

Enemies of Honeybees and their Management

Background

- Honey bee colonies are attacked by a **large number of enemies**.
- For efficient management, the colonies require **appropriate protection** from these enemies.
- It is important to understand **nature** and **extent of damage** caused by the bee enemies and how to prevent and control them?
- Some of the important enemies requiring regular attention of a beekeeper are described below.

Major enemies of honeybees are:

- Predatory Wasps



- Wax Moths



- Parasitic Mites



- Other Bee Enemies



1. Predatory wasps

- *Vespa velutina* (*V. auraria*) Nests on tree tops/buildings
- *Vespa magnifica* Under-ground nest.
- *Vespa tropica* (*V. cincta*) Underground nest.
- *Vespa basalis* Nest on tree top/buildings.

Nature of damage

- The wasps **catch the bees at hive entrance** and kill them
- Most serious damage in **hills** is caused by *V. magnifica* which cuts down bees in large number while sitting or flying at/near hive entrance
- Sometimes even *V. basalis* has been found causing severe damage to the colonies
- The weak colonies may even perish due to its attack.



Figure 16.3 Severe attack of *Vespa basalis* at the hive entrance of *A. cerana*.



Figure 16.2 *Vespa magnifica* Note large number of slaughtered bees at hive entrance



Figure 16.1 *Vespa auraria* at hive entrance to attack bees. Note clustering of bees at entrance as a protective measure

Prevention and control

- - **Kill the fecunded females** visiting the apiary during spring by flapping
- - **Burn the nests** during night time
- - In fire prone places **destroy the nests by spraying** them with strong insecticidal solution.

2. Wax Moth

Taxonomy

- Common name: Greater wax moth
- Technical name: *Galleria mellonella*
- Family: Pyralidae
- Order: Lepidoptera



Nature and extent of damage:

- - The attack is more prevalent **during monsoon**
- - The wax moth **larvae tunnel** through the mid ribs of the comb and there is presence of **small mass of minute wax particles outside the tunnels**
- - In case of severe infestation:
 - further brood rearing is stopped
 - bees stop field work
 - colony may abscond.



Prevention and control:

- - Close **cracks and crevices** in the hive. Reduce hive entrance
- - **Remove extra combs** not covered by bees. Keep the bottom board clean.
- **Control in storage:** Keep spare combs in empty hive bodies in tiers and close both at bottom and top.
- **Disinfect the stack** by burning sulphur @ 180 g/ cubic metre (fumigation by sulphur fumes).
- After fumigation, put **naphthalene flakes** in moth proof stacks.

3. Ectoparasitic Mites

- In Pakistan, ectoparasitic mites *Varroa destructor* and *Tropilaelaps clareae* are causing severe damage to *A. mellifera* colonies.
- However, no damage in *A. cerana* colonies due to these mites has been reported.



Varroa destructor



Tropilaelaps clareae

i) Tropilaelaps clareae:

- This mite feeds only on **bee brood**.
- In case of severe infestation of this mite **dead brood is thrown outside** the hive by workers.
- The bee colonies **may even abscond** if control measures are not adopted.
- The **diagnostic symptoms** are:
 - irregular brood pattern
 - perforated brood capping
 - dead or malformed wingless bees at the hive's entrance
 - fast running small brownish mites can also be seen on the infected brood frame.

Tropilaelaps clareae:



ii) *Varroa destructor*:

- This mite develops and reproduces in the **sealed brood cells** of honey bees feeding on **haemolymph of bee pupa**.
- Parasitized individual **may die** or develop into **deformed, weak individual** incapable of normal functioning
- This mite has caused **heavy losses to *A. mellifera*** colonies throughout the world as it reproduces both on **drone** and **worker brood** of this species.
- Although the **native host of this mite is *A. cerana***, yet it is causing no serious damage to it.
- On *A. cerana* this mite reproduces **only on drone** brood and is unable to complete life cycle on worker brood due to slightly shorter developmental period

The symptoms of colony infestation with *Varroa* are:

- Spotty brood pattern
- Mite can be seen on adult bee's body as mature female mite attaches to young adult bee and also feed on haemolymph till further reproduction in the brood cell
- Dead brood and malformed adult bees are seen near/around hive entrance
- Colonies become weak and wounds inflicted by mites make the bees more susceptible to bacterial and viral diseases.



Varroa destructor on a bee pupa



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Uncapped pupal brood due to attack of *Varroa destructor*



Methods of *Varroa* mite detection:

- Open about **50 sealed brood cells** and **remove pupae** using forceps and **count number of mites** in each cell and pupa
- To examine mites on adult bees, take about **100 bees** from a colony in a wide mouthed bottle and sprinkle about **15 gram** of finely powdered **sugar** and shake the container after closing its mouth.
- Fine sugar particles will dislodge the mites as these stick to mite foot pads and disable them to grip the bee body surface.
- Take a white paper sheet and release the contents over it.
- The adult bees will fly away whereas mites can be seen in the collected sugar powder.
- Count the number of mites
- Natural mite drop in 24 hours is also taken as assessment tool for mite infestation but for this purpose **screened bottom boards** (with 8 mesh wire screen) with sticky paper need to be inserted in the bee hives.
- A drop of **more than 30 mites in 24 hours** is considered high infestation and requires treatment of bee colony.

Control:

Tropilaelaps clareae:

- Sulphur dusting on top bars @ 200mg/frame

Varroa destructor:

- Formic acid fumigation @ 50ml/hive in sponge pads covered with perforated polythene bags.
- Level of mite infestation can be kept low by putting sugar (finely powdered sugar) @ 30g/frame and then sweeping sugar down between the frame spaces using a bee brush.

Other Bee Enemies

4. Bee louse, *Braula coeca*:

- **Wingless fly** found on **thorax** of bee and feeds by **coming near mouth** close to **opening of salivary glands** and take the available nourishment.
- It is not a serious pest.

5. Other enemies:

- **Bird, bee eater**, *Merops orientalis* and **king crow**, *Dicrurus* sp. eat bees while they are flying. To control the menace, scare them away.
- Attack of **ants** can be controlled by making the hive ant proof by putting the legs of hive stand in pots containing water.
- **Bears** and *Pine martens* are the mammals which attack the bees for honey and bees.



Bee louse, *Braula coeca*



Bee louse, *Braula coeca*



Bee eater, *Merops orientalis*



King crow, *Dicrurus* sp.



Pine martens