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The Truth About 'Toxic Molds'

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With the arrival of the rainy season comes the re-emergence of a common household problem: mold. Mold (or mould if you prefer) is a non-scientific term for a varied group of fungi. Molds existed on the planet long before humans and will likely exist long after the last humans are gone. Humans evolved in a world heavily populated by molds and virtually every breath we take, indoors or out, brings us in contact with mold spores.

Given its ubiquity, you might wonder why I would want to write about mold? Well in the last 20 years an industry has built up around the idea of "toxic molds." This industry preys on our fears and ignorance with mold being described as "black gold" in some circles.

The reality is there is no such thing as "toxic mold." There are some mold species that are "toxigenic," that is they produce "mycotoxins." Mycotoxins are metabolites produced by molds that are capable of harming other living organisms. Molds evolved these metabolites as part of their strategy to battle bacteria (and each other). One of the most famous of these mycotoxins is a compound we call penicillin. Penicillin is produced by the mold *Penicillium* (one of the supposedly "toxic molds") and is essentially harmless to non-allergic humans in the concentrations encountered in our day-to-day lives.

Certainly there are people who can be deathly allergic to penicillin. Approximately five per cent of individuals have some allergic airway response to elevated mold spore concentrations. But let's put that number into perspective, about 10 per cent of people are allergic to household pets.

Issues with mold have been known since biblical times and everyone knows that you should not eat moldy food as it can make you sick. Only recently has airborne exposure been considered a concern.

It has been argued that our current generation of mold panic can be directly linked to U.S. Centers for Disease Control (CDC) studies in 1994 and 1997. At that time, the CDC incorrectly linked lung damage in children to the presence of *Stachybotrys chartarum* mold. In 2000, this linkage was retracted by the CDC. Unfortunately, by then the damage was done and a few very lucrative lawsuits later, the "toxic mold" industry was born.

In order to grow, mold only needs warmth, moisture and food (often called "the mold triangle"...the mold version of "the fire triangle"). Molds will thrive at temperatures over 5 degrees C (and under about 45 degrees C) and humidity over about 50 per cent. Molds have evolved to live on pretty much anything organic in nature so can grow almost anywhere. To make it worse some molds, like *Penicillium* or *Cladosporium*, can tolerate colder temperatures. This is why you tend to find these two molds growing on rotting veggies in your fridge.

So what is the truth about mold? The fact that is understood now, that was not fully recognized in the 1990s, is that it is not the mold in your house that is making you sick. Rather it is living in conditions where mold can thrive that actually causes illnesses. As explained by the World Health Organization in 2009

> Sufficient epidemiological evidence is available...to show that the occupants of damp or mouldy buildings, both houses and public buildings, are at increased risk of respiratory symptoms, respiratory infections and exacerbation of asthma. Some evidence suggests increased risks of allergic rhinitis and asthma. Although few intervention studies were available, their results show that remediation of dampness can reduce adverse health outcomes.

As for the mycotoxins, the research is also clear:

> Current scientific evidence does not support the proposition that human health has been adversely affected by inhaled mycotoxins in home, school, or office environments (Hardin Kelman and Saxon, 2003)

and

> Currently, there is no supportive evidence to imply that inhaling mold or mycotoxins in indoor environments is responsible for any serious health effects other than transient irritation and allergies in immunocompetent individuals (Fung and Clark, 2004).

Now I am not saying that mold is good for you as that is clearly not the case. Molds can and do produce spores that can act as human allergens. At high enough concentrations mold spores can even induce headaches in people who are not directly allergic to mold. As well persons with immunosuppressed conditions should be especially careful to reduce exposure to molds. Molds can also damage and weaken structures. But on a day-to-day basis, molds and mold spores are not a significant risk to a healthy individual.

The take home message from this blog is simple: it is not some "toxic mold" that is making people sick, it is living in conditions conducive to mold growth that is bad for human health. As such mold can serve as a useful indicator. If you see mold it is time to deal with the conditions that are likely to make you sick sometime in the future.

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