Insect Diagnostic Laboratory
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Clothes Moths

Tinea and *Tineola* species (Family: Tineidae)

Life stages of a clothes moth:
larva (lower), pupa (upper), and adult (right).
Photo from Clemson University -
USDA Cooperative Extension Slide Series, Bugwood.org

Fabric damaged by insects.
Photo from University of Georgia Archive, Bugwood.org

Clothes moths are often found in dark places. They dislike sunlight and are not attracted to artificial light. They may be seen fluttering about in darkened corners or at the edge of a circle of light. When the items on which they are resting are moved, they either run quickly for cover or fly to a darker area to conceal themselves. Infestations often start when woolens are improperly stored in dark places and left undisturbed for long periods of time. For information on other insects that can cause damage, see the Insect Diagnostic Lab Factsheet: Beetles Infesting Woolens.

Injury

There are two species of clothes moths that commonly infest homes, the casemaking clothes moth (*Tinea pellionella*) and the webbing clothes moth (*Tineola bisselliella*). It is the caterpillar (larval stage) of these insects that does the actual feeding. Clothes moths feed on all kinds of dry materials of animal origin including woolens, mohair, hair, bristles, fur and feathers and dead insects. Holes are chewed in woolens or threadbare spots caused where fibers are chewed in carpeting. Household items that may be attacked include clothing, blankets, comforters, rugs, carpets, drapes, pillows, hair mattresses, brushes, upholstery, furs, piano felts or other natural or synthetic fabrics mixed with wool. Silken feeding tubes or hard protective cases are often found on infested fabrics.

Description

The adult moths of these two species look very much alike. They are yellowish-tan to buff-colored with a wingspread of about 1/2 inch. The larvae are white with brown to black heads, and are also about 1/2 inch

long. The casemaking clothes moth larvae spin a protective case out of silk and material fibers, often blending in with the fabric so damage is not noticed until a bare spot or hole is produced. The webbing clothes moth spins silk over the fibers it is feeding on but does not form a case around itself until ready to enter the pupa (resting stage).

Life History

Clothes moths undergo complete metamorphosis – egg, larva, pupa and adult. Female clothes moths deposit soft white eggs in clothing and household furnishings. A single female may deposit from 100 to 300 eggs. Eggs hatch in one to two weeks during the summer or in heated rooms, while in unheated rooms hatching may take longer. After leaving the eggs, the tiny larvae begin feeding and soon begin to spin some silk; either for a case or as webbing over the fabric. The amount of time it takes for a larva to mature varies greatly, from about 40 to over 200 days. The pupa stage is formed in the larval feeding area and it usually takes between 1 and 4 weeks to hatch. Adults emerge from the pupae mate and begin the cycle again.

Management

There are several steps one can take to protect clothing and furnishings against damage by clothes moths.

a) Establish a regular inspection program of all susceptible items at least once a year. Take all items out of closets and drawers, and vacuum closets and drawers thoroughly to remove lint on which larvae may feed.

b) Consider discarding infested item, especially if unimportant. Once damage has occurred it may be difficult if not impossible to repair satisfactorily.

c) When making purchases, look for woolens and wool synthetic blends that have been treated by the manufacturer with a moth resistant compound.

d) In the home, clean often to prevent lint, dust or hair from accumulating. Regular vacuum cleaning of rugs, carpets, drapes, upholstered furniture, pet bedding, closets, cracks and crevices in floors, and areas inside and behind heaters, furnace air ducts and vents is important. Particularly susceptible are areas that are under furniture that is seldom moved and along baseboards where wool lint may accumulate. After using the vacuum, empty the bag because it may contain eggs or larvae. Remove animal nests (birds, rodents, bees and wasps) and get rid of rodents.

e) Clean garments regularly. Thoroughly clean garments before storage. Clothes moths are attracted to articles soiled by food, beverages, perspiration, or urine. For furs, professional cleaning and cold storage is recommended.

f) Store articles properly. Place clean articles in air-tight storage containers. Good plastic bags (without holes) sealed after the clean item is placed inside should prevent clothes moth infestation as long as the bag remains without punctures or tears. Use storage containers with tight fitting lids and seal storage containers or cartons with a good quality tape. All seams and joints should be taped over. If garments are completely clean when placed in sealed containers they should be safe from clothes moths. Note: Cedar chests are good pest-proof containers primarily because of their tight construction, and not the fact that they may release cedar oil. Cedar oil can kill young larvae, but may not affect older ones. Also, as the wood ages the oils are not as volatile.

g) Place garments in cold storage where temperatures remain below 40° F. Larvae are inactive at temperatures below 40° F. Many people assume that freezing temperatures will control these insects - not always so. Clothes moths have survived for long periods in unheated attics and barns in old furniture, clothing and blankets exposed to below freezing temperatures. Although lower temperatures slow down or put a temporary halt to their activities, the clothes moths are usually not directly killed by them. Freezing infested woolens can work to kill clothes moths if there is an abrupt change from warm (70° F; 21° C) to freezing (0° F; -18° C) and leaving the items for at least 72 hours once the material reaches 0° F.

h) If you have infested articles, you can often rid them of larvae and eggs by brushing and sunning them, or by having items dry cleaned. Vigorous brushing outdoors in bright sunshine, particularly of areas around cuffs,

collars and other hidden places, if done periodically, can be effective in destroying clothes moths. If pillows, mattresses, or upholstered furnishings are infested you may want to have them treated by a professional pest control firm, or dispose of the infested articles.

i) Trapping – There are pheromone traps available to catch webbing clothes moths, but not the casemaking clothes moths. The pheromone, a sex attractant in this case, attracts males to the trap where they get stuck on the sticky sides. Pheromone traps will attract only the species they are designed for and will not attract other moths or insects. Traps should be placed in closets where clothes are stored. Traps help detect the presence of the webbing clothes moth, and helps to reduce the numbers of male moths, but they do not provide complete control.

j) Pesticides – Home treatment of garments is not generally suggested. Although there are some insecticide products that list clothes moths on the label, you need to read the label thoroughly. Not all products are made for use on fabric; some may have an oil base that should not be used on fabrics that stain easily. To avoid damaging carpet or fabric, test a small area first.

If needed, infested areas may be treated, such as closets or drawers. Insecticides registered for homeowner use for clothes moths in New York State in 2009 include cyfluthrin, deltamethrin, or permethrin plus trans-allethrin.

k) If you have a widespread infestation, it is advisable to enlist the services of a pest management professional.

Notes on other products:

Home remedies ** Herbal moth repellents are available for use in storage. These usually consist of dried herbs packaged in small cloth bags. There is little research data on the effectiveness of these preparations. Essential oils may also be toxic to clothes moth larvae. Suggested are cedar, eucalyptus, pennyroyal, lavender and tansy.

** Herbal remedy note - Mentions of these remedies are not endorsements by Cornell University of any product or procedure. They are not recommendation for use either express or implied. Neither Cornell University, nor its employees or agents, are responsible for any injury or damage to person or property arising out of the use of this information.

Commercially available repellents or moth protectants include paradichlorobenzene (PDB) or naphthalene crystals or moth balls. Both are toxins and can be absorbed into the body when vapors are inhaled, especially over prolonged periods of time. Chemically sensitive individuals should avoid the use of these protectants. For these materials to be effective, and so you are not constantly exposed to vapors, containers and closets should be airtight. Flakes or balls are placed in the container or closet in which the articles are to be stored. The vapors are heavier than air, and the chemicals should be placed in a shallow container on a shelf or suspended from a clothes rod or hook in a thin cloth bag in closets. DO NOT USE PLASTIC HANGERS; REMOVE PLASTIC BUTTONS BEFORE STORAGE as the plastic may react with the paradichlorobenzene or naphthalene and fuse with the garment. Or one may scatter moth balls, flakes or crystals among the woolens stored in airtight chests or cartons (remember above caution about plastic). Air garments thoroughly, or better yet, clean them before use.

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