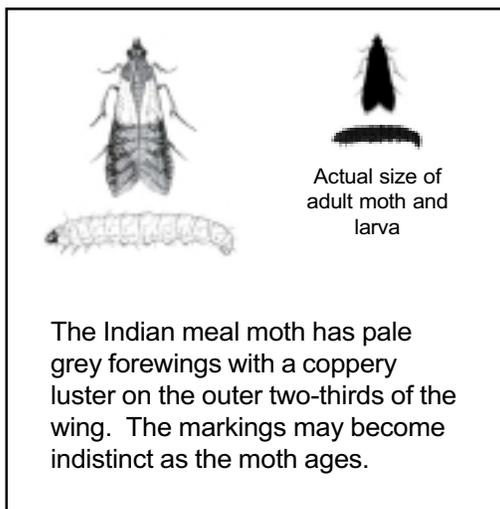


Controlling Stored Product Pests

Eliminating all infested food products is an important factor in controlling these pests.

Stored product or pantry pests include several beetles, moths, psocids, and mites that can infest whole grains or processed foods. The pests are usually introduced into the home in an infested package of food. Initially, infestations are easily overlooked because most stored product pests are very small. Often the first indication of an infestation is the sudden appearance of moth larvae crawling across the ceiling or counter tops, small moths flying about the kitchen, or the presence of beetles in or near the food package.



The Indian meal moth has pale grey forewings with a coppery luster on the outer two-thirds of the wing. The markings may become indistinct as the moth ages.

The Indian meal moth is one of the most common stored product pests in Los Angeles County. All damage to the stored products is done by the larvae. They attack a wide range of products including cereal and cereal products, coarse flour and cornmeal, rice, dried fruit, dehydrated vegetables, nuts, chocolate, dried dog and cat food, bird seed, and dried herb and flower arrangements.

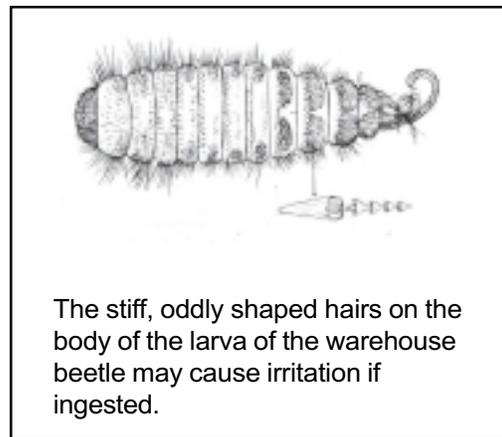
One of the most definitive characteristics of an infestation by the Indian meal moth is the extensive webbing produced by the larvae as they feed and crawl on the food surface. The webbing will cause the food particles to clump together, and can also be observed on the inside surfaces of the food container. Mature larvae, which are about 1/2 inch (12 mm), will often leave the site of infestation and crawl for a distance of up to twenty-five feet to find a protected site where they can transform into adult moths. This transformation stage is known

as the pupa, and larvae spin a thick cover of webbing over the case to protect and secure it to surfaces. Development from egg to adult requires approximately 6 to 8 weeks within the home.

Although the Indian meal moth is the major species of moth infesting stored food products in Los Angeles County, several species of beetles commonly attack a wide variety of foods.

The warehouse beetle feeds on many stored foods including cereals, candy, cocoa, cookies, cornmeal, fish meal, flour, nuts, dried peas and beans, pastas, potato chips, spices, dried pet foods, as well as rodent bait, and dead animals and insects. The adults have oval bodies that are about 1/8 inch long with a brown and yellowish pattern on the wing covers. The larvae are extremely active and will crawl about seeking new food sources to infest.

Larvae are about 3/16 inch (4 mm) when full grown and have numerous stiff hairs on their bodies, as well as a tail of long thin hairs that extends from the tip of the abdomen. The larvae undergo several molts, and the cast skins along with these hairs will accumulate within the infested food product. In heavy infestations, the skins and hairs can be irritating to the mouth, esophagus, and digestive tract if they are ingested. There is one report in the literature which indicates the nature of these hairs and their abundance may have caused enteric irritation in two infants that swallowed larvae from an infested cereal product. Any food found infested with this beetle should be discarded.



The stiff, oddly shaped hairs on the body of the larva of the warehouse beetle may cause irritation if ingested.

There are a number of other beetles which commonly infest stored products in Los Angeles County. Products most often infested are grains and grain products such as flour, meals, breakfast foods, nuts, dried peas and beans, pasta, spices, coconut, dried fruit, pet foods such as stock and poultry feeds, dried dog and cat food, bird seed and fish food, rodent baits and even dead animals and insects.



Merchant grain beetle

The merchant grain beetle and the sawtoothed grain beetle are two slender, very flat, brown beetles that are about 1/10 inch long (2.5 mm) and almost identical in appearance. Their extremely flat bodies enable them to easily enter very small openings in product packages and storage containers. Despite the similarity in appearance, the sawtoothed grain beetle is incapable of flight, whereas the merchant grain beetle flies readily and is encountered more frequently as a pest of stored products in Los Angeles County.

The confused flour beetle and the red flour beetle are also similar in appearance. The adult beetles are about 1/8 inch long (4 mm) and have shiny, reddish brown bodies that are fattened, and oval. Under ideal conditions, especially when infestations remain undetected for long periods of time, the adults have been known to survive for up to four years. A sustained infestation of these beetles often imparts a musty odor to the food.



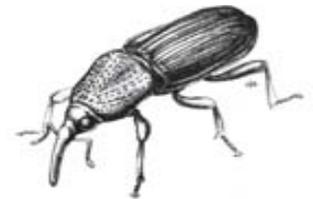
Red flour beetle



Cigarette beetle (left) and the drugstore beetle (right)

The cigarette beetle and the drugstore beetle closely resemble one another, and both are common pests in Los Angeles County. The adult beetles are oval, about 1/8 inch long (4 mm) and uniformly brown in color. The easiest way to distinguish between the two is by examining the wing covers. Distinct longitudinal grooves can be readily observed on the wing covers of the drugstore beetle, whereas the wing covers of the cigarette beetle are smooth. Although both beetles infest a wide variety of stored products, they are most often found in dried pet food, cereals, spices such as chili powder and paprika, and bunched dried pepper arrangements

The granary weevil and the rice weevil infest whole grains and seeds, including rice, corn, millet, rye, beans, and large bird seed. Infestations have also been found in milled products which have become hardened and caked by exposure to moisture. The female beetle makes an opening in the hard exterior coat of the seed and deposits an egg into the meat of the seed before sealing the hole. The larva feeds inside the seed until fully grown, and then pupates. Only when the adult weevil emerges from the pupa is it able to eat its way out of the seed. Adults are 1/8 to 1/4 inch long (2.5 to 4 mm), reddish brown to black in color with long snouts. They can live for 6 to 8 months and may be found some distance from the infested food product.



Granary weevil



Psocid (left) and grain mite (right)

Psocids and mites are extremely small pests which usually occur only when foods are stored under damp conditions. Although their small size may make detection difficult if only a few are present within the product, when conditions are ideal their numbers increase substantially, and the surface of the food product will appear to "move".

The key to successful control of stored product pests is to locate and eliminate all sources of infestation. Finding pests in one area of the home does not necessarily mean the infestation is in that location. Many stored product pests can fly, and many are attracted to lights during dusk or evening flights. Commonly infested products include: grain and grain products such as flours, meals, breakfast foods, nuts, dried peas and beans, as well as pasta, spices, coconut, dried fruit, dead animals and dead insects. Don't overlook pet foods such as stock and poultry feeds, dried dog and cat food, bird seed and fish food, or dried flower arrangements, potpourri containers, or flower petal sachets.

Signs of infestation are webbing on container surfaces or product, or tiny holes in the packaging material made by adult beetles exiting the original product container. Some pantry pests produce secretions which give foods a musty, disagreeable odor.

Check all items in pantries or on storage or decorative shelves. Adult beetles and moth larvae can frequently be found in storage cabinets adjacent to pantries. Thoroughly vacuum all upper and lower surfaces of shelves. Use a crevice attachment to clean cracks and crevices and a brush attachment which will help dislodge moth pupae and protective webbing. Follow with a good cleaning using soap and water, scrubbing all corners and crevices that could harbor eggs and pupae.

Most home infestations of pantry pests are maintained on spills in cupboards and drawers, or in opened packages of food stored for long periods of time. Following the general guidelines listed below will help prevent infestations.

- Always remember to place opened foods, including pet foods, in containers with tight-fitting lids. Clean containers before filling them with fresh food.
- Never mix old and new lots of food. If the old product is infested, the pest will quickly invade the new.
- Clean all food storage areas on a regular basis. Certain pests need only small amounts of food to live and breed.
- Keep storage areas dry. Moisture favors the development of pantry pests; dryness discourages them.
- If shelving is old, consider replacing with new material. If gaps occur around the edges of shelves, applying a caulking material to tightly seal edges against cabinet walls will prevent cracks and crevices where pests can hide.
- When shopping, avoid purchasing broken or damaged packages of food.
- Some pantry pests breed in the nests of rodents and birds and may migrate from these into homes. Eliminate any nests found in or near the home. Pantry pests can also breed in rodent bait. During rodent abatement activities, remember to check bait stations frequently and discard infested baits. When rodents have been eliminated discard any uneaten bait according to label instructions.

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