

HMC Job#: 105642



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3005 E. Boundary Terrace - Suite F - Midlothian, VA 23112

Mold Analysis Report prepared for

Sample Company

123 Main St.

Richmond, VA 23220

Ph. 804-562-3435

Fax. 804-562-3435

Job Number: 0524-1

Job Name: Jones House

Date Sampled: 9/3/2011

Date Analyzed: 9/6/2011

AIHA EMPAT Laboratory ID# 188863



LAB #188863

AIHA Accredited
Environmental Microbiology



Certified Clinical Microbiologist



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Spore Trap Analysis
 SOP #HMC101
 HMC# **105642**

| | | |
|---|---|---|
| Customer Sample Company 123 Main St. Richmond, VA 23220 Ph. 804-562-34 Fax. 804-562-3435 | Job Number: 0524-1 Job Name: Jones House | Collected by: Steve Hayes Email: steve@hayesmicrobial.com Date Collected: 9/3/2011 Date Received: 9/6/2011 Date Reported: 9/6/2011 |
|---|---|---|

| HMC ID Number | HMC# - 1 | | | HMC# - 2 | | | HMC# - 3 | | | - | | |
|-------------------------|--------------------------|------------------------|------------|--------------------------|------------------------|------------|--------------------------|------------------------|------------|-----------------------|------------------------|------------|
| Sample ID # | ST-1 | | | ST-2 | | | ST-3 | | | | | |
| Sample Name | Exterior | | | First Floor | | | Second Floor | | | | | |
| Sample Volume | 75 Liters | | | 75 Liters | | | 75 Liters | | | Liters | | |
| Limit of Detection | 13 spores/M ³ | | | 13 spores/M ³ | | | 13 spores/M ³ | | | spores/M ³ | | |
| Background | 1+ | | | 1+ | | | 2 | | | | | |
| Fragments | 27 /M ³ | | | 13 /M ³ | | | 27 /M ³ | | | /M ³ | | |
| Organism | Raw Count | Count / M ³ | % of Total | Raw Count | Count / M ³ | % of Total | Raw Count | Count / M ³ | % of Total | Raw Count | Count / M ³ | % of Total |
| Alternaria | 4 | 53 | 0.56 | | | | | | | | | |
| Ascospores | 420 | 5600 | 58.5 | 124 | 1653 | 19.3 | 172 | 2293 | 52.3 | | | |
| Aspergillus/Penicillium | 63 | 840 | 8.8 | 420 | 5600 | 65.3 | 72 | 960 | 21.9 | | | |
| Basidiospores | 128 | 1707 | 17.8 | 52 | 693 | 8.1 | 49 | 653 | 14.9 | | | |
| Bipolaris/Drechslera | | | | | | | | | | | | |
| Chaetomium | | | | 3 | 40 | 0.5 | | | | | | |
| Cladosporium | 96 | 1280 | 13.4 | 23 | 307 | 3.6 | 34 | 453 | 10.3 | | | |
| Curvularia | | | | | | | | | | | | |
| Epicoccum | | | | | | | | | | | | |
| Fusarium | | | | | | | | | | | | |
| Memnoniella | | | | | | | | | | | | |
| Myxomycetes | 7 | 93 | 1.0 | | | | 2 | 27 | 0.6 | | | |
| Pithomyces | | | | | | | | | | | | |
| Stachybotrys | | | | | 280 | 3.3 | | | | | | |
| Stemphylium | | | | | | | | | | | | |
| Tetraploa | | | | | | | | | | | | |
| Ulocladium | | | | | | | | | | | | |
| Unidentifiable spore | | | | | | | | | | | | |
| Total | 718 | 9573 | | 622 | 8573 | | 329 | 4387 | | | | |

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|-------------------------|------------------|----------------------------------|---------------------------------------|-------------------|
| Water Damage Indicators | Common Allergens | Slightly Higher than Outside Air | Significantly Higher than Outside Air | Ratio Abnormality |
|-------------------------|------------------|----------------------------------|---------------------------------------|-------------------|

Signature: Stephen A. Hayes Date: 9/6/11 Reviewed by: Julie Dillie



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Direct ID Analysis
HMC Report #
105642

| | | |
|--|---|---|
| Customer Sample Company 123 Main St. Richmond, VA 23220 Ph. 804-562-3435 Fax. 804-562-3435 | Job Number: 0524-1 Job Name: Jones House | Collected by: Steve Hayes Email: steve@hayesmicrobial.com Date Collected: 9/3/2011 Date Received: 9/6/2011 Date Reported: 9/6/2011 |
|--|---|---|

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|----------------|----------------|-------------------|------------------|
| HMC ID Number: | 105642 - 4 | Sample Type: | Bio-Tape |
| Sample ID #: | TL-1 | Sample Name: | Dining Room Wall |
| Organism | Spore Estimate | Mycelial Estimate | Notes |
| Aspergillus | Moderate | Few | |
| | | | |
| | | | |

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|----------------|----------------|-------------------|--------------------------|
| HMC ID Number: | 105642 - 5 | Sample Type: | Bio-Tape |
| Sample ID #: | TL-2 | Sample Name: | Behind Kitchen Baseboard |
| Organism | Spore Estimate | Mycelial Estimate | Notes |
| Chaetomium | Heavy | Many | |
| Stachybotrys | Heavy | Many | |
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|----------------|----------------|-------------------|-----------------|
| HMC ID Number: | 105642 - 6 | Sample Type: | Bio-Tape |
| Sample ID #: | TL-3 | Sample Name: | By Water Heater |
| Organism | Spore Estimate | Mycelial Estimate | Notes |
| Chaetomium | Moderate | Many | |
| Penicillium | Heavy | Many | |
| Stachybotrys | Heavy | Many | |
| | | | |
| | | | |

Signature: Stephen N. Hayes

Date: 9/6/2011

Reviewed by: Julie Dillie

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| Limit of Detection | The Limit of Detection is the lowest number of spores that can be detected based on the total volume of the sample collected and the percentage of the slide that is counted. At Hayes Microbial, 100% of the slide is read so the LOD is based solely on the total volume. Raw spore counts that exceed 500 spores will be estimated. |
| Blanks | Results have not been corrected for field or laboratory blanks. |
| Background | <p>The Background is the amount of debris that is present in the sample. This debris consists of skin cells, dirt, dust, pollen, drywall dust and other organic and nonorganic matter. As the background density increases, the likelihood of spores, especially small spores such as those of Aspergillus / Penicillium may be obscured. The background is rated on a scale of 1 to 4 and each level is determined as follows:</p> <p>ND : No background detected. (Pump or cassette malfunction) Recollect sample. 1 : Extremely light background. No spores will be uncountable. 1+ : Very light background. Less than 1% of small spores may be uncountable. 2 : Light background. Less than 3% of small spores may be uncountable. 2+ : Moderate background. Less than 5% of small spores may be uncountable. 3 : Moderate/Heavy background. 5% to 25% of small spores and less than 5% of large spores may be uncountable. 3+ : Heavy background. More than 25% of small spores and more than 5% of large spores may be uncountable. 4 : Sample unreadable. Recollect sample.</p> |
| Fragments | Fragments are small pieces of fungal mycelium or spores. They are not identifiable as to type and when present in very large numbers, may indicate the presence of mold amplification. |
| Indoor / Outdoor Comparisons | There are no national standards for the numbers of fungal spores that may be present in the indoor environment. As a general rule and guideline that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should not exceed those that are present outdoors at any given time. There will always be some mold spores present in "normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore counts should not be used as the sole determining factor of mold contamination. There are many factors that can cause anomalies in the comparison of indoor and outdoor samples due to the dynamic nature of both of those environments. |
| Water Damage Indicators | These molds are commonly seen in conditions of prolonged water intrusion and usually indicate a problem. |
| Common Allergens | Although all molds are potential allergens, these are the most common allergens that may be found indoors. |
| Slightly Higher than Outside Air | The spore count is slightly higher than the outside count and may or may not indicate a source of contamination. |
| Significantly Higher than Outside Air | The spore count is significantly higher than the outdoor count and probably indicates a source of contamination. |
| Ratio Abnormality | The types of spores found indoors should be similar to the ones that were identified in the outdoor sample. Significant increases (more than 25 or 30%) in the ratio of a particular spore type may indicate the presence of abnormal levels of mold, even if the total number of spores of that type is lower in the indoor environment than it was outdoors. |
| Note | Fungi that are present in indoor samples at levels lower than 200 per cubic meter are considered insignificant. Insignificant spore counts are not color coded on the report. |

Additional Information for Direct Identification Analysis

| Spore Estimate | |
|-----------------------|------------------------|
| ND | None Detected |
| Rare | <10 Spores |
| Light | 10-100 Spores |
| Moderate | 100-1000 Spores |
| Heavy | >1000 Spores |

| Mycelial Estimate | | |
|--------------------------|--------------------------------------|---|
| ND | None Detected | No active growth at site. |
| Trace | Very small amount of mycelium | Probably no active growth at site. |
| Few | Some mycelium | Possible active growth at site. |
| Many | Large amounts of mycelium | Probable active growth at site. |

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|----------------------------------|------------------------|---|
| Alternaria | Habitat: | Commonly found outdoors in soil and decaying plants. Indoors it is commonly found on window sills and other horizontal surfaces. |
| | Health Effects: | A common allergen and has been associated with hypersensitivity pneumonitis. <i>Alternaria</i> is capable of producing toxic metabolites which may be associated with disease in humans or animals. Occasionally an agent of onychomycosis, ulcerated cutaneous infection and chronic sinusitis, principally in the immunocompromised patient. |
| Ascospores | Habitat: | A large group consisting of more than 3000 species of fungi. Common plant pathogens and outdoor numbers become very high following rain. Most of the genera are indistinguishable by spore trap analysis and are combined on the report. |
| | Health Effects: | Health affects are poorly studied, but many are likely to be allergenic. |
| Aspergillus | Habitat: | One of the most common fungi isolated from the environment. Found in soil, decomposing plant material, and indoors on a wide variety of cellulose containing materials. |
| | Health Effects: | Known to be allergenic and many species also produce mycotoxins and carcinogens. They are a common cause of extrinsic asthma and hypersensitivity pneumonitis. Many species are opportunistic pathogens and are known to cause sinus lesions, ear infections, respiratory infections, and invasive systemic disease. |
| Aspergillus / Penicillium | Habitat: | The most common fungi isolated from the environment. Very common in soil and on decaying plant material. Are able to grow well indoors on a wide variety of substrates. |
| | Health Effects: | This group contains common allergens and many can cause hypersensitivity pneumonitis. They may cause extrinsic asthma, and many are opportunistic pathogens. Many species produce mycotoxins which may be associated with disease in humans and other animals. Toxin production is dependent on the species and on the food source for the fungus. Some of these toxins have been found to be carcinogenic. |
| Basidiospores | Habitat: | A common group of Fungi that includes the mushrooms and bracket fungi. They are saprophytes and plant pathogens. In wet conditions they can cause structural damage to buildings. |
| | Health Effects: | Common allergens and are also associated with hypersensitivity pneumonitis. |
| Chaetomium | Habitat: | Ascomycete fungus, commonly isolated from soil and decaying plant materials. It is cellulolytic and grows well indoors on damp sheetrock and other paper substrates. It is often found growing with <i>Stachybotrys</i> . |
| | Health Effects: | It is reported to be allergenic and may produce toxins. |
| Cladosporium | Habitat: | One of the most common genera worldwide. Found in soil and plant debris and on the leaf surfaces of living plants. The outdoor numbers are lower in the winter and often relatively high in the summer, especially in high humidity. The outdoor numbers often spike in the late afternoon and evening. Indoors, it can be found growing on textiles, wood, sheetrock, moist window sills and in HVAC supply ducts. |
| | Health Effects: | A common allergen, producing more than 10 allergenic antigens and a common cause of hypersensitivity pneumonitis. |
| Myxomycetes | Habitat: | Found on decaying plant material and as a plant pathogen. |
| | Health Effects: | Some allergenic properties reported, but generally pose no health concerns to humans. |

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| Penicillium | Habitat: Often the most common type of fungi isolated from the environment. They are common indoors as well, and are found in house dust, water-damaged papers, fabrics, behind or on paint, and in fiberglass duct insulation. They are also found in a variety of food products. |
| | Health Effects: It is a common allergen and an agent of hypersensitivity pneumonitis. Toxins are produced by various species. The production of volatile organic compounds has also been demonstrated. Most species are non-pathogenic, but <i>Penicillium marneffei</i> is a human pathogen in immunocompromized people. |
| Stachybotrys | Habitat: Commonly found in soil and on decaying plant material. It is cellulolytic, and can be found indoors on wet materials containing cellulose, such as wallboard, ceiling tile, and other paper-based materials. It is found outdoors on decaying plant material although it is rarely detected on outdoor air samples. |
| | Health Effects: Allergenic properties are poorly studied and no cases of infection have been reported in humans. They do however produce potent tricothecene mycotoxins. The toxins produced by this fungus can suppress the immune system affecting the lymphoid tissue and the bone marrow. The mycotoxin is also reported to be a liver and kidney carcinogen. |