SEEML Reference Number:
H-24[redacted]

Southeast Environmental Microbiology Laboratories
410 W Grand Pkwy S, Suite 250
Katy, TX. 77494
Phone: 832-437-2667

The information and data for **Wildcat Inspections** has been checked for thoroughness and accuracy. The following reports are contained within this document:

- [x] Surface/Bulk Report
- [x] Spore Trap Report
- [ ] Andersen Fungal Report
- [ ] Quantitative Fungal Report

Lab Manager Review : *Magzoub Ismail* Date : 08-29-2024

Thank you for using SEEML laboratories. We strive to provide superior quality and service. SEEML laboratories are accredited through AIHA LAP, LLC (EMLAP #232339) for the analysis of Spore Traps and Surface/Bulk Samples and licensed by the Texas Department of Licensing and Regulation (LAB1016).

The data within this report is reliable to three significant figures. The third significant figure is technically unjustified. In this instance, the third figure is reported as an estimate to facilitate the interpretation by the customer.

Guidelines for Interpretation:
No accepted quantitative regulatory standards currently exist by which to assess the health risks related to mold and bacterial exposure. Molds and bacteria have been associated with a variety of health effects and sensitivity varies from person to person.
Several organizations, including: the American Conference of Government Industrial Hygienists (ACGIH); the American Industrial Hygiene Association (AIHA); the Indoor Air Quality Association (IAQA); the United States Environmental Protection Agency (USEPA); the Centers for Disease Control (CDC), as well as the California Department of Health Services (CADHS), have all published guidelines for assessment and interpretation of mold resulting from water intrusion in buildings.

Interpretation of the data and information within this document is left to the company, consultant, and/or persons who conducted the fieldwork.

Spore Trap Report

Wildcat Inspections	Date Sampled: 08/29/2024
1141 Forest Valley Dr	Date Received: 08/29/2024
Cleveland,Texas,77328	Date Analyzed: 08/29/2024
(281) 484-9453	Date Reported: 08/29/2024
	Date Revised:
	Project Name: [redacted]
	Project Address:
	Project City, State, ZIP: Houston, TX 77057
	SEEML Reference # : H-240829063

TEST METHOD: DIRECT MICROSCOPY EXAMINATION SEEML SOP 7

Client Sample ID	3832 2043			3831 9920			3831 9952		
Location	Outside			Front Right Bedroom First Floor			Middle Bedroom First Floor		
Lab Sample ID	H-240829063-274			H-240829063-275			H-240829063-276		
Detection Limit (spores/m^3)	13			13			13		
Hyphal Fragments				8	107		2	27	
Pollen	1	13		1	13				
Spore Trap Used	AOC			AOC			AOC		
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%
Alternaria (=Ulocladium)									
Ascospores	264	3520	23				4	53	2
Basidiospores	416	5547	37						
Bipolaris/Drechslera	1	13	<1						
Cercospora	2	27	<1						
Chaetomium	1	13	<1						
Cladosporium	64	853	6	16	213	8	8	107	4
Colorless/Other Brown*									
Curvularia	123	1640	11	29	387	14	4	53	2
Epicoccum									
Fusarium	1	13	<1						
Memnoniella									
Nigrospora	11	147	1	2	27	1			
Oidium									
Penicillium/Aspergillus	248	3307	22	160	2133	76	184	2453	92
Pithomyces									
Polythrincium									
Pyricularia	1	13	<1						
Rusts									
Smuts/Periconia/Myxomy	2	27	<1						
Spegazzinia				1	13	<1			
Stachybotrys				3	40	1	1	13	<1
Tetraploa									
Torula									
Zygomycetes									
Background debris (1-5)**	3			3			3		
Sample Volume(liters)	75			75			75		
TOTAL SPORES/M^3	1134	**15100**		211	**2810**		201	**2680**	

Comments:

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.

The analytical sensitivity is the spores/m^3 divided by the raw count, expressed in spores/m^3. The limit of detection is the analytical sensitivity (in spores/m^3) multiplied by the sample volume (in liters) divided by 1000 liters.

*Colorless,other Brown are spores without a distinctive morphology on spore traps and non-viable surface samples.

**Background debris is the amount of particulate matter present on the slide and is graded from 1-5 with 1 = very light, 2= Light, 3 = Medium, 4 = Heavy, 5 = Very Heavy. The higher the rating the more likelihood spores may be underestimated. A rating of 5 should be interpreted as minimal counts and may actually be higher than reported.

***Ulocladium has been recognized by the International Mycological Association to be equal to Alternaria and so they are reported as one.

Disclaimer: The sample results are determined by the sample volume, which is provided by the customer.

This report relates only to the samples tested as they were received.

Respectfully submitted, SEEML

410 W Grand Pkwy S, Suite 250
Katy, TX. 77494
Phone: 832-437-2667

Magzoub Ismail

Magzoub Ismail, Approved Laboratory Signatory

Spore Trap Report

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	Date Revised:
	Project Name: [redacted]
	Project Address: [redacted]
	Project City, State, ZIP: Houston, TX 77057
	SEEML Reference # : H-240829063

TEST METHOD: DIRECT MICROSCOPY EXAMINATION SEEML SOP 7

Client Sample ID	3831 9945			3831 9944			3831 9946		
Location	Front Jack/Jill Bedroom			Back Jack/Jill Bedroom			Living Room		
Lab Sample ID	H-240829063-277			H-240829063-278			H-240829063-279		
Detection Limit (spores/m^3)	13			13			13		
Hyphal Fragments	1	13		3	40				
Pollen									
Spore Trap Used	AOC			AOC			AOC		
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%
Alternaria (=Ulocladium)									
Ascospores									
Basidiospores				4	53	2			
Bipolaris/Drechslera									
Cercospora				1	13	1			
Chaetomium							2	27	1
Cladosporium				32	427	16			
Colorless/Other Brown*									
Curvularia	2	27	1	8	107	4	4	53	2
Epicoccum									
Fusarium									
Memnoniella									
Nigrospora	1	13	1	1	13	1			
Oidium									
Penicillium/Aspergillus	192	2560	98	152	2027	76	208	2773	96
Pithomyces									
Polythrincium									
Pyricularia									
Rusts									
Smuts/Periconia/Myxomy							2	27	1
Spegazzinia	1	13	1						
Stachybotrys				1	13	1			
Tetraploa									
Torula									
Zygomycetes									
Background debris (1-5)**	3			3			3		
Sample Volume(liters)	75			75			75		
TOTAL SPORES/M^3	196	**2610**		199	**2650**		216	**2880**	

Comments:

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The analytical sensitivity is the spores/m^3 divided by the raw count, expressed in spores/m^3. The limit of detection is the analytical sensitivity (in spores/m^3) multiplied by the sample volume (in liters) divided by 1000 liters.

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**Background debris is the amount of particulate matter present on the slide and is graded from 1-5 with 1 = very light, 2= Light, 3 = Medium, 4 = Heavy, 5 = Very Heavy. The higher the rating the more likelihood spores may be underestimated. A rating of 5 should be interpreted as minimal counts and may actually be higher than reported.

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Respectfully submitted, SEEML

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Magzoub Ismail

Magzoub Ismail, Approved Laboratory Signatory

Spore Trap Report

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1141 Forest Valley Dr	Date Received: 08/29/2024
Cleveland,Texas,77328	Date Analyzed: 08/29/2024
(281) 484-9453	Date Reported: 08/29/2024
	Date Revised:
	Project Name: [redacted]
	Project Address: [redacted]
	Project City, State, ZIP: Houston, TX 77057
	SEEML Reference # : H-240829063

TEST METHOD: DIRECT MICROSCOPY EXAMINATION SEEML SOP 7

Client Sample ID	3832 2036			3832 2041			3832 2034		
Location	Entertain Room			Dining			Sitting Room First Floor		
Lab Sample ID	H-240829063-280			H-240829063-281			H-240829063-282		
Detection Limit (spores/m^3)	13			13			13		
Hyphal Fragments				2	27		1	13	
Pollen							1	13	
Spore Trap Used	AOC			AOC			AOC		
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%
Alternaria (=Ulocladium)									
Ascospores							4	53	2
Basidiospores									
Bipolaris/Drechslera									
Cercospora									
Chaetomium									
Cladosporium	8	107	3	8	107	3			
Colorless/Other Brown*									
Curvularia				6	80	2	1	13	1
Epicoccum									
Fusarium									
Memnoniella									
Nigrospora				3	40	1			
Oidium									
Penicillium/Aspergillus	272	3627	97	232	3093	93	168	2240	97
Pithomyces	1	13	<1						
Polythrincium									
Pyricularia									
Rusts									
Smuts/Periconia/Myxomy				1	13	<1			
Spegazzinia									
Stachybotrys									
Tetraploa									
Torula									
Zygomycetes									
Background debris (1-5)**	3			3			3		
Sample Volume(liters)	75			75			75		
TOTAL SPORES/M^3	281	**3750**		250	**3330**		173	**2310**	

Comments:

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.

The analytical sensitivity is the spores/m^3 divided by the raw count, expressed in spores/m^3. The limit of detection is the analytical sensitivity (in spores/m^3) multiplied by the sample volume (in liters) divided by 1000 liters.

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Respectfully submitted, SEEML

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Phone: 832-437-2667

Magzoub Ismail

Magzoub Ismail, Approved Laboratory Signatory

Spore Trap Report

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1141 Forest Valley Dr	Date Received: 08/29/2024
Cleveland,Texas,77328	Date Analyzed: 08/29/2024
(281) 484-9453	Date Reported: 08/29/2024
	Date Revised:
	Project Name: [redacted]
	Project Address: [redacted]
	Project City, State, ZIP: Houston, TX 77057
	SEEML Reference # : H-240829063

TEST METHOD: DIRECT MICROSCOPY EXAMINATION SEEML SOP 7

Client Sample ID	3831 9939			3831 9943			3831 9926		
Location	Study Second Floor			Sitting Room Second Floor			Primary Bedroom		
Lab Sample ID	H-240829063-283			H-240829063-284			H-240829063-285		
Detection Limit (spores/m^3)	13			13			13		
Hyphal Fragments	1	13					1	13	
Pollen				1	13				
Spore Trap Used	AOC			AOC			AOC		
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%
Alternaria (=Ulocladium)									
Ascospores	4	53	2						
Basidiospores									
Bipolaris/Drechslera									
Cercospora									
Chaetomium				7	93	10			
Cladosporium	24	320	12	4	53	6	20	267	16
Colorless/Other Brown*									
Curvularia	2	27	1				1	13	1
Epicoccum									
Fusarium									
Memnoniella									
Nigrospora	1	13	<1						
Oidium									
Penicillium/Aspergillus	176	2347	85	44	587	65	104	1387	83
Pithomyces									
Polythrincium									
Pyricularia									
Rusts									
Smuts/Periconia/Myxomy				5	67	7			
Spegazzinia									
Stachybotrys				8	107	12			
Tetraploa									
Torula									
Zygomycetes									
Background debris (1-5)**	3			3			3		
Sample Volume(liters)	75			75			75		
TOTAL SPORES/M^3	207	**2760**		68	**907**		125	**1670**	

Comments:

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Spore Trap Report

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(281) 484-9453	Date Reported: 08/29/2024
	Date Revised:
	Project Name: [redacted]
	Project Address: [redacted]
	Project City, State, ZIP: Houston, TX 77057
	SEEML Reference # : H-240829063

TEST METHOD: DIRECT MICROSCOPY EXAMINATION SEEML SOP 7

Client Sample ID	3831 9947			3831 9938			3831 9916		
Location	His Closet			Her Closet			Sound Room Second Floor		
Lab Sample ID	H-240829063-286			H-240829063-287			H-240829063-291		
Detection Limit (spores/m^3)	13			13			13		
Hyphal Fragments				3	40				
Pollen									
Spore Trap Used	AOC			AOC			AOC		
	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%	raw ct.	spores/m^3	%
Alternaria (=Ulocladium)				1	13	1			
Ascospores									
Basidiospores				4	53	3			
Bipolaris/Drechslera									
Cercospora									
Chaetomium				1	13	1			
Cladosporium	16	213	16	32	427	27	20	267	3
Colorless/Other Brown*									
Curvularia	4	53	4	3	40	3			
Epicoccum									
Fusarium									
Memnoniella									
Nigrospora	1	13	1	1	13	1			
Oidium									
Penicillium/Aspergillus	72	960	73	72	960	62	600	8000	97
Pithomyces									
Polythrincium									
Pyricularia									
Rusts									
Smuts/Periconia/Myxomy	2	27	2	2	27	2			
Spegazzinia									
Stachybotrys	3	40	3	1	13	1			
Tetraploa									
Torula									
Zygomycetes									
Background debris (1-5)**	3			3			3		
Sample Volume(liters)	75			75			75		
TOTAL SPORES/M^3	98	**1310**		117	**1560**		620	**8270**	

Comments:

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Magzoub Ismail, Approved Laboratory Signatory

Surface and Bulk Sample Report

Wildcat Inspections	Date Sampled: 08/29/2024
1141 Forest Valley Dr	Date Received: 08/29/2024
Cleveland,Texas,77328	Date Analyzed: 08/29/2024
(281) 484-9453	Date Reported: 08/29/2024
	Date Revised:
	Project Name: [redacted]
	Project Address: [redacted]
	Project City, State ZIP: Houston, TX 77057
	SEEML Reference #: H-240829063

TEST METHOD: Direct Microscopic Examination (SEEML SOP 18)

Client Sample ID	1	2	3	
Location	Down Right Bath	Middle First Floor Bedroom Vent	Primary Dryer	
SEEML Sample ID	H-240829063-288	H-240829063-289	H-240829063-290	
Sample Type	Tape	Tape	Tape	
	Quantification*	Quantification*	Quantification*	
Hyphal Fragments	**M**	**L**	**M**	
Pollen				
General Impressions **	**FG**	**FG**	**FG**	
Miscellaneous Spores				
Fungal Growth:				
Acremonium				
Alternaria (=Ulocladium)				
Ascospores				
Basidiospores				
Bipolaris/Drechslera				
Cercospora				
Chaetomium	**L**			
Cladosporium	**H**	**M**	**H**	
Curvularia				
Epicoccum				
Fusarium				
Geotrichum sp.				
Memnoniella				
Myxomycetes				
Nigrospora				
Penicillium/Aspergillus				
Pithomyces				
Rusts				
Stachybotrys	**L**			
Torula				
Trichoderma				
Revisions:				

**** General Impressions: NFG = No Fungal Growth, FG = Fungal Growth, MFG = Minimal Fungal Growth Or Growth in vicinity**

Ulocladium has been recognized by the International Mycological Association to be equal to Alternaria and so they are reported as one.

Quantification of fungal growth is done by semi-quantitative grading using the following ranges:

Scattered Spores = 1-20 fungal spores

VL = 21-100 fungal spores **L = 101-1,000 fungal spores** **M = 1,001-10,000 fungal spores** **H = >10,000 fungal spores**

ND = No Fungal Spores Detected

Disclaimer: This report relates only to the samples tested as received.

Respectfully submitted, SEEML

Magzoub Ismail, **Approved Laboratory Signatory**

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AIHA LAP, LLC EMLAP #232339

Texas Lic: LAB1016

Form 46.0 Rev 5 02/03/22

Fungal Descriptions

Alternaria sp.

Aw - 0.89. Conidia dimensions: 18-83 x 7-18 microns. A very common allergen with an IgE mediated response. It is often found in carpets, textiles and on horizontal surfaces in building interiors. Often found on window frames. Outdoors it may be isolated from samples of soil, seeds and plants. It is commonly found in outdoor samples. The large spore size, 20 - 200 microns in length and 7 - 18 microns in sizes, suggests that the spores from these fungi will be deposited in the nose, mouth and upper respiratory tract. It may be related to bakers' asthma. It has been associated with hypersensitivity pneumonitis.

The species *Alternaria alternata* can produce tenuazonic acid and other toxic metabolites that may be associated with disease in humans or animals. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms; chronic cases may develop pulmonary emphysema.

Ascospore

A spore borne in a special cell called an ascus. Spores of this type are reported to be allergenic. All ascomycetes, members of a group of fungi called Ascomycotina, have this type of spore. The minute black dots on rotting wood and leaves or the little cups on lichens are examples of ascomycetes; another is the "truffle" mushroom.

Aspergillus/Penicillium

These are two of the most commonly found allergenic fungi in problem buildings. *Aspergillus* comes in many varieties (species). Many of the varieties produce toxic substances. It may be associated with symptoms such as sinusitis, allergic bronchopulmonary aspergillosis, and other allergic symptoms. *Penicillium* is a variety of mold that is very common indoors and is found in increased numbers in problem buildings. It also has many varieties, some of which produce toxic substances. The symptoms are allergic reactions, mucous membrane irritation, headaches, vomiting, and diarrhea. Due to the morphological similarity of *Aspergillus* and *Penicillium*, they are not differentiated by microscopic analysis and are reported together.

Aspergillus sp.

Aw 0.75 - 0.82. Reported to be allergenic. Members of this genus are reported to cause ear infections. Many species produce mycotoxins that may be associated with disease in humans and other animals. Toxin production is dependent on the species or a strain within a species and on the food source for the fungus. Some of these toxins have been found to be carcinogenic in animal species. Several toxins are considered potential human carcinogens. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms; chronic cases may develop pulmonary emphysema; may also be associated with sinusitis, allergic bronchopulmonary aspergillosis, and other allergic symptoms.

Aureobasidium

Aureobasidium pullulans is a ubiquitous and generalistic black, yeast-like fungus that can be found in different environments (e.g., soil, water, air, and limestone). It is well known as a naturally occurring epiphyte or endophyte of a wide range of plant species (e.g. apple, grape, cucumber, green beans, cabbage) without causing any symptoms of disease. *A. pullulans* has a high importance in biotechnology for the production of different enzymes, siderophores and pullulan. Furthermore, *A. pullulans* is used in biological control of plant diseases, especially storage diseases.
Chronic human exposure to *A. pullulans* via humidifiers or air conditioners can lead to hypersensitivity pneumonitis (extrinsic allergic alveolitis) or "humidifier lung". This condition is characterized acutely by dyspnea, cough, fever, chest infiltrates, and acute inflammatory reaction. The condition can also be chronic, and lymphocyte mediated. The chronic condition is characterized radiographically by reticulonodular infiltrates in the lung, with apical sparing. The strains causing infections in humans were reclassified to *A. melanogenum.*

Basidiospore

Spore from basidiomycetes. Many varieties are reported to be allergenic.

Bipolaris sp.

Aw 0.93. Conidia dimensions: 7-14 x 5-9 microns. It is parasitic on plants and soft fruits. Found in soil and on house plants and vegetables, it is also known as "gray mold". It causes leaf rot on grapes, strawberries, lettuce, etc. It is a well-known allergen, producing asthma type symptoms in greenhouse workers and "wine grower's lung".

Botrytis sp.

A fungus with large spores that could be expected to be deposited in the upper respiratory tract. This fungus can produce the mycotoxin - sterigmatocystin, which has been shown to produce liver and kidney damage when ingested by laboratory animals.

Cercaspora

Common outdoors in agricultural areas, especially during harvest. Parasite of higher plants, causing leaf spot. Commonly found as parasites on higher plants.

Chaetomium sp.

Large ascomycetous fungus producing perithecia. It is found on a variety of substrates containing cellulose, including paper and plant compost. It has been found on paper in sheetrock. It can produce an *Acremonium*- like state on fungal media. Varieties are considered allergenic and have been associated with peritonitis, cutaneous lesions, and system mycosis.

Cladosporium sp.

Aw 0.88; Aw 0.84. Most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter. The numbers are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is a common allergen. Indoor *Cladosporium* sp. may be different than the species identified outdoors. It is commonly found on the surface of fiberglass duct liners in the interior of supply ducts. A wide variety of plants are food sources for this fungus. It is found on dead plants, woody plants, food, straw, soil, paint, and textiles. Produces greater than 10 antigens. Antigens in commercial extracts are of variable quality and may degrade within weeks of preparation. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include skin lesions, eye ulceration, mycosis (including onychomycosis, an infection of the nails of the feet or hands) edema and bronchospasms; chronic cases may develop pulmonary emphysema.

Curvularia sp.

Reported to be allergenic and has been associated with allergic fungal sinusitis. It may cause corneal infections, mycetoma, and infections in immune compromised hosts.

Dreschlera sp.

Conidia dimensions: 40-120 x 17-28 microns. Found on grasses, grains and decaying food. It can occasionally cause a corneal infection of the eye.

Epicoccum sp.

Conidia dimensions: 15-25 microns. A common allergen. It is found in plants, soil, grains, textiles and paper products.

Fusarium sp.

Aw 0.90. A common soil fungus. It is found on a wide range of plants. It is often found in humidifiers. Several species in this genus can produce potent trichothecene toxins. The trichothecene (scirpene) toxin targets the following systems: circulatory, alimentary, skin, and nervous. Produces vomitoxin on grains during unusually damp growing conditions. Symptoms may occur either through ingestion of contaminated grains or possibly inhalation of spores. The genera can produce hemorrhagic syndrome in humans (alimentary toxic aleukia). This is characterized by nausea, vomiting, diarrhea, dermatitis, and extensive internal bleeding. Reported to be allergenic. Frequently involved in eye, skin, and nail infections.

Myxomycetes

Members of a group of fungi that is included in the category of "slime molds". They're occasionally found indoors, but mainly reside in forested regions on decaying logs, stumps, and dead leaves. Myxomycetes display characteristics of fungi *and* protozoans. In favorable (wet) conditions they exhibit motile, amoeba-like cells, usually bounded only by a plasma membrane, that are variable in size and form. During dry spells, they form a resting body (sclerotium) with dry, airborne spores. These fungi are not known to produce toxins but can cause hay fever and asthma.

Memnoniella

Contaminant found most often with *Stachybotrys* on wet cellulose. Forms in chains, but it are very similar to *Stachybotrys* and sometimes is considered to be in the *Stachybotrys* family. Certain species do produce toxins very similar to the ones produced by *Stachybotrys chartarum* and many consider the IAQ importance of *Memnoniella* to be on par with *Stachybotrys* . Allergenic and infectious properties are not well studied.

Nigrospora sp.

Commonly found in warm climates, this mold may be responsible for allergic reactions such as hay fever and asthma. It is found on decaying plant material and in the soil. It is not often found indoors.

Oidium sp.

The asexual phase of *Erysiphe* sp. It is a plant pathogen causing powdery mildews. It is very common on the leaf's stems, and flowers of plants. The health effects and allergenicity have not been studied. It does not grow on non-living surfaces such as wood or drywall.

Penicillium sp.

Aw 0.78 - 0.88. A wide number of organisms have been placed in this genus. Identification to species is difficult. Often found in aerosol samples. Commonly found in soil, food, cellulose and grains. It is also found in paint and compost piles. It may cause hypersensitivity pneumonitis, allergic alveolitis in susceptible individuals. It is reported to be allergenic (skin). It is commonly found in carpet, wallpaper, and in interior fiberglass duct insulation. Some species can produce mycotoxins. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms; chronic cases may develop pulmonary emphysema. It may also cause headaches, vomiting, and diarrhea.

Periconia sp.

Periconia sp. are found in soil, blackened and dead herbaceous stems leaf spots, grasses, rushes, and sedges. Almost always associated with other fungi. Rarely found growing indoors. Reportedly associated with a rare case of mycotic keratitis.

Pithomyces sp.

A common mold found on dead leaves, plants, soil and especially grasses. Causes facial eczema in ruminants. It exhibits distinctive multi-celled brown conidia. It is not known to be a human allergen or pathogen. It is rarely found indoors, although it can grow on paper.

Rusts/Smuts

These fungi are associated with plant diseases. In the classification scheme of the fungi, the smuts have much in common with the rusts, and they are frequently discussed together. Both groups produce wind-borne, resistant teliospores that serve as the basis for their classification and their means of spread. Rusts usually attack vegetative regions (i.e., leaves and stems) of plants; smuts usually are associated with the reproductive structures (seeds). They can cause hay fever and asthma.

Spegazzinia

Spegazzinia species comprise a very small proportion of the fungal biota. This genus is somewhat related to other lobed or ornamented genera such as *Candelabrum* . No information is available regarding health effects or toxicity. Allergenicity has not been studied. Usually identified on spore trap samples where it is seen every few weeks. (Spores have very distinctive morphology.) May also be found in air by culturable (Andersen) samples if a long enough incubation period is provided so that sporulation occurs. Our laboratory has never found this organism growing on indoor environmental surfaces. Natural habitat includes soil and many kinds of trees and plants.

Sporotrichum

Sporotrichum species comprise a very small proportion of the fungal biota and are most closely related to other colorless hyphomycetes such as Chrysosporium. The only information available regarding health effects are a few rare cases of repeated isolations from respiratory secretions suggestive of bronchopulmonary colonization. No information is available regarding toxicity. Allergenicity has not been studied. May be identified on surfaces by tape lifts, tease mounts from bulk samples, and in air by culturable (Andersen) samples. Many times sporulating colorless fungi are very difficult to identify, with critical structures only very faintly visible under oil immersion magnification. Thus, these isolates may be placed in the category "Colorless, sporulating, ID unknown" on the Andersen report format. Spores do not have distinctive morphology and would be categorized as "other colorless" on spore trap samples. Natural habitat includes soil and decaying wood.

Stachybotrys sp.

Aw - 0.94, optimum Aw ->0.98. Several strains of this fungus (*S. atra, S. chartarum* and *S. alternans* are synonymous) may produce a trichothecene mycotoxin- Satratoxin H - which is poisonous by inhalation. The toxins are present on the fungal spores. This is a slow growing fungus on media. It does not compete well with other rapidly growing fungi. The dark colored fungus grows on building material with high cellulose content and low nitrogen content. Areas with a relative humidity above 55%, and are subject to temperature fluctuations, are ideal for toxin production. Individuals with chronic exposure to the toxin produced by this fungus reported cold and flu symptoms, sore throats, diarrhea, headaches, fatigue, dermatitis, intermittent local hair loss and generalized malaise. Other symptoms include coughs, rhinitis, nosebleed, a burning sensation in the nasal passages, throat, and lungs, and fever. The toxins produced by this fungus will suppress the immune system affecting the lymphoid tissue and the bone marrow. Animals injected with the toxin from this fungus exhibited the following symptoms: necrosis and hemorrhage within the brain, thymus, spleen, intestine, lung, heart, lymph node, liver, and kidney. Affects by absorption of the toxin in the human lung are known as pneumomycosis.

This organism is rarely found in outdoor samples. It is usually difficult to find in indoor air samples unless it is physically disturbed (or possibly -this is speculation- a drop in the relative humidity). The spores are in a gelatinous mass. Appropriate media for the growth of this organism will have high cellulose content and low nitrogen content. The spores will die readily after release. The dead spores are still allergenic and toxigenic. Percutaneous absorption has caused mild symptoms.

Stemphylium sp.

Reported to be allergenic. Isolated from dead plants and cellulose materials.

Torula sp.

Found outdoors in air, soil, on dead vegetation, wood, and grasses. Also found indoors on cellulose materials. Reported to be allergenic and may cause hay fever and asthma.

Tetraploa

Tetraploa species comprise a very small proportion of the fungal biota. This genus is somewhat related to *Triposporium* and Diplocladiella. The only reported human infections are two cases of keratitis (1970, 1980) and one case of subcutaneous infection of the knee (1990). No information is available regarding other health effects or toxicity. Allergenicity has not been studied. Usually identified on spore trap samples where it is seen every few weeks. (Spores have very distinctive morphology.) Our laboratory has never found this organism growing on indoor environmental surfaces. Natural habitat includes leaf bases and stems just above the soil on many kinds of plants and trees.

Ulocladium sp.

Aw 0.89. Isolated from dead plants and cellulose materials. Found on textiles.

Zygomycetes

Zygomycetes are one of the four major groups of fungi, the others being the Oomycetes, the Ascomycetes, and the Basidiomycetes. Zygomycetes are common, fast growing, and often overgrow and/or inhibit other fungi nearby. Rhizopus and Mucor are two of the most common Zygomycetes seen in the indoor environment. However, others are seen as well, including *Syncephalastrum* , *Circinella* , *Mortierella* , *Mycotypha* , *Cunninghamella* , and *Choanephora* . For further information, please see descriptions of these individual genera.

The following table lists mycotoxins that are produced by certain types of fungi:

Fungi	Mycotoxin
Acremonium crotocinigenum	Crotocin
Aspergillus favus	Alfatoxin B, cyclopiazonic acid
Aspergillus fumigatus	Fumagilin, gliotoxin
Aspergillus carneus	Critrinin
Aspergillus clavatus	Cytochalasin, patulin
Aspergillus Parasiticus	Alfatoxin B
Aspergillus nomius	Alfatoxin B
Aspergillus niger	Ochratoxin A, malformin, oxalicacid
Acremonium crotocinigenum	Crotocin
Aspergillus nidulans	Sterigmatocystin
Aspergillus ochraceus	Ochratoxin A, penicillic acid
Aspergillus versicolor	Sterigmatocystin, 5 ethoxysterigmatocystin
Aspergillus ustus	Ausdiol, austamide, austocystin,brevianamide
Aspergillus terreus	Citreoviridin
Alternaria	Alternariol, altertoxin, altenuene, altenusin, tenuazonic acid
Arthrinium	Nitropropionic acid
Bioploaris	Cytochalasin, sporidesmin, sterigmatocystin
Chaetomium	Chaetoglobosin A,B,C. Sterigmatocystin
Cladosporium	Cladosporic acid
Clavipes purpurea	Ergotism
Cylindrocorpon	Trichothecene
Diplodia	Diplodiatoxin
Fusarium	Trichothecene, zearalenone
Fusarium moniliforme	Fumonisins
Emericella nidulans	Sterigmatocystin
Gliocladium	Gliotoxin
Memnoniella	Griseofulvin , dechlorogriseofulvin, epi-decholorgriseofulvin, trichodermin, trichodermol
Myrothecium	Trichothecene
Paecilomyces	Patulin, viriditoxin
Penicillium aurantiocandidum	Penicillic acid
Penicillium aurantiogriseum	Penicillic acid
Penicillium brasilanum	Penicillic acid
Penicillium brevicompactum	Mycophenolic acid
Penicillium camemberti	Cyclopiazonic acid
Penicillium carneum	Mycophenolic acid, Roquefortine C
Penicillium crateriforme	Rubratoxin

Fungi	**Mycotoxin**
Penicillium citrinum	Citrinin
Penicillium commune	Cyclopiazonic acid
Penicillium crustosum	Roquefortine C
Penicillium chrysogenum	Roquefortine C
Penicillium discolor	Chaetoglobosin C
Penicillium expansum	Citrinin, Roquefortine C
Penicillium griseofulvum	Roquefortine C, cyclopiazonic acid, griseofulvin
Penicillium hirsutum	Roquefortine C
Penicillium hordei	Roquefortine C
Penicillium nordicum	Ochratoxin A
Penicillium paneum	Roquefortine C
Penicillium palitans	Cyclopiazonic acid
Penicillium polonicum	Penicillic acid
Penicillum roqueforti	Roquefortine C, Mycophenolic acid
Penicillium veridicatum	Penicillic acid
Penicillium verrucosum	Citrinin, ochratoxin A
Penicillium/ Aspergillus	Patulin
Penicillium/ Aspergillus/Alternaria	Glitoxin
Phomopsis	Macrocyclic trichothecenes
Phoma	Brefeldin, cytochalasin, secalonic acid, tenuazonic acid
Pithomyces	Sporidesmin
Rhizoctonia	Slaframine
Rhizopus	Rhizonin
Sclerotinia	Furanocoumarins
Stachybotrys chartarum	Iso-satratoxin F, roridin E, L-2, satratoxin G & H, trichodermin, trichodermol, trichothecene
Torula	Cytotoxins
Trichoderma	Trichodermin, trichodermol, gliotoxin
Trichothecium	Trichothecene
Wallemia	Walleminol
Zygosporium	Cytochalasin

General terms

Allergen

An allergen is a substance that elicits an IgE antibody response and is responsible for producing allergic reactions. Chemicals are released when IgE on certain cells contact an allergen. These chemicals can cause injury to surrounding tissue - the visible signs of an allergy. Only a few fungal allergens have been characterized but all fungi are thought to be potentially allergenic. Fungal allergens are proteins found in either the mycelium or spores

"Black mold"

A poorly defined term. Black mold or toxic black mold has usually been associated with the mold *Stachybotrys chartarum* . While there are only a few molds that are truly black, there are many that can appear black. Not all molds that appear to be black are *Stachybotrys* .

Fungi

Fungi are neither animals nor plants and are classified in a kingdom of their own. The Kingdom of Fungi. Fungi include a very large group of organisms, including molds, yeasts, mushrooms and puffballs. There are >100,000 accepted fungal species but current estimates range to 1.5 million species. Mycologists (people who study fungi) have grouped fungi into four large groups according to their method of reproduction.

Hidden mold

This refers to visible mold growth on building structures that is not easily seen, including the areas above drop ceilings, within a wall cavity (the space between the inner and outer structure of a wall), inside air handlers, or within the ducting of a heating/ventilation system.

Microbial Volatile Organic Compounds (MVOCs)

Fungi produce chemicals as a result of their metabolism. Some of these chemicals, MVOCs, are responsible for the characteristic moldy, musty, or earthy smell of fungi, whether mushrooms or molds. Some MVOCs are considered offensive or annoying. Specific MVOCs are thought to be characteristic of wood rot and mold growth on building materials. The human nose is very sensitive to mold odors and sometimes more so than current analytical instruments.

Mold

Molds are a group of organisms that belong to the Kingdom of Fungi (see Fungi). Even though the terms mold and fungi had been commonly referred to interchangeably, all molds are fungi, but not all fungi are molds.

Mycotoxin

Mycotoxins are compounds produced by some fungi that are toxic to humans or animals. By convention, the term? Mycotoxin. Excludes mushroom toxins. Fungi that produce mycotoxins are called "toxigenic fungi."

Spore

General term for a reproductive structure in fungi, bacteria and some plants. In fungi, the spore is the structure which may be used for dissemination and may be resistant to adverse environmental conditions.

Toxic mold

The term "toxic mold" has no scientific meaning since the mold itself is not toxic. The metabolic byproducts of some molds may be toxic (see mycotoxin).

Hypha (plural, hyphae)

An individual fungal thread or filament of connected cells; the thread that represents the individual parts of the fungal body.