



Flour and Grain Beetles

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Introduction

Flour and grain beetles are small brown insects that infest grain, flour, and animal feeds. They degrade the quality of stored products but are harmless if accidentally ingested. Discarding the infested food source and storing remaining foods and feeds in tight-sealing containers is key to controlling these pests.

Sawtoothed Grain Beetle

Description

The adult sawtoothed grain beetle (*Oryzaephilus surinamensis*) is a small, active, brown beetle measuring 2-3 mm long (Fig. 1). It has a flattened body with six saw-toothed projections on each side of the thorax behind the head. The beetle has a distinctly jointed appearance where the narrow thorax joins the broader abdomen. The larva is a yellowish-white grub with a segmented body about 2-3 mm long. It has a brown head, three pairs of obvious legs, and the abdomen tapers toward the tip. The sawtoothed grain beetle is a common pest of stored products found throughout most of the world.



Figure 1. Adult sawtoothed grain beetle (Udo Schmidt, CC BY-SA 2.0, commons.wikimedia.org)

The closely related merchant grain beetle (*Oryzaephilus mercator*) is another important pantry pest. It also measures 2-3 mm long and is often mistaken for the sawtoothed grain beetle. The

sawtoothed grain beetle and the merchant grain beetle both belong to the family Silvanidae in the order Coleoptera.

Life Cycle

Sawtoothed grain beetles have a complete life cycle of egg, larval, pupal, and adult stages. Adult females can deposit over 250 eggs. Several generations may occur each year, as the life cycle requires only 3-4 weeks during the summer. Adult sawtoothed grain beetles do not fly. They live about 6-10 months, with some living up to three years.

Habitat and Damage

The sawtoothed grain beetle is a common pest of homes, grocery stores, food warehouses, and grain storage facilities. It readily penetrates packaged cereals, dried fruits, pasta, nuts, and candies. It also attacks flour, grain products, dry pet foods, sugar, drugs, dried meat, and tobacco.

Cultural Control

Controlling this pantry pest requires careful inspection of all foods. Discard heavily infested material and place remaining foods in new containers with tight sealing lids. Vacuum kitchen cabinets and shelving thoroughly, which removes any spilled flour dust and crumbs in the cracks and crevices that support pantry pests. Wiping the cabinets down may make a paste of the flour that is very difficult to remove fully.

Flour Beetles

Description

The confused flour beetle (*Tribolium confusum*) and the red flour beetle (*Tribolium castaneum*) (Fig. 2) are similar in appearance and habits. Adult confused flour beetles have the antennae gradually enlarged toward the tip; the antennae of the red flour beetle

have the last three segments abruptly enlarged in a club. *Tribolium confusum* cannot fly, but *T. castaneum* sometimes flies. The adults of both species are elongated, reddish-brown beetles about 3-4 mm long.

Tribolium spp. larvae are yellowish with brown head capsules, three pairs of legs, and a segmented body. There is a pair of dark brown, hook-like projections at the tip of the abdomen. Mature larvae measure up to 13 mm long. *Tribolium* flour beetles belong to the family Tenebrionidae in the order Coleoptera.



Figure 2. Adult red flour beetle (Peggy Greb, USDA Agricultural Research Service, Bugwood.org).

Life Cycle

Flour beetles have a complete life cycle of egg, larval, pupal, and adult stages. Adult females may live for as long as 2-3 years and deposit 300-400 eggs. Their life cycle requires one to four months when temperatures are favorable, and they can breed year-round in warm temperatures.

Habitat and Damage

These beetles are very common pests that infest flour mills, warehouses, grocery stores, and houses. They feed upon grain, cake mixes, spices, beans, dried fruits, nuts, chocolate, and other foods. Other possible food sources include dry pet foods, birdseed, dried flowers or ornamental corn, garden seeds, and potpourri. Flour beetles attack milled grain products such as flour and meals; broken or damaged grains and seeds; and whole grains infested by other stored product pests. These beetles often arrive in infested flour and can build up into large populations on food accumulations in cabinet cracks and crevices and in furniture where crumbs accumulate. Confused flour beetles are the most

abundant and injurious insect pests of flour mills in the United States.

Cultural Control

As with sawtoothed grain beetles, control of flour beetles begins with the location of the infested food. Look for contaminated food items with obvious leaks in the packaging (Fig. 3). Whole grains may have holes in them and be covered with fine, powdery material. Flour mixes may have evidence of larvae or adult beetles in them. Discard heavily infested materials and repackage other foods in containers with tight-sealing lids. A thorough cleaning using a vacuum cleaner to get into the cracks and crevices of the cabinets and shelving will control this pest.



Figure 3. Bag of flour infested by stored product pests (Raeky, public domain, commons.wikimedia.org).

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