

# Pests of honey bees and their management



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# Introduction

- In our country bee enemies are more dangerous taking a heavy toll of life, as a result of which annually many colonies deserted by the bees.



# Pests of honey bees



# 1. Wax moths

- Colonies of all honey bee species are attacked by two species of wax moths viz. Greater wax moth, *Galleria mellonella* and Lesser wax moth, *Achroia grisella*. Out of these two species, *G. mellonella* is more damaging to the bee hives.

## A. Greater wax moth, *Galleria mellonella*

- It is the most common and severe pest of hive
- Combs of all the species of *Apis* are freely attacked.
- It is one of the most important enemies of the bee colony causing serious damage particularly to weak colonies where the numbers of bees are not sufficient enough to cover all the combs.
- The caterpillars live in silken tunnels made by them and feed on the **wax** in the combs.



# A. Greater wax moth, *Galleria mellonella*



## **B. Lesser wax moth, *Achroia grisella***

- It is troublesome particularly in stored combs.
- *A. grisella* larvae are 15-20 mm in size, white in colour with brown head and live segregated in silken tunnels covered with frass and webbings whereas greater wax moth larvae congregate.
- The larvae prefer to eat honey bee wax.



## B. Lesser wax moth, *Achroia grisella*



# Management of wax moths

- Maintain strong and healthy colonies.
- Close all cracks and crevices of the hive and reduce entrance size.
- Keep the bottom board clean.
- Collect and burn the debris periodically.
- Keep empty infested combs in sun for a few minutes or in hot water (60°C) for 4-5 h to kill the larvae.
- Artificial cold e.g. -6.7°C for 4-5 hrs, or -12.2°C for 3 hrs or -15°C for 2 hrs is effective in killing all the stages of wax moth.
- Fumigation of empty comb with ethylene bromide.

## 2. Wasps

### A. Yellow banded hornet *Vespa orientalis*

- The yellow banded hornet wasp is a social insect constructing papery nests in hollow spaces.
- It waits at the entrance of the hive, catches bees as they come out, and macerates them for feeding the juice to its young.
- It captures bee in the field also.

# A. Yellow banded hornet *Vespa orientalis*





## B. Bee hunter wasp *Philanthus triangulum*

- The bee hunter wasp is black in colour with transverse yellow lines on the abdomen.
- It catches bees while they are on flight.
- A wasp can collect about 20 bees a day, stings and carries them to its underground nest and places one in each of the compartments of the nest before laying an egg on the back of each bee.
- The grub on hatching feeds on the bee.

**B. Bee hunter wasp *Philanthus triangulum***



# Management of wasps

- Killing of gravid wasp queens, found building nest, early in the spring i.e. by sweeping in net.
- Use of wasp traps and poisoned baits (candy, meat, rotten fish, apple, etc.) are also helpful.
- Nest destruction: Their nest can be traced by tying a thread to a worker wasp and following its flight and the nest can then be destroyed.
- Destroying wasp nests with kerosene torches or fumigation with aluminium phosphide or spraying insecticides.

### 3. Ants

- The ants are dangerous enemies of the bee. They attack weak colonies and carry away the honey, pollen and the brood.
- Strong colonies are able to withstand the ants, but in weak colonies ant attack will result in destruction and end of the colony.
- They some times leads to absconding.
- These can be a nuisance to the beekeeper in performing routine beekeeping operations.



# Ants



# Management of ants

- Fill cracks and crevices in the hive.
- Maintain strong colonies.
- Keep bottom boards raised off the ground.
- Place the colony on stand with oil or sticky barrier. Alternatively, put legs of the stand in broad plastic or iron bowls full of water (ant wells) to check entry of ants into the hive.
- Drench underground nests of ants with chlorpyrifos (0.2%).

## 4. Birds

- Several birds predate on honey bees.
- Important bee eaters include Green Bee-eaters (Little Green Bee-eater, *Merops orientalis* and Olive Bee-eater, *Merops superciliosus*) and Black Drongo/ King Crow, *Dicrurus ater*).

# Different species of birds



1. Green Bee-eaters (Little Green Bee-eater, *Merops orientalis*)
2. Olive Bee-eater, *Merops superciliosus*)
3. Black Drongo/ King Crow, *Dicrurus ater*).



# Management of birds

- Scaring (Use of sound in high pitch.
- Beating the drums and empty tins.
- Throwing pieces of stones/ pebbles through *Gulel* or hand.
- Use of sulphur-potash mixture for producing regular blasts.
- Keep bee hives under thick canopy of trees.
- Destroy nesting sites of bee eating birds.

## 5. Varroa mite or Ectoparasitic mite, *Varroa destructor*

- Mites feed on the hemolymph of bees, preferentially of the drone brood, leaving them severely deformed.
- In the infested colonies, adult mites can be seen on adults, larvae and pupae of honey bees.
- Two to six mites on an infested individual honey bee adult/ brood result in decline in colony size and activity.
- The infested brood has **perforations in their cell cappings**.
- The higher number of mites in drone brood implies the preference of this mite for drone brood than the worker brood for its development.

# Varroa mite or Ectoparasitic mite, *Varroa destructor*



# Management of Varroa mite

- Management of the mite involves Integrated Varroa Management (IVM) for which various strategies as campaign are required to curb this menace.
- The management includes:-
  - A. Non chemical methods
  - B. Chemical Methods



# A. Non chemical methods

1. **Destruction of drone brood:** Since the Varroa mite is attracted to drone brood and has higher multiplication rate on it, the destruction of unwanted drone brood by cutting out.
2. **Queen arrestation:** Caging the queen bee for two weeks to create bloodlessness conditions also has adverse effect on the development and multiplication of the mite.
3. **Use of sticky papers:** Varroa adult mites adhering to the body of adult bees often are fallen down by grooming of the bees particularly at night. The placement of a sticky paper on floor board covered with 8 mesh plastic screen prevents the mite to return to the brood combs as the mites get stuck to these sticky papers.

## B. Chemical methods

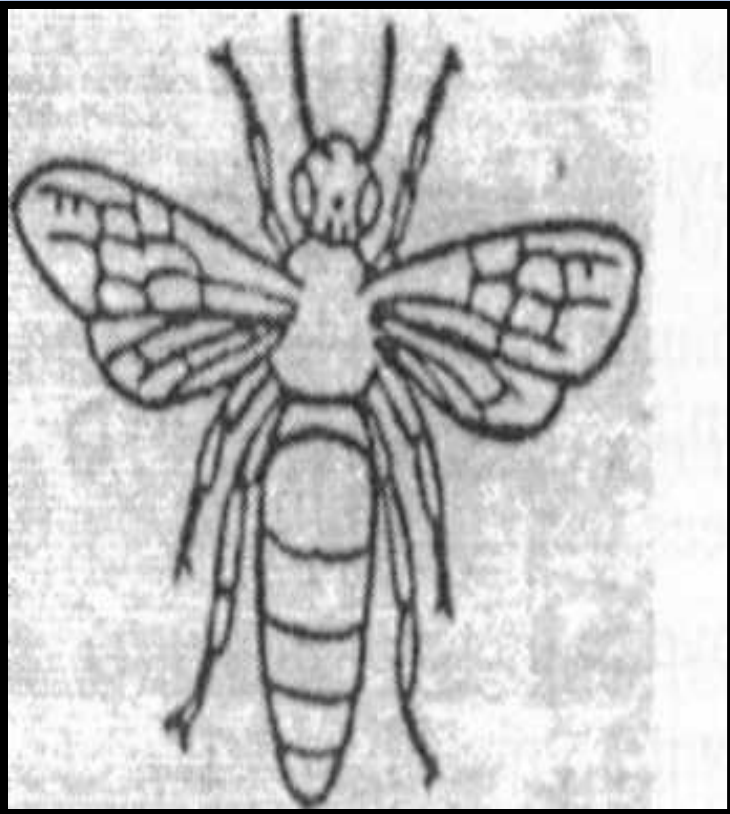
- Slow release strip formulations like fluvalinate, flumethrin, bromopropylate and amitraz have been reported to be effective for the control of this mite abroad but these pesticides are not registered and available in our country.
- **Formic acid:** Formic acid (85%) @ 5 ml per day continuously for two weeks is to be administered to the infested colonies.
- **Oxalic acid:** This organic acid, available from chemical dealers in anhydrous form, it is effective against the mite.
- Dusting of sulphur powder on top bar of wooden frames.

## 6. Endoparasitic mite/ Acarine mite / Tracheal mite *Acarapis woodi*

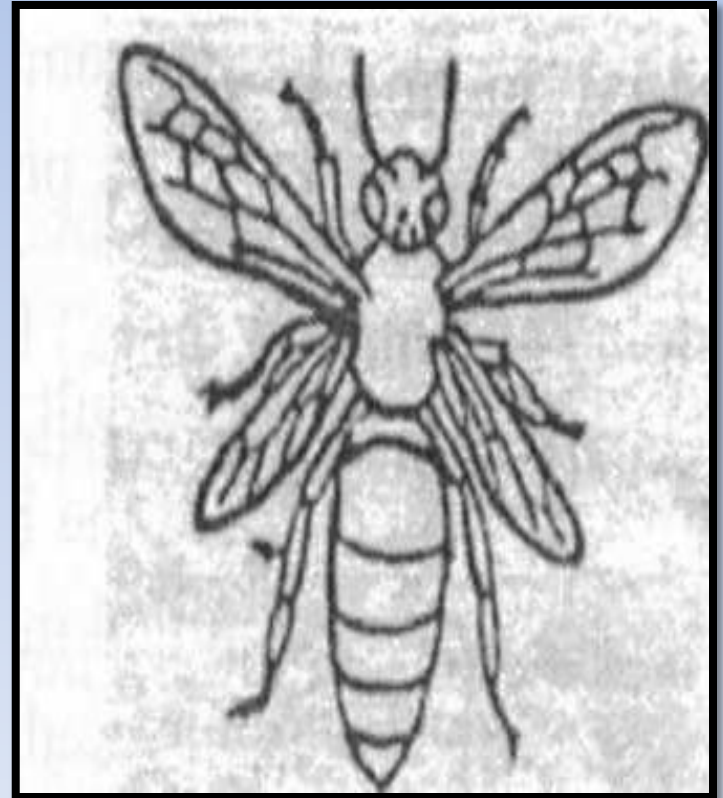
- The tracheal mite causes Acarine disease of adults.
- The adult mites infest the prothoracic Tracheae i.e. the first pair found on the thorax, and complete their life cycle there.
- They feed on the blood (haemolymph) by piercing with their mouthparts through the tracheal walls.
- It causes 'K' winged condition in bees, where the wings are held at unusual angle and bees are unable to fly. Bees are seen crawling in front of the hive.

# Tracheal mite *Acarapis woodi*

Healthy honey bee



K- Winged honey bee



# Management

- Use of formic acid @ 5 ml daily for 21 days to be applied as suggested in the case of Varroa mite.
- Dusting of sulphur powder on top bar of wooden frames.





Thank You.....