

Bees and Their Dangerous Enemies

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SUMMARY

Beekeeping remains one of the profitable areas among the agriculturist, which has not been exploited to its full potential. Among several limiting factor, honeybee enemies constitute a major factor. Wax moths and wasps cause heavy losses to beekeepers throughout the world, therefore got maximum attention by researchers. In addition to these pests, parasitic mites, birds, and mammals occasionally attained the status of serious pests in particular situations. In the present article focus is on various aspects of bee enemies, nature of damage and their management.

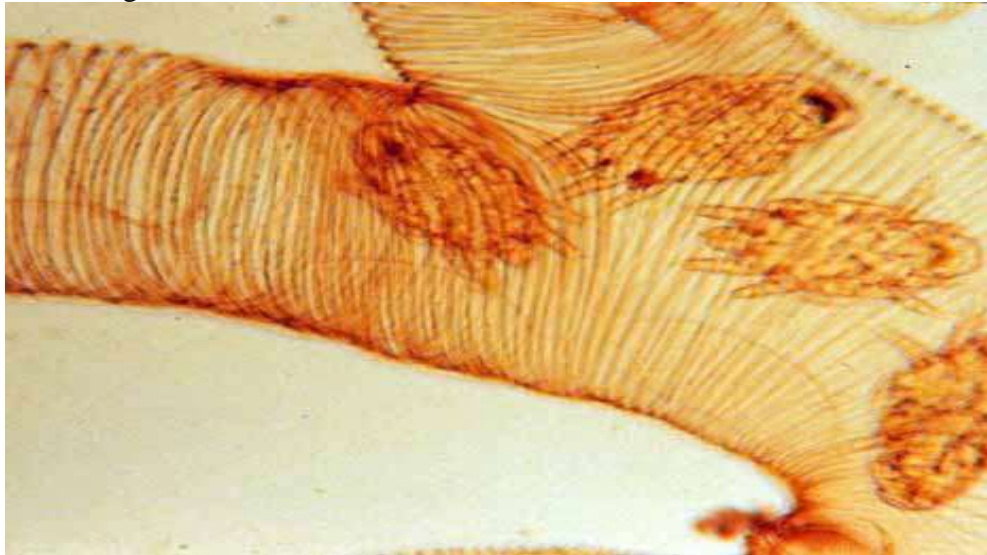
INTRODUCTION

Beekeeping is a fascinating and rewarding activity that involves the maintenance of honeybee colonies for the production of honey and other bee products. It is an ancient practice that dates back thousands of years, and it is still relevant today due to the important role that bees play in pollinating plants and crops. Beekeeping is not only beneficial for the environment but can also be a profitable business for those who choose to pursue it. However, bees face numerous threats from their natural enemies that can cause significant harm to their colonies.

Parasitic mites infesting bee colonies and their management

Acarapis woodi (Tracheal mite)

It is an endoparasitic mite which inhabits the tracheae and air sacs of adult bees. It infests tracheae that would lead from the first pair of thoracic spiracles of adult bees. The damage caused by this mite is commonly called as Acarine or Isle of wight disease.



Symptoms

- The infested bees have distended shining abdomen. They generally crawl on the ground with disjointed K-shaped hind wings.
- Presence of dark brown spotting on the tracheal wall which become blackened, brittle, and also damages the flight muscle fibers.

Diagnosis

- Diagnosis can be confirmed by microscopic examination of the tracheal tubes.
- About 10 suspected bees with K- shaped wings are anesthetized and pinned on their back to a piece of cork through the thorax.

Management

- Treatment with 85% formic acid (5ml/day) regularly for three weeks.

- Six weeks of continuous exposure of bee colonies to the vapors of menthol and thymol controls the mite's infestation.

Varroa destructor and *Varroa jacobsoni*

The varroa mite is one of the most dangerous pests of bees, causing significant damage to colonies. They attach to the bodies of adult bees and feed on their blood, leading to weakened immune systems, deformities, and reduced lifespan. Infected bees may also have deformed wings or a shorter abdomen.



Symptoms

- *Varroa* infested bee colonies become weak and show a spotty brood pattern with punctured capping.
- The bees become stunted with deformed legs and wings.
- Parasitized pupae would appear to have small pale or reddish-brown spots on their white bodies.

Diagnosis

- Mites are detected by pulling up capped brood cells using a scratcher.
- Presence of sealed brood cells with perforation.

Management

- Management technique includes using chemicals treatments, such as oxalic acid, formic acid or thymol.
- Hand removal of sealed drone brood from freshly infested colonies.
- Creating the colonies brood less by caging queen for three weeks.

Tropilaelaps clareae

It is a native parasite of the giant honeybee, *A. dorsata* and recently it switched over to the colonies of western honeybee, *Apis mellifera* on its introduction into the Asian continent. It is an ectoparasitic mite that exploits the brood of *Apis dorsata* and *Apis mellifera*. The adult female is 1.0mm long and 0.55mm wide, elongated, and light reddish brown in colour.



Tropilaelaps clareae

Symptoms

- A scattered brood pattern.

- The brood cells have sunken capping.
- The adult mites can be seen often running on the combs.

Diagnosis

- The most reliable method of diagnosis is to open large number of sealed brood cells and examine the nymphs and adult mites.
- Presence of dead mites on a thick sheet of paper inserted on the bottom board.

Management

- Creating brood less conditions in bee colonies for 2 to 3 weeks by caging the queen.
- Application of effective doses (200mg/frame) of sulphur for four weeks.

Insect Pest Attacking Honey Bees Colonies

Greater Wax Moth (*Galleria mellonella*)

The greater wax moth is a pest of bee hives that feeds on the bee's wax, larvae, and pollen.

The larvae tunnel through the comb, weakening the structural integrity of the hive and leaving behind a web-like substance.

Nature of damage

- The wax moth larvae burrow into the comb by producing silken tunnels along with their excreta.
- They feed on the propolis, pollen and bees wax on the combs.
- During the severe infestation, the combs are seen covered with silken web with numerous black faecal particles by destroying the comb.

Management

- Keep the colonies strong, hygiene and healthy with adequate food storage.
- Minimize cracks and crevices in the hive, providing artificial feeding during dearth seasons.
- Chlorosol, a mixture of methyl bromide and carbontetra chloride kills all the stages of wax moths including eggs.

Ants



Ants are destructive predators of honeybees and cause heavy losses to beekeeping in tropical and sub-tropical regions. The weaver ants, *Oecophylla smaragdina*, black ants, *Camponotus compressus* etc are the major predators of bee colonies.

Management

- As weak colonies are more vulnerable for ant's attack, keep only strong colony in the apiary.
- Search ants' nest in the vicinity of the apiaries and disturb or drive away the ants by using repellents such as ethanol, sodium fluoride, sulphur, borax, kerosene oil etc., is effective in reducing their attack.
- Keep the apiary clean by removing the dead log, rotten woods, stones and cut the grass regularly.
- Colonies capable of defending by fanning should be selected and used as breeder colonies for mass rearing of queen bees.

Wasps

Wasps are widely distributed and highly destructive predators of honeybees. They attack on bees at their hive entrance and also on the flowers. The giant hornet, *Vespa mandarina*, yellow banded wasps, *Vespa tropica* etc., are the major predators of honeybee colonies. They take over both brood and adult bees to feed their young ones in their nests.



Management

- Collect and kill adult wasps during active predation.
- Locate and destruct nests by fumigation with calcium cyanide or aluminum phosphide and spray carbaryl on their nests.

Vertebrate Pests

Honeybee colonies are also affected by variety of vertebrate pests such as amphibians, reptiles, birds, and mammals. Among these pests, birds cause severe damage to bee colonies.

Frogs and Lizards



The frogs and toads' prey upon varieties of insects and occasionally feed on bees at the hive entrance. These are proficient in capturing bees and are less affected by bee sting and bee venom. Lizards are occasional predators of honey bee colonies and eat both brood and adult bees.

Birds



Birds are the major predators of honeybees. The beaks of the birds are well adapted to catch bees easily during flight. They are able to manipulate the prey, dislodge the sting and remove the poison sac of the bees.

Mammals



Mice are known to invade bee colonies for shelter and destroy the comb. They feed on bees and hive products such as honey and pollen. Bears usually dismantle the hive to feed on the honey, pollen, brood, and adult bees. They tear the hive into pieces and carry off the combs with honey to escape from mass stinging of bees.

Monkeys remove the adult bees from the comb and feed on the honey and brood.

Management

- Place the bee hives in a safe place.
- Use the bee hives free from cracks and crevices and also maintain colonies with hygienic condition.
- Covering apiaries with strong mesh would prevent the entry and attack of birds.
- Construct a strong fence around the apiary.

CONCLUSION

In conclusion, bees face numerous threats from their natural enemies including mites, moths, ants and vertebrate's pests. Early detection and management are crucial in protecting bees and their colonies. Beekeepers should regularly inspect their hives for signs of infestation and use appropriate management techniques to prevent the spread of pests and diseases. By doing so, we can ensure the survival of these vital pollinators and safeguard our ecosystems.

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