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Shedding Light on a Dark Enemy, The Clothes Moth

Topic: Carpet Moths

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There are many great questions in life that may never be answered. What really happened to the dinosaurs? What is the secret of the pyramids? Is Scotchguard™ effective on wool? What kinds of moths eat rugs and how do we deal with them?

There are too many unanswered questions in life and the cleaning industry as a whole. However, the purpose here is to educate the rug cleaner about identifying clothes moths, the damage they cause, how to get rid of them, and how to protect a rug from further damage. It is important that the rug cleaner fully understand these concepts.

What are They?

The type of moth that we in the cleaning industry are concerned with is the clothes moth. Specifically, there are only two different kinds of clothes moths that we need to know about — the webbing moth (*Tineola bisselliella*) and the casemaking moth (*Tinea pellionella*). The adult webbing moth is about a half-inch long and yellowish beige in color. The casemaking moth is similar in size but differs in color; it is brownish and has three dark spots on its forward wings. The adult moths themselves cause no damage, however the larvae they produce are very damaging. It is the larvae that actually feed on wool. Each moth's larvae spins a silken tube that acts like a barrier of protection. The webbing moth larvae attach their tubes to dark crevices or seams, rendering themselves stationary to feed in one location. The casemaking moth's larvae do not attach their tubes or "cases," which allows them to be mobile and cause a wider spectrum of damage.

"The life cycle of the clothes moth can last from two months to 2½ years. The adults lay eggs on products that the larvae will consume. Each female moth can lay from 100 to 150 eggs, which hatch in about five days. The small white caterpillars vary in size from 1/16 inch newly hatched to 1/3 inch fully grown."¹ The larval stage itself can last from "2-30 months."² The great variance in the life cycle is due to the availability of food (wool). That is why moths can be so devastating to rugs. Rugs provide a huge source of food. If gone unnoticed the larvae can feed for almost 2½ years. An infestation of only several weeks can result in pile loss the size of a fist.

Where We Find Them

"Moths and their larvae thrive in dark, undisturbed areas where a rug gets little traffic and is not often vacuumed."³ Moths are attracted to the keratin in animal hair. The wool alone in an Oriental rug is susceptible, but imagine a dirty rug covered in dog and cat hair. That would be like a filet mignon. "Clothes moths can feed on mixtures of natural and synthetic fabrics. However, they cannot feed on materials made of synthetic fibers. In

nature, clothes moths have been found infesting pollen, hair, dead insects and dried animal remains." ⁴

In a rug infestation these characteristics can be observed:

- Actual flying adult moths. When a lot of flying adults are present, the infestation can be considerable.
- Loose carpet fibers on top of the pile resulting from the larvae actually eating the knots off the foundation of the rug.
- "Cocoons — 1/8-inch diameter x 1/2-inch long slightly fuzzy cylinders usually the same color as the rug's pile (larvae camouflage their cocoons to blend in with the color of the wool that surrounds them.)" ⁵
- The actual larvae squirming along the pile surface and underneath the rug.

How Do We Get Rid of Them?

Up to this point everything has been very straightforward and factual. However, when it comes to getting rid of the moths, tempers flare and controversy ensues. Different books have cited everything from placing an infested rug in the sun for a few hours to rolling it up and placing it in your cavernous freezer. As professionals we need to know the facts. We need to deal with an infestation quickly and have a solution to the problem that is 100 percent effective. Imagine bringing an infested rug into your plant and placing it in the sun for an afternoon and then feeling confident enough to place the rug in your beating/dusting pile with 50-100 other rugs. Rug expert Aram Jerrehian writes, "A thorough professional cleaning is the best way to prevent moth damage because the washing removes the larvae and the hot drying destroys the eggs." This is very good news for the consumer; however it does not consider the possibility that the larvae may move (most likely involuntarily) from one rug to another in a cleaning plant. What all this means is that we need something to kill these bad guys before we clean the infected rug.

The safest and most effective insecticide the rug cleaner can use is pyrethrum.

"Pyrethrum is the oleoresin extract of dried chrysanthemum flowers. The extract contains about 50 percent active insecticide ingredients known as pyrethrins. These strongly lipophilic esters rapidly penetrate many insects and paralyze their nervous systems. Both crude pyrethrum extract and purified pyrethrins are contained in various commercial products, commonly dissolved in petroleum distillates. Some are packaged in pressurized containers ("bug-bombs"), usually in combination with the synergists piperonyl butoxide and n-octyl bicycloheptene dicarboximide. The synergists retard enzymatic degradation of pyrethrins. Some commercial products also contain organophosphate or carbamate insecticides. These are included because the rapid paralytic effect of pyrethrins on insects ("quick knockdown") is not always lethal." ⁶

That is the business end of pyrethrins. Pyrethrins are commonly found in pet shampoos, so that should tell us that it is relatively safe. Will pyrethrins cause dyes to become unstable? I haven't experienced any problems personally, nor have I uncovered any research that would lead me to believe so. As with any product we use on rugs, read the

label and test it in an inconspicuous area. Furthermore, "pyrethrins break down quickly after application and are considered safe for use in the home."⁷

"Be aware that mothballs, flakes, or crystals (naphthalene or paradichlorobenzene) are ineffective in moth control for rugs. These materials act only as a minor repellent to moths. They do not kill moth larvae, and the naphthalene odor can be unpleasant and difficult to remove from the rug."⁸

Effective Application:

- A. Use a pyrethrin product specifically formulated to kill clothes moths, particularly the larvae and egg stages. (i.e. Raid, Black Flag)
- B. Spray the infested rug thoroughly on the front and back, preferably outside or in a very well ventilated room.
- C. Roll the rug up and put it aside for a day, allowing time for the pyrethrins to work. Rolling the rug up will keep the deadly concentration high and potentially more effective (it saves space too).
- D. The rug is now ready for typical cleaning. A good run through the beater/duster will be particularly effective to remove all the dead matter. If you don't have access to this type of machinery, a rigorous vacuuming will do.

Prevention

One of the major hurdles in preventing moth damage is consumer education. Too many consumers believe that getting their rugs cleaned is bad. People are home less often than ever before, and have less time to care for their rugs (i.e. vacuuming) and even less to inspect dark places such as under furniture. Rugs get dirty and they are lying or hanging targets.

Preparing Rugs for Storage

It has all come to this. The great debate. Every cleaner has his own ultra secret methods of preparing rugs for long-term storage (six months to several years). The largest controversy lies in what is done to keep rugs safe from moth infestation. Many of these secrets have been handed down from one generation to the next, dating back as far as those mysterious pyramids. The truth is that these secrets are based on tradition as opposed to science. Remember, as professionals, all we care about are the facts. So, let's break the silence and talk about some quantifiable facts.

First and foremost, mothballs are bad. As stated earlier, mothballs are only a minor repellent and do not kill larvae or eggs, and the odor they produce can be almost impossible to get rid of. That's not all, "mothballs contain 100 percent of their naphthalene or paradichlorobenzene. Both of these ingredients can produce harmful effects when they enter your system through inhalation. Irritation to nose, throat and lungs, headache, confusion, excitement or depression, and liver and kidney damage can result from the exposure to mothball vapors over a long period of time.

Mothballs containing naphthalene are of special concern because naphthalene can promote a breakdown of red blood cells resulting in hemolytic anemia. Hemolytic anemia in mild form may cause only fatigue. In more severe cases, it can cause acute kidney failure."⁹

Of course only high concentrations of these ingredients can cause any of these effects. Such concentrations are found when vapors are absorbed by clothes or rugs that are stored or kept in closed areas with poor ventilation. "Poisonings have been reported following dressing infants in clothing that was stored with naphthalene mothballs, suggesting that absorption of naphthalene may occur through the skin."¹⁰ Packing a rug to be stored with mothballs or crystals may be mildly effective as a repellent for six months, but it is inappropriate because many cause irreversible damage to the rug and its owners. Furthermore, you can't even get rid of them. "Mothballs should be taken to a licensed hazardous waste handler or saved for a professional household hazardous waste collection program."¹¹ And if you are not 100 percent sure that they are bad, "museum experts do not recommend storage with mothballs, which may affect dyes."¹²

So, how do we protect rugs from infestation? The safest way right now is with moth repelling agents containing magnesium silicofluoride. It is not an insecticide. It does not kill moths, larvae or eggs. Instead, it makes the wool less appetizing by changing the taste. It is applied as a spray solution covering the front and back of the rug thoroughly. It lasts for up to three years and has no residual odor. Most importantly, it is not harmful to people. "Think twice about using mothballs or flakes — these materials have little repellent effect, and the odor they impart to the rug can be difficult to remove. Cedar scent is useless in moth control. Periodic inspection of the rug is strongly recommended."¹³

In learning to identify moths, the damage they cause, how to effectively kill them and how to prevent further damage from occurring, we can now speak intelligently with customers about their moth problems.

Hopefully I have shed some moth evading light on this subject that will be helpful to some of you in the cleaning industry, as well as your customers.

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