GOT MOLD?

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Your Certified Kama'aina Lab Team

A BASIC HAWAII MOLD RESOURCE

The Facts About Mold: For Everyone

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http://www.aiha.org

What is mold? Molds are forms of fungi that are found everywhere -- both indoors and outdoors all year round. Outdoors, molds live in the soil, on plants and on dead or decaying matter. Another common term for mold is mildew. Mold growth is encouraged by warm and humid conditions, although it can grow during cold weather also. There are many thousands of species of mold and they can be in any color, including white, orange, green, brown, or black. Many times, mold can be detected by a musty odor. Most fungi, including molds, produce microscopic cells called "spores" that spread easily through the air. Live spores act like seeds, forming new mold growths (colonies) when they find the right conditions. All of us are exposed to fungal spores daily in the air we breathe, both outside and inside.

How does mold get into a house or building? Most if not all of the mold found indoors comes from outdoor sources. It seems likely to grow and become a problem only where there is water damage, high humidity, or dampness. All molds need moisture to grow. Common sources of indoor moisture that can cause mold problems include flooding, roof and plumbing leaks, damp basement or crawl spaces, or anywhere moist air condenses on cold surfaces. Bathroom showers and steam from cooking may also create problems if not well ventilated.

How can I prevent mold growth? Controlling excess moisture is the key to preventing and stopping indoor mold growth. Keeping susceptible areas in the home clean and dry is very important. Ventilate or use exhaust fans (to the outdoors) to remove moisture where it accumulates: bathrooms; kitchens; and laundry areas. Be sure the clothes dryer vents to outside the house. Repair water leaks promptly, and either dry out and clean or replace any water-damaged materials. Materials that stay wet for longer than 48 hours are likely to produce mold growth. Lowering the humidity in the home also helps prevent condensation problems. To lower humidity during humid weather, air conditioners and dehumidifiers may be used. Proper

exterior wall insulation helps prevent condensation inside the home during cold weather that could cause mold growth.

Can mold be toxic? Some molds can produce toxic substances called mycotoxins. Airborne mycotoxins have not been shown to cause health problems to occupants in residential or commercial buildings. The health effects of breathing mycotoxins are not well understood and are currently under study.

High or chronic airborne exposures, typically associated with certain occupations like agricultural work, have been associated with illnesses, although these are rare. More is known about eating mycotoxins (from humans and animals consuming moldy foods or feed) and the resulting health effects than is known about breathing mycotoxins.

What is "black mold"? The news media often refer to "black mold" or "toxic black mold." It has usually been associated with the mold *Stachybotrys chartarum*, a type of greenish-black mold commonly associated with heavy water damage. Known health effects are similar to other common molds. It has been inconclusively associated with more severe health effects in some people. While there are only a few molds that are truly black, many can appear black. Not all mold that appears to be black is *Stachybotrys.*

Why are we concerned about mold? Small amounts of mold growth in workplaces or homes (such as mildew on a shower curtain) or workplaces are not a major concern, but no mold should be permitted to grow and multiply indoors. When molds are present in large quantities, they may cause nuisance odors and health problems for some people. Mold can damage building materials, finishes and home furnishings. Some molds can cause structural damage to wood.

How do molds affect people? Most people will have no reaction at all when exposed to molds. Allergic reactions, similar to common pollen or animal allergies, are the most common health effects for individuals sensitive to molds. Flu-like symptoms and skin rash may occur. Molds may also aggravate asthma. Fungal infections from building-associated molds may occur in people with serious immune disease but this is very rare. Most symptoms are temporary and eliminated by correcting the mold problem in the home.

Who is affected by exposure to mold? For those who are affected by mold exposure, there can be a wide variation in how they react. People who may be affected more severely and quickly than others include:

* infants and children
* elderly people
* pregnant women
* individuals with respiratory conditions or allergies and asthma
* persons with weakened immune systems (for example, people with HIV infection, chemotherapy patients, or organ or bone marrow transplant recipients, autoimmune diseases.)

Those with special health concerns should consult their doctor if they are concerned about mold exposure. The symptoms that may seem to occur f from mold exposure can also be due to other causes such as bacterial or viral infections, or other allergies.

What should I do if I see or smell mold in my home? The most important step in solving a mold problem is to identify and fix the moisture sources that caused the mold growth. For small mold problems, use detergent and water to wash mold off hard surfaces and dry completely.

Porous or absorbent materials (such as ceiling tiles, wallboard and carpeting) that become moldy should be replaced. If you do not see mold growth, but notice a musty odor, mold may be growing behind water-damaged materials, such as walls, carpeting or wallpaper. Persons cleaning mold should wear gloves, eye protection and a dust mask or respirator to protect against breathing airborne spores (an N95 dust mask or respirator may be purchased in hardware stores). If you have health concerns, you should consult your doctor before doing any mold cleanup.

Should I test my home for mold? Probably not. It should not be your first step. Your first step should be to inspect your home for any evidence of water damage and any visible mold growth. Testing for mold is expensive, and you should have a clear reason for doing so. In most cases, it is not economically practical or useful to test for mold growth on surfaces or for airborne spores in the home. Testing also tells you little about where mold is located and how to clean it up. In addition, there are no standards for "acceptable" levels of mold in buildings, so when testing is done, it is usually to compare the levels and types of mold spores found inside the home with those found outside the home. If you know you have a mold problem, it is more important to spend time and resources to get rid of the mold and solve the moisture problem causing the moldy conditions rather than to test for the mold problem.

Who do I call to deal with extensive mold growth in a building? A professional experienced in mold cleanup may need to be hired to address extensive mold growth in a building. It is important to correct large mold problems as soon as possible by first fixing the source of the moisture problem, then cleaning the surfaces, and finally by drying the area completely. If you use outside contractors or professionals, make sure they have experience cleaning up mold, check their references, and have them follow the recommendations and guidelines given in the information resources below.

For more information -

Consult other fact sheets from AIHA on mold: *The Facts About Mold: For the Professional* and *The Facts About Mold: A Glossary*.

* State or Local Department of Health
* Environmental Protection Agency (EPA): www.epa.gov/iaq
* EPA and FEMA Flood Clean-up Guidelines: www.epa.gov/iaq/pubs/flood.html and www.fema.gov
* Centers for Disease Control and Prevention (CDC): www.cdc.gov/nceh/asthma/factsheets/molds/molds.htm
* California Indoor Air Quality Program: www.cal-iaq.org//iaqsheet.htm
* New York City Department of Health "Guidelines on Assessment and Remediation of Fungi in Indoor Environments": www.nyc.gov/html/doh/html/epi/moldrpt1.html
- Listings of indoor air quality consultants can be obtained from the American Industrial Hygiene Association (AIHA) Consultants Listing [FYI: We cannot recommend specific contractors. On the Consultant Listing, they identify themselves.]. See consumer brochure "How to Select an Indoor Air Quality Consultant" at www.aiha.org or call (703) 849-8888.

More technical information:

* *Bioaerosols: Assessment and Control.* American Conference of Governmental Industrial Hygienists (ACGIH), 1999, J. Macher, ed. Order from www.acgih.org
* *IICRC S500, Standard and Reference Guide for Professional Water Damage Restoration.* Institute of Inspection, Cleaning and Restoration, 1999. Order from www.iicrc.org

This Fact Sheet is a joint effort by the following AIHA Technical Committees:

* Biosafety and Environmental Microbiology
* Environmental Microbiology Laboratory Accreditation (EMLAC)
* Indoor Environmental Quality (IEQ)

LOCAL MOLD & FUNGI REFERRALS

CLEANING PRODUCTS

"Sasococide" for hard surfaces
Otake Instruments, Inc
Ms. Jean Otake
1314 South King Street, Suite 615
Honolulu, Hawaii 96814
808-592-8933

"A-33" for hard surfaces
Crestek Cleaning Center
930 Hauoli Street, Suite 301
Honolulu, Hawaii 96826
808-942-2500
(Crestek can refer you to professional on-site cleaning crews)

Medical Questions re: Human Reactions to Mold & Fungi

George M. Ewing, MD, Allergist & Immunologist
1329 Lusitana Street, Suite 603
Honolulu, Hawaii 96813

Dr. Philip Foti, Pulmonologist
30 Aulike Street, Suite 601
Kailua, Hawaii 96734
808-262-6951

Medical Questions re: Animal Reactions to Mold & Fungi

Arlene Skillman, DVM
University Pet Clinic
988-2111
Doug Chang, DVM
Aloha Animal Hospital
734-2242

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SOME COMMON MOLD AND FUNGI

***Acremonium* sp. (approximately 80-90 species)**
Acremonium is found in most parts of the world. It is found frequently and is widespread. It requires very wet conditions for growth indoors. Out-of-doors it is found in the soil, on dead organic debris in hay and other food stuffs. It is a common allergen responsible for Type I allergies (hay fever, asthma) and Type III hypersensitivity pneumonitis responses.

***Alternaria* sp. (approximately 40-50 species)**
Alternaria is found in most parts of the world. It is found frequently and is widespread. Out-of-doors it is found in the soil, on dead organic debris, on foodstuffs and textiles. It is a plant pathogen and may be used in the biocontrol of weeds and other plants. It is a common allergen responsible for Type I allergies (hay fever, asthma) and Type III hypersensitivity pneumonitis responses. Possible effects on humans include nasal lesions, subcutaneous lesions, nail infections; the majority of infections reported from persons with underlying disease or in those taking immunosuppressive drugs.

Ascospores (more than 3000 genera)
This spore category is produced by morels, truffles, cup fungi, ergot, and many micro-fungi. These are found frequently and are widespread. Possible effects on humans are dependent on the genus and species, but the vast majority do not cause disease.

***Aspergillus* sp. (approx. 200 species)**
Aspergillus is one of the most common fungal genera worldwide. Indoors it is found on a wide range of substrates. Out-of-doors it is found in the soil and on decaying plant debris. It is a common allergen responsible for Type I allergies (hay fever, asthma) and Type III hypersensitivity pneumonitis responses. Possible effects on humans include respiratory, invasive, cutaneous, ear and corneal disease. Severe, invasive disease is usually associated with immunosupressed hosts. Many species grow at 37° C (body temperature).

- *A. fumigatus*: Fungus ball and invasive disease.
- *A. flavus*: nasal sinus lesions, invasive disease.
- *A. niger*: "Swimmers ear," and invasive disease.

Basidiospores (more than 1200 genera)
This spore category is produced by mushrooms, puffballs, shelf fungi, rusts, smuts and many other fungi. These are found frequently and are widespread. Indoors, several genera produce dry rot in wood. Out-of-doors they are found in gardens, forests, and woodlands. They are probably common allergens responsible for Type I allergies (hay fever, asthma) and Type III hypersensitivity pneumonitis responses.

***Chaetomium* sp. (approximately 81 species)**
Chaetomium is found frequently and widespread in most parts of the world under varied ecological conditions. Indoors it may be widespread and found on cellulolytic material. It is very commonly found on damp sheetrock paper. Out-of-doors it is found in soil, seeds, cellulose substrates, dung, woody and straw materials. It may be a Type I allergen (hay fever, asthma).

***Cladosporium* sp. (approximately 28-40 species)**
Cladosporium sp. is found frequently and widespread in most parts of the world under varied ecological conditions. Indoors it is found on many substrates, including textiles, moist window sills and wood. It does grow at 0°C, and so is associated with refrigerated foods. Out-of-doors it is found in soil, plant litter, leaf surfaces and old or decayed plants. It is a common allergen responsible for Type I allergies (hay fever, asthma) and Type III hypersensitivity pneumonitis responses. It is generally non-pathogenic.

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***Curvularia* sp. (approximately 15 species)**
Curvularia is found frequently and widespread, more commonly in tropical and sub-tropical regions. Indoors it is found on a variety of substrates. Out-of-doors it is found in plant debris and soil. It is a common allergen responsible for Type I allergies (hay fever, asthma).

***Paecilomyces* sp. (up to 30 species)**
Paecilomyces is found frequently and widespread in most parts of the world under varied ecological conditions. Indoors it is found on many substrates including jute fibers, paper, PVC and leather. It grows well on general fungal media and some species produce distinctive pigments such as lilac and ocher.

Out-of-doors it is found in soil and decaying plant material, composting processes, and legumes. It is a common allergen responsible for Type I [atopic and anaphylactic hypersensitivity (hay fever, asthma)] responses and Type III [immune complex mediated hypersensitivity (hypersensitivity pneumonitis: humidifier lung)] responses. Although *Paecilomyces* grows at 37°C, human disease is relatively rare.

***Penicillium* sp. (approximately 200 species)**
Penicillium is found frequently and widespread in most parts of the world under varied ecological conditions. Indoors it is commonly found in house dust. It grows in water damaged buildings on wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint. It is also found in blue rot of apples, dried foodstuffs, cheeses, fresh herbs, spices, dry cereals, nuts, onions, and oranges. Out-of-doors it is found in soil, decaying plant debris, compost piles, and fruit rot. It is a common allergen responsible for Type I [atopic and anaphylactic hypersensitivity (hay fever, asthma)] responses and Type III [immune complex mediated hypersensitivity (hypersensitivity pneumonitis: humidifier lung)] responses.

***Stachybotrys* sp. (approximately 15 species)**
Stachybotrys is found frequently and widespread in most parts of the world under varied ecological conditions. Indoors it is commonly found on wet materials containing cellulose, such as wallboard, jute, wicker, straw baskets, and other paper materials. Out-of-doors it is found in soil, decaying plant substrates, decomposing cellulose (hay, straw), leaf litter, and seeds. Type I allergies (hay fever, asthma) have been reported. Many human reports of *Stachybotrys* toxicosis are anecdotal. *Stachybotrys* mycotoxicosis is currently the subject of toxin research. Human toxicosis has been described and may be characterized by dermatitis, cough, rhinitis, itching or burning sensation in mouth, throat, nasal passages, and eyes.

[1] From Characteristics of Some Commonly Encountered Fungal Genera, compiled by Janet Gallup and Miriam Valesco, PhD., 1999.