

## ***Environmental Triggers for Respiratory Distress Special Section on Mold***

### Description:

Fungi, mold in this specific case, are in a completely different kingdom of organisms called Eumycota. They are eukaryotic having a well defined nucleus enclosed by a nuclear membrane, and the cells contain a cell membrane and the various cellular organelles making it similar to animal cells.

Molds are found virtually everywhere in the environment (over 200,000 species of fungi have been catalogued by scientists, at least 200 of these have been identified as familiar pathogens). Mold in nature break down organic waste, and because of this they are readily found in building materials ranging from wood, drywall, stucco, sheetrock, wall paper, ceiling tiles, showers, and the lists goes on. Whereas, much is known of viruses and bacteria, little is known of mold/fungi concerning indoor air quality. New research is coming forth showing a distinct link between mold and human health and disease. Mayo clinic discovered that fungi, and not bacteria, are the culprit behind chronic sinusitis.<sup>1</sup>

Why the interests in mold? Mold/fungi release secondary metabolites called mycotoxins. These are toxins produced by molds to defend against enemies in nature which are bacteria, viruses, and other organisms such as dust mites. The well known mold *Aspergillus* produces the powerful carcinogens aflatoxin, it is the only mycotoxin regulated in America, and “is the most carcinogenic chemical known to science”<sup>2</sup>, and ochratoxin. “Although aflatoxin is the most carcinogenic substance on the planet, ochratoxin beats it ten times over in terms of toxicity and damage inflicted on the human body”<sup>3</sup>.

Mycotoxins are relatively large and non-volatile molecules (do not readily release into the air themselves), so direct contact is mostly required. The mold overcome this due to the spores they produce and release into the air. Exposure to molds and the secondary metabolites they produce are an area of growing concern in Indian Country. The routes of entry to the human body are mainly skin contact, and inhalation into the respiratory system.

On the Pine Ridge Indian Reservation, mold has been found in 75% of the 1,700 tribal housing units. Health effects range From chronic sinusitis, severe headaches, fungal skin infections In children and elderly, upper and lower respiratory illness, and On the fringe: reports of elevated cancer cases, and diabetes worsening. This black mold is causing many tribal members to become sick. The diabetes epidemic on the Pine Ridge Reservation alone is 800% higher than the U.S. national average of diabetes in a population.

## **Black Mold**

- Found in 75% of the 1,700 tribal housing on the Pine Ridge Indian Reservation
- Causes sickness and poor health among tribal members
- Health effects include chronic sinusitis, severe headaches, fungal skin infections, upper and lower respiratory illness; cancer cases rising and diabetes worsening
- Diabetes found to be 800% higher on this reservation than U.S. national average

Reports of asthma and other respiratory ailments, related to elevated glucose levels in other Indian communities due to mold/fungi infested housing are constantly surfacing and are an ever growing problem in Indian Country. The environmental impact of these organisms and their metabolites, how they affect indoor air quality, and human health is the primary concern of the EPA National Tribal Science Council. An organized effort needs to be launched in Indian Country to look into this issue which affects tribes across the United States.

## References

A. Sugar, A. A Practical Guide to Medically Important Fungi and the Diseases They Cause. Lippincott-Raven. Philadelphia, PA. 1997.

1. Salvatore, S. Fungus causes most chronic sinusitis, researchers say. CNN report Sept. 9, 1999.
2. Etzel, R. Mycotoxins. Journal of the American Medical Association. 287(4). Jan23/30, 2002.
3. Kemin.com. Kemin Americas, Inc.: The Control of Mold and Mycotoxins in Ruminant Foods. Dec. 2002.

## Efforts to Address this Issue:

The EPA's Office of Indoor Air and Radiation has developed a web site dedicated to the mold issue and has also produced two documents dealing with mold. The web site is located at <http://www.epa.gov/mold/moldresources.html>. The two documents are also located there and are (1) "[A Brief Guide to Mold, Moisture, and Your Home](#)" and (2) "[Mold Remediation in Schools and Commercial Buildings](#)". Both documents can be downloaded using the PDF format. The web site also lists other resources.

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