

Insects Infesting Home Foods

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DRY and cured foods are the ones most susceptible to insect attack in the home. Because of their short storage period, most fresh foods, such as fruits and vegetables, do not become infested except by those field insects that remain on them after harvesting. This bulletin contains information on the habits and control of the common insects found in flour and other ground or processed cereals, dried fruits, cured meats, nuts, and spices.

It is not pleasant to think of eating food upon which insects have been crawling and feeding. Although such food is usually considered unclean and most people will not eat it if they know of its condition, if the insects are not germ carriers, there is no evidence that it is at all injurious. The greatest damage to food by insects is not the amount actually eaten but that which is rendered unfit or undesirable for human consumption by the mere presence of the insects.

Insect pests of food products first come into the home with packages of food. All flour, meal, breakfast food, dried fruits, nuts, and similar materials may contain insects. Breakfast foods in sealed packages are usually "sterilized" by heat or other means at the time of packing. They are safe, then, unless the wrapper has holes or folds through which insects may crawl. Sometimes insects cut very small round holes in the wrapper by which they can enter or leave the container.

These holes, bits of meal webbed together with silk, and the insects themselves should be watched for, and packages containing them destroyed immediately. The grocer can not be expected to take back infested goods if kept very long after their purchase. Insects may have entered them after they were bought. Groceries should be examined before being put away. The grocer will be glad to cooperate if he is treated fairly in such matters. Moreover, if a package is received containing insects, do not judge the merchant too severely. He has to handle in large quantities goods that may previously have been exposed to insects in warehouses, wholesale stock rooms, and railroad cars. He has no control over insect infestation of foods until they reach his own establishment. It should be realized that it is easy for him to miss an infested package now and then. He will appreciate having it called to his attention immediately.

It is easier to rid the kitchen or pantry of insects before they begin to increase than to do so after every crack and corner is the home of a "bug" family. If one sees moths or beetles around where food is kept, they may be coming from a small bag of meal, a partially used can of nuts, or an opened box of cookies back in some forgotten corner. It is time, then, to explore and clean out such old and useless lots of food. A thorough clean-up is usually enough to get rid of food insects.



FIG. 1. CONFUSED FLOUR BEETLE (ENLARGED)

Sometimes beetles may lodge in cracks in a wooden flour bin or some other inaccessible location. They may be killed by squirting machine oil into the corners and cracks around the cupboard shelves and bin. Foods should be kept only in the necessary quantities, especially in summer. Whenever possible they should be kept in tight containers, so that if one food is infested the rest will not become contaminated.

Confused Flour Beetle

The confused flour beetle (fig. 1) is the most common beetle infesting flour in Minnesota. It is dark reddish brown, about one sixth of an inch in length, flattened, and somewhat oval in outline. It crawls about slowly. When rubbed between the fingers it gives off a rather sharp pungent odor.

The common "flour worms" are the young, larval forms of this insect. They vary in length from about one twenty-fifth of an inch at the time of hatching to about one fourth of an inch when full grown. Their color varies from white, for a short time after each molt, to yellow.

The confused flour beetle has been found in wheat, barley, oat, rye, corn, and rice flour; bran; breakfast foods; grains, ground or rolled in various ways; peanuts; and various shelled nuts. It will feed for some time in sugar and corn starch but cannot lay eggs and develop without other food.

Saw-toothed Grain Beetle

The adult saw-toothed beetle is slender, brown, and smaller than the confused flour beetle, being only about one tenth of an inch in length. The sides of the thorax bear tooth-like projections which give it its common name. This is one of the most common beetles occurring in flour, cereal products, and many other foods. The worms are smaller than those of the confused flour beetle, which they resemble.

The small size of this beetle enables it to crawl into small cracks and crevices, thus escaping when efforts are made to get rid of it by cleaning.

The saw-toothed beetle feeds upon various meals, breakfast foods, flour, grain debris, dried meats, dried fruits, chocolate, and other materials. Its

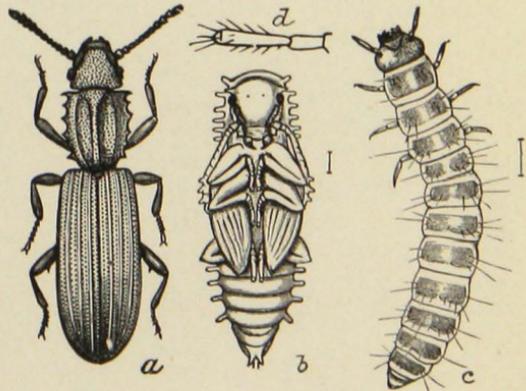


FIG. 2. SAW-TOOTHED GRAIN BEETLE
a, Adult; b and c, young stages (From U.S.D.A.)

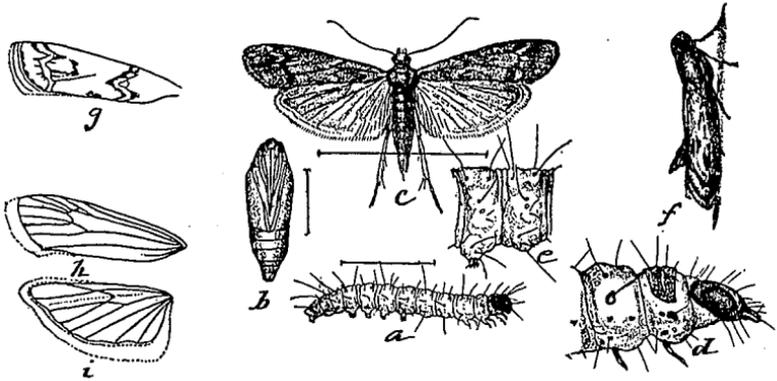


FIG. 3. MEDITERRANEAN FLOUR MOTH

a and *b*, young stages; *d*, head and thorax of worm; *e*, abdomen of worm; *c* and *f*, adult moth; *g*, *h*, and *i*, wings

name is misleading, for it is not a true grain beetle but one that feeds principally on ground products. It commonly migrates all over an infested building. It is sometimes a pest in damp grains, especially oats.

Mediterranean Flour Moth

The adult moth has a wing expanse of less than an inch. The ground color is gray with transverse black bars. While at rest, the position in which it is usually seen, the fore part of the body is elevated, giving a distinct slope to the

wings which are wrapped about the body. The attitude of the moth while at rest is the most reliable characteristic by which to distinguish it, as the markings disappear when the wings become worn.

The worm, when full grown, is from one half to five eighths of an inch long, white, often with a distinctly pink tinge. Its color and the fact that it is usually found in silken tubes that are spun in the flour are the most distinguishing characteristics.

Indian-meal Moth

This moth infests almost any food material and is one of the most common pests in grocery stores. The adult has a wing expanse of one half to three fourths of an inch. The adult moth is distinguished by the light grayish marking on the inner third of the fore wings. When the moth is at rest, this appears as a light band across the forward third of the wings. The rest of the wings is reddish brown.

The worm is about one-half inch long when fully grown and varies in color.

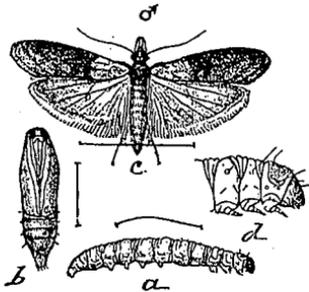


FIG. 4. INDIAN-MEAL MOTH

a and *b*, young stages; *c*, adult moth; *d*, head and thorax of worm (From Riley and Howard)

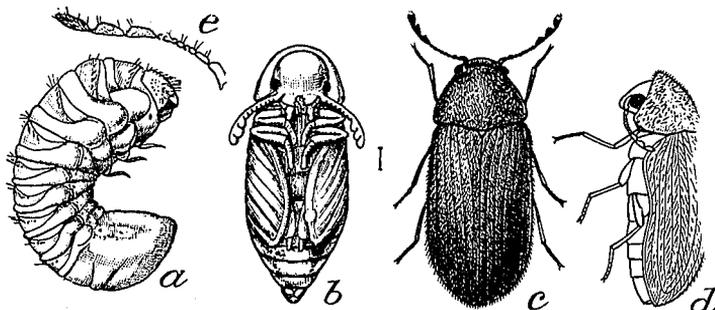


FIG. 5. DRUGSTORE BEETLE

α , Worm; b , pupa; c , adult, top view; d , adult, side view; e , feeler
(From Chittenden)

The ground color is whitish but may be variously tinted with yellow, green, or even pink.

A list of the materials infested by this moth includes nearly all products used for human food—all sorts of cereals, flour, dried fruits, dried roots, some spices, and nuts as well as nut candy. When this insect is found, a thorough cleaning is necessary as it will spread from one material to another.

Drugstore Beetle

Because of its ability to attack a large variety of foods, the drugstore beetle is one of the most injurious and hardest to combat of all insects in stored food products. The adult is about one tenth of an inch in length and is reddish brown. The feelers end in three large joints that form a sort of club. The worms are small white grubs covered with silky hair and have three pairs of small legs.

The list of the foods in which the drugstore beetle has been found includes more than a hundred items, among them grains and grain products, drugs, peppers, spices, and other plant products.

Dermestid Beetles

Several members of the family of beetles known to entomologists as the Dermestidae are important pests of stored foods. They are rather general feeders, although they prefer foods high in fat and protein. Some, in fact, will hardly feed on cereals at all.

The larder beetle is one of the larger, more conspicuous species. The adult varies from one fourth to one third of an inch in length. Its general color is dark brown with a conspicuous band of pale yellowish brown across the base of the wings. The worm is covered with moderately long brown hairs and bears two short, curved spines at the

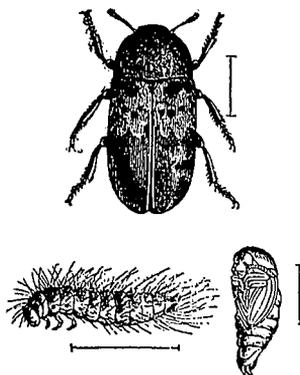


FIG. 6. LARDER BEETLE

rear end. The life cycle requires forty or fifty days in warm weather.

The adults and worms, especially the latter, feed largely on animal matter such as ham, bacon, cheese, butter, moldy bread, and garbage. The worms may bore into spoiled hams upon which they are feeding. Cured meats often must be wrapped tightly to protect them from these insects. When larder beetles become numerous, the worms may burrow into soft wood and fiber insulation nearby to pupate. The destruction from this source may be considerable at times.

The hide or leather beetle is similar to the larder beetle in appearance, habits, and life history. It differs, however, in that the adult bears no yellowish transverse band. It is probably the more common species in raw hides, hence the name. Frequently it becomes so numerous in summer around the incinerator and partly burned garbage from the latter in an apartment house that it migrates throughout the building, causing much annoyance.

The large cabinet beetle is a smaller species which infests dry products high in protein but not so high in fat. Its food is often of vegetable nature rather than animal, namely, the germ of stored seed grains and other seeds and nuts and their protein-containing products.

The adult is about one eighth of an inch long and is black spotted with gray and light brown. The worm is brown above and white below, and the body is covered with reddish-brown hairs that are slightly longer at the rear end.

The black carpet beetle can develop normally on foods relatively low in food value, such as wool, feathers, and fur. Its development is slower on these

materials, however, than in fish meal, dried meat scrap, and wheat germ. The life cycle varies from as short as eight to ten months to as long as two or three years, depending upon both food and temperature conditions.

The adult beetle is oval in outline and about one eighth of an inch long, although it is remarkably variable in size. It is black, with yellowish legs and feelers. The worms are covered with short shiny brown hairs and bear a tuft of relatively long hairs forming a conspicuous tail at the end of the body. It is well known in the home as a pest of rugs and stored woolens.

Other Insects

Such insects as roaches and ants are controlled by methods quite different from those used to control the insects described here. Separate directions should be obtained in case information is desired regarding either of these pests.

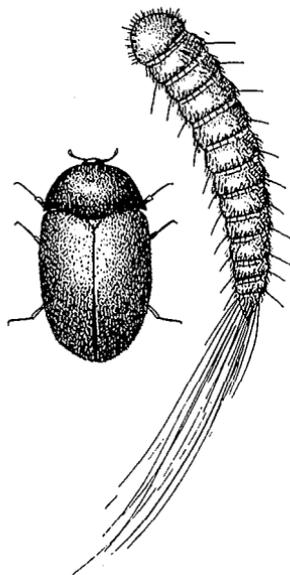


FIG. 7. BLACK CARPET BEETLE, WORM AND ADULT

Control of Insects in Food Products

THE idea that fumigation of a building is the one easy way to get rid of insects appears to have become rather general. Fumigation is often expensive and is seldom a satisfactory substitute for a clean-up. Except under special conditions, fumigation is an emergency measure.

Cleanliness is the most important means of insect control. The use of the word "cleanliness" here is somewhat different from the usual sense. In a house apparently kept "spick and span," some condition may have been overlooked that appears insignificant, yet it makes possible the multiplication of some kinds of insects. Cleanliness with respect to insect control under storage conditions involves the frequent clean-up and disposal of accumulations, old lots, and foreign material that may harbor and support insect pests of products stored nearby.

High Temperature

Heat is an important means of killing insects. It is often relatively cheap and is easy to apply. All insects die within a few minutes at 120° to 125° F. The chief difficulty lies in raising their surroundings, such as the interior of a sack of flour or seeds, to that temperature. The rate of heat transfer into stored products is relatively slow, hence the treatment is more effective when the product can be spread out in a thin layer.

In oven-heating for small quantities, the material should be placed in pans, not more than an inch and a half or two inches deep. The pans may then be placed in the oven and the heat turned on. A gas oven, with the fire as low as it will burn well, will heat

the surface of the material to a temperature of about 180° F. in fifteen minutes. The center of the material will then have reached a temperature of about 120° F. The heat should be turned off at this point and the material left in the oven with the door closed for half an hour.

When any cereal product is heated, other than one used for making raised bread and pastry, the only danger is that of scorching. For flour used in baking, a temperature of 174° F. or higher must be avoided and a thermometer should be used. For ordinary breakfast foods and meals, a thermometer is advisable but not absolutely necessary. Frequent stirring will give more uniform heating and will reduce the possibility of scorching the material.

Low Temperature

Aside from the fact that storage at moderately low temperatures (40° to 55° F.) is effective in the *prevention* of insect damage because the insects lie dormant, temperatures below freezing may be utilized to kill many stored-product insects as the latter are usually highly susceptible to freezing. Small lots of flour, cereals, and other products may be set out in the cold for a day or two during subzero weather.

Fly Sprays

As careful cleaning cannot always be followed by heating or fumigation, it is often desirable to use a spray. Once every year or so, the cleaning should be followed by a thorough painting that will fill all cracks where pests may hide. The paint should be applied in such a way that it will fill all cracks so the surface can be cleaned easily.

Various sprays on the market are efficient contact insecticides, that is, they kill insects when they actually come in contact with them. Most of these sprays are composed of pyrethrum extract in a base of kerosene or a similar light mineral oil. Kerosene or turpentine may be used alone. Gasoline is too dangerous from the standpoint of fire hazard, although all these sprays must be kept away from fire. Some sprays have a strong odor that may to a certain extent repel insects.

Housefly sprays are good only for insects flying around or located on or near a surface that can be sprayed. They are used in buildings that can not be fumigated, and where insects may be hiding in cracks or on the walls at clean-up time. They are useful in the home to squirt into cracks and corners of the cupboards and shelves to kill insects and their eggs that cannot be reached by ordinary cleaning methods.

Fumigation

General fumigation of a building should be done only by an experienced person. Usually hydrocyanic acid gas is used, although there are several substitutes that are as yet not so well

developed for this work. Most cities have rigid ordinances regulating the fumigation of buildings.

Although sulfur dioxide, produced by burning sulfur candles, is effective in killing insects, the gas injures flour and some other foods and may injure fabrics if the air is moist. Formaldehyde is not effective as an insect fumigant.

For the fumigation of small tight cupboards, flour bins, and storage boxes one may apply a noninflammable liquid fumigant at the rate of a cupful to each 25 cubic feet, a space about equivalent to a three-foot cube. The fumigant may be carbon tetrachloride, but a mixture of three parts of ethylene dichloride to one part of carbon tetrachloride is more effective. Such mixtures are obtainable commercially through drug and chemical supply firms. The fumigant may be poured on papers or cloths laid over foodstuffs to be fumigated, or it may be poured directly into an empty flour bin. Fine materials, such as flour, absorb so much fumigant that they are not readily treated in this manner. Fumigants of this sort should be used only where the nearby windows can be kept open to prevent possible accumulation of fumes in amounts dangerous to persons staying in the building.

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