BUG BIZ
Pest Management and Insect Identification Series
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Braula coeca, Bee Louse

(Diptera: Braulidae)

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Description

The bee louse, *Braula coeca*, is a wingless fly symbiont of western honeybee. In addition to the absence of flight wings, the rudimentary hind wings (halteres) possessed by most members of the order Diptera are absent. Adult bee lice are oval, around 1/20 of an inch (1.2 mm) in length, and equal or slightly less (1 mm) in width. Adults are reddish brown in color, with bodies bearing long spine-like hairs (setae). The thorax is short, and the abdomen makes up most of the visible top surface. The three pairs of legs are long and suited to grasping honeybees as a mode of transport. Adult bee lice may be misidentified as varroa mites due to their small size and oval shape. Bee lice have distinct body segments and six legs. Varroa mites are more evenly rounded and have eight legs. In cases of uncertainty, specimens should be submitted to an insect taxonomist or diagnostician familiar with honeybee colony symbionts.

Braula coeca eggs are minute (<1 mm), white in color and oval. Eggs possess a flat extension (flange) on either side. Larvae are maggot-like in appearance. Pupae are slightly larger than adults. Immature stages are rarely observed due to their minute size and occurrence deep within honeybee colonies.

Life Cycle

Mated female bee lice lay eggs in various locations within honeybee hives, with those on honey capped cells most likely to hatch successfully, typically within two to seven days, depending on temperature. After hatching, larvae burrow beneath the honey caps, leaving visible tunnels around 1/25 of an inch (1 mm) in diameter. When successful,

A top (dorsal) view of an adult bee louse (Pest and Diseases Image Library, Bugwood.org, CC BY-NC 3.0 US).

An adult bee louse attached to the head of its honeybee host (Thies H. Büscher, Dennis S. Petersen, Nienke N. Bijma, Fabian Bäumler, Christian W. W. Pirk, Sebastian Büsse, Lars Heepe, Stanislav N. Gorb, Physiological Entomology, CC BY 4.0).

the larvae feed on honey and pollen. Larvae undergo three larvae stages for a total larval period of seven to 11 days, then pupate for a period of one to three days before emerging as adults. Adults must attach to an adult honeybee for transport (referred to as phoresy) to a new feeding site, or die quickly, often within a day. Once a suitable transport bee is found, the bee louse migrates to the front of the carrier bee and steals food as the bee feeds itself or other bees, or feeds directly on bee regurgitant. Well-fed bee lice lay eggs in the hive to begin a new generation. The entire life cycle requires as few as 10 days, depending on temperature. Bee lice are entirely dependent on honeybees for their life cycle and are incapable of surviving away from their hosts.

Ecological Significance and Pest Status

The bee louse was discovered during 1818 by the German zoologist Christian Ludwig Nitzsch. It is thought to be native to Europe. *Braula coeca*, as well as other members of the family Braulidae are widely distributed globally, including Asia, North America, South America, Africa and Tasmania.

Bee lice normally do not pose a threat to honeybee health or productivity. Direct damage to honey cap cells typically does no long-term damage, although aesthetic damage may occur if large numbers of bee lice are present.

Control

Bee louse control is not recommended or required in most cases. If present in large numbers, beekeepers who specialize in comb honey production may opt for control measures to limit the damage on honeycombs via tunneling of larvae. Two simple management practices exist that can control such damage. Freezing combs for 48 hours kills all life stages and honey extraction purges the larvae.

References

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