



**The Identification Specialists**

Analysis Report  
prepared for  
Sample Company

**Report Date: 3/2/2017**

**Project Name: 123 Main Street**

**Project #: 1234**

**SanAir ID#: 17007578**



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**Phone:** 555-555-5555

**Project Number:** 1234  
**P.O. Number:** 100  
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**Collected Date:** 3/1/2017  
**Received Date:** 3/2/2017 11:00:00 AM

SanAir ID Number  
**17007578**  
 FINAL REPORT  
 3/2/2017 11:15:18 AM

Analyst: Zhang, Ph.D, Richard

## Air Cassette Analysis

ND = None Detected. Blank spaces indicate no spores detected.

SanAir ID Number	17007578-001			17007578-002			17007578-003			17007578-004		
Analysis Using STL	105C			105C			105C			105C		
Sample Number	1			2			3			4		
Sample Identification	Outside			Kitchen			Bathroom			Bedroom		
Sample Type	Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell			Air Cassette - Air-O-Cell		
Volume	75 Liters			75 Liters			75 Liters			75 Liters		
Analytical Sensitivity	13 Count/M <sup>3</sup>			13 Count/M <sup>3</sup>			13 Count/M <sup>3</sup>			13 Count/M <sup>3</sup>		
Background Density	2			2			1+			2+		
<b>Other</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Dander	5	67	n/a	414	5520	n/a	325	4333	n/a	660	8800	n/a
Fibers	1	13	n/a	6	80	n/a	14	187	n/a	21	280	n/a
Mycelial Fragments	2	27	n/a	6	80	n/a	1	13	n/a	2	27	n/a
Pollen	158	2107	n/a	8	107	n/a				2	27	n/a
<b>Fungal Identification</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>	<b>Raw Count</b>	<b>Count/M<sup>3</sup></b>	<b>%</b>
Alternaria species	2	27	< 1									
Ascospores	345	4600	34	86	1147	18	21	280	6	49	653	18
Aspergillus/Penicillium	12	160	1	159	2120	34	37	493	11	72	960	27
Basidiospores	402	5360	40	132	1760	28	55	733	16	18	240	7
Chaetomium species				4	53	< 1	1	13	< 1	2	27	< 1
Cladosporium species	228	3040	23	76	1013	16	224	2987	66	119	1587	45
Curvularia species	2	27	< 1				1	13	< 1			
Epicoccum species	1	13	< 1							1	13	< 1
Fusarium species	1	13	< 1	1	13	< 1						
Pithomyces species	2	27	< 1							1	13	< 1
Rusts				1	13	< 1						
Smuts/Myxomycetes	10	133	< 1	2	27	< 1	1	13	< 1	2	27	< 1
Stachybotrys species				8	107	2						
Ulocladium species										1	13	< 1
<b>TOTAL</b>	<b>1005</b>	<b>13400</b>		<b>469</b>	<b>6253</b>		<b>340</b>	<b>4533</b>		<b>265</b>	<b>3533</b>	

Signature:

Date: 3/2/2017

Reviewed:

Date: 3/2/2017



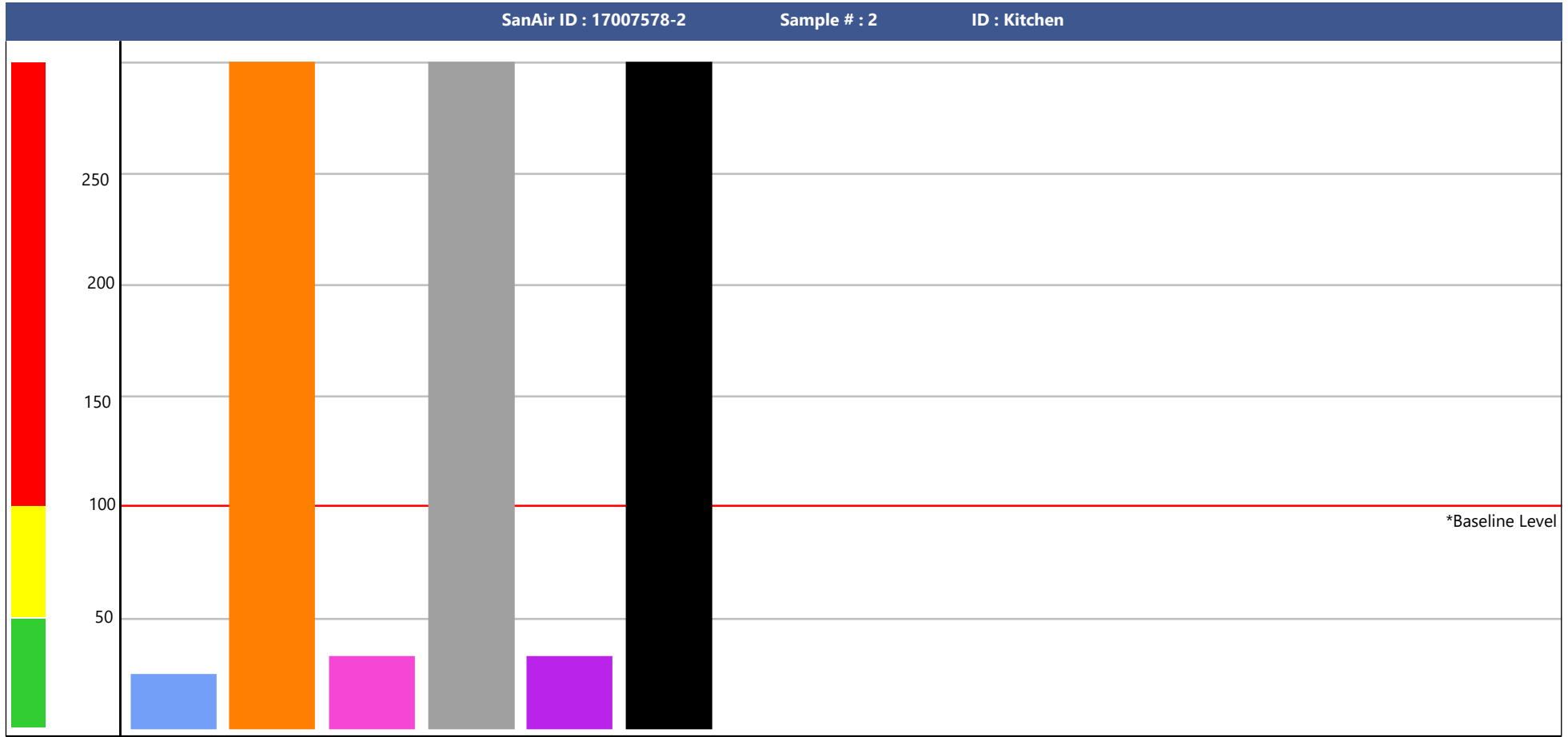
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### Air Cassette Analysis - Spores % of Outside Air



Count/m³ higher than Baseline	Ascospores	Aspergillus/Penicillium	Basidiospores	Chaetomium species	Cladosporium species
Count/m³ comparable to Baseline					
Within 50% of Baseline Count/m³	Stachybotrys species				

\*The Baseline Level (100%) represents the average baseline sample counts. Counts above the baseline may indicate higher than expected levels of a given result.



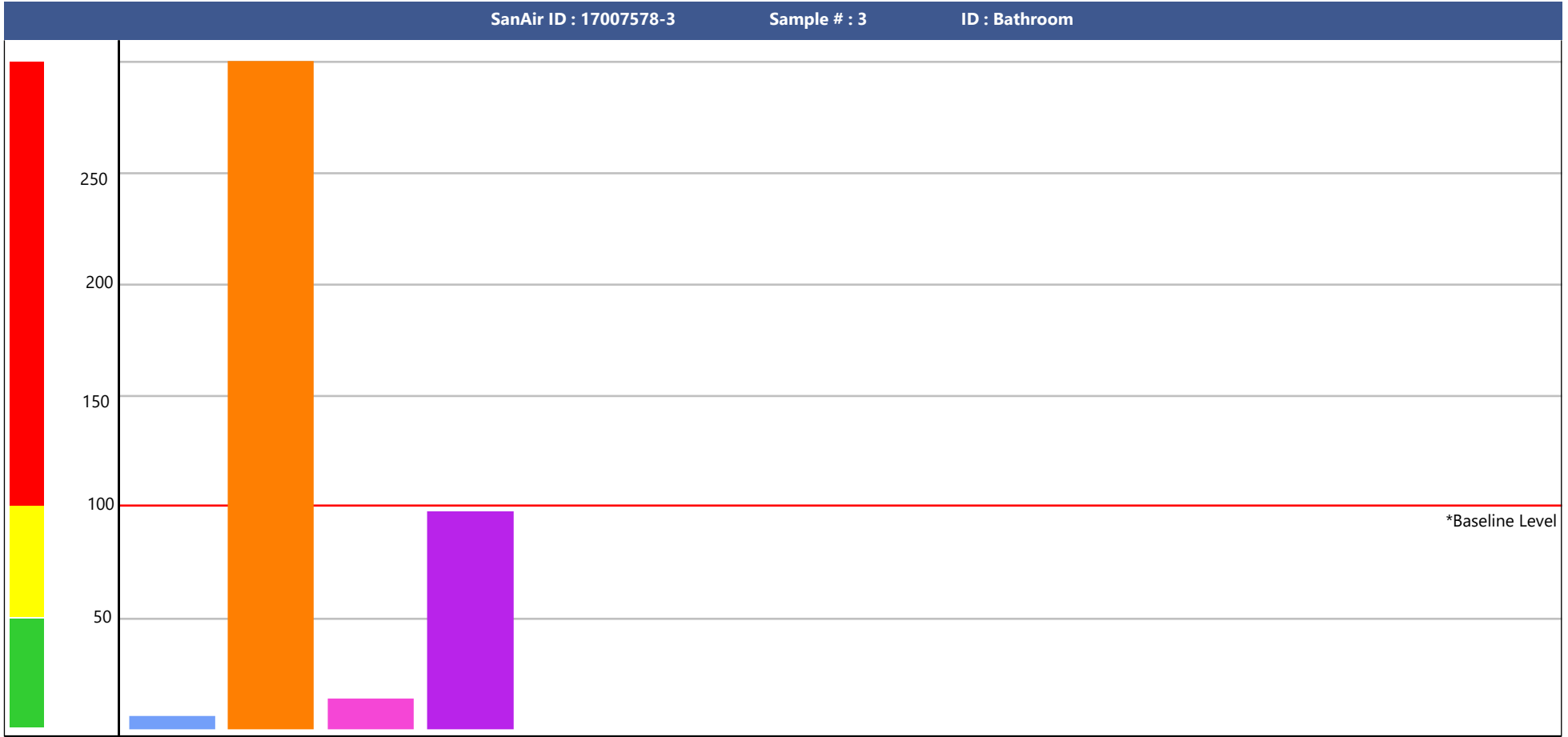
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### Air Cassette Analysis - Spores % of Outside Air



<span style="color: red;">■</span> Count/m³ higher than Baseline	<span style="border: 1px solid blue; padding: 2px;">A</span> Ascospores	<span style="border: 1px solid orange; padding: 2px;">B</span> Aspergillus/Penicillium	<span style="border: 1px solid magenta; padding: 2px;">C</span> Basidiospores	<span style="border: 1px solid purple; padding: 2px;">D</span> Cladosporium species
<span style="color: yellow;">■</span> Count/m³ comparable to Baseline				
<span style="color: green;">■</span> Within 50% of Baseline Count/m³				

\*The Baseline Level (100%) represents the average baseline sample counts. Counts above the baseline may indicate higher than expected levels of a given result.



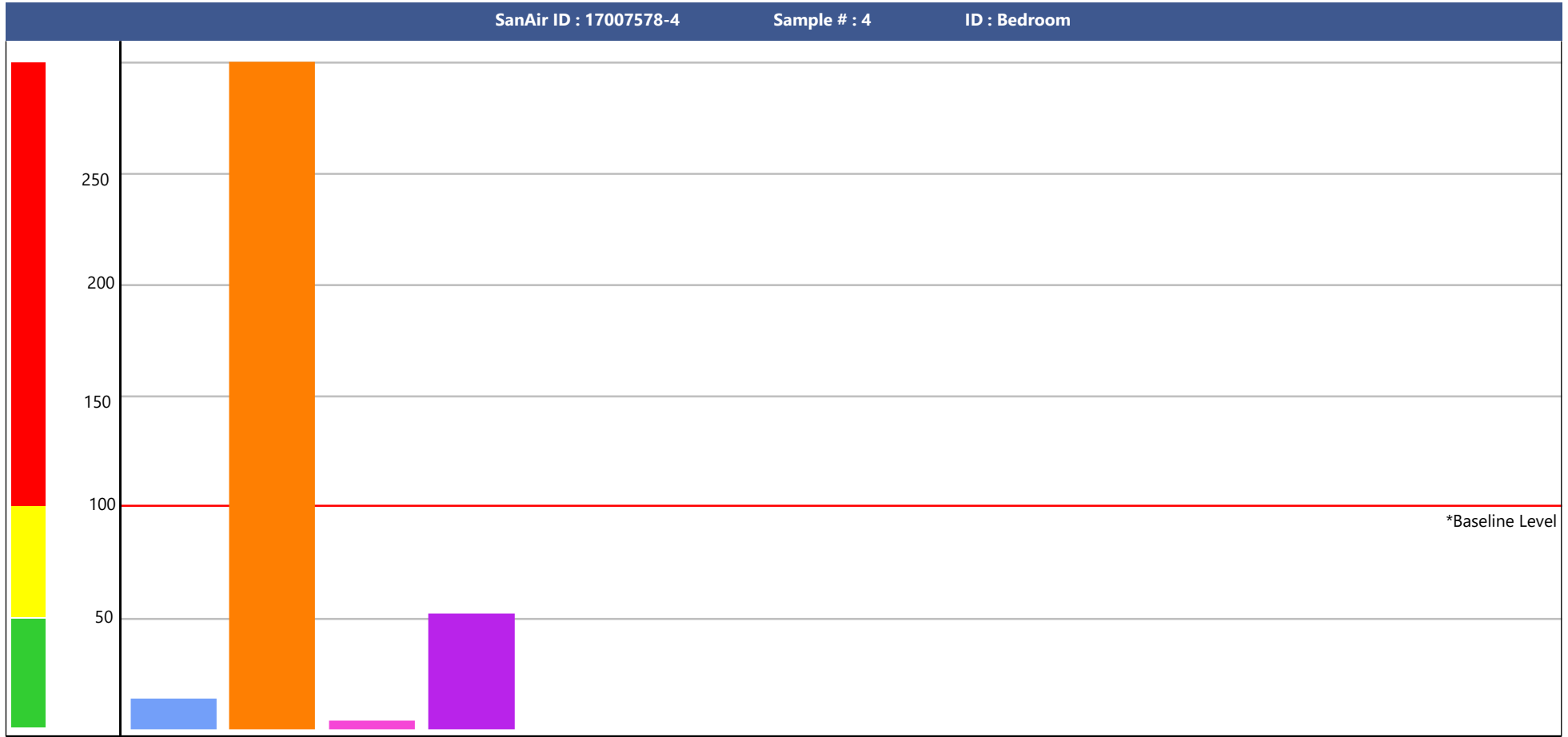
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Analyst: Macdonald, Claire

### Direct Identification Analysis

SanAir ID: 17007578-005    Sample #:5    Kitchen Cabinet


#### D1 - Direct Identification Analysis on Bio-Tape using STL 104

Direct ID of Mold

Fungi	Estimated Amount
Aspergillus species	Light
Chaetomium species	Light
Stachybotrys species	Moderate

Estimated Amount	Indication of Growth	Evidence of Mycelial Fragments/Conidiophores
Rare	Not Likely	None
Light	Possible	Some, 10 to 25% of Tape Covered
Moderate	Probable	Abundant, 25 to 50% of Tape Covered
Heavy	Significant	Throughout, 50 to 100% of Tape Covered

\*Refer to additional information page for further details

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**Dander** - Comprised of human and/or animal skin cells. Counts may be higher in carpeted rooms and in rooms with more traffic.  
*Health Effects:* May cause allergies.

**Fibers** - This category can include clothing, carpet, and insulation fibers.

**Mycelial Fragments** - A mycelium (plural = mycelia) is the "body" of a fungus. It is a collective term for hyphae (singular = hypha), which are the tubular units of the mycelium usually composed of chitin. The terms hyphae and mycelial fragments are used interchangeably. [This information was referenced from the mycology text "The Fifth Kingdom"] In some cases a fungal identification cannot be obtained due to lack of sporulation. Only the mycelial fragments are present, and cannot be identified without the distinguishing characteristics of the spores or the structures they grow from.  
*Health Effects:* Allergic reactions may occur in the presence of spores (conidia) or mycelial/hyphal fragments.

**Pollen** - Produced by trees, flowers, weeds and grasses. The level of pollen production can depend on water availability, precipitation, temperature, and light. Pollen is usually dispersed by either insects or the wind.  
*Health Effects:* Mostly effects the respiratory tract with hay fever symptoms but has also been shown to trigger asthma in some people.

**Alternaria species** - This genus comprises a large number of saprobes and plant pathogens. It is one of the predominate airborne fungal spores indoor and outdoor. Outdoors it may be isolated from samples of soil, seeds, and plants. It is one of the more common fungi found in nature, extremely widespread and ubiquitous. Conidia are easily carried by the wind, with peak concentrations in the summer and early fall. It is commonly found in outdoor samples. It is often found in indoor environments, on drywall, ceiling tiles, in house dust, carpets, textiles, and on horizontal surfaces in building interiors. Often found on window frames.

*Health Effects:* In humans, it is recognized to cause type I and III allergic responses. Because of the large size of the spores, it can be deposited in the nose, mouth and upper respiratory tract, causing nasal septum infections. It has been known to cause Baker's asthma, farmer's lung, and hay fever. It has been associated with hypersensitivity pneumonitis, sinusitis, dermatomycosis, onychomycosis, subcutaneous phaeohyphomycosis, and invasive infection. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms, chronic cases may develop pulmonary emphysema.

*References:* Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.

**Ascospores** - From the fungal Subphylum Ascomycotina. Ascospores are ubiquitous in nature and are commonly found in the outdoor environment. This class contains the "sac fungi" and yeasts. Some ascospores can be identified by spore morphology, however; some care should be exercised with regard to specific identification. They are identified on tape lifts and non-viable analysis by the fact that they have no attachment scars and are sometimes enclosed in sheaths with or without sacs. Ascomycetes may develop both sexual and asexual stages. Rain and high humidity may help asci to release, and disperse ascospores, which is why during these weather conditions there is a great increase in counts.  
*Health Effects:* This group contains possible allergens.



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**Aspergillus species** - A genus of fungi containing over 180 recognized species. Members of this genus have been recovered from a variety of habitats, but are especially common as saprophytes on decaying vegetation, soils, stored food, and feed products in tropical and subtropical regions. Some species are xerophilic. Some species are parasitic on insects, plants and animals, including man. Some species are reported mycotoxin producers. Both *Penicillium* and *Aspergillus* spores share similar morphology on non-viable analysis and therefore are lumped together into the same group. Only through the visualization of reproductive structures can the genera be distinguished.

**Health Effects:** Can produce type I and III fungal hypersensitivities. All of the species contained in this genus should be considered allergenic. Various *Aspergillus* species are a common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms. Chronic cases may develop pulmonary emphysema. Members of this genus are reported to cause a variety of opportunistic infections of the ears and eyes. Severe pulmonary infections may also occur.

**References:** Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. *Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control*. London and New York: Taylor & Francis, 2001.

**Aspergillus/Penicillium** - These spores are easily aerosolized. Only through the visualization of reproductive structures can the genera be distinguished. Also included in this group are the spores of the genera *Acremonium*, *Phialophora*, *Vorticillium*, *Paecilomyces*, etc. Small, round spores of this group lack the necessary distinguishing characteristics when seen on non-viable examination.

**Health Effects:** Can cause a variety of symptoms including allergic reactions. Most symptoms occur if the individual is immunocompromised in some way (HIV, cancer, etc). Both *Penicillium* and *Aspergillus* spores share similar morphology on non-viable analysis and therefore are lumped together into the same group.

**Basidiospores** - From the Subphylum Basidiomycotina which contains the mushrooms, shelf fungi, and a variety of other macrofungi. They are saprophytes, ectomycorrhizal fungi or agents of wood rot, which may destroy the structure wood of buildings. It is extremely difficult to identify a specific genera of mushrooms by using standard culture plate techniques. Some basidiomycete spores can be identified by spore morphology; however, some care should be exercised with regard to specific identification. The release of basidiospores is dependant upon moisture, and they are dispersed by wind.

**Health Effects:** Many have the potential to produce a variety of toxins. Members of this group may trigger Type I and III fungal hypersensitivity reactions. Rarely reported as opportunistic pathogens.

**Chaetomium species** - It is an ascomycete. It is found on a variety of substrates containing cellulose including paper and plant compost. It can be found on the damp or water damaged paper in sheetrock after a long term water damage. Several species have been reported to play a major role in decomposition of cellulose made materials. These fungi are able to dissolve the cellulose fibers in cotton and paper, and thus cause these materials to disintegrate. The process is especially rapid under moist conditions.

**Health Effects:** *Chaetomium* can produce type I fungal hypersensitivity and has caused onychomycosis (nail infections).

**References:** Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. *Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control*. London and New York: Taylor & Francis, 2001.





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**Cladosporium species** - The most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter and are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is commonly found on the surface of fiberglass duct liner 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. Often found in dirty refrigerators and especially in reservoirs where condensation is collected, on moist window frames it can easily be seen covering the whole painted area with a velvety olive green layer.

**Health Effects:** It is a common allergen. It can cause mycosis. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchospasms, chronic cases may develop pulmonary emphysema. Illnesses caused by this genus can include phaeohyphomycosis, chromoblastomycosis, hay fever and common allergies.

**References:** Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. *Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control*. London and New York: Taylor & Francis, 2001.

**Curvularia species** - Curvularia is found on plant material and is considered a saprobe. It has also been isolated from dust samples and from wallpaper.

**Health Effects:** It has been reported to cause type I hypersensitivity and to be a cause of allergic fungal sinusitis. It may cause corneal infections, mycetoma and infections in immune compromised hosts.

**References:** De Hoog, G.S., J. Guarro, J. Gene, and M.J. Figueras. *Atlas of Clinical Fungi*, 2nd Edition. The Netherlands: CBS, 2000.

**Epicoccum species** - It is found in plants, soil, grains, textiles, and paper products. Frequently isolated from air and occasionally occurs in house dust. Is a saprophyte and considered a weakly parasitic secondary invader of plants, moldy paper and textiles. Epicoccum is usually isolated with either Cladosporium species or Aureobasidium species.

**Health Effects:** A common allergen. It also has the potential to produce type I fungal hypersensitivity reactions.

**References:** Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. *Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control*. London and New York: Taylor & Francis, 2001.

**Fusarium species** - A common soil fungus and plant pathogen. Fusarium is frequently isolated from plants and grains. It is often found in humidifiers and requires wet conditions to grow.

**Health Effects:** A type I allergen. Frequently involved in eye, skin and nail infections. Fusarium is the most common cause of mycotic keratitis and has been isolated from patients with a variety of infections. Some species produce mycotoxin. Food safety issues are related to some species of this genus.

**References:** Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. *Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control*. London and New York: Taylor & Francis, 2001.

**Pithomyces species** - Grows on dead grass in pastures and decaying plant material.

**Health Effects:** Causes facial eczema in ruminants.

**References:** St-Germain, Guy, and Richard Summerbell. *Identifying Filamentous Fungi: A Clinical Laboratory Handbook*. California: Star Publishing Co., 1996.

**Rusts** - From the group Uredinales, called Rusts due to the color of the spores, which are known for causing disease in plants.



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**Smuts/Myxomycetes** - Smuts and Myxomycetes are parasitic plant pathogens. They are typically grouped together due to their association with plants, the outdoors and because they share similar microscopic morphology.

**Health Effects:** Can produce type I fungal hypersensitivity reactions.

**References:** Martin, G.W., C.J. Alexopoulos, and M.L. Farr. The Genera of Myxomycetes. Iowa City, Iowa: University of Iowa Press, 1983.

**Stachybotrys species** - This organism is rarely found in outdoor samples. It is usually difficult to find in indoor air samples unless it is physically disturbed because the spores are in a gelatinous mass. Grows well on wet media, preferably containing cellulose. It proliferates in the indoor environment with long term water damage, growing on wallpaper, gypsum board, and textiles. As a general rule, air cultures for Stachybotrys yields unpredictable results, mainly due to the fact that this fungus is usually accompanied by other fungi such as Aspergillus and Penicillium that normally are better aerosolized than Stachybotrys. This is a slow growing fungus on media. It does not compete well with other rapidly growing fungi. The black fungi grow on building material with high cellulose content and low nitrogen content. Appropriate media for the growth of this organism will have high cellulose content and low nitrogen content.

**Health Effects:** It has worldwide distribution and has been reported to cause dermatitis, cough, rhinitis, and headache, although no definitive reports of human infections have been verified. It has the ability to cause type I hypersensitivity. It is a documented mycotoxin producer.

**References:** Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis, 2001.

**Ulocladium species** - Isolated from soil, dead plants and cellulose materials. Found on textiles. It can be found on many types of materials, but mostly found on decaying materials. Has a greater water activity need for growth and is therefore considered a water indicator organism.

**Health Effects:** Reported to be a major allergen. Rarely causes subcutaneous infections in humans. It has a high water requirement.

**References:** De Hoog, G.S., J. Guarro, J. Gene, and M.J. Figueras. Atlas of Clinical Fungi, 2nd Edition. The Netherlands: CBS, 2000.