**Mold Spore Release during Simulated Flooding and High Humidity**

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**RATIONALE:** Two one-month simulations were performed in a chamber to measure mold spore release from deteriorating building materials caused by flooding and excessive dampness.

**METHODS:** Penicillium chrysogenum was implanted on the backside of a typical wooden frame gypsum wall inside of an environmental chamber. The wall cavity was sealed. Water was fed slowly into the wall cavity, emulating a leaky foundation. One inch of water flooded the bottom of the chamber producing 100% RH continuously. Spore release inside the wall cavity and on the front side of the wall was measured and compared. Aspergillus fumigatus was implanted in the wall cavity, emulating a leaky foundation. One inch of water flooded to measure mold spore release from deteriorating building materials caused mental conditions. The colonization process appears to be selective, modulated by environmental conditions, until wall integrity is disrupted. The mold accompanying findings of extensive mold on building surfaces, as is often assumed or insinuated, until wall integrity is disrupted. The mold colonization process appears to be selective, modulated by environmental conditions.

**RESULTS:** Many other molds produced heavy growth in equal or greater abundance. Sustained heavy growth during one month of flooding and later elimination of water did NOT release spores into air, until stripped by high velocity air. With sustained high humidity (no flooding) surface mold and spore releases within the wall cavity increased gradually, but not in front. Near the end, different spores were eventually released into the front airspace, but in far lesser amounts.

**CONCLUSIONS:** The wall is an effective barrier against molds released from the wall cavity. Spore release is inhibited by very high humidity conditions. High air contamination does not necessarily accompany findings of extensive mold on building surfaces, as is often assumed or insinuated, until wall integrity is disrupted. The mold colonization process appears to be selective, modulated by environmental conditions.

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**Diversity of Viable Airborne Fungi in Tulsa, Oklahoma**

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**RATIONALE:** The atmosphere contains a tremendous diversity of airborne fungal allergens; however, many unknown spores are commonly seen on our Burkard spore trap slides. To improve our understanding of the atmosphere, we conducted a Burkard spore trap sampling to determine the diversity of airborne fungi.

**METHODS:** A single stage viable impaction sampler was used to collect weekly air samples on the University of Tulsa campus (Tulsa, Oklahoma) from February 2015 to August 2016. Air samples were incubated for three-days and mycelial colonies were identified by microscopy, while yeast-like colonies were identified using molecular methods. DNA was extracted from each yeast isolate and was used in a polymerase chain reaction to amplify ITS1 rDNA or EL0 genes. The resulting amplicons were sequenced and identified by using the NCBI database.

**RESULTS:** Seventeen genera of mycelial isolates were identified along with non-sporulating fungi; the mean was 1,532 (SE=5,195) CFU/m3 with the most common genera being Cladosporium, Alternaria, and Penicillium with a frequency of 100%, 70%, and 51% respectively. Mycelial isolates included 6 genera not normally identified on Burkard slides. Twenty-seven taxa of yeast were identified from 146 isolates with the most abundant taxa being Komagataella spp., Aureobasidium pullulans, and Cryptococcus mangus with a contribution of 35, 28, and 16 isolates respectively. No yeasts were identified from Burkard slides.

**CONCLUSIONS:** Culture-based sampling may be an effective supplement to spore trap sampling to determine the diversity of airborne fungi, but it has limitations associated with sampling duration and medium choice biases.

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**Comparison of Airborne Mold in the Mojave Desert and Las Vegas**

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**RATIONALE:** This study compared airborne mold concentrations in Las Vegas with the surrounding desert to determine seasonal variability between the urban and rural desert environments.

**METHODS:** Air samples were collected using a Burkard spore trap from January 1st to December 31st 2015, at a National Allergy Bureau (NAB) site in Las Vegas and a site in the Mojave Desert, located approximately 32 miles south of Las Vegas. Microscope slides were prepared and analyzed by light microscopy.

**RESULTS:** Las Vegas had an annual mean of 374±280 spores/m3 compared to 350±265 spores/m3 at the Mojave site (p<0.01). The peak concentrations occurred in June (1917 spores/m3) in Las Vegas and in March (1789 spores/m3) for the Mojave site. There were differences observed between Cladosporium and smut concentrations. At the Mojave site, the peak was in July with 1151 spores/m3, while the peak was in June for Las Vegas (696 spores/m3). The smut concentrations for both sites had the highest concentrations in June, with lower concentration is Las Vegas (599 grains/m3) compared to the Mojave desert (1439 grains/m3).

**CONCLUSIONS:** Mold concentrations in Las Vegas and the Mojave Desert show similar overall patterns. For both locations, Cladosporium and smuts had higher counts during the warmer months (March-September), which is consistent with expected trends for airborne molds. Although the Mojave location had a slightly lower mean concentration than Las Vegas, both Cladosporium and smut levels were higher in the Mojave site. Higher variation in the types of molds was observed at the Las Vegas site.

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**Study on the Clinical and Immunological Characteristics of Fungal Sensitive Asthma and Allergic Bronchopulmonary Aspergillosis**

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**RATIONALE:** The aim of this study was to investigate the clinical and immunologic characteristics of fungal-sensitive asthma (FA), non-fungal-sensitive asthma (NFA), and ABPA. We make an evaluation of each patient and seek to further treatment.

**METHODS:** We recruited 56 subjects with asthma and 36 patients with ABPA. All asthmatic cases underwent detection of total IgE, and eight types of fungal-specific immunoglobulin E (sIgE) and sIgE-M-X. Asthmatic patients with more than one type of fungal sIgE≥0.35Ku/L were placed in the FA group (n=31), and those who did not fulfill this criterion were placed in the NFA group (n=25). Then, sIgG-Af was detected in the FA group, whereas the ABPA group underwent detection of total IgE and sIgE-Af, sIgG-Af, and sIgE- M-X.

**RESULTS:** Prevalence of bronchiectasis (88.9%), as well as eosinophil number in sputum (13.0-1.5, 23.5%), eosinophil blood number in blood [0.85(0.30, 1.41)*10^9/L], erythrocyte sedimentation rate [22(15,40)] and dose of oral corticosteroids [15(10,23.5)] in the ABPA group was higher than that in the NFA group. The FVC%pred and FEV1%pred in ABPA patients were significantly lower than those in NFA patients. The level of sIgE-Af was associated with the damage of lung function.

**CONCLUSIONS:** There were different clinical and immunological features among NFA, FA and ABPA. The ABPA had worse function as well as higher percentage of bronchiectasis, and higher dose of oral corticosteroid. Besides, the sensitivity to aspergillus was more severe in ABPA. The level of sIgE-Af was associated with the damage of lung function.