Bald Brood and Wax Moth

By Sally Ponting, National Bee Unit

Wax moth larvae feed off honey comb, and, as they tunnel below the cappings they cause them to become damaged and pupae to be exposed. This results in bald brood whereby honey bee pupae continue to develop in uncapped cells. Sally Ponting describes the signs of wax moth infestation to look out for.

Background

Bald brood is a common disorder in which honey bee pupae become uncapped and continue development exposed on the frame within the colony. Bald brood is thought to be caused by both the lesser wax moth, *Achroia grisella,* and greater wax moth, *Galleria mellonella*, when their larvae tunnel under the brood cappings on the comb. The greater wax moth is considered the more destructive and common pest of honey bees while the lesser wax moth is less prevalent and reported to be less destructive.[1] This article focusses primarily on the role of the greater wax moth. It is reported that the greater wax moth is distributed in areas where beekeeping is practised, but distribution is limited by the inability of the pest to withstand prolonged periods of cold.[2] Although the larvae of both moths are considered minor pests of honey bee colonies, they do damage combs, especially in compromised colonies, and can cause significant damage to stored beekeeping equipment.[3]

What causes bald brood?

Bald brood is a common disorder within honey bee colonies. Developing honey bee pupae are sealed in their cells under wax cappings 8–9 days after eggs are laid. Bald brood results in small patches of cells, where larvae become partially or completely uncapped. This can be caused by wax moth larvae tunnelling through the comb, damaging multiple cells in the pattern of their travel. Cappings of cells become damaged and, on instinct, bees will chew the remainder of the cap of affected cells, sometimes completely uncapping them. This results in the exposure of the developing pupae, and is known as bald brood. Impacted cells can also be seen to have a raised edge protruding from the comb surface (Figure 1). This is not something to be worried about as exposed pupae typically continue to develop normally and emerge as fully formed adult bees.

It is important to add that bald brood can also be a result of general beekeeping husbandry. If frames are too close to each other within a colony the bees will uncap brood to make room for movement between the frames, resulting in bald brood.[4]

Wax moth infestations

Female moths lay their eggs in clusters in small crevices inside the hive.[3] As these eggs hatch, larvae then move onto the honey bee comb to feed. It is this part of the lifecycle which is most damaging to bee colonies. Adult wax moths cause no damage, it is the developing larvae that are a problem. As larvae burrow through the comb and feed upon the wax, they leave behind distinctive masses of silk webs which can be problematic for emerging bees (Figure 2). After the larvae finish feeding (Figure 3), their next goal is to find an appropriate location to place their cocoons. Greater wax moth larvae are known to chew away wood to create an area to attach their cocoon, resulting in minor excavations or large holes,[3] which can compromise wooden beekeeping equipment, including the hive body and frames.

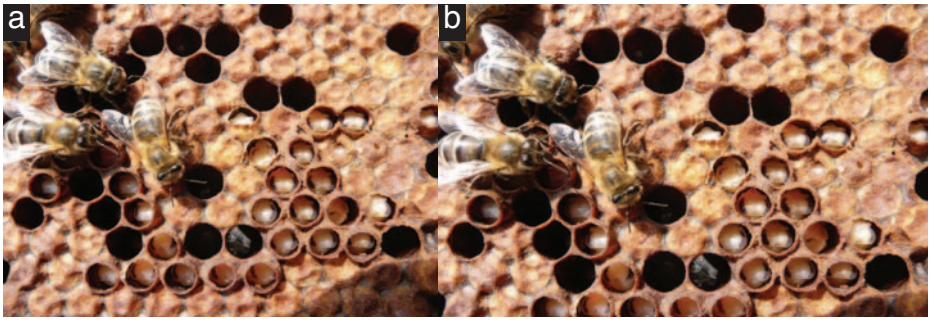

Figure 1. (a) Bald brood within the hive; (b) Bald brood with wax moth activity; both images are from Beebase,[4] courtesy crown copyright.

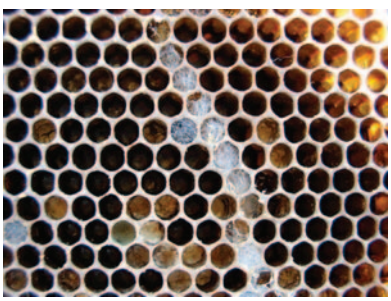

Figure 2. Silk web trails from wax moth larvae; image from Beebase,[4] crown copyright.

Figure 3. View of the smooth, non-spiny dorsal surface of a wax moth larva; photo by Richard Ball.

Can I prevent bald brood?

Pure wax is reported to stunt development of wax moth larvae and so larvae are reliant on impurities within the wax for their development.[2] Therefore, dark, older combs are particularly at risk of supporting wax moth infestation and can suffer the most damage. To combat this, basic apiary hygiene should be followed. Combs should not be left lying around the apiary and dead colonies should be removed as this will attract wax moths. Varroa inserts should be periodically cleaned and combs should be replaced regularly. Lightly infested boxes may be placed on strong colonies to be cleaned out, but heavily infested combs cannot be effectively treated and should be burned.[2] Strong colonies of bees will reduce the effects of wax moth. In the case of the genetic form of bald brood, re-queening of the colony will usually resolve the problem.

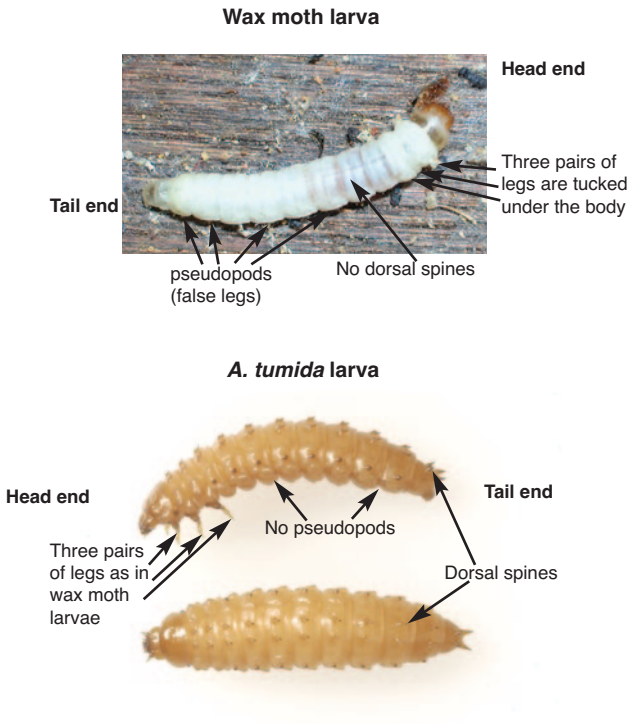

Figure 4. Top panel shows a dorsal view of a wax moth with small pseudopods, some arrowed in the rear segments. Bottom panel shows a side view and dorsal view of a small hive beetle with the three pairs of front legs and dorsal spines indicated. Note there are no pseudopods present. All images are courtesy Crown copyright.

Wax moth versus the notifiable pest, the small hive beetle

The larvae of the small hive beetle (SHB), *Aethina tumida*, look similar to wax moth larvae, with both residing in bee colonies. Unlike wax moth, SHB is a notifiable pest with statutory surveillance programmes in place, as the insect is not considered to be present in the UK. Unlike wax moth, SHB infestation results in total devastation of honey bee colonies. SHB larvae have three pairs of legs only near the head and they have two dorsal spines on each body segment. Wax moth larvae also have three pairs of true legs near the head, but in contrast to SHB larvae, wax moth larvae have a two-segment gap, then two small false legs (called pseudopods) on the remainder of the body segments (Figure 4). Wax moth larvae bear no spines on their dorsal surfaces. If SHB is suspected, it must be reported to the National Bee Unit without delay.

References

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