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Warehouse Beetle *Trogoderma variabile* (Ballion)



GENERAL INFORMATION

The Warehouse Beetle (*T. variabile*) is found throughout the Northern Hemisphere and is being closely monitored in Australia. Of the many *Trogoderma* species, it is the most commonly found in dried grains and other stored foods but is also found in homes and museums. In the museum setting *T. variabile* is a special threat to plant and insect collections.

The Warehouse Beetle tends to be very active and can develop at rapid rate. Larvae may be spotted as a result of their coloring and light avoidance movement and may be found in a food source or in cracks and crevices in the storage area.

Unlike many *Trogoderma* spp, the adult Warehouse beetle can fly.

In addition to the threat to collections, the numerous larval setae (hair-like projections) of *Trogoderma* spp. are shed and can cause irritations in respiratory and digestive tracts of anyone exposed to them.

The life cycle and biological ability of *Trogoderma* to resist low humidity, starvation and some common control procedures make them a particularly persistent pest.

SIGNS OF INFESTATION

Infestation is indicated by live or dead insects, masses of larval molts and a fine dust. Emergence holes may be found in whole grains.

FOOD SOURCES

Trogoderma variabile is a voracious feeder and one of the most important pests of dried foods. Although preferring dried and processed grains and animal feeds the Warehouse beetle is also found in dead animals, cereals, candy, cocoa, cookies, fish meal, flour, dead insects, milk powder, nut meats, pet foods, potato chips, noodles, spaghetti, pollen, and dried spices.

In the museum setting these beetles are notorious pests of dried plant and animal specimens.

LIFE CYCLE

Under optimal conditions the life cycle of *Trogoderma variabile* from egg to adult is completed in 30 to 37 days. The female can deposit more than 90 eggs within an infested food source. At 90F/32.2C and 50% relative humidity the eggs hatch in about six days.

The larvae are very active and will crawl throughout infested material and into adjacent food sources.

DIAGNOSTIC MORPHOLOGY

Adults:

- about 1/8 inch/3.2mm in length ranging from 1/16 inch to ¼ inch.
- oval in overall shape
- base color is black or brownish-black
- three reddish-brown, golden, or gray irregular lines across the body
- the elytra (wing covers) have mottled patterns of brown and yellow on a dark background
- elytra will have numerous hairs

Immature Stage:

- approximately ¼ inch/6.3 mm in length
- yellow-white to dark, reddish- brown, many setae (hairs)

throughout infested material and into adjacent food sources. The male has five molts and the female six before pupation. If natural crevices are not available during pupation they will bore into cork, wood, mortar and styrofoam. The pupal stage requires about five days. The adults are short lived. Under adverse environmental conditions, *Trogoderma* larvae are known to enter facultative diapause, a resting state during which metabolism slows and growth stops.

CONTROL & TREATMENT

Although known to respond to a variety of pest control treatments, *Trogoderma variabile* is very tolerant of low relative humidity and other adverse environmental conditions. During diapause the larvae can survive more than a year without food and may be unresponsive to toxic fumigants and anoxic treatments. This makes them particularly resistant to many common pest control procedures. Because *Trogoderma* occur naturally outdoors and are able to fly, total elimination of the beetles may not be possible in many areas.