

Confused and Red Flour Beetles

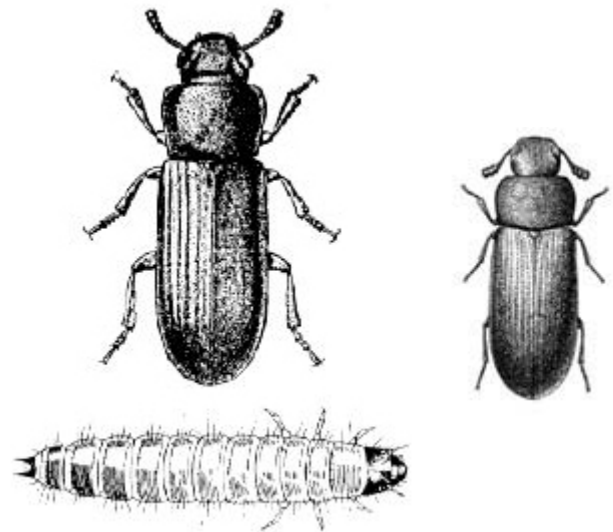
Common Name	Scientific Name
Confused Flour Beetle	<i>Tribolium confusum</i> Jacquelin duVal
Red Flour Beetle	<i>Tribolium castaneum</i> (Herbst)

Both the confused and red flour beetles, known as "bran bugs," primarily attack milled grain products, such as flour and cereals. Both adults and larvae feed on grain dust and broken kernels, but not the undamaged whole grain kernels. These beetles often hitchhike into the home in infested flour and can multiply into large populations. Some survive on food accumulations in cabinet cracks, crevices, and furniture. Confused flour beetles are the most abundant and injurious insect pest of flour mills in the United States. Badly infested flour is characterized by a sharp odor and moldy flavor. They do not bite or sting humans or pets, spread disease, or feed on or damage the house or furniture.

Identification

Both the confused and red flour beetles are similar in appearance. They measure about 1/8-inch long and are flat, shiny, reddish-brown, and elongated. Antennae segments of the confused flour beetle increase in size gradually from the base to the tip to form a club of four segments; in the red flour beetle, the last segments at the tip of the antennae are abruptly larger than the preceding ones, forming a three-segmented club.

Also, the confused flour beetle has a straight-sided thorax, while the thorax of the red flour beetle has curved sides. The eggs, larvae, and pupae are similar in both beetles. Eggs are whitish or colorless and microscopic in size, with food particles adhering to the sticky surface. Brown-headed larvae are cream to yellow, slender, and wiry, reaching a length of 1/4 inch.



**Confused Flour Beetle
Adult and Larva**

**Red Flour
Beetle**

Larvae have six legs and two-pointed or forked projections at the last rear body segment. Pupae are white to light brown.

Life Cycle and Habits

Female beetles each lay 300 to 400 eggs in flour or other foods during a period of five to eight months (two to three eggs per day). Within 5 to 12 days, these eggs hatch into slender, cylindrical, white larvae tinged with yellow. The length of the larval period varies from 22 to more than 100 days; the pupal period is about 8 days. Fully grown larvae transform to naked pupae, and in a week adults emerge. The life cycle requires 7 to 12 weeks, with adults living for 3 years or more.

Adults are very active, quickly running for cover when disturbed, and can be found either on the surface or deep within the food material. Because of their small size and shape, they can frequently invade storage containers. Both beetles breed in damaged grain, grain dust, high-moisture wheat kernels, flour, etc. Beetle specimens have been found in barley, breakfast cereals, corn, cornmeal, crackers, flour, millet,

oats, rice, rye, wheat and wheat bran, nutmeats, dried fruits, legume seeds, beans, milk chocolate, cottonseed, peas, powdered milk, sunflower seeds, vetch seeds, spices, herbarium and museum specimens, and even baits poisoned with arsenicals. The red flour beetle can fly short distances, whereas the confused flour beetle does not fly. Confused flour beetles are more common in northern states; the red flour beetle is more common in warmer parts of the southern United States.

Non-Chemical Control Measures

Usually the most simple and effective control measure is to locate the source of infestation and quickly get rid of it. Dispose of heavily infested foods in wrapped, heavy plastic bags or in sealed containers and leave for garbage disposal service. You can also bury these containers deep in the soil if permitted, practical, and regulations allow. If you detect these beetles early, disposal alone may solve the problem.

Carefully examine foods such as flour, pancake flour, cornmeal, cereals, raisins, dry dog and cat food, spices, candy, dates, dried meats and fruits, rice, and macaroni at the time of purchase. Check the packaging date to establish freshness. Examine broken and damaged packages and boxes to avoid bringing these stored product pests accidentally into the home. Purchase seldom-used foods in small quantities to prevent long storage periods of one month or more, especially during warmer months. Store susceptible foods in insect-proof containers of glass, heavy plastic, or metal, ideally with screw-type lids, or store foods in a refrigerator or freezer. Use older packages before new ones, avoid spillage in cabinets, and always keep food-storage spaces clean. Properly ventilate the storage area to discourage these moisture-loving pests.

Lightly heat infested or suspect foods with questionable infestations in a shallow pan in the oven at 120 degrees F for one hour or at 130 degrees F for 30 minutes; place in a deep freeze at 0 degrees F for four days; or heat in a

microwave oven for five minutes. Heat-treat dried fruits or vegetables by placing in a cheesecloth bag, and dipping in boiling water for 6 to 10 seconds. Sifting the food material will remove possible insect fragments, and any remaining fragments will not cause harm if consumed. After insects are killed, contaminated food might be used outdoors during the winter months for bird feed. Seeds saved for planting may have the germination reduced by super-heating or cooling.

Careful sanitation is the best method to avoid stored-product pests. After removing all food, food packages, utensils, dishes, etc. from the cupboard, shelves, or storage area, use a strong suction vacuum cleaner with proper attachments to clean all spilled foods (cornmeal, toaster crumbs, bits of pet food, raisins, etc.) from the cracks and crevices, behind, under, and in appliances and furniture. Scrub with soap and hot water. After shelves are thoroughly dry, cover with clean, fresh paper or foil before replacing with food or cooking utensils. The ability of these insects to find a small amount of food is amazing. Pheromone trap/lures are commercially available from Insects Limited, Inc., 10540 Jessup Boulevard, Indianapolis, Indiana 1-800-992-1991.



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