

Small Hive Beetle

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INTRODUCTION

The small hive beetle (SHB), *Aethina tumida* Murray, is an emerging and invasive pest of the European honey bee. The SHB can impact colony health and damage beekeeping equipment.

SPREAD OF SMALL HIVE BEETLE

The SHB is native to Sub-Saharan Africa and has spread into many regions of the globe in recent years. The SHB was first discovered in USA in 1998 (Florida) and has become well established in most states across the USA, with particularly large populations in warmer, coastal states. The SHB was first discovered in Australia in 2002 (New South Wales) and has since become well established spreading along the Eastern Coast.

In Canada, the SHB was discovered in Manitoba (2002 and 2006), Alberta (2006) and Québec (2008, 2009). In the Prairie Provinces, control measures were taken to control the pest and SHB failed to establish a population. It is still to be determined whether SHB has been able to establish a resident population in one region of southern Quebec.

In September 2010, SHB was identified in southern Ontario. At present, it remains unknown whether SHB will establish a resident population in Ontario.

LIFE CYCLE AND BIOLOGY

The SHB is a member of the “sap beetle”, family Nitidulidae. Like all other beetles, the SHB goes through complete metamorphosis from egg to larvae to pupae to adult. The timing of full development varies from 21 to 94 days depending on the temperature and humidity.

Adult SHB will seek out honey bee colonies for shelter, food and breeding area for their developing young. The eggs of the SHB are small (1.4 x 0.26 mm), pearly white

and laid in clusters in cracks and crevices of the hive. Eggs hatch in three to six days.

Larvae grow to 11 x 1.6 mm before pupation. Larvae resemble grubs and are white to beige in color with a brown hardened head, three sets of legs and rows of brown spines along the length of the body (Figure 1). Larvae are typically found clustered together in cells of the honey comb, often immersed in a film of fermented honey.

The larvae are the most destructive life stage of the SHB in terms of damage to honey bee colonies. Larvae feed on honey bee brood, pollen, honey and tunnel through wax comb consuming protein required for their development. Larvae defecate in the honey comb, causing the honey to ferment and spoil. Like other sap beetles (i.e. Nitidulids), SHB are closely associated with a specific strain of yeast (*Kodamaea ohmeri*) that may aid in feeding.



Figure 1. Small hive beetle larva

After 10 to 28 days (average 16 days) the larvae will leave the colony, burrow into the soil (on average 10 cm deep and 30 cm from the colony entrance) to pupate in the soil (10 to 60 days, average 25 days). Lighter, sandier soils are most suitable for SHB pupation. Adults are reddish brown to black (4 to 7 x 2 to 3.5 mm) with clubbed antennae, shortened wing coverings that do not extend the full length of the abdomen and a distinct crescent moon shaped structure behind the head (Figure 2).

Adults are long lived (up to six months), can disperse by flying (10 to 14 km) and have a tremendous reproductive capacity. The dispersal of adults is aided by movement of infested honey bee colonies and beekeeping equipment. In addition, SHB are not restricted to honey bee colonies, being able to survive on rotting fruit and can go without food for up to 10 days in the adult stage. This may also contribute to their dispersal. In winter, adult SHB can live within the honey bee cluster.

IMPACT

Weakened and compromised honey bee colonies are at greatest risk of SHB damage. However this may also include healthy nucleus colonies, mating nucs and queen banks. A honey bee colony without a strong population of worker bees to protect the exposed food stores and bee brood can succumb to a rapid increase in numbers of SHB larvae. This will further stress the colony as SHB larvae will feed on brood, spoil food stores and foul the environment of the colony.

In severe infestations of SHB, colonies may perish or abandon the hive. Although adult SHB may be present in strong, populous colonies; the development of large numbers of SHB larvae is often restricted by the activities of the honey bee workers.

In dead honey bee colonies or exposed beekeeping equipment, SHB infestations can increase dramatically as there is a large source of larval food and no protection. Similarly in honey houses and extracting facilities, SHB can spoil honey when honey comb is exposed for long periods of time. It is recommended that beekeepers promptly extract any exposed honey comb and clean facilities immediately after extraction. Wax cappings should also be stored in beetle tight containers and rendered as soon as possible.

DETECTION

Adult SHB are often found in dark, tight spaces in the hive environment. However, they may be encountered



Figure 2. Adult small hive beetle

anywhere in the colony, especially when present at high densities. Adults are typically found on the underside of the inner cover, tops of frames and on the bottom board. Adult SHB will move quickly away from light, so it is important to make a quick visual scan as soon as the colony is opened.

Adults can also be detected by a variety of traps, which typically have tight spaces that attract SHB adults. Two of the most common traps are corrugated cardboard or plastic inserts and traps containing oil. The larvae of SHB are typically found on the surface of unprotected comb and at higher densities on the bottom board. Symptoms of the SHB larvae include clusters of larvae feeding in the comb and fermented honey oozing down the surface of the frame (a.k.a. “sliming”) (Figure 3). This can be seen in both field colonies and in extraction facilities.

MANAGEMENT

There is only one registered treatment for SHB in Canada, CheckMite+™ (see treatment recommendations on the label for SHB and follow all label instructions).

Operators should:

- Maintain strong, healthy, populous honey bee colonies and promptly manage weak colonies in apiaries.



Figure 3. Small hive beetle infesting a honey frame

- Inspect colonies for the presence of SHB and be familiar with the biology and description of this emerging pest.
- Contact the office of the Provincial Apiarist if you find evidence of SHB in your operation.

RESOURCES

Apiculture website:

www.omafra.gov.on.ca/english/food/inspection/bees/apicultu.html

Treatment recommendations:

(pdf format)

www.omafra.gov.on.ca/english/food/inspection/bees/recommendations.pdf

(HTML format)

www.omafra.gov.on.ca/english/food/inspection/bees/recommendations.htm

Beekeeping and Honey Production Business Information Bundle:

www.omafra.gov.on.ca/english/food/inspection/honey-bib/welcome.htm

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