISEASES

MAAREC

The Mid-Atlantic Apicultural Research and Extension Consortium: Delaware, Maryland, New Jersey, Pennsylvania, West Virginia, and the USDA cooperating.



PennState Extension



The key to protecting honey bee colonies from harmful diseases, parasites, and other pests is the ability to identify problems early. This brochure is a quick reference to common honey bee maladies. For a more detailed treatment of this subject, including descriptions of symptoms and approved treatments and control measures, see the additional resources provided at the end of this brochure.

HONEY BEE DEVELOPMENT



IMAGE BY DON SEIFRIT, JR.

QUEEN HONEY BEE

A healthy honey bee colony has three distinct types of individuals: queen, worker, and drone. The queen is an especially important individual in the colony, as she is the only actively reproductive female and generally lays all the eggs.



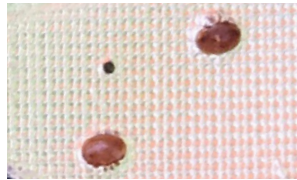
IMAGES BY ROBYN UNDERWOOD

HEALTHY C-SHAPED LARVAE

It is important to be able to identify healthy brood stages. Healthy worker, queen, and drone larvae are pearly white in color with a glistening appearance. They are curled in a "C" shape on the bottom of the cell and continue to grow during the larval period, eventually

filling their cell. A healthy worker brood pattern is easy to recognize: brood cappings are medium brown in color, convex, and without punctures. Healthy capped worker brood normally appears as a solid pattern of cells with only a few uncapped cells; these may contain eggs, uncapped larvae, nectar, or pollen.

HONEY BEE PARASITES, PESTS, AND PREDATORS



IMAGES BY ROBYN UNDERWOOD

VARROA MITE (*VARROA DESTRUCTOR*)

The varroa mite is considered by many to be the most serious malady of honey bees. It now occurs nearly worldwide. This external parasite feeds on the fat bodies of adult bees, prepupae, and pupae.

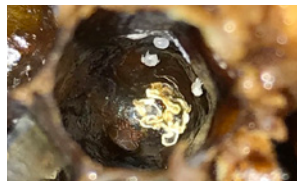


IMAGE COURTESY THE UNIVERSITY OF MANITOBA



HONEY BEE TRACHEAL MITE (*ACARAPIS WOODI*)

A second mite that infests honey bees is the honey bee tracheal mite. This internal parasitic mite lives within the tracheae, or breathing tubes, inside the thorax of adult honey bees. Tracheal mites may also be found in air sacs in the thorax, abdomen, and head. The mites pierce the breathing tube walls with their mouthparts and feed on the hemolymph, or blood, of the bees.



IMAGES BY ROBYN UNDERWOOD

SMALL HIVE BEETLE (*AETHINA TUMIDA*)

The small hive beetle, North America's newest beekeeping pest, was first identified in Florida in the spring of 1998. This pest originated in Africa. The adult beetle is small (about one-third the size of a bee), black or brown, and covered with fine hair. The larvae are small, cream-colored grubs without prolegs.

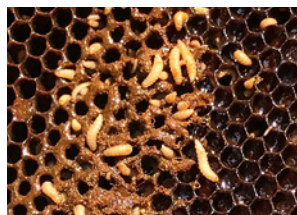


IMAGE BY JEFF PETTIS

BEE LOUSE (*BRAULA COECA*)

Braula coeca, commonly known as the bee louse, is actually a wingless fly. The adults are small (slightly smaller than the head of a straight pin) and reddish brown in color. Although several adult flies may live on a queen, usually only one will be found on a worker. These pests apparently do little harm.



IMAGE BY ROBYN UNDERWOOD

GREATER WAX MOTH (*GALLERIA MELLONELLA*)

Larvae of the greater wax moth cause considerable damage to beeswax combs left unattended by bees. Beeswax combs in the hives of weak or dead colonies and those placed in storage are subject to attack. Wax moths pose a continuous threat except when temperatures drop below 40°F.

SPIDERS, EARWIGS, AND COCKROACHES

Beehives provide shelter to a number of large and small arthropods such as spiders, earwigs, and cockroaches. These are not harmful to the bees or hive equipment and do not require control.



IMAGE BY ROBYN UNDERWOOD

ANTS

Ants are usually not serious pests in honey bee hives. Occasionally, however, certain species may enter hives to search for food or establish nesting sites. Ants are typically found between the inner and outer covers of the hive and in pollen traps. Although ants seldom disturb the bees, they can be a nuisance to the beekeeper.



IMAGE BY ROBYN UNDERWOOD

MICE

Mice are a serious pest of stored combs and may inhabit hives with active honey bee colonies during the fall and winter months. These rodents chew combs and frames to make room for building their nests. Mice urinate on combs and frames, making bees reluctant to use the combs or clean out these nests in the spring.



IMAGE BY ROBYN UNDERWOOD

SKUNKS

In some locations, skunks are a serious threat to successful beekeeping since they hamper the development of strong colonies. Being insectivorous (insect eating), skunks will raid bee yards nightly, scratch on hive entrances, and consume large numbers of bees.

Although such attacks are most common in the spring, they can also occur throughout the summer and fall.



IMAGE BY ROBYN UNDERWOOD

BEARS

Bears are a serious threat to beekeeping operations since they do a great deal of damage to hives and equipment. They normally visit apiaries at night, smashing the hives to eat brood and honey. Once bears locate an apiary, they return again and again, and it becomes exceedingly difficult to control their marauding behavior.



FOR ADDITIONAL INFORMATION, VISIT THE MAAREC WEBSITE:

<https://canr.udel.edu/maarec/>

MAAREC is an official activity of honey bee researchers and extension educators in Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, West Virginia, and Washington, D.C.

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