



BUG BIZ

Pest Management and Insect Identification Series



Achroia grisella, Lesser Wax Moth (Lepidoptera: Pyralidae)

Hasim Hakanoglu, Forest Huval, Chris Carlton, Thomas Reagan

Description

The lesser wax moth, *Achroia grisella*, is one of the two primary wax moth species that infest weak or unoccupied western honeybee (*Apis mellifera*) colonies. Adult lesser wax moths range between $\frac{2}{5}$ and $\frac{1}{2}$ of an inch (10 to 13 mm) in length, measured from the front of the head to the end of the wings when held in the rooflike resting position. Wingspan on mounted specimens is $\frac{2}{3}$ to 1 inch. Adults are slender, silver-gray to dull yellow in color with golden yellow heads. Female adults are typically larger in size and darker in color than males. Adult lesser wax moths have vestigial mouthparts.

Lesser wax moth eggs are spherical and tiny, measuring approximately $\frac{1}{50}$ of an inch (0.5 mm) in diameter. They are initially cream colored or pinkish, and darken as they mature. Eggs can be found in protected crevices and cracks of combs. Larvae are white, narrow bodied caterpillars. Each of the first three segments possesses a pair of true legs. Each abdominal segment possesses stubby, fleshy prolegs typical of most caterpillars. Mature larvae are light gray, occasionally with a pink or pinkish-orange tinge, and $\frac{2}{3}$ to $\frac{4}{5}$ of an inch (16 to 20 mm) long. The head and prominent thoracic shield immediately behind the head are dark reddish brown. Pupae can be found anywhere in the hive. They are slightly less than $\frac{1}{2}$ inch (11 to 12 mm) in length, cigar-shaped, and yellow to tan in color. Pupae are covered in tough, white silk cocoons that may in turn be covered with excrement and other debris.

The other primary wax moth species that is more prevalent and more destructive is the greater wax moth (*Galleria mellonella*), which is treated in a different article in this series. Its life history and many of its physical traits are similar to that of the lesser wax moth. Mature larvae and adult greater wax moths are larger than their lesser wax moth counterparts, with a maximum wingspan of more than 1 $\frac{1}{2}$ inches in adults (40 mm). Egg texture and head shapes differ between the two species. Correct identification is important in making management decisions and an experienced apiculturist or entomology diagnostician should be consulted for positive diagnosis.



An adult lesser wax moth, lower (ventral) view (Pest and Diseases Image Library, Bugwood.org, CC BY-NC 3.0 US)

Life Cycle

Once mated, female lesser wax moths lay eggs in batches in crevices and cracks of combs for about five days. Each female moth can deposit between 50 to 150 eggs, depending on the temperature. Adult moths may live for two (females) or three (males) weeks. They do not feed as adults. Warmer temperatures are more favorable for faster development across all life stages. Eggs typically hatch in five to eight days when the temperature is between 84 F to 95 F (29 C to 35 C). Upon hatching, larvae immediately begin tunneling through wax combs and lining the inside walls with silken web and feces. These silken tunnels weaken the combs and restrict the movement of bees. Larvae feed on wax, honey, pollen and other debris to sustain their growth. Both tunneling and feeding continue for one to six months, depending on ambient temperature. Mature larvae are capable of boring into woodenware, damaging the hive body or frames, but are less likely to cause damage than greater

wax moths. Small larvae can also damage frames if they do not find sufficient edible material. These larvae remain small and often die before pupation. Larval duration is typically six to seven weeks but may extend up to five months under unfavorable conditions. Frass from damaged wood and other hive debris is spun together with silk into cocoons for pupation by mature larvae. Cocoon silk is stronger and coarser than that found in the tunnels and has a paper-like texture. It is usually cemented to frames or other wood, especially on damaged surfaces. Cocoons can also be found within combs or in loose debris at the bottom of hives. Maturation of pupae takes up to two months, again depending on the temperature, with an average maturation time of around 37 days. Once they emerge from their cocoons, adult lesser wax moths leave the hive and hide in nearby trees and bushes. Mating occurs inside the honeybee hives, where males attract females using ultrasonic signals, and females immediately start depositing eggs.

Ecological Significance and Pest Status

Lesser wax moth was first described by Johan Christian Fabricius in 1794. The species is found throughout the world in regions where honeybees are kept for commercial or hobbyist purposes. In the U.S., damage caused by the lesser wax moth is most severe in the southern states, such as Louisiana, where the climate is warmer and more conducive to large populations. Lesser wax moths are considered secondary or opportunistic pests, and do not pose a threat to strong, healthy colonies. Rather, they thrive in weak colonies and destroy unused or inadequately protected combs. As with greater wax moth, a clear sign of wax moth infestation is the presence of bald brood, uncapped brood cells typically observed in a straight line or small patch. This occurs due to nurse bees uncapping brood cells in hopes of catching the tunneling larvae. Lesser wax moths are often concentrated in lower levels of the hive and hive floor due to competition with greater wax moths, which are larger and more dominant when both are present. Lesser wax moths often take over abandoned feral hives and serve a useful function as a cleanup crew.

Control

Several methods are effective in controlling wax moth infestations in managed honeybee colonies. The best control method is maintaining strong and healthy



Lesser wax moth cocoons inside a honeybee hive (Marc Hess, BugGuide.Net, CC BY-ND-NC 1.0).

colonies. Such colonies have a high bee-to-comb ratio, a young, healthy queen and a large number of guard bees to defend combs against pests. Other beekeeping practices that help in controlling wax moth infestations include regularly cleaning and inspecting colonies to prevent the buildup of wax debris, cocoons, and other materials that the lesser wax moth larvae feed on. Removing weak or dead colonies and replacing old combs with new ones every three to four years can also help prevent infestations.

When storing honeybee equipment, all combs and other materials should be clean and free from wax debris. In addition, empty hive boxes and light or newer combs can be in well-lit, highly ventilated areas to reduce wax moth populations. Other details of control are identical to those used against greater wax moth and are covered in the article about that species.

References

- Cushman, D.A. Life Cycle of Wax Moth. Dave Cushman's Beekeeping Website. <http://www.dave-cushman.net/bee/waxmothlifecycle.html> (accessed 10 April 2023).
- Egelie, A.A., A. N. Mortensen, L. Barber, J. Sullivan, J. D. Ellis. 2015. Lesser wax moth. Featured Creatures. https://entnemdept.ufl.edu/creatures/MISC/BEES/Achroia_grisella.htm (accessed 10 April 2023).
- Snyder, R. 2021. Detecting wax moth larvae in sealed brood. Bee Informed Partnership. <https://beeinformed.org/2021/07/02/detecting-wax-moth-larvae-in-frames-of-sealed-brood/> (accessed 10 April 2023).
- Wax moth. BeeAware. <https://beeaware.org.au/archive-pest/wax-moth-18/> (accessed 10 April 2023).
- Wax moth: a beekeeping pest. 2022. Agriculture Victoria. <https://agriculture.vic.gov.au/biosecurity/pest-insects-and-mites/priority-pest-insects-and-mites/wax-moth-a-beekeeping-pest> (accessed 10 April 2023).
- William, J. L. 1997. Insects: Lepidoptera (moths). *Honey Bee Pests, Predators and Diseases* pp. 122. [https://www.ars.usda.gov/ARSUserFiles/60500500/PDFFiles/1-100/066-Williams--Insects;%20Lepidoptera%20\(Moths\).pdf](https://www.ars.usda.gov/ARSUserFiles/60500500/PDFFiles/1-100/066-Williams--Insects;%20Lepidoptera%20(Moths).pdf) (accessed 10 April 2023).

Contact Us: For advice about arthropod identification or diagnosis, contact the LSU AgCenter Department of Entomology. Reach the department through the Contact Us webpage: <https://bit.ly/36c4awm>.

