

HONEY BEE
DISEASES AND
PESTS

Tracheal mite

Acarapis woodi

- Acariosis is a disease caused by *Acarapis woodi* which is located in the respiratory system of honey bees.
- It is an endoparasitic mite.
- They are widespread all over the world, especially in South Asia.
- Diagnosis is difficult because the symptoms are not obvious.
- The disease causes;
 - to weaken of the colonies and to disappear,
 - to fall of honey production,
 - shortening of the life span of the bees and deaths.

- It is an overlooked disease.
- Except from *A. woodi*,
- there are *A. dorsalis* and *A. externus* in the genus, but they are harmless and ectoparasites.
- *A. woodi* parasites on the bee in a very short period of their 30-40 days old life.
- It is observed that the majority of these mites are located in the thoracic canal of the bees and the other parts are located in the abdominal air sacs.
- the males are 125-136 microns length, while the females are 143-174.
- They are usually located in the branch of the respiratory tract, approximately 200 microns diameter, which opens to the first chest stigma.

- It is a prostigmatic mite.
- It has a biting-sucking type mouth organelle.
- They feed hemolymph of bees.
- During the feeding, the trachea wall of bee is damaged, and the resulting damage and obstruction makes oxygen intake to the flight muscles difficult.
- Death usually occurs due to respiratory failure.
- The infested bees are susceptible to bacterial (septicemia) and viral diseases (chronic bee paralysis etc.).

Life cycle

- All developmental stages (eggs, larvae, protonymph-deutonymph, and adults) are found in the respiratory system of bees.
- A mated female mite lays 5-10 eggs to the tracheal tract of bee within 3-4 days.
- Larva emerge within 3-4 days, then nymphs and adults arise.
- The males develop within 10-12 days, while the females develop within 14-15 days.
- The mites in the tracheal canal leave the host from the outer hole (1. thoracic spiracle) of the trachea located in the prothorax to pass to another bee.

- The infestation is more severe in younger bee.
- Drones are more preferred because they have larger breast.
- Transmission is caused by transferring colonies to each other.
- The level of infestation is generally low, therefore it does not attract much attention.
- The most noticeable symptom in the infested bees is the decrease in the ability to fly.
- Early fatigue and walking around hive are typical.

- The wings are not normal and are saggy.
- Abdomen is swollen.
- In microscopical examination, it is seen spots, incrustations, and blackening in the trachea.
- The disease is particularly severe during the winter and early spring.

Diagnosis

◦ Direct methods;

1. Microscopical examination of prepreparates that are mixed with 7.5% KOH and incubated for 24 hours at 37° C or for one night at room temperature.
2. The first thoracic spiracle of the bee is extracted with forceps and examined microscopically.
3. Microscopical examination of the bee thorax by staining with Methylene blue.
4. Microscopical examination of trachea by staining with Congo red dye.

◦ Indirects methods:

- A. ELISA
- B. PCR
- C. Chromatography

Treatment and Control

- Formic acid (65%) and menthol are the most effective and non-residue medicines.
- Additionally, it has been reported that self-cleaning behavior, which is an instinctive behavior of bees, is effective on mites, and that fewer mites are seen in the colonies that are perform this behavior.

Tropilaelaps
infestations

- *Tropilaelaps clarea* is a mesostigmatic mite and cause disease in both adults and immatures of bees.
- After the emergence of the mites in Iran, it has been included to the list of "compulsory notification of diseases" in Turkey in 2012.
- Until today, the infestation has not been reported in Turkey.
- The life cycle of *T. clarea* is similar to varroa and is inversely proportional to the development of varroa.
- They disrupt the habitat of varroa.
- Varroa drugs are effective in treatment.

Bee "Louse"

Braula coeca

- It belongs to the Braulidae family found in the Diptera order of the Insecta class.
- The body consists of caput, thorax and abdomen.
- They have 3 pairs legs.
- They have not wings.
- Though they do not have biting-sucking mouth parts, they are likened to louse.
- They consume the nutrients like pollen, honey, royal jelly of honey bee.

- Effective measures against of this insect must be taken in spring and autumn.
- The hives should be checked frequently.
- Visible adult insects should be collected.
- The varroa drugs are effective.
- For each hive, 8-10 cigarettes can be lit and the smoke can be fumigated through the hive hole. Then, the fainted insects are collected.

Wax moth

Galleria mellonella

- It is the damage caused by butterfly larvae.
- The infestation is prevalent especially in low-altitude temperate zones.
- Adult butterflies enter into the hive and leave their eggs in cracks and frame cavities.
- The larvae feed by eating the honeycomb and cause the hive to go out.
- There are no moth problems in strong colonies.
- Measures should be taken to prevent excessive moisture formation in the hives.

- Death's Head Hawkmoth (*Acherontia atropos*)
- European oil beetle (*Meloe variegatus*)
- Wasps
- Ants
- Earwig (*Forficula auricularia*)
- Praying mantis (*Mantis religiosa*)
- Bee-eater birds
- Hedgehogs
- Bears