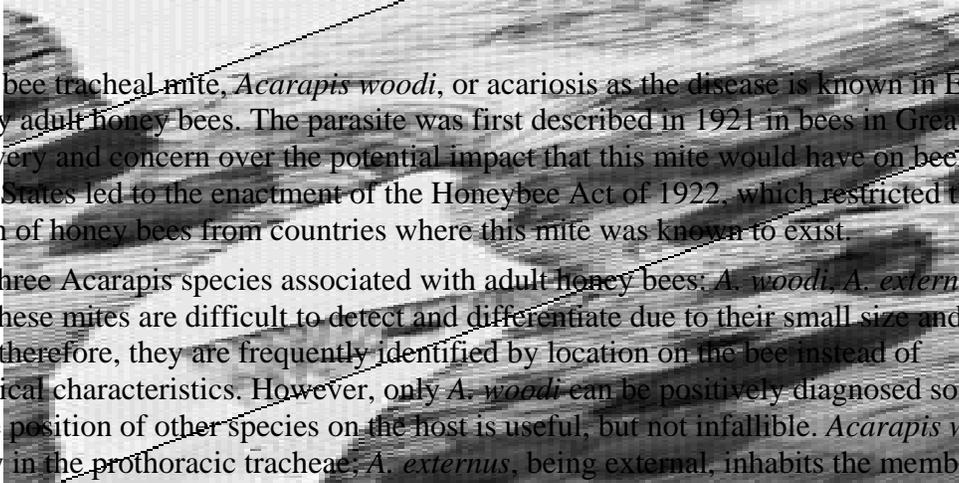


HONEY BEE TRACHEAL MITE -

Acarapis woodi



The honey bee tracheal mite, *Acarapis woodi*, or acariosis as the disease is known in Europe, afflicts only adult honey bees. The parasite was first described in 1921 in bees in Great Britain. This discovery and concern over the potential impact that this mite would have on beekeeping in the United States led to the enactment of the Honeybee Act of 1922, which restricted the importation of honey bees from countries where this mite was known to exist.

There are three *Acarapis* species associated with adult honey bees: *A. woodi*, *A. externus*, and *A. dorsalis*. These mites are difficult to detect and differentiate due to their small size and similarity; therefore, they are frequently identified by location on the bee instead of morphological characteristics. However, only *A. woodi* can be positively diagnosed solely on habitat; the position of other species on the host is useful, but not infallible. *Acarapis woodi* lives exclusively in the prothoracic tracheae, *A. externus*, being external, inhabits the membranous area between the posterior region of the head and thorax or the ventral neck region and the posterior tentorial pits; and *A. dorsalis* is usually found in the dorsal groove between the mesoscutum and mesocutellum and the wing bases.

The *A. woodi* female is 143-174 um in length and the male 125- 136 um. The body is oval, widest between the second and third pair of legs, and is whitish or pearly white with shining, smooth cuticle; a few long hairs are present on the body and legs. It has an elongate, beak-like gnathosoma with long, blade-like styles (mouthparts) for feeding.

When over 30 percent of the bees in a colony become parasitized by *A. woodi*, honey production may be reduced and the likelihood of winter survival decreases with a corresponding increase in infestation. Individual bees are believed to die because of the disruption to respiration due to the mites clogging the tracheae, the damage caused by the mites to the integrity of the tracheae, microorganisms entering the hemolymph (blood) through the damaged tracheae, and from the loss of hemolymph.

The tracheal mite has now been reported on every continent except Australia. Initial detections of *A. woodi* were reported in Brazil in 1974, in Mexico in 1980, and in Texas in 1984. The mites are transmitted bee to bee within a colony by queens, drones and workers. In addition, the movement of package bees and queens, as well as established colonies, has resulted in the dissemination of this mite throughout much of the United States.

One of the first problems that became apparent when the tracheal mite was detected in the United States was the lack of agreement on their economic impact. The literature from Europe did not always agree and beekeepers, research scientists and regulatory officials had differing opinions on the interpretation of the data. However, it soon became evident that the mites were having a serious impact on beekeeping and spreading faster than predicted. The level of infestation within colonies was higher than expected. It is apparent that the tracheal mite found an extremely susceptible honey bee host in the United States.

The population of *A. woodi* in a colony may vary seasonally. During the period of maximum bee population, the percentage of bees with mites is reduced. The likelihood of detecting tracheal mites is highest in the fall and winter. No one symptom characterizes this disease; an affected bee could have disjointed wings and be unable to fly, or have a distended abdomen, or both. Absence of these symptoms does not necessarily imply freedom from mites. Positive diagnosis can only be made by microscopic examination of the tracheae; since only *A. woodi* is found in the bee tracheae, this is an important diagnostic feature.

In sampling for *A. woodi*, collect moribund bees that may be crawling near the hive entrance or bees at the entrance as they are leaving or returning to the hive. These bees should be placed in 70% ethyl or methyl alcohol as they are collected. Bees that have been dead for an indeterminate period are less than ideal for tracheal mite diagnosis.

Menthol is the only material that is currently approved by the Environmental Protection Agency (EPA) for the control of these mites in the United States. Beekeepers can minimize the impact of tracheal mites by intensive management practices to maintain populous colonies and by using menthol.

Colonies can be treated with menthol when there is no heavy nectar flow and daytime temperatures are expected to reach at least 60 F. The best time being in the spring when the weather is warm, and in the late summer or fall of the year immediately after removing the surplus honey.

Directions for Using Menthol: Fifty grams (1.8 ounce) of crystalline menthol should be enclosed in a 7" x 7" plastic screen bag or equally porous material and placed inside a colony for 20-25 days. Menthol placed on the top bars is the preferred method of treatment provided the daytime temperature does not exceed 80 degrees F. During hot weather, the menthol should be placed on the bottom board of the colony. There should be no honey supers on the hive during the treatment, and the menthol should be taken out of a colony at least one month before any anticipated flow. Before using menthol, read and follow the approved label carefully.

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