



# VARMANT GUARD®

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Common Name: **Blow flies / bottle flies**

Scientific Name: **Calliphora species and Phaenicia species**

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## BLOW FLIES / BOTTLE FLIES

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**Introduction.** The common name of blowfly refers to the fly's deposition of eggs, and comes from antiquity with references dating back into the 16<sup>th</sup> century. The common name of bottle probably comes from "bot" which is an old term for maggot, thus bottle would mean a little maggot. Alternatively, the name bottle fly may reflect the shiny, glass-like or metallic coloration of those flies. These flies are more than just a nuisance; they are of medical importance because of their mechanical transmission of disease organisms and ability to cause myiasis (infestation of tissues/cavities) in humans and animals. About 80 species occur throughout the United States and Canada.

**Recognition.** Adult blow flies / bottle flies measure 1/8 to 5/8 inch long, making them somewhat larger than house flies. They are partly or wholly metallic blue, green, bronze, brassy or black and have sponging-sucking mouthparts.

The mature larvae (maggots) are 3/8 to 7/8 inches long, eyeless, legless, and tapering narrower towards the pointed head from the large rounded rear segment. The head contains a pair of dark mouth hooks. The larvae are pale yellow to white and breath through spiracles (breathing pores) found at the rear of the body.

**Similar Flies.** The cluster fly (*Pollenia rudis*) has golden hairs on the thorax and a dull grayish-tan or grayish-brown overall coloration. The house fly (*Musca domestica*) and flesh flies (*Sarcophaga* species) have a dull, gray and black body and the thorax has 4 or 3 dorsal black stripes, respectively.



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### Representative Species.

1. The bluebottle flies, *Calliphora vicina* and *Calliphora vomitoria*, measure 1/4 to 9/16 inch long and have a dull bluish-black thorax and a shiny metallic dark blue abdomen.
2. The bronzebottle fly, *Phaenicia pallescens* (formerly *Phaenicia cuprina*), are 3/16 to 3/8 inch long with a shiny thorax and abdomen that are colored metallic bronze.
3. The greenbottle flies, *Lucilia illustris* and *Phaenicia sericata*, range about 1/4 to 3/8 inch long and have a shiny metallic green thorax and abdomen without stripes.

**Biology.** Female blowflies lay their eggs (up to 2,373) on suitable larval food material. Upon hatching, the larvae may feed on the surface and then burrow into the food material, which is less decayed. Larvae pass through 3 instars. Mature larvae usually leave their food material to pupate. Most species pupate within the top 2 inches of the soil. They may overwinter as mature larvae, pupae or adults. Biological notes and developmental times for some of the more common species can be summarized as follows:

1. The bluebottle fly (*Calliphora vicina*) deposits up to about 180 eggs at one time, with a lifetime total of 540 to 720. At 25-35°F and 40% RH, eggs hatch in about 11 hours. The 3 larval instars require 3 to 9 days, depending on latitude and climate, while the pupa stage lasts 7 to 10 days. To summarize, development time (egg to adult) requires 15 to 20 days.
2. The bronzebottle fly (*Phaenicia pallescens*/formerly *Phaenicia cuprina*) deposits eggs in batches of about 100. Eggs hatch in 8 to 15 hours, depending on temperature. Eggs do not hatch below 74°F or above 104°F. The 3 instars require about 72 hours under favorable temperatures. The pupa stage lasts 6 to 7 days in the summer to weeks in cold weather. Developmental time (egg to adult) may be as short as about 10 days.
3. The greenbottle fly (*Phaenicia sericata*) females lay about 180 eggs at one time, with a lifetime total of up to 2,373. Eggs hatch in 8 to 43 hours, depending on temperature. Eggs do not hatch below 59°F or above 99°F. The 1st instar lasts 2 to 3 hours and is non-feeding; the 2nd instar requires 1.5 to 9.5 days and feeds, and the 3rd instar is non-feeding and mobile. The pupa stage lasts 3 to 5 days during the summer. Adult pre-oviposition (waiting time before egg-laying) probably last 5 to 9 days. Developmental time (egg to adult) may require 10 days or longer.

**Medical Importance.** Blow fly disease carrying possibilities are often overlooked. Because many species feed on filth such as human excrement and sewage and/or develop in the carcasses of infected animals, these flies may easily infect the food humans eat. Disease organisms may be mechanically transferred via external body surfaces, by their infected fluids during frequent regurgitation, and by infected fecal deposits. The list of

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diseases associated with intestinal track problems is nearly identical to that for the housefly, with some of the better-known including *Entamoeba coli* and *Shigella dysenteriae*, which cause diarrhea, and *Vibrio comma* which causes cholera. Non-intestinal disease organisms include plague (*Pasteurella pestis*), anthrax (*Bacillus anthracis*), tuberculosis (*Mycobacterium tuberculosis*), and tularemia (*Pasteurella tularensis*).

Myiasis refers to any disease that results from the infestation of human tissues or cavities by fly larvae. Infestation by *Callitroga Americana* can result in death (8% mortality in 179 cases reported in 1933). “Surgical maggots” are the larvae of some blow flies, which actually help clean infected wounds and promote healing. Intestinal myiasis is usually accidental and has involved species of *Chrysomya*, *Lucilia*, *Calliphora*, and *Phaenicia*, which can result in diarrhea with blood discharge and living or dead larvae being expelled with the vomit and/or stool. All 3 representative species highlighted above are recorded as causing myiasis in humans.

**Habits.** Most species develop in meat or animal carcasses, but if these are not available they will use animal excrement, decaying vegetation, and garbage. Dead raccoons, opossums, rodents, birds, and other small animals can be the source of flies within structures while dog excrement and garbage are common outdoor sources.

These flies are usually the first insects to arrive and infest after an animal dies. Forensic entomologists often rely on their knowledge of the development times of blow fly larvae to help determine the time of death in murder cases.

**Cultural Control & Preventative Measures.** Blow fly presence in and around homes and buildings can best be prevented through good sanitation practices and exclusion/pest proofing.

Sanitation involves the removal or elimination of the larval developmental sites. This may involve the timely emptying and cleaning of garbage receptacles to render breeding materials unsuitable by drying them out. Sanitation should eliminate the bulk of the fly problem so that mechanical and insecticidal measures will be more effective.

Exclusion measures must include all necessary corrective steps to ensure:

- (1) garbage receptacles have tight-fitting closures, (2) buildings have tight-fitting windows and doors, (3) windows are securely screened if they can be opened, (4) exterior doors have self-closures, (5) all gaps associated with utility penetrations through exterior walls are patched, (6) all vents are securely screened, and (7) if affordable, the installation of air curtains or vinyl strip curtains at loading dock doors and delivery entrances to food preparation areas.

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**Professional Control.** A Varmet Guard technician will recommend and follow the basic 5 steps of IPM: identification, inspection, sanitation, mechanical control/exclusion, and insecticide application if required, to address blow fly infestation and breeding situations.

Once blowflies are identified as the problem, the inspection involves locating the fly breeding and larval developmental sites. It is sometimes helpful to do this at night when the flies are resting near their food and/or larval developmental sites. Attics, chimney flues and structural voids are always suspected as breeding sites of bluebottle flies utilizing the carcasses of expired wildlife.

The technician may perform insecticide applications using appropriately labeled pesticides. Outdoors, this may include the use of residual formulations or insecticide baits in the bottom of dumpsters, as well as treatment of vertical walls adjacent to dumpsters and other breeding sites with a residual liquid insecticide formulation. Indoors, insect light traps and food lure or pheromone lure sticky-surfaced traps are particularly effective in reducing the number of invasive flies.



Blow fly larva or maggot