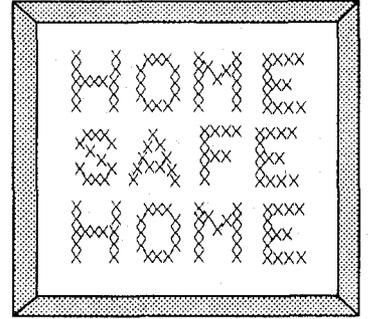


# Alternatives

A Washington Toxics Coalition Fact Sheet

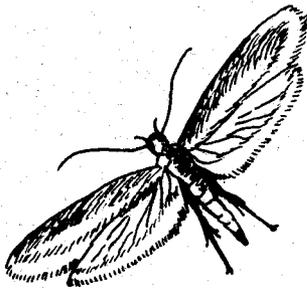


## Clothing Moths—Prevention and Control

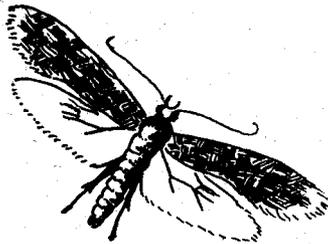
Jennie Goldberg

*The clothes moth is a creature rare  
That lives and even thrives on air  
And has a light and buoyant soul  
Since when it feeds it eats a hole.*

—Arthur Mallis



*Webbing Clothes Moth (Tineola bisselliella): Head and forewings shiny, golden-buff or putty colored, unspotted. Wingspan 1/2 inch. Can be found worldwide. Narrow and fringe-winged.*



*Casemaking Clothes Moth (Tinea pellionella): Head and forewings dusty brownish, the forewings with three dark spots, sometimes indistinct. Larvae forms a movable case around its body. Less common than Webbing Clothes Moth and a little smaller.*

**A**s winter sets in, there's nothing worse than pulling your favorite wool sweater out of the closet to discover that it has been ravaged by hungry moths. One traditional way to prevent this damage is to store woolens in cedar chests. More recently, our parents packed sweaters and blankets in mothballs. The odor you smelled when you unpacked them came from either naphthalene or camphor, toxic chemicals used to repel or kill moths. In many cases moth damage can be prevented without using any chemicals at all. The key to controlling these voracious critters requires an understanding of their life cycle and feeding habits. A few simple precautions you can perform will keep the moths from making themselves at home in your home.

### The Biology of the Clothing Moths

Two types of moths that occur in Washington may attack clothing and furniture: the Webbing Clothes Moth and the Casemaking Clothes Moth. The moths you see flying in large numbers around lights are not clothing moths at all. The larvae of these moths, which are much larger than clothing moths, eat outdoor vegetation and not household fabrics.

The different species of clothes-eating moths are difficult to tell apart, but there's no real need to identify the particular species, since the control measures will be identical. You may not even notice the clothing moths themselves. These insects are quite small—not more than one-half inch long—and when disturbed will run or fly to conceal themselves. They prefer dark, hidden places like the creases and folds in clothes hanging in rarely disturbed closets or under furniture slipcovers. Clothing moths may be confused with similar-looking moths that eat grains or fruit but whose flight is calmer and steadier than the fluttering flight of the clothes moths.

Even if you don't see the clothing moths, you will see the damage left by the feeding larvae. Only the larvae have chewing or biting mandibles which allow them to eat fabrics; the adult moths do not even have the mouthparts necessary to chew on clothes.

The moth goes through four lifestages: egg, larva, pupa, and adult. The adult moths live two to four weeks. In heated houses the females may lay eggs at any time of the year; a new generation is produced within a month if conditions are perfect or it may take up to a year if conditions are unfavorable. The female dies after laying the eggs.

The larvae are tan or cream-colored with a dark head and are very small—less than one-quarter of an inch long. They are active as soon as they emerge, and because of their small size they are capable of crawling into any crack or crevice, including the depths of your furniture. Larvae can live without food for some time. There may be more moths during times of higher humidity, but larvae can exist at any time of the year, so control measures must be continuous to prevent reinfestation.

Larvae of the Webbing Clothes Moth spin either tubes or flat mats of silk, usually incorporating some of the fabric on which they are feeding. Casemaking Moth larvae spin a larger silken case which they carry about as they feed. These casings can be spotted in sweaters or other clothing if you look carefully. After as little as one month or as much as 29 months, the larvae reach full development and spin a pupal case. (Casemaking Moths actually use the cases they have been dragging around—they just seal off the

ends.) The moth emerges in 8 to 25 days, depending on the temperature. Within a day, it will mate and lay 40 to 200 eggs, completing the lifecycle (in 5 to 9 months) and ensuring that there will be plenty of moths around to feed on your clothes and furniture.

### Eating Habits

Moths will munch on anything containing wool, furs, or feathers, and even cotton, silk, rayon, and synthetics if dirty or mixed with wool. Larvae are able to digest only animal fibers. Acrylic, silk, polyester, and cotton can still be damaged by the larvae as they cut through the fibers to get to the dirt and stains on the fabric or to gain access to nearby dirty wool or fur.

We usually think of moths eating holes in clothing, blankets, or rugs, but they will also damage upholstery, piano felt, and even natural bristle brushes. Although moths do eat fabric materials, it's not the fabric itself they are primarily attracted to: it's the dirt, lint, salt, dead insects, or stains from human sweat and food such as tomato juice, milk, coffee, and beef gravy that moths like to eat. Wool is particularly susceptible because of the oils which it contains and can be damaged even when clean, but clean wool is probably less attractive to moths than dirty wool.

### Control Methods

#### ■ Prevention

Moth infestations are easier to prevent than to control. One frequent source of moth infestations is old clothing or furniture purchased at yard sales. Inspect any used clothing or furniture carefully for moths before bringing them into the house. It may be best to have them cleaned first as a preventative measure. Do not accumulate woollens that are not used. They serve as a constant potential source of infestation if they are not frequently worn or inspected. Get rid of them.

#### ■ Cleaning

You can prevent moth "feeding frenzies" very easily just by removing their food! If you don't make your home welcome to them, moths won't stay for dinner. In other words, keep your clothes and furniture clean.

Unfortunately for those of us who hate housework, the most important control method is to vacuum frequently to remove accumulations of lint, pet and human hair, dirt, and other organic debris. We're talking about more than just a cursory sweeping of the rugs. When vacuuming and cleaning, pay special attention to rugs and carpets, drapes, upholstered furniture (including underneath and behind), and closets. Use a crevice tool to reach corners, cracks, ducts and vents and baseboard mouldings and other hard to reach surfaces. Don't overlook radiators and the surfaces hidden behind them. (Be sure to dispose of the contents of the cleaner bag right away.) Resist the urge to shove that last bit of dirt behind the sofa or sweep the lint into floor gratings. Go find the dustpan and use it. Closets where fabric, fur, and feathers are stored are considered prime living spaces for moths. Clean the shelves thoroughly.

Since moths like dark places, it helps to move your furniture around occasionally. And don't forget to clean extra thoroughly in areas where pets live, because moths love to multiply there. The fear of losing a favorite sweater to a hungry moth is a great incentive for getting the house cleaned!

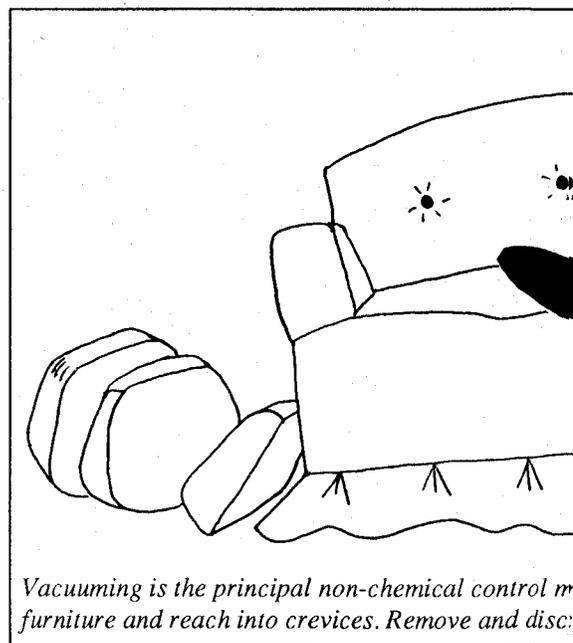
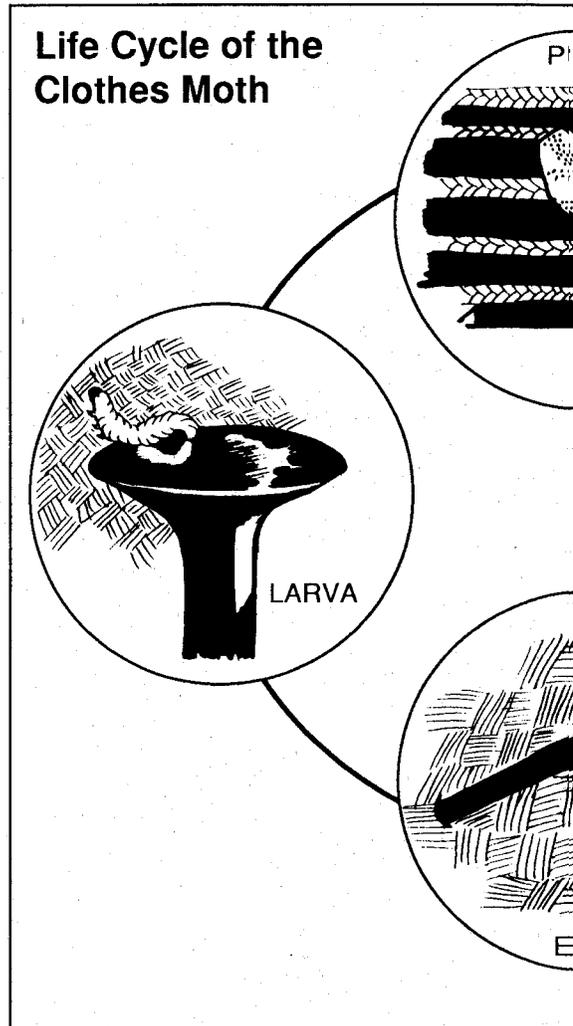
Cleanliness is especially important with your clothes. **Never store dirty clothes;** wash your sweaters **before** you pack them away. Drycleaning is very effective at killing moths in all stages of development and so is any type of handwashing. If shrinkage is not a problem, running clothes through the dryer kills moths too.

One more thing—if you have rats or mice, don't use poison to get rid of them. The dead carcasses which remain in inaccessible places provide a favorite cafe for clothing moth larvae.

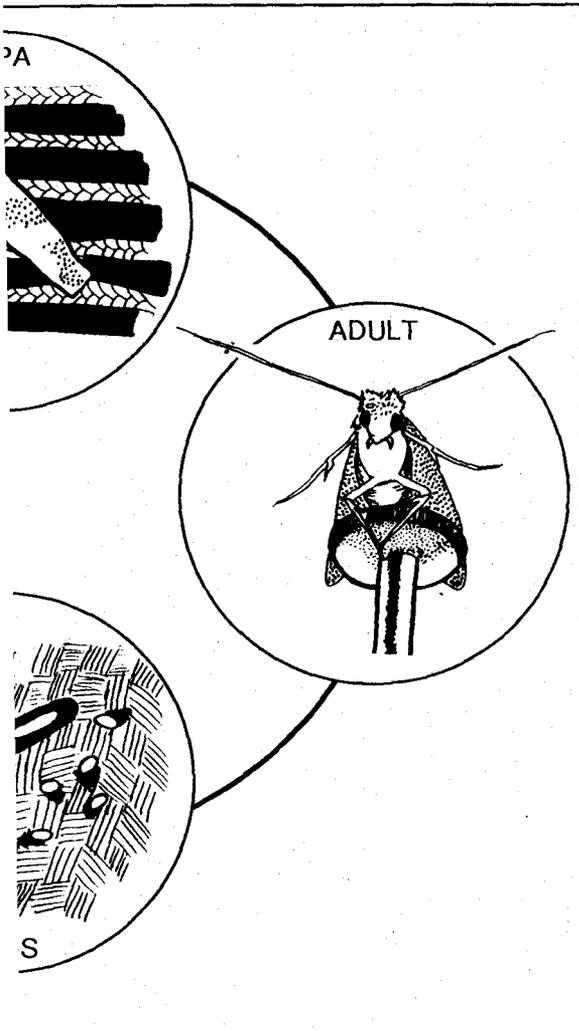
#### ■ Storage

Storing clothes in airtight containers such as cedar chests or in bags that have

### Life Cycle of the Clothes Moth



*Vacuuming is the principal non-chemical control method for clothes moths. Vacuum frequently, especially in and around furniture and reach into crevices. Remove and discard the vacuum bag or canister contents.*



been sealed with tape is effective at keeping moth larvae out. However, if clothes were packed with even one egg, larva, or moth hidden under a collar or cuff, the moth larvae will eventually have a feast. This is why it is so important to clean your clothes before you store them.

A cedar chest is the time-honored place to store your winter clothes during the spring and summer. Cedar chests work to control moth infestations primarily because of the tight seal that keeps larvae out. The oil from the heartwood of cedar contains a volatile oil which in high concentrations may kill moth larvae. However, it has been shown that the amount of cedar oil given off from a cedar chest is not enough to either kill or repel moths.

High heat (in excess of 99° F for one week) will destroy all life stages of the moth. In some parts of the country, attics will get that hot in the summer.

At the other temperature extreme, freezing can also kill moths if it is done properly. Apparently it is not the cold temperature alone which is fatal but the sudden change from cold to hot to cold again. Best results occur when articles are kept at 18° F for several days, then suddenly exposed to 50° F for a short time, then placed back at 18° again. At this point they can be held permanently at 40°. Articles small enough to be bagged can be moved in and out of a bin-type freezer. You may want to warn your houseguests that there is a sweater in the freezer before they find it themselves! In cold climates objects too large to place in a freezer can be put outside in the winter to achieve the same effect.

A method often recommended in the past for repelling moths is the use of various herbs and scents. Unfortunately, cedar chips, dried lavender, peppercorns, cayenne pepper, eucalyptus leaves, and hellebore do not repel clothing moths. This is not to say that clothes should not be stored with herbal sachets. They do add a nice scent—just don't count on them alone to repel moths.

#### ■ Airing, Sunning, and Shaking

Another option, rather than sealing your clothes away each summer, is to wear your clothes at regular intervals or shake them out and expose them to the sun. The handling involved in wearing a sweater, for example, is enough to knock off the fragile larvae and cocoons. One of my cleaning rituals involves dumping all my sweaters on the floor with the intention of folding them and putting them away. Instead, I just shake them and shove them back in the box. This little exercise of exposing them to light and shaking will destroy most larvae before they do damage. Sunning clothes will not kill eggs, but well-grown larvae will usually fall off. You must keep doing this periodically because if some larvae survive, they will multiply and can do a lot of damage.

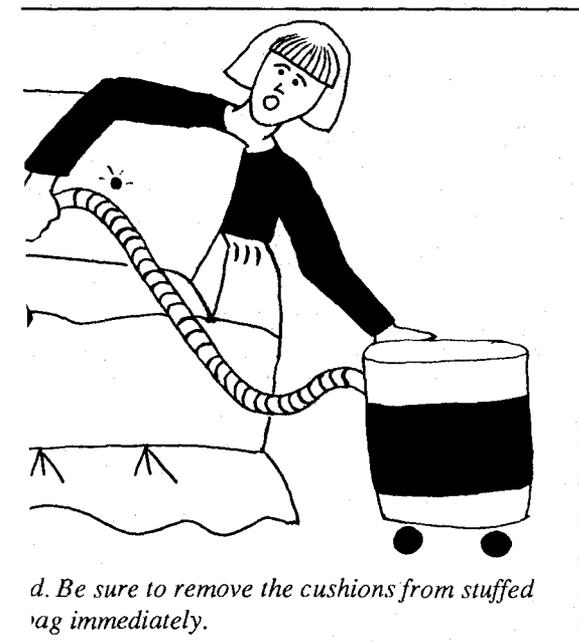
Vacuum cleaners can even be used on clothes occasionally. This method does not work as well with furs, however. The larvae actually eat the hide near the fur, causing the fur to fall out. Furs should be combed out with a very fine comb or taken to a professional storage facility.

Furniture coverings are not really protected by normal use. Unfortunately, even heavy use by "couch potatoes" will not control moths on overstuffed chairs and sofas. Periodic vacuuming of the seat covers all around the edges of your chairs and sofas is necessary. If an infestation occurs in the stuffing material itself, try the freezing method if practical. Otherwise, professional fumigation or replacement may be necessary.

#### ■ Chemical Fumigants and Repellants

The use of mothballs or other chemicals for controlling moths is not recommended. Department stores carry a variety of moth control products in the form of blocks for hanging in closets, crystals for sprinkling on clothes, or mothballs for placing in cedar chests and storage boxes. Many of these products have a strong chemical odor. Sometimes, however, these products are scented with oils of lavender or cedar to give them a pleasant smell and to associate them with herbal sachets. The packages may even show pictures of herbs or use the word "sachet". Unfortunately, some people may get the mistaken impression that these products contain only safe, herbal ingredients.

In fact, as much as 95-100% of a typical commercial moth control product may



d. Be sure to remove the cushions from stuffed bag immediately.

consist of the toxic chemicals paradichlorobenzene (PDCB) or naphthalene. These volatile organic chemicals are dangerous to human health and the environment in the amounts needed to effectively kill moths (one pound of PDCB for every 100 cubic feet of confined space). The chemical concentration required to kill moths may not be achieved in homes. Even at lower levels, however, these chemicals are dangerous.

The chemicals can enter the body through inhalation, skin absorption, or accidental ingestion—especially by children. Exposure over a long period of time may cause liver and kidney damage, the severity of effects varying widely with the individual. Irritation to the nose, throat and lungs, headaches, depression, and corneal damage to the eyes are other hazards. Naphthalene is considered more toxic than PDCB even though it kills moths more slowly. A primary derivative of coal tar, it can promote a catastrophic breakdown of red blood cells resulting in anemia or acute kidney failure in sensitive individuals. This is much more likely to occur in dark-skinned people than in Caucasians. PDCB may pose a long-term health hazard. It has caused cancer in animals and is classified by the Environmental Protection Agency as a possible human carcinogen.

Mothballs are sometimes made of camphor, which acts as both a fumigant and a repellent. Because it is a naturally-derived material, camphor is sometimes mistakenly thought to be less dangerous than PDCB or naphthalene. However, it is a poison which may cause neurological disorders, and deaths have occurred from the ingestion of camphor mothballs. An indication of the inhalation danger from camphor is the air concentration allowed in workplaces: only 2 parts per million, 37 times as strict as for PDCB!

Exposure to the chemicals found in mothballs and crystals is compounded because mothballs are generally stored in closets and other places with very little ventilation. Clothes absorb the chemicals, which can then be transferred to the person when clothes are worn. Babies can absorb enough naphthalene from treated clothing to experience acute systemic reactions, and deaths have occurred. Unfortunately, naphthalene is not very soluble in water, so it is difficult to remove by washing. It would probably be wise to dryclean any articles that have been stored with mothballs before using them.

Another serious danger with mothballs is that they look like candy to children. In 1988, 87% of the reported poisonings from moth chemicals were to children under 6 years of age. The accidental ingestion of one mothball could cause severe illness, coma, and even death in a child in less than one hour. Thanks to the quick response of Poison Control Centers, serious injuries have been reduced. If you suspect a child has eaten a mothball, immediately call the Seattle Poison Center's 24-hour telephone line at 1-800-732-6985 (in the state of Washington).

If you already have mothballs at home, store them tightly wrapped in double plastic bags. Mothballs should not be put in the trash unless they are completely spent (they will be very small and no longer smell). Otherwise, take unwanted and unused mothballs to a designated household hazardous waste disposal facility for proper disposal. ■

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## Summary of Moth Control

- ❖ Be wary of used clothing and furniture. Inspect carefully and clean or discard.
- ❖ Get rid of unused clothing.
- ❖ Clean all clothes before storing. Do not store clothes if stained!
- ❖ Store clean clothes in tightly sealed containers.
- ❖ Periodically shake, brush, and expose clothes to sunlight.
- ❖ Vacuum often. Clean closets and behind baseboards and cracks in floors.
- ❖ Move furniture around from time to time.
- ❖ Avoid the use of mothballs or moth blocks.
- ❖ Trap rather than poison rats.

*The Author: Jennie Goldberg coordinated Metro's Household Hazardous Waste program for the years 1987-88. She has written a book on HHW programs around the world. She is currently an environmental analyst at the Seattle Drainage and Wastewater Utility.*

*Illustrations by Liz Hoenig.*

**The Washington Toxics Coalition is a non-profit environmental organization working to reduce our society's reliance on toxic chemicals. We identify and promote alternative products and techniques which are non-toxic and environmentally sound. Memberships are available for as little as \$20 per year. Please write or phone for information, or send your check to: WTC, 4516 University Way NE, Seattle, WA 98105. (206) 632-1545.**

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