SUMMARY OF TESTING RESULTS FOR:

Andrew Koch
Wellfleet Shellfish Constable
Site Located at:
Wellfleet Shellfish Department
35 Kendrick Avenue
Wellfleet, MA 02667
Project Number: 296
Report Version: 1.0

Target Inspections, LLC.

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Testing Conditions

December 13, 2013

Weather – Mostly Sunny

Wind – WNW 20 mph

Outdoor Temperature – 28°F

Outdoor Relative Humidity – 62%

****Testing Notes****

All testing performed in the facility was performed non-invasively and all inspection results (visual & laboratory) are for conditions at the time of testing only. Observations and testing results are for areas that were accessible at the time of testing and do not include any areas outside of the job scope or areas that were inaccessible.

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TARGET INSPECTIONS

Description of Inspection

At your request Target Inspections visited 35 Kendrick Avenue in Wellfleet, MA on Friday, December 13, 2013 and performed a limited air quality/mold verification inspection on the first floor of the Wellfleet Shellfish Department facility. The goal was to inspect for the presence of potential microbial contamination and/or air quality concerns in the facility. According to Andrew Koch (Wellfleet Shellfish Constable) this inspection was conducted for the purpose of collecting data from visually suspect areas of the first floor of the facility. Additionally the inspection included taking appropriate samples to provide detailed analysis of what, if any, microbial spores were present in the environment beyond the visual inspection. The scope of the inspection including a visual assessment of the exterior and first floor of the facility. The number of samples taken for lab analysis was determined based on visual observations during the initial inspection.

A visual inspection of the facility was performed as well as humidity and temperature readings. In addition to the visual inspection, air samples and tape lift samples were collected in the facility for review by approved laboratory technicians.

One (1) Deluxe Air Sampling Kits with MegaLite Pumps were utilized, serial number 18480, with Allergenco-D air cartridges to take samples of airborne particles from the facility. These air samples as well as EMS brand tape lift samples were delivered to H2O EnviroComp in West Dennis, MA for microscopical analysis, the results of these analyses have been included in this report below including the Chain of Custody for the aforementioned samples.

The scope of this project included the following areas: visual assessment and sampling of the exterior and first floor of the facility.

The scope of a limited inspection are as follows**:**

- A sample collection and visual assessment will be conducted only in “client defined” areas and is not a complete assessment of the subject property. It is the discretion of the client as to the area, media type, and amount of samples to be taken.
- Determinations as to the extent or type of microbial contamination will not be made from results of the visual assessment alone; an appropriate number of samples must be collected as determined by a complete visual assessment of the “client defined” area before mold can be identified in designated area or areas.
- The results of limited microbial sampling are not a guarantee that mold does or does not exist in the other areas of the subject property. The results are indicative only of the presence or absence of mold in the selected areas sampled at the time the limited mold sampling was performed.

Additional equipment used for analysis include –

Tramex MRH – non-invasive moisture meter – s/n MRH 11091306

Extech – moisture & humidity meter – s/n 10016037

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Samples Location Codes:

Andrew Koch's Office = Sample collected near the center of Andrew Koch's office (air sample).

Center of Ceiling in Room Adjacent to Office = Sample collected on the surface of the gypsum board ceiling outside of Andrew Koch's office (tape lift sample)

Ceiling Above Furnace = Sample collected on the surface of the gypsum board ceiling above and in front of the furnace (tape lift sample)

Findings & Conclusions

Upon completion of the visual inspection the following was observed –

- Odor detected upon entering the facility.
- Large Areas of visible microbial contamination detected in the room adjacent to Andrew Koch's office.
- No door present separating Andrew Koch's office with the adjacent room.
- Furnace/air handler not operational.
- Visible areas of the roof (as viewed from the rear of the facility) that had been compromised. Moisture events (rain, snow, high humidity) would results in water/moisture intrusion events within the facility.
- Multiple broken exterior windows present.
- Average facility temperature was 61 degrees Fahrenheit in the areas inspected.
- Average relative humidity was 55% in the areas inspected.

As a result of the customer concerns air and tape lift samples were collected in a representative number of areas of the facility to determine if any microbial spores were present beyond the visual inspection. Sampling was performed in Andrew Koch's office and the room adjacent to his office.

The laboratory findings indicated the following -

Air Samples Results (laboratory results are included below in the report)

- **ELEVATED** levels of airborne Aspergillus/Penicillium-Like, Stachybotrys, and Cladosporium spores within the Andrew Koch's Office sample. ***These levels of contaminants are above recommended action levels and above external ambient levels. REMEDIATION is required.***

- **LOW** levels of airborne Basidiospores, Chaetomium, and Smut spores comprised the remaining spores within the Andrew Koch's Office sample. ***These levels of contaminants are below recommended action levels and/or below external ambient levels. No remediation is required for these spore types at low concentrations.***

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Tape Lift Samples Results (laboratory results are included below in the report)

- **HIGH** levels of surface Stachybotrys spores in the Center of Ceiling in Room Adjacent to Office area sample***. These levels of contaminants are above recommended action levels. REMEDIATION is required.***

- **HIGH** levels of surface Aspergillus/Penicillium-Like and Cladosporium spores in the Ceiling Above Furnace area sample***. These levels of contaminants are above recommended action levels. REMEDIATION is required.***

Remediation is only recommended when indoor air quality samples have spore counts both above external ambient levels and above the recommended action level of 500 spores per cubic meter or if Medium or greater concentrations are detected on surface samples. If these criteria have not been met then No Remediation is required. Remediation may be recommended if spore count in conjunction to visual inspection or visual inspection alone indicate the potential for a future problem or other consideration that needs to be addressed. The only exception to this guideline is Stachybotrys; there are NO acceptable levels of this mold spore within a home or building.

NOTE - there is always a potential health risk to children, elderly, people with suppressed immune systems, people with asthma, or people with allergies to specific contaminants even with mold spore counts below the recommended action levels.

Source Location

At the time of inspection there was no visible moisture or standing water in the areas inspected. According to the Shellfish Constable, Andrew Koch, roof damage and potential microbial contamination was first observed approximately two (2) years and four (4) prior to the inspection date. The roof damage has led to extensive water damage since then. He also indicated that water from roof leak areas migrated to the first floor and that visual detection of the potential microbial contamination began occurring at that time period as well. He also stated that he has exhibited symptoms of excessive cough, cold shivers, and fatigue during the aforementioned time period. The EPA has stated that these symptoms can be related to exposure to mold spores in indoor environments (http://www.epa.gov/mold/moldcourse/chapter1.html#1.7) & (http://www.epa.gov/mold/append_b.html). Mr. Koch also indicated that he had observed mice feces in the facility.

The Environmental Protection Agency (EPA) recommends that water intrusion episodes be dried within the first 24-48 hours of a water intrusion event in buildings to help avoid the need for remediation of mold growth by taking quick action before growth starts (http://www.epa.gov/mold/moldcleanup.html) & (http://www.epa.gov/iedmold1/table1.html). According to Mr. Koch, drying was not performed after any water intrusion episode within this time period.

Average relative humidity level in the facility was slightly above EPA recommended levels at the time of the inspection and there is evidence that multiple water intrusion events had occurred in the past due to the compromised areas of the facility's roof.

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Conclusion Summary

Based on the visual inspection there was a moisture concern (slightly elevated humidity and water damage most likely from the roof leaks) in the facility at the time of the inspection. The aforementioned moisture intrusion events migrated to the first floor of the facility which is most likely related to the microbial contamination throughout the facility. According to the EPA "Moisture is the most important factor influencing mold growth indoors. Controlling indoor moisture helps limit mold growth" (http://www.epa.gov/mold/moldcourse/chapter1.html#1.7).

Elevated levels of microbial spores within the air in the office area and surfaces in the room adjacent to the office are most likely due to the water intrusion episodes from the roof leaks.

Laboratory testing and visual inspection did indicate elevated levels of microbial contamination present in the air in the office and the surfaces of areas in the room adjacent to the office. The tested and visual levels of contaminants within these areas are above recommended action and visual levels. Remediation of these areas is highly recommended. These mold spores can create/increase an air quality hazard and are most likely the cause of the odor detected in facility. Due to the spore concentrations of Aspergillus/Penicillium-Like and Stachybotrys detected in the air within the office area it is recommended that a suitable alternate location be explored for the Wellfleet Shellfish Department until repairs and microbial remediation is complete as the aforementioned spore types and concentrations are most likely not suitable for an office environment at this time.

Remediation Recommendation -

The following is not intended to be the specific process, protocol or order in which certain steps are performed and is a general guideline only. These are recommendations only. Note, based on observed microbial contamination and laboratory results remediation should only be performed by a certified mold remediation specialist.

Remediation should include. But not limited to -

- Removal/cleaning of all porous/semi-porous material in the affected areas throughout the facility (including all gypsum board). Consult a remediation professional to determine which items can be cleaned and which items must be removed and discarded.
- Utilize a negative air system/air scrubber in the facility to clean any contaminants from the air. Minimum of 48 hours continuous after remediation.
- Removal/Treatment of contaminated surfaces in the affected areas throughout the facility. as recommended by remediator.
- Wipe down/treat all surfaces in the affected areas throughout the facility with biocide or enzyme treatment.
- Additionally remediation steps may be required, consult remediation contractor for more information.

Post remediation verification (PRV) is recommended to confirm the proper completion of microbial remediation in the affected areas. This will verify all airborne contaminants have been removed.

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Recommendations -

Recommendations include, but not limited to -

- Consider an alternate office location for the Wellfleet Shellfish Department until repairs and remediation are complete.
- Consult a licensed contractor to advise on and complete repairs to the leaks in the roof and the windows of the facility.
- Consult a licensed HVAC contractor to replace the current air handler and any duct work present in the facility.

Nonconformance -

- Due to an outdoor temperature of <32 degrees Fahrenheit and partial snow cover on the ground an outdoor control sample was not collected.
    - A suitable alternate location to collect a control sample inside the facility did not exist as all areas of the facility exhibited potential microbial contamination.
    - The lack of a control sample did not affect the outcome of the final air sample results as outdoor samples collected under the aforementioned conditions typically results in Non-Detect or statistically insignificant spore concentrations.

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This inspection report is solely based on the conditions within the defined area at the time of inspection only and makes no express or implied warrant or guarantee as to future changes in condition or conditions outside of the described job scope.

Sincerely,

Steven Grevelis

Certified Mold Professional &
Building Professional Institute Building Analyst

Reference Materials

I.E.S.O, (Indoor Environmental Standards Organization), Standards of Practice for the Assessment of Indoor Environmental Quality, 2nd Edition

I.I.C.R.C Standard S-520, Standard and Reference Guide for Professional Mold Remediation

O.S.H.A, Hazard Communication Standard 29 CFR 1910.1200, 1910.134, 1910.139

Center for Disease Control – www.cdc.gov

United States Environmental Protection Agency (EPA)
http://www.epa.gov/iaq/schools/tfs/guideh.html

http://www.epa.gov/iaq/pubs/airduct.html#naima

NYCDHMH (The New York City Department of Health and Mental Hygiene) Guidelines on Assessment and Remediation of Fungi in Indoor Environments (November 2008)
http://www.nyc.gov/html/doh/downloads/pdf/epi/epi-mold-guidelines.pdf

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DIGITAL PHOTO

DIGITAL PHOTO

PHOTO SUMMARY	PHOTO SUMMARY
One of the structurally compromised areas of the roof.	Section of ceiling on first floor behind the furnace exhibiting visible microbial contamination, water staining/damage, and structurally unsound gypsum board.

DIGITAL PHOTO

DIGITAL PHOTO

PHOTO SUMMARY	PHOTO SUMMARY
Non operational furnace/air handler.	Air sample collection in Andrew Koch's office area.

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TARGET INSPECTIONS

Mold Identification by Samples

Sample Number: 01205-01
Client Sample ID: 873832
Magnification: 600 X

Sample Medium: Allergenco-D
Sampling Rate: 15L/Min for 5 Minutes
Total Liters: 75
Location: Andrew Koch's Office

Sample Data:

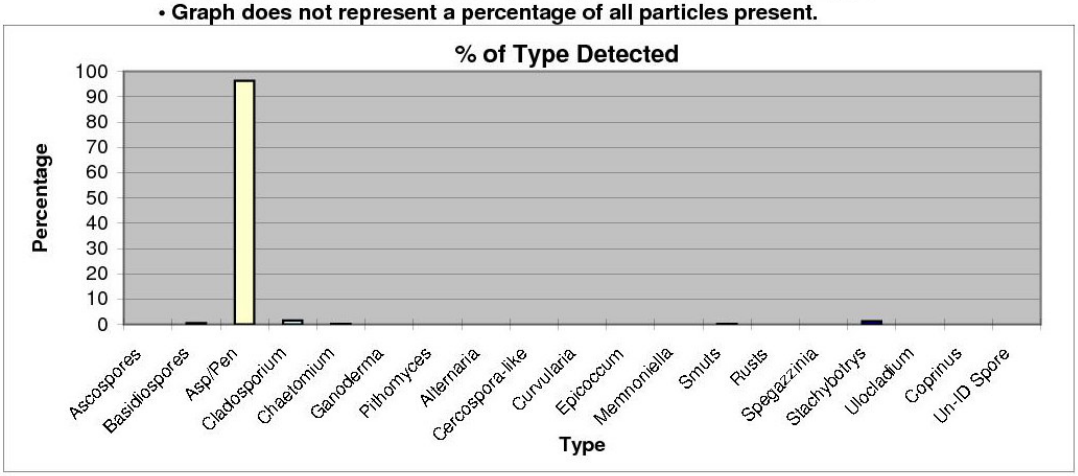
Type:	Raw Count	Count/ Cubic Meter	Type:	Raw Count	Count/ Cubic Meter
Ascospores, Non-specified	ND	ND	Smuts	**2**	**84**
Basidiospores, Non-specified	**5**	**211**	Rusts	ND	ND
Aspergillus/Penicillium-Like	**880**	**37053**	Spegazzinia	ND	ND
Cladosporium	**14**	**589**	Stachybotrys	**11**	**463**
Chaetomium	**2**	**84**	Ulocladium	ND	ND
Ganoderma	ND	ND	Coprinus	ND	ND
Pithomyces	ND	ND	Un-ID Spore	ND	ND
Alternaria	ND	ND	Pollen	ND	ND
Cercospora-like	ND	ND	Hyphal Frags	ND	ND
Curvularia	ND	ND	Insect Frags	ND	ND
Epicoccum	ND	ND			
Memnoniella	ND	ND			

Skin Fragment Prevalence; 1 (Low) to 4 (High):	1
Background Density; 1 (Low) to 5 (Overloaded):	2
Total Fungal Raw Count:	914
Analytical Sensitivity (Spore/Cubic Meter):	42
Total Fungal Count (Spore/Cubic Meter):	**38484**

Sample Data Comments:

Reporting Notes: N/A = Not Applicable
ND = None Detected * = Type detected observed in clumps

Graph Notes: **•Sample graph represents ONLY spore types detected on the sample.**
• Graph does not represent a percentage of all particles present.



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TARGET INSPECTIONS

Mold Identification by Samples

Sample Number:	01205-02	**Sample Medium:**	EMS Tape Lift
Client Sample ID:	**104381**	**Sampling Rate:**	NA
Magnification:	**600 X**	**Location:**	Center of Ceiling in Room Adjacent to Office

Sample Data:

Type:	Result
Ascospores, Non-specified	ND
Basidiospores, Non-specified	ND
Aspergillus/Penicillium-Like	ND
Cladosporium	ND
Chaetomium	ND
Ganoderma	ND
Pithomyces	ND
Alternaria	ND
Botrytis	ND
Curvularia	ND
Epicoccum	ND
Memnoniella	ND

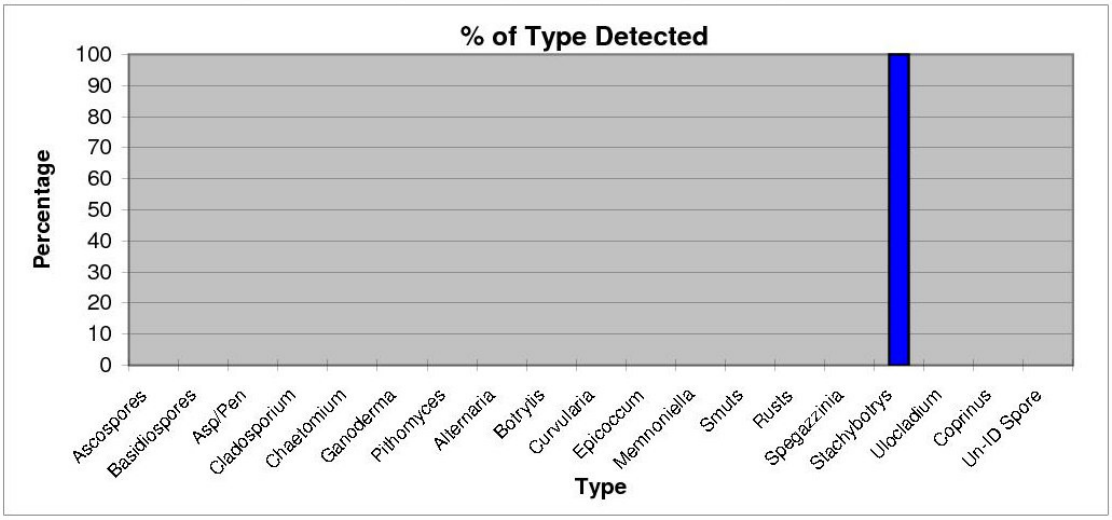
Type:	Result
Smuts	ND
Rusts	ND
Spegazzinia	ND
Stachybotrys *	**High**
Ulocladium	ND
Coprinus	ND
Un-ID Spore	ND
Pollen	ND
Hyphal Frags	ND
Fiber	ND
Insect Frags	ND

Reporting Notes:

N/A = Not Applicable
ND = None Detected
Rare = 1-10
Low = 11 to 100
Medium = 101 to 1000
High = >1000

* = Sample contains fruiting structures and/or hyphae associated with this spore type.

Graph 1 Notes: • Sample graph represents ONLY spore types detected on the sample.
• Graph does not represent a percentage of all particles present.



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TARGET INSPECTIONS

Mold Identification by Samples

Sample Number:	01205-03	**Sample Medium:**	EMS Tape Lift
Client Sample ID:	**102551**	**Sampling Rate:**	NA
Magnification:	**600 X**	**Location:**	Ceiling Above Furnace

Sample Data:

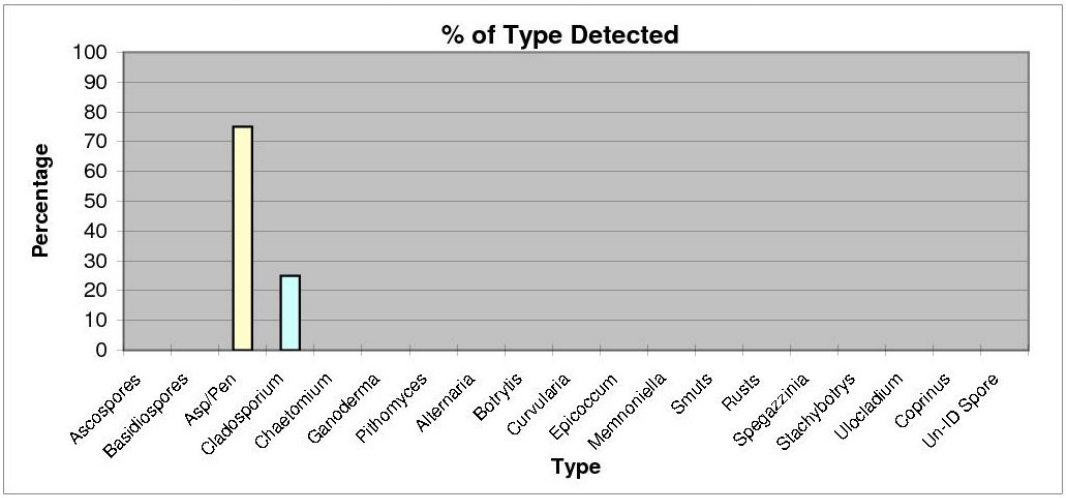
Type:	Result
Ascospores, Non-specified	ND
Basidiospores, Non-specified	ND
Aspergillus/Penicillium-Like	**High**
Cladosporium	**High**
Chaetomium	ND
Ganoderma	ND
Pithomyces	ND
Alternaria	ND
Botrytis	ND
Curvularia	ND
Epicoccum	ND
Memnoniella	ND

Type:	Result
Smuts	ND
Rusts	ND
Spegazzinia	ND
Stachybotrys	ND
Ulocladium	ND
Coprinus	ND
Un-ID Spore	ND
Pollen	ND
Hyphal Frags	ND
Fiber	ND
Insect Frags	ND

Reporting Notes:

N/A = Not Applicable
ND = None Detected
Rare = 1-10
Low = 11 to 100
Medium = 101 to 1000
High = >1000
* = Sample contains fruiting structures and/or hyphae associated with this spore type.

Graph 1 Notes: • Sample graph represents ONLY spore types detected on the sample.
• Graph does not represent a percentage of all particles present.



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H2O EnviroComp
24 School Street
P.O. Box 444
West Dennis, MA 02670

Microbial Chain of Custody
Version 1.0
4/9/2012

Client: Target Inspections Phone: (888) - 280- 2108 Client Address: 24 School Street, P.O. Box 444; West Dennis, MA 02670

Project Name: Wellfleet Shellfish Department Project Number: 296

Proj. Address: 35 Kendrick Avenue Town: Wellfleet State: MA Zip Code 02667

Sampled By: Steven Grevelis Project Contact: Andrew Koch

Date: 12/13/2013 Project Manager: Steven Grevelis

Turn Around Time: ☐ Rush ☒ 24 Hour ☐ 48 Hour ☐ 3 Day ☐ 5 Day

Email Address(es) to Send Report to:

Email 1: steve@targetinspections.com

Email 2:

H2O Lab ID: **01205**

SAMPLE ID	LOCATION	Sample Type (Air, Tape Lift, Bulk)	Volume Data			Sample Media (Air-O-Cell, Allergenco-D, etc)
			Rate (l/min)	Time (min)	Volume	
873832	Andrew Koch's Office	Air	15	5	75	Allergenco-D
104381	Center of Ceiling in Room Adjacent to Office	Tape	NA	NA	NA	EMS Tape Lift
102551	Ceiling Above Furnace	Tape	NA	NA	NA	EMS Tape Lift

Relinquished by: Steven Grevelis Date/Time: 12/13/2013

Received by: Steven Grevelis Date/Time: 12/13/2013

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TARGET INSPECTIONS

Target Inspections, LLC Summary of Testing Results Copyright 2010/2011/2012

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Fungal Glossary

Note: The following list is not inclusive of all molds and fungi.

Absidia: Found outdoors in soil and decaying vegetation. Found indoors in stored grains and other foods. Absidia is recognized as an allergen. In immune-compromised patients pulmonary invasions, the meninges (brain or spinal cord), and kidney infections can result from exposure

Acremonium: Found outdoors in decaying or dead plant materials. Found indoors in food and wet, cellulose based building materials. Grows well indoors when there is a high water contents (>0.90 Aw). Type I (Hay fever, asthma) and Type III (hypersensitivity pneumonitis) allergen. Known to cause infections in immune-deficient patients and persons with wound injuries. There are 100 known species.

Alternaria: Common saprobe and pathogen of plants. Typically found on plant tissue, decaying wood, and foods, soil and air outdoors. Indoors it is found near condensation (window frames, showers), house dust (in carpets, and air). It also colonizes building supplies, computer disks, cosmetics, leather, optical instruments, paper, sewage, stone monuments, textiles, wood pulp, and jet fuel. Type I allergies (hay fever, asthma) and Type III (hypersensitivity pneumonitis). Alternaria spores are one of the most common and potent indoor and outdoor airborne allergens. Additionally, Alternaria sensitization has been determined to be one of the most important factors in the onset of childhood asthma. Synergy with Cladosporium or Ulocladium may increase the severity of symptoms.

Arthrinium: Found outdoors in decaying plant material and soil. Found indoors on cellulose containing materials. *Arthrinium sphaerospermum* is recognized as an allergen.

Ascospores: Ascospores are found everywhere in nature. Ascospores are the result of sexual reproduction and produced in a saclike structure called an ascus. All ascospores belong to members of the Phylum Ascomycota, which encompasses a plethora of genera worldwide.

Asperigillus/Penicillium: These species are common contaminants on various substances. This organism causes food spoilage and is an indicated organism for dampness indoors. Some of these species are known to produce mycotoxins. If health effects are noticed by occupants or workers, in an environment that evidences an amplification of Penicillium, identification of species is helpful. These especially opportunistic pathogens may cause respiratory infections. Some varieties produce mycotoxins and aflatoxins.

Basidiospores: Found outdoors in gardens forests and woodlands. Plant pathogen. Indoors it is the agent of “dry rot” and other fungi causing white and brown wood rot. Grow and destroy the structural wood of buildings. Poria incrassata causes a particularly destructive dry rot in buildings. A probably common allergen. Type I allergies (hay fever, asthma).

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Bipolaris: Found outdoors in plant debris and soil. Found indoors on houseplants and indoor building materials. Type I allergies (hay fever, asthma). Most commonly reported cause of allergic and chronic invasive sinusitis.

Botrytis: Plant pathogen responsible for causing gray mold (*B. cincera)* on grapes, strawberries, raspberries, blackberries, low bush blueberries, lettuce, cabbage and onion. Indoors it is found on houseplants fruits and vegetables. Type I (hay fever, asthma) and type III (hypersensitivity) allergies.

Candida: Found in leaves, flowers, soil, water and is an inhabitant of the skin, mouth and vagina. It is unknown what suitable substrates are in the indoor environment. Has been reported as an allergen. Occurs in patients taking drugs such as oral contraceptives and antibiotics.
Cercospora: Found outdoors on plants. It is a plant parasite causing leaf spot. It is unknown what substrates it prefers indoors. Thrives in moderate to high humidity its allergenic potential is unknown.

Chaetomium: Found outdoors in soil, seeds, dung, woody and straw materials. Indoors found on damp sheet rock paper. Type I allergies (hay fever, asthma).

Coprinus: Found outdoors in wood, dung, litter and soil. Industrial uses: Popular experimental organism in genetic research

Cladosporium: Found outdoors in soil of many different types. Indoors it is found on many substrates including textiles, wood, and moist windowsills. Cladosporium grows at 0degrees C, and so is associated with refrigerated foods. It is a common and important allergen. Type I allergies (hay fever, asthma).

Cladophialophora (form of Cladosporium): Phialophora: Found outdoors in wood roots, stems and leaves of plants and grasses, and soil. It is a water loving fungus. Allergenicity has not been studied.

Coprinus: Found outdoors in wood, dung, litter and soil. Industrial uses: Popular experimental organism in genetic research

Curvularia: found outdoors in plant saprobe and pathogen to cereal plants and soil. Found indoors in paper and wood products. Type I allergies (asthma and hay fever) A relatively common cause of allergic fungal sinusitis.

Dactylaria: Found outdoors in decaying soil and leaves. Dactylaria species comprise a very small proportion of the fungal biota. There have been several reports of opportunistic infections caused by these genera but a true pathogenic role has not been firmly established. No information is available regarding upper respiratory health effects, or toxicity. Allergenicity has not been studied.

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Epicoccum: Found outdoors in plant debris and soil. Found indoors in paper and textiles. Type I allergies (asthma and hay fever).

Fusarium: Found outdoors in soil. Occasionally found on a variety of substrates. Fusarium requires very wet conditions. Aw=0.86-0.91 (minimum for various species). . Type I allergies (asthma and hay fever).

Gandomera: Found outdoors on conifers and hardwoods worldwide, causing white rot, root rot, and stem rot. Ganoderma species are known to cause allergies in people on a worldwide scale.

Memnoniella: Found outdoors in plant litter soil and many types of plants and trees. Found indoors on a variety of substrates (cellulolytic). Allergens are unknown. Very closely related to Stachybotrys.

Myxomycetes: Found outdoors in decaying logs and stumps, particularly in forested areas. Only found occasionally indoors. Type I allergies (hay fever, asthma)

Nigrospora: Found outdoors in decaying plants and soil. Rarely found indoors. Type I allergies (asthma and hay fever).

Pithomyces: Found outdoors in bark, leaf litter and soils. Indoors it is found in paper and requires high levels of moisture for spore germination. Its allergenic potential is unknown.

Rust: Rusts are parasitic to many types of plants. Rust fungi require a living plant host for growth. Type I allergens (hay fever, asthma). There are 5000 known species of rusts belonging to at least 150 different genera. Rusts are the cause of great economic losses on many cultivated plants.

Scopulariopsis (Hyphomycetes) Teleomorph: *Microascus* (Ascomycetes) Mainly soil-borne, but also frequently isolated from wood, grain, fruit, paper, and food such as meat and dairy products. Also isolated from indoor environments. ***Most species can liberate arsenic gaseous compounds that can lead to arsenic poisoning. Has recently been associated with invasive human infections***.

Spegazzinia: Found outdoors in plants and soil. It is unknown what substrates it is found on indoors. Allergenic properties are unknown.

Stachybotrys: Stachybotrys: Stachybotrys grows on wet materials that contain cellulose and low nitrogen content. Usually but not limited to building materials such as wallboard paper (unfinished drywall) that has a high water activity over a long period of time. It produces several types of toxic metabolites and mycotoxins that can irritate skin and mucous membranes. One of the mycotoxins it produces called satratoxin is also toxic when inhaled. ***Extreme care should be taken when this organism is amplified indoors***. Individuals with chronic exposure to the toxin produced by this fungus reported cold and flu symptoms, sore throat, diarrhea, headaches, fatigue, dermatitis, intermittent local hair loss, and generalized malaise. The toxins produced by this fungus will suppress the immune system affecting the lymphoid tissue and the bone marrow.

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Stemphylium: Found outdoors in soil, wood, decaying vegetation. Some species found on leaves are plant pathogens. Indoors growth is rare. Known allergen. Shares allergens with Alternaria. Type I allergies (hay fever, asthma).

Torula: Found outdoors in leaves, plant roots, plant litter, soil and wood. Indoors it is found in paper, wicker furniture and wood. Type I allergies (hay fever, asthma).

Ulocladium: Found outdoors in soil, dung paint, grasses, fibers, wood, decaying plant material, paper and textiles. Indoors it is found in gypsum board, paper, paint, tapestries, jute and other straw materials. Ulocladium has a high water requirement. As an allergen it is major with type I allergies (hay fever, asthma) and it cross reacts with Alternaria, adding to the burden of Alternaria –sensitive patients.

Wallemia: Found outdoors in hay and soil. Found indoors in jams, salted fish, mattresses, textiles and wood in crawl spaces. It is a Type I (hay fever and asthma) allergen.

Zygomycetes: Found outdoors in decaying plant and animal matter. Found indoors in fruits and vegetables. It is a Type1 (hay fever, asthma) and Type III (hypersensitivity) allergen. Many zygomycetes are extremely fast growing and can inhibit other fungi when competing for food and space.

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