

Hive beetles with honey bees and stingless bees

Species include the small hive beetle *Aethina tumida* and several species of large hive beetles including *Oplostoma fuliginosus* and *Oplostomus haroldi*.

Hive beetles occur naturally in Africa where they are considered as minor secondary pests. In sub-Saharan Africa the small hive beetle is found in most *Apis mellifera* honey bee colonies throughout the year and seems to co-habit with them. However most large hive beetles are nectar feeding and are found in hives when nectar and pollen from plants become scarce. They are opportunistic pests and can live without honey bees, unlike the small hive beetle which is dependent on bees. Small hive beetles can now be found in honey bee colonies in Australia, and the warmer parts of the USA, causing considerable damage to beekeeping. They were found in Italy in 2014 but have not been detected in 2015.

The small hive beetle can be destructive to bee colonies, causing damage to comb, stored honey and pollen. Serious beetle infestation of colonies may cause bees to abandon their hive.

Life cycle

Small hive beetle

The adult small hive beetle is dark brown and about half a centimetre in length. The adults live up to six months and can be observed almost anywhere in a colony. Female beetles lay irregular masses of eggs in cracks or crevices. The eggs hatch in 2-3 days into white-coloured larvae that grow to 10-11 mm in length, and take 10-16 days to mature.

Beetle larvae tunnel through

combs feeding on brood, honey and pollen, defecating and causing discoloration and fermentation of the honey.

Mature larvae leave the colony and burrow into nearby soil to pupate. The pupation period is 3-4 weeks. Newly emerged adults seek honey bee colonies, mate and the females begin egg-laying about a week after emergence. Small hive beetles may have four or five generations a year during warm seasons.

Large hive beetle

Little is known of the life cycle and biology of large hive beetle species. Unlike the small hive beetle, which starts its lifecycle inside the honey bee colony, the large hive beetle requires decomposing plant material and herbivore faeces (for example cattle dung) for egg laying and development to adult. Large hive beetles feed on flowers and seek food inside a honey bee colony only when there is a shortage of forage elsewhere.

Avoidance

To avoid infestation by hive beetles beekeepers should:

- Always maintain strong colonies.
- Avoid throwing away discarded combs of brood, honey or pollen around the apiary.
- Use traps to de-populate the apiary and surrounding areas of small hive beetles. These beetles are active at dusk and are attracted to honey or bee bread bait. Beekeepers can construct simple traps using available materials or containers. Traps work on a simple principle of a bait (honey, bee bread or vinegar) with a surrounding bridge of non-toxic oil. The beetles suffocate as they pass through the oil to get to the bait.
- In the case of large hive beetles, carry out regular hive inspections to remove and destroy the beetles especially during a dearth period.
- Seal cracks and gaps in hives to prevent large beetle entry. In Ghana top-bar hive entrances are made as triangular holes, exactly the size of the worker honey bee to deny large hive beetle entry.

Small hive beetles on honeycomb



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Larvae of small hive beetle *Aethina tumida*

Stored honey combs and small hive beetles

Honey combs harvested from infested colonies could contain beetle eggs. Under the right conditions these eggs may hatch into larvae which will begin to eat honey and destroy the combs. To avoid this, harvested honey combs should be processed as soon as practicable.

Large hive beetle



Conclusion

The presence of hive beetles in colonies of African bees does not seem to affect colony performance. However, when these beetles occur in *Apis mellifera* colonies in other regions they are a problem for bees and beekeepers. We recommend avoiding chemical control measures and the use of environmentally friendly methods such as traps. Physically removing large hive beetles and killing them during regular colony inspections may control their activities.

Case study from Ghana

Large and small hive beetles are found in Ghana but their activities do not seem to affect the life of honey bee colonies.

In stingless beekeeping however, the small hive beetle is a considerable threat to colony survival and performance. When the beetles access the nest of a weak colony, many eggs are quickly laid that hatch and consume the stores of both honey and bee bread. Larvae infestation becomes so great that the colony absconds. The success of stingless beekeeping hinges on the beekeeper's ability to quickly secure the hive during colony transfer from natural nests in logs to wooden bee hives. The rule for stingless beekeeping is to seal all gaps or holes that may become entry points for small hive beetles especially during the initial stages of colony establishment. A well-established colony can secure its nest with lots of propolis and can resist small hive beetles.

Large hive beetles have not been found in stingless bee colonies in Ghana.

Kwame S Aidoo

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