Small Hive Beetle (SHB) *Aethina tumida* Murray Information Sheet

Introduction

The small hive beetle *Aethina Tumida* is native to sub-Saharan Africa. In that part of Africa this beetle feeds on honey and bee brood but can also complete its lifecycle on fruit. Although it may act as a parasite that destroys weakened and diseased hives, it is generally only considered a minor pest in African honeybee subspecies. In contrast, in European honeybee colonies, SHB infestation has a deleterious effect. The beetle and its larvae can multiply to huge numbers within an infested colony, where they consume bee eggs, brood as well as honey and pollen. This beetle was detected for the first time in apiaries in Europe in South West Italy in September 2014. Apiaries found to be infested with SHB were destroyed and comprehensive SHB control and eradication measures were implemented. This will limit the risk to other European countries by the prevention of spread and establishment of the SHB however beekeeper vigilance is critical.

Biology and life cycle of SHB

The newly-matured adult beetle is light, yellowish brown and becomes brown, dark brown and finally black at full maturity. It is the adult stage of SHB that will be detected earliest if there is an outbreak of SHB in an apiary. The adult beetles are ovoid in shape and approximately 5-7mm in length. Their antennae are club-shaped and have a short wing case (elytra), which is covered in fine hairs. During the first day or two after emergence, young beetles are active, take flight readily and orient towards the light. Later they become less active and keep to less illuminated portions of the bee colony. Adult beetles are active fliers and occasionally individuals or swarms can infest a honeybee colony.

The female SHB lays between one thousand and two thousand eggs, in clusters, inside the hive, in wood crevices, or directly in the bees' brood cells, but these small eggs (approximately 1.5 x 0.25mm) are difficult to detect upon visual inspection. The eggs hatch into larvae in usually 2-6 days. The duration of the larval stage is weather dependent, in particular the temperature has a significant effect, for this reason the larval stage may last from eight to 29 days. The larvae feed on honeycomb and kill bee larvae. The larvae are cream in colour, 10-11mm long and look similar to a caterpillar. The larvae have three sets of legs just below the head, but they lack the "false" legs or prolegs that are present in caterpillars. When the larvae had completed their growth stage, they leave the hive and crawl away from the hive, before they dig into the soil, generally at a depth of 1 to 30cm and close to the colonies (but up to 20m from the colony). Once in the soil they begin pupation. Pupation takes 2-12 weeks, depending on temperature and nature of the soil. SHB can have several generations per year (one to six) depending on the climatic conditions and soil composition.

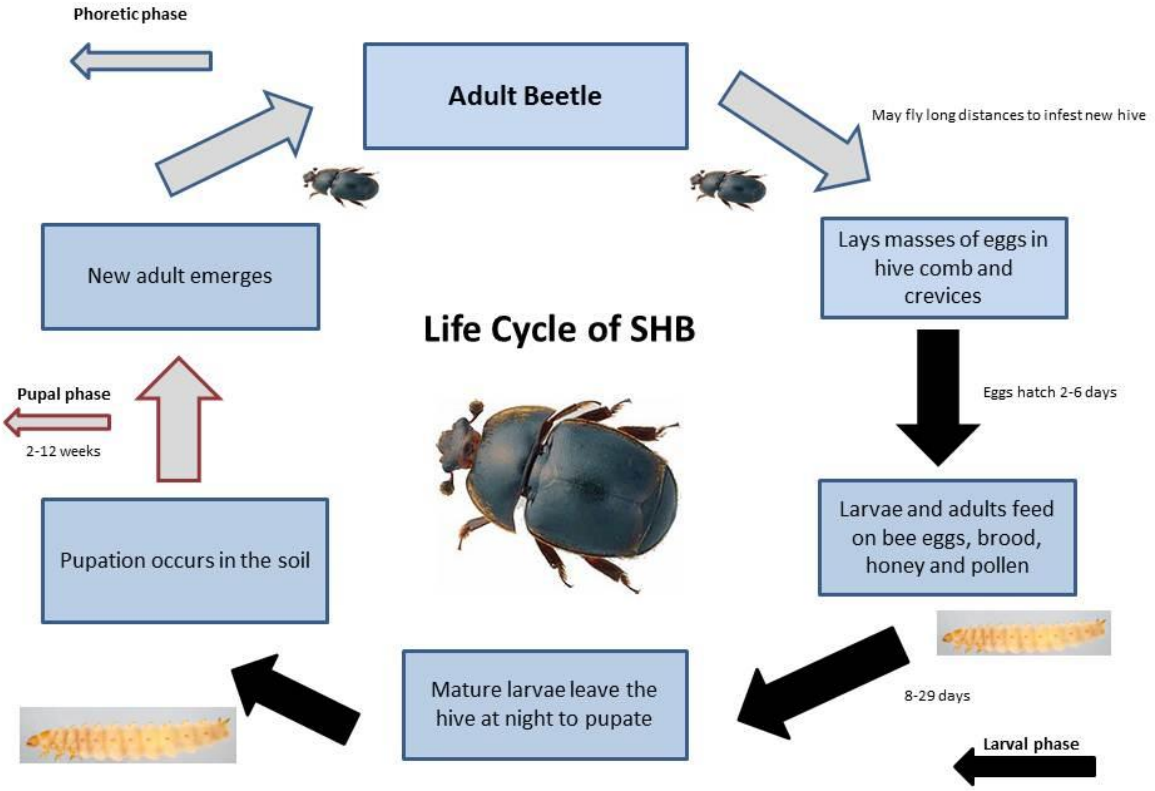

Figure 1. Life cycle of small hive beetle (SHB), *Aethina tumida*

Stopping the spread of SHB

The best way to stop the spread of SHB is to employ a monitoring scheme. The aim of a monitoring scheme is detect SHB early when eradication is still possible and thus prevent the spread of the beetle to other apiaries.

The Department of Agriculture, Food and the Marine (DAFM) has established a monitoring programme . A number of apiaries have volunteered across Ireland in areas that have been identified as most at risk for the introduction of SHB as well as areas to provide geographical spread. This monitoring programme involves the selected beekeepers using two different trapping methods in their hives. These traps will be used in conjunction with regular visual monitoring of the hive carried out by the beekeeper. The two trap types that have been selected for monitoring purposes are the SHB floor trap (Figure 2), which is essentially corrugated plastic with 4mm gaps, and the SHB frame trap (Figure 3). Hive floor debris will also be sampled twice during the season and sent to the DAFM laboratories for analysis.

Figure 2. Small hive beetle floor trap **Figure 3. Small hive beetle frame trap**

Both traps are commercially available from most good beekeeping equipment suppliers.

What to do if you suspect small hive beetle

In Ireland all suspect *Aethina tumida* adults, larvae or eggs should immediately be submitted for identification to: Dr. Mary Coffey, Plant Health Laboratory, Department of Agriculture, Food and the Marine, Backweston Campus, Celbridge, Co. Kildare. Use a sealed container. Please provide as many details as possible - your name, address and phone number, the apiary name and location. Do not send live beetles, larvae or eggs in the post. Kill them first by keeping them in a freezer for a minimum of 12 hours or by putting them in 70% ethanol.

Acknowledgements

This document was prepared from text adapted from 'Parasites of the honeybee' by Mary Coffey and 'Guidelines for the surveillance of the small hive beetle (*Aethina tumida*) infestation compiled by the European Union Reference for Honeybee Health (EURL), Sophia Antipolis, France.