

Indoor Allergens

MGH Pulmonary Grand Rounds
March 4, 2009

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Cambridge, MA

Since 1992
MIAI has completed
more than 3000 building
inspections, including
more than 1,000
“sick building
investigations.”

We have taken and
analyzed by
microscopy over
25,000 air and dust
samples.

May Indoor Air Investigations LLC



May Indoor Air Investigations: two levels of service

Consultation: 2-3 hours
Investigation: 4-5 hours

Client interview
Walkthrough : exterior and interior
Sampling in relevant areas
Report with observations and recommendations

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Below: Aspergillus
mildew grew on the back
of an easy chair because
the fabric was in contact
with a cold, glass sliding
door. The heat register
flapped the material and
spores became airborne.

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Above: Aspergillus
mildew on a chair leg.
The yellow colonies
grew on many furniture
surfaces and in
carpeting in the slab
home. An infant
suffered serious, chronic
respiratory problems.

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Cladosporium Growing in a Window AC

A photograph of a window air conditioning unit. A white arrow points to a dark, moldy area on the left side of the unit. A white circle highlights a similar moldy area on the right side of the unit.

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The thick coating of dust on
the AC coil below is typical of
most poorly filtered systems.
Clean fins can be seen at the
bottom where there has been
low air flow.

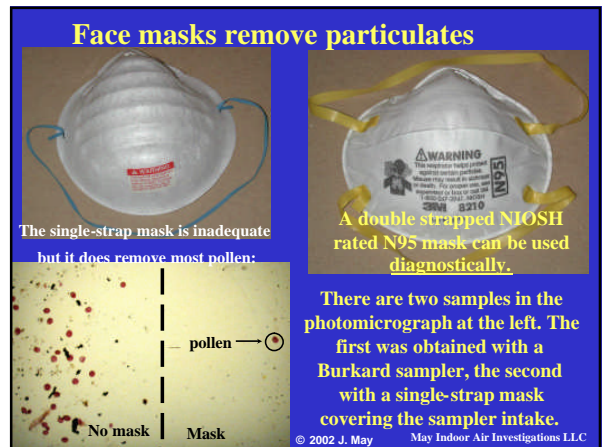
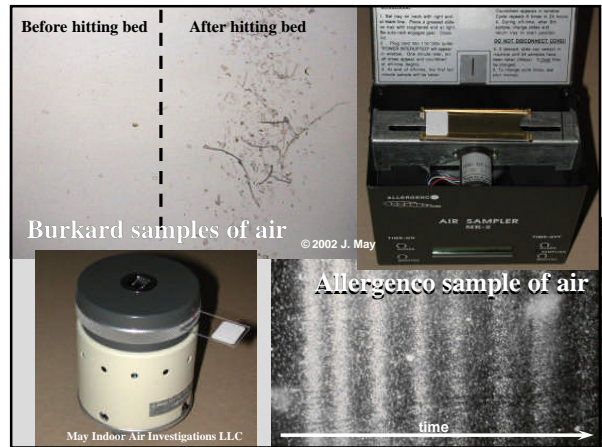
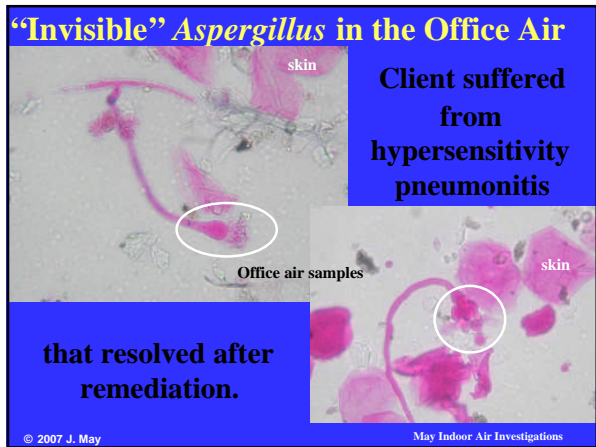
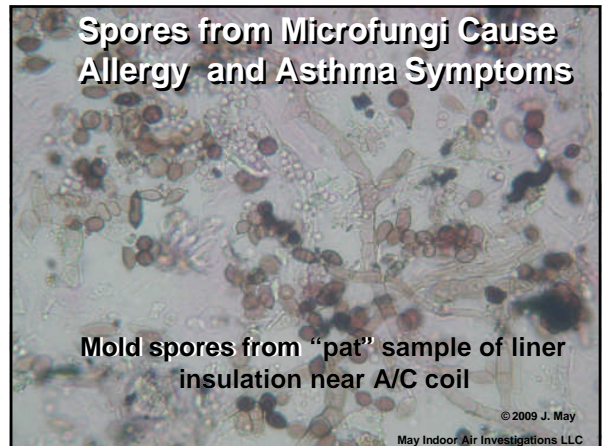
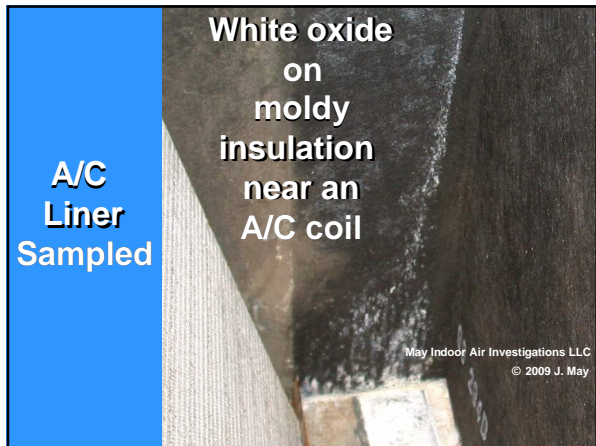
A photograph showing a thick, dark coating of dust on an AC coil. Below the coil, the clean metal fins are visible.

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Mold hyphae
growing in the dust
from the AC coil at
the left.

A microscopic view of mold hyphae, showing long, branching, filamentous structures.

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Cat Dander Particle and Penicillium Spore in Burkard Air Sample at 1000x

cat dander

spore

The particles are stained pink by acid fuchsin in this light micrograph. In every home with pets, many dander particles are in the air. They are probably epidermal and coated with sebaceous allergens.

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Pet Dander, Fur and Hair

Rabbit

dog fur

cat fur

rabbit fur

skin

Dog

Cat

horse hair

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SEM of Cockatiel Feather with Unknown Particles (4000x)

Keratin granules?

wing

Large numbers of these particles were in the air of the home. The client had hypersensitivity pneumonitis.

4,000x 20.0 kV 10µm ST May Indoor Air Investigations LLC 03 MAR 00

Bird Bioaerosol

From a quilt 1,000x

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Wool Moth Fecal Pellets

Low power light

Pellet Color Depends on Fiber Color

50x SEM

Surface of Wool Moth Fecal

Missing surface spherules 8000x SEM

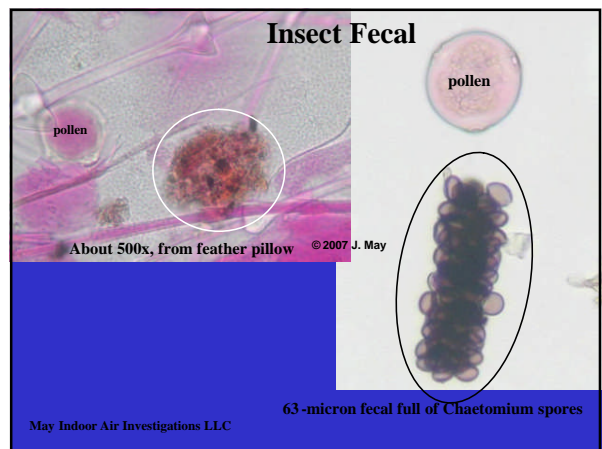
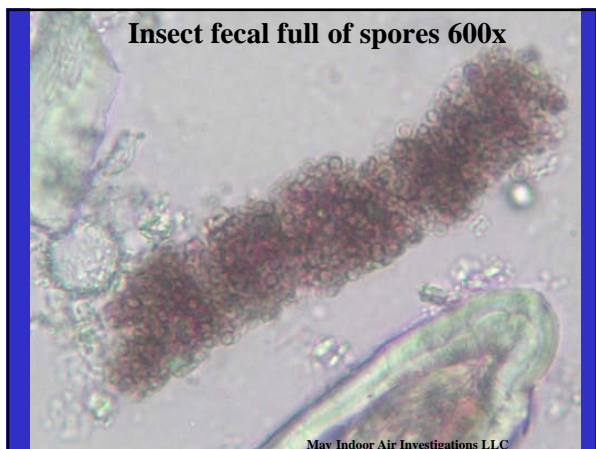
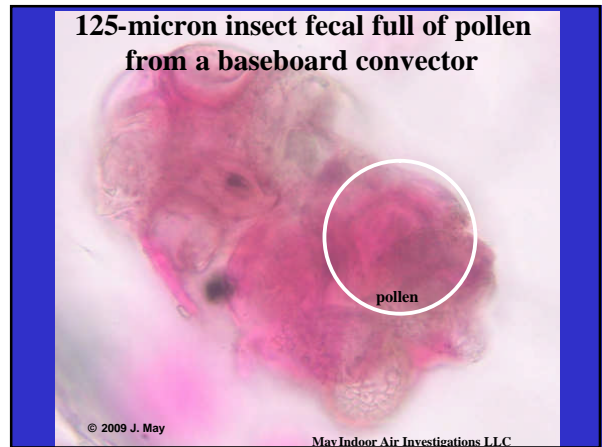
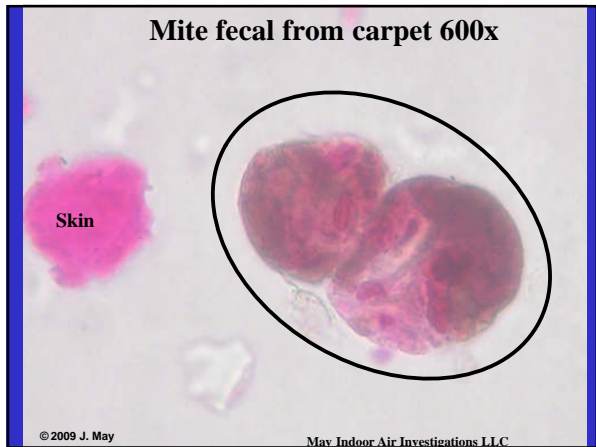
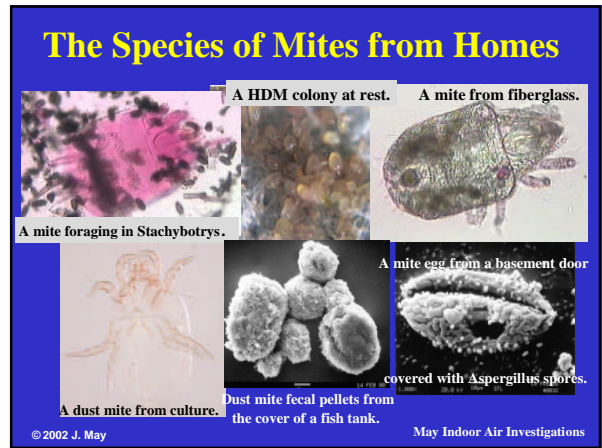
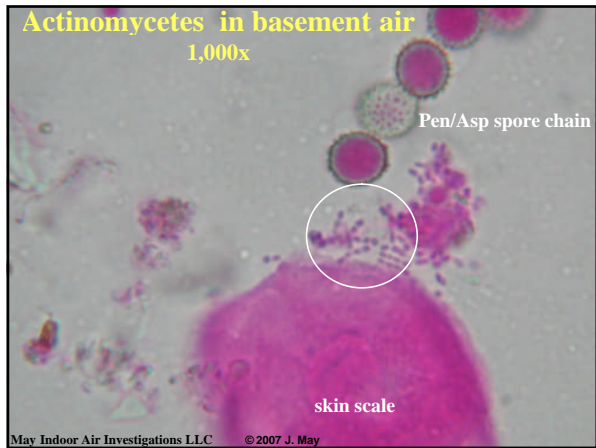
Spherule with "adhesive"

30,000x SEM

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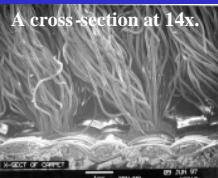
The tray of a furnace humidifier full of mineral clumps. Floating on the water surface is a large, white colony of actinomycetes, a mold-like growth that can cause hypersensitivity pneumonitis

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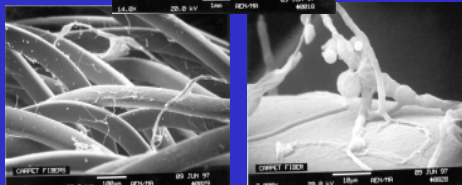


SEM of a Smelly, Almost New Carpet

Below left:
tops of fiber loops
with hyphae and
cellulose strands
at 150x.



Below right:
growing spores
and hyphae on
carpet fiber at
2000x

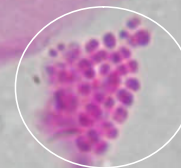


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Bacteria cluster from carpet 1,200x

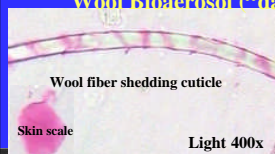
Skin scale



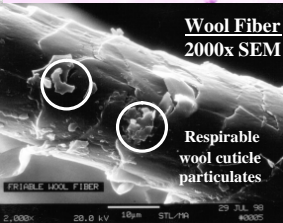
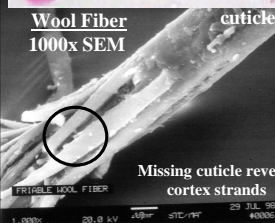
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Wool Bioaerosol ("dander") Can Be an Irritant



Wool cuticle and cortex particles
in an air sample



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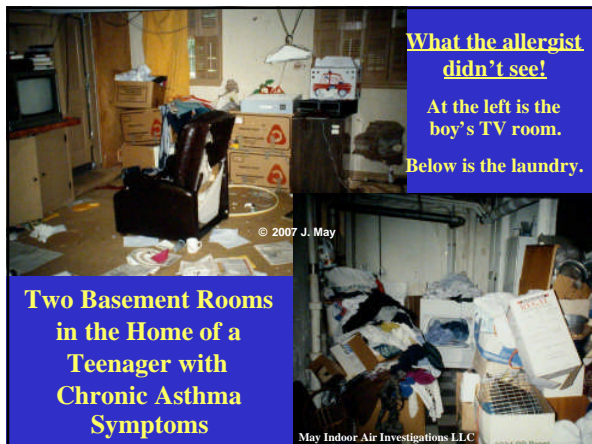
Evaporative Furnace Humidifiers



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The water in furnace humidifier trays is always contaminated with organisms: bacteria, mold or actinomycetes. Most of the debris in the tray, however, is minerals that form from evaporation of water.

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What the allergist didn't see!

At the left is the boy's TV room.

Below is the laundry.

Two Basement Rooms
in the Home of a
Teenager with
Chronic Asthma
Symptoms

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Mushrooms Growing Out of a Basement Carpet

What the allergist didn't see!

The tenants had only rented the apartment for one year. They wondered what the "white smoke" was that billowed from the carpeting when they exercised on the floor. The husband started having chronic sinus infections and the wife became an asthmatic.

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The Home Guide for People with Allergies and Asthma

JEFFREY C. MAY
MY HOUSE IS KILLING ME!
FORWARDED BY
Jonathan M. Samet, M.D.
The Johns Hopkins School of Public Health

2001

The MOLD SURVIVAL GUIDE
AND FOR YOUR HOME

JEFFREY C. MAY
MY OFFICE IS KILLING ME!
The Sick Building Survival

2004

2006

2008

Jeff May's HEALTHY HOME TIPS
A WORKBOOK FOR DETECTING, DIAGNOSING & ELIMINATING
Funky Fenton, Stinky Stenchies, Musty Mold, and Other Aggravating Home Problems

Jeffrey C. May & Connie L. May

For PDF of presentation:
info@mayindoorair.com