

The Small Hive Beetle, *Aethina tumida*

A new beekeeping pest

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Figure 1:
Small hive beetle adult



Figure 2:
Larvae in honey comb

Order Coleoptera: Family Nitidulidae

Description: Adults and larvae of the small hive beetle are found in active bee hives and stored bee equipment where they feed on honey and pollen. Adults are broad, flattened beetles about 5-7 mm ($\frac{1}{4}$ inch) long and dark brown to nearly black in color. Adults are red just after pupation and soon thereafter become blackish. They move rapidly across comb and are difficult to pick up. The larvae are elongate, whitish grubs with rows of small spines along the back. Larvae look superficially like wax moth larvae, but the legs of beetle larvae are larger, more pronounced, and restricted to near the head. Beetle larvae do not spin webs or cocoons in the bee hive but rather pupate in the soil outside the hive. Pupae are whitish brown. The small hive beetle is native to southern Africa where it requires 38-81 days to develop from egg to adult, and five generations per year are possible. The first record of this beetle in the western hemisphere was determined from a commercial apiary in Florida in May 1998. Beetle specimens were found from bee hives near Atlanta, Georgia in June 1998 and confirmed as *A. tumida* on July 13, 1998.

Damage: In Africa the small hive beetle behaves as a scavenger of weakened colonies much like the greater wax moth, and it is relegated to secondary pest status. But that has not been the experience of Florida beekeepers in whose apiaries the beetles have caused considerable damage and colony loss. Beetle larvae tunnel through combs, killing bee brood and ruining combs. Larvae can heavily damage delicate, newly drawn-out comb; however, old sturdy brood comb seems to withstand heavy larval infestation without disintegrating. Bees in Florida have been found to abandon combs and entire colonies once they are infested. Beetles defecate in honey and cause it to ferment, producing a frothy mess in supers and honey houses. Honey thus contaminated is no longer salable, and moreover it is unpalatable to bees and cannot even be used as bee feed. Florida observers report that the fermented honey smells like rotting oranges. In heavily-infested operations in Florida larvae by the thousands have been observed crawling out of colony entrances or across honey house floors in an effort to reach soil to dig in and complete their development.

It is cause for concern that the beetle's behavior in Florida has been much more virulent than that reported from Africa. Such is often the case with pest organisms when they are imported to new locations without their natural assembly of diseases, predators, and parasites that keep their populations in check.

Control: There are no chemical control measures developed or approved for this pest. If *A. tumida* is suspected or detected, the following precautions are suggested:

1. Be clean around the honey house. Do not leave filled supers standing long before extraction. Do not leave cappings exposed for long periods. Beetles can build up rapidly in stored honey, especially away from protective bees.
2. Do not stack or store infested supers onto strong colonies.
3. Be aware that supering colonies, making splits, exchanging combs, or use of Porter bee escapes can spread the beetles or provide room for beetles to become established away from the cluster of protective bees.
4. Monitor colonies for hygienic behavior; ie., the ability to actively rid themselves of both larval and adult *A. tumida*. Propagate those queen lines found to be beetle-resistant.
5. Experiment with trapping or cultural control measures. It may be possible to trap beetle larvae as they attempt to reach soil and pupate. Moving colonies may be advisable to keep a beetle population from building up in any particular apiary. The ability of beetles to complete development may vary according to different soil conditions and beekeepers may find some locations naturally less prone to beetle infestation. Fire ants may be a beneficial insect in this context if they are found to prey on pupating beetles.
6. Bees will normally not clean up equipment or supers full of beetle-fermented honey. However, bees may finish the job if the beekeeper first washes out as much honey as possible with a high-pressure water hose.

References:

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Figures 1 and 2: Jeff Lotz