

Sawtoothed and Merchant Grain Beetles



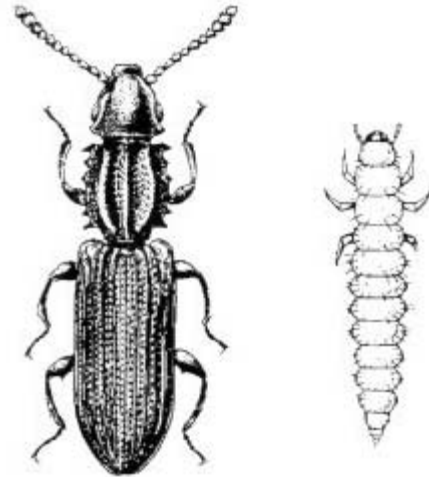
Common Name	Scientific Name
Sawtoothed Grain Beetle	<i>Oryzaephilus surinamensis</i> (Linnaeus)
Merchant Grain Beetle	<i>Oryzaephilus mercator</i> (Fauvel)

Both sawtoothed and merchant grain beetles are common stored-food product pests that infest cereals, cornmeal, cornstarch, popcorn, rice, dried fruits, breakfast foods, flour, rolled oats, bran, macaroni, sugar, drugs, spices, herbs, candy, dried meats, chocolate, bread, nuts, crackers, raisins, dried dog and cat food, and other foodstuffs, making them unsaleable and unpalatable. These beetles are capable of chewing into unopened paper or cardboard boxes, through cellophane, plastic, and foil wrapped packages. Once inside, populations build up rapidly often spreading to other stored foods and into food debris accumulated in the cupboard corners, cracks, and crevices. Sometimes all life stages (egg, larva, pupa, and adult) may be found. These insects contaminate more food than they consume, and usually are discovered leaving the infested food to crawl about the house. Adults and larvae are external feeders, feeding on finely divided food particles and not whole grains. They do not bite or sting humans or pets, spread disease, or feed on or damage the house or furniture. These insects have running legs (ambulatory) much like cockroaches and penetrate "tightly sealed" packaging.

Identification

Both beetles are flattened, reddish-brown, and about 1/10-inch long. They have six sawtooth-like projections on each side of the thorax (middle part between the head and the wing covers). It is difficult to separate these two

beetles. Under magnification, the sawtoothed grain beetle has exposed eyes, whereas the merchant grain beetle has the eyes more protected by small knobs behind the eyes. Also, the head is more triangular in the merchant grain beetle. Males can be separated from females by observing a tooth on the femur of the hind leg. Eggs, larvae, and pupae of both beetles are similar. Eggs are white, microscopic, and elongated. Full-grown larvae are less than 1/8-inch long, with a dirty white background and yellowish plates on the back. The head is brown with three pairs of legs. The pupal case is a capsule of glued foodstuff fragments.



Sawtooth Grain Beetle: Adult and Larva



Merchant Grain Beetle

Life Cycle and Habits

Both beetles lay eggs singly or in small batches in the food material where the life cycle is completed. The sawtoothed grain beetle cannot fly, but the merchant grain beetle can fly. Adults usually live about 6 to 10 months, with some

living as long as 3 years and 3 months. Female sawtoothed grain beetles usually emerge in April and lay an average of 300 eggs. Egg laying begins about 5 days after emergence and continues up to 3 to 4 weeks. Eggs hatch in about 8 days, larvae mature in 37 days, and pupa about 67 days. The life cycle can be completed in 51 days or as early as 27 to 35 days in Washington, D.C. Merchant grain beetles lay an average of 200 eggs over 28 to 42 days, requiring about 35 days to complete the life cycle. There may be as many as 6 to 7 generations under warm conditions of 85 degrees F to 95 degrees F and 70-percent relative humidity, with fewer generations throughout the winter months. Adults remain active and feed. The sawtoothed grain beetle prefers cereal-based products, whereas the merchant grain beetle prefers nuts, seeds, and dried fruit.

Non-Chemical Control Measures

The simplest and most effective control measure is to locate the source of infestation and quickly get rid of it. Use a flashlight or other light source to examine all food storage areas and food products carefully. Dispose of heavily infested foods in wrapped, heavy plastic bags or in sealed containers for garbage disposal service, or bury deep in the soil if permitted, practical, and regulations allow. If you detect infestations early, disposal alone may solve the problem. At the time of purchase, 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. 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 the warm summer months. Store susceptible foods in insect-proof containers of glass, heavy plastic, or metal, ideally with screw-type lids, or store in a refrigerator or freezer. Use older packages before newer ones, avoid spillage in cabinets, and always keep food storage spaces clean. Properly ventilate the

storage area to discourage these moisture-loving stored-product pests.

Lightly infested or suspect foods with questionable infestations can be heated in a shallow pan in the oven at 120 degrees F for 1 hour or at 130 degrees F for 30 minutes, placed in a deep freeze at 0 degrees F for 4 days, or heated in a microwave oven for 5 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 insect fragments. 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 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.



Source: William F. Lyon

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