



# Tracheal mite

The tracheal mite (*Acarapis woodi*) is a parasite that lives and reproduces in the trachea of European honey bees. This microscopic internal mite clogs the breathing tubes of adult EHB, blocking oxygen flow and ultimately killing them. The female mite lays eggs to the walls of the trachea, which hatch and develop to adult mites in 10-15 days. The mites parasitise bees up to two weeks old, and they pierce the tracheal tube walls in order to feed on the haemolymph. Bees infected with the tracheal mite exhibit signs of weakness that include inability to fly and “disjointed” wings. The disease caused by this mite is known as acarine disease or acariosis.

## Symptoms

As one of the most widely spread diseases of the European honey bees, tracheal mites can cause specific symptoms that indicate its presence in the hives. In general, tracheal mites affect flight activity and shorten the lifespan of adult bees.

The wings of infected bees are typically disjointed, projecting about 90 degrees from the axis of the body. Many infected adult EHB also extend their wings outwards, an occurrence known as the “K-wing.” The tracheal mite may also cause bees to

exhibit symptoms of dysentery as well as an excessive swarming tendency.

Infected EHB colonies will also show signs of lethargy. Even on good days, a great number of bees may remain in the hive instead of flying. The population buildup is also significantly slower than normal. During summer and autumn, mite-infested bees may appear strong. As winter approaches, however, they collapse due to the shortened lifespan caused by acariosis. During winter, a colony may have only a queen and just a handful of EHB, although there may be lots of honey.

The susceptibility of European honey bees diminishes rapidly with age. Female mites transfer to young bees less than 3-4 days old and show a particular preference for recently emerged bees that are less than 24 hours old.



## How it spreads

Tracheal mites are spread within the hive as a result of direct contact between bees. Female mites migrate out of the spiracle, attaching to the tip of the hair of the bees. Close contact between bees allows for the passage of female mites from infested to noninfested bees. The infestation is quickly spread from one hive to another by drifting of the bees. Beekeepers may also contribute in the transfer of tracheal mites by combining or dividing colonies. Movements of colonies by migratory beekeepers as well as swarms from infested colonies are other factors in the dispersal of this mite.



## Prevention

Two of the most important steps in the prevention process are cleanliness and maintaining a regular checking schedule. Hives must be regularly inspected for infection, primarily in the summer and fall. Collecting a sample of 50-75 bees and examining them will help identify whether or not the hive is infested by the mite. Avoiding movement of colonies and combining or dividing colonies may also help prevent the spread of the mite in case of minimally infested hives.



## Eradication

Fortunately, tracheal mites can be eradicated without destroying everything living in the hive. There are

several treatment options for tracheal mites, and many of them are completely natural and have no harmful effect on the bees.

### MENTHOL

A packet containing about 50-60 grams of menthol pellets is placed in each infected hive. The menthol packet must be placed on top of the frames when maximum temperatures are cooler than 15°C, (60°F) and on the bottom board when temperatures are warmer (26°C, 19°F). As exposure to air increases and temperatures gradually rise, the menthol vapourizes, filling the colony with its fumes. The tracheal mites are killed when the bees breathe the vapour. The vapour kills adult mites, but has no effect on the eggs or larvae. Therefore, menthol packets should be present in the hives for about 2 weeks, which is the development time of a mite.

The dosage recommended for treating infested colonies is 2 ounces for each 2-story hive.

### GREASE PATTIES

Grease patties are made from 1 part solid vegetable shortening such as Crisco mixed with 2-3 parts of granulated sugar. Some beekeepers prefer mixing 1 part liquid vegetable oil to 2-3 parts powdered or granulated sugar. Adding natural oil extracts such as lemon grass or spearmint to the texture can make grease patties more attractive to the bees. The oil or grease of the patties is intended to mask the smell used by mites to find young bees.

The patties are formed similar to a hamburger, and placed into infested hives on wax paper, most commonly on the centre of the frames. When bees come to eat the sugar, they get oil on their body, which in turn interferes with the mite's ability to spread to other bees. As a result, the mite eventually dies.



## Locate the source

In order to control the spread of the tracheal mites, it is important to determine how the hives became infected in the first place. The most common sources of tracheal mite include:

- local swarms that carry acariosis
- recently acquired, used equipment
- recently introduced swarms
- visits by other beekeepers

### SOURCES

[https://www.countryrubes.com/images/Tracheal\\_mites\\_Acarine\\_Disease.pdf](https://www.countryrubes.com/images/Tracheal_mites_Acarine_Disease.pdf)  
<http://www2.ca.uky.edu/entomology/entfacts/ef012.asp>  
[http://www.clemson.edu/extension/beekeepers/factsheets/honey\\_bee\\_tracheal\\_mite.html](http://www.clemson.edu/extension/beekeepers/factsheets/honey_bee_tracheal_mite.html)  
[http://www.agf.gov.bc.ca/apiculture/factsheets/219\\_hbhtm.htm](http://www.agf.gov.bc.ca/apiculture/factsheets/219_hbhtm.htm)  
[https://en.wikipedia.org/wiki/Acarapis\\_woodi](https://en.wikipedia.org/wiki/Acarapis_woodi)  
<http://www.ent.uga.edu/bees/disorders/honey-bee-parasites.html>  
<http://www.dave-cushman.net/bee/acarinetreatment.html>

### BANNER PHOTOS ON PAGE 1

1. Microscopic view of tracheal mites. PHOTO: Pest and Diseases Image Library, Bugwood.org
2. Tracheal mite infected worker bee (left) showing the classic K-wing symptom can be hard to detect in a colony. PHOTO: Rob Snyder, www.beeinformed.org
3. Various life stages of *A. woodi* collected from honey bee tracheal tube (larva, male, female, gg). PHOTO: USDA