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Species Ecology List

The following list contains fungi commonly encountered in both indoor as well as outdoor environments. The information contained within was drawn from both the primary scientific literature and commonly available reference books. This information is constantly changing as more research is completed in this field and often the subject of conflicting opinions within the scientific community. We have compiled this data to assist our clients in their investigations; however Paracel is not responsible for any interpretations and actions initiated based on this information.

Common Propagules Identified by Direct Microscopic Exam

Acremonium species – indicates the sporulating structure was present on the sample. This implies the fungus was actively growing on the sample. *Acremonium* species are hydrophilic molds sometimes found on wet building material.

Acremonium spores – are hydrophilic molds sometimes found on wet building material.

Alternaria spores – are phylloplane fungi which are common in outdoor air samples. *Mystrospriella* or *Ulocladium* spores can sometimes be misidentified as *Alternaria* spores.

Ascospores – during the summer months it is common to find ascospores in outdoor air samples.

Amerospores – recovery can indicate the presence of many species including *Aspergillus*/*Penicillium*/*Trichoderma*, some known to be allergenic and toxigenic. Without culturing in a controlled environment, it could be inaccurate and misleading to identify these to the species level from the microscopic analysis alone. During the summer months it is common to find amerospores in outdoor air samples.

Aspergillus species – indicates the *Aspergillus* sporulating structure was present. This implies the fungus is actively growing on the substrate. This can indicate the presence of many species within this genus, some known to be allergenic and toxigenic. Without culturing in a controlled environment, it could be inaccurate and misleading to identify these to the species level from the microscopic analysis alone.

Aspergillus/*Penicillium* species – indicates either the *Aspergillus* or *Pencillium* sporulating structure was present but the genus was undifferentiable. Recovery can indicate the presence of many fungi within these genera, some known to be allergenic and toxigenic. Without culturing in a controlled environment, it could be inaccurate and misleading to identify these to the species level from the microscopic analysis alone.

Aspergillus/*Penicillium*-like spores – these spore types are undifferentiable by direct microscopy. Recovery can indicate the presence of many fungi within these genera, some known to be allergenic and toxigenic. Without culturing in a controlled environment, it could be inaccurate and misleading to identify these to the species level from the microscopic analysis alone. *Trichoderma*, *Acremonium*, *Aphanocladium*, *Beuveria*, *Gliocladium*, *Paecilomyces*, *Phialophora*, *Cladosporium*, amerospores or Basidiospores are often misidentified as *Aspergillus*/*Penicillium*-like spores.

Basidiospores – during the summer and fall months it is common to find basidiospores in outdoor air samples.

PARACEL LABORATORIES LTD.

Species Ecology List

Botrytis spores – are plant pathogens found in humid regions. They have been isolated from soil and are commonly found on vegetation. *Cochliobolus* or *Chaetomium* are often misidentified as *Botrytis* spores.

Cladosporium spores – are phylloplane fungi which are common in outdoor air samples however, some species have been found growing on wet building materials. *Cladophialophora*, *Exophiala*, *Fulvia*, *Gonatobotryum*, *Mycovellosiella*, *Periconiella*, *Phaeoramularia*, *Septonema* or *Stenella* spores are often misidentified as *Cladosporium* spores.

Chaetomium species – indicates *Chaetomium* ascocarps were visible on the sample. This implies the fungus is actively growing on the sample. These are soft-rot fungi that cause the destruction of cellulose layers in wood fibers and are associated with very wet wood (i.e. it is hydrophilic). Some strains produce mycotoxins.

Chaetomium spores – are soft-rot fungi that cause the destruction of cellulose layers in wood fibers and are associated with very wet wood (i.e. it is hydrophilic). Some strains produce mycotoxins.

Cunninghamella spores – have been isolated from a wide range of substrates.

Curvularia spores – are phylloplane fungi common in outdoor air samples. *Drechslera* or *Biopolaris* spores are often misidentified as *Curvularia* spores.

Dendryphiella spores – are phylloplane fungi, and known plant pathogens.

Dictyospore – is a spore type with multiple cells/septations in more than one plane. This spore type is found in such genera as *Ulocladium*, *Alternaria*, *Pithomyces* and *Stemphylium*.

Didymospore – is a spore with one septation and two cells. These include the Cladosporium genus.

Drech., Exsero., Helminth., Bipol. spores – refers to *Drechslera*, *Exserohilum*, *Helminthosporum* and *Bipolaris* species. These fungi are undifferentiable by microscopic analysis and are phylloplane fungi that are less common in outdoor air samples.

Epicoccum spores – are phylloplane fungi that are common in outdoor air samples.

Fusariella spores – are phylloplane fungi that are less common in outdoor air samples.

Fusarium spores – are known plant pathogens commonly found in the outdoor environment. *Clyclindrocarpon*, *Acremonium*, *Gliocladium*, *Microdontium* or *Monographella* spores are often misidentified as *Fusarium* spores.

Gliomastix spores – have been isolated from plant material.

Graphium species – have been isolated from plant material.

Helicospore – a spiral-shaped spore found in such fungi as Helicomyces species

Hyaline mycelial fragments – indicate colourless mycelial fragments were found on the sample. This may suggest mold presence/growth on or near the sample.

Memnoniella species – indicates the *Memnoniella* sporulating structure was visible on the sample. This implies the fungus is actively growing on the sample. *Memnoniella* species are associated with very wet wood and the paper-side of wallboard. While the spores of this species are not viable in samples that have not been wet in the recent past, they remain toxigenic and allergenic. It is more common in subtropical regions.

PARACEL
LABORATORIES LTD.

Species Ecology List

Memnoniella spores – are associated with very wet wood and the paper-side of wallboard. While the spores of this species are not viable in samples that have not been wet in the recent past, they remain toxigenic and allergenic. It is more common in subtropical regions.

Mucor spores – have been isolated from a wide range of substrates.

Nigrospora spores – are phylloplane fungi that are less common in outdoor air samples.

Oidium spores – during the summer months it is common to find these spores in outdoor air samples.

Paecilomyces spores – have been isolated from a wide range of substrates. Some species are known facultative pathogens that produce cytotoxic volatiles.

Penicillium species – indicates the *Penicillium* sporulating structure was present. The presence of the sporulating structure implies the fungus is actively growing on the substrate. This can indicate the presence of many species within this genus, some known to be allergenic and toxigenic. Without culturing in a controlled environment, it could be inaccurate and misleading to identify these to the species level from the microscopic analysis alone.

Peronospora spores – during the summer months it is common to find these spores in outdoor air samples.

Phialophora spores – is a soft-rot fungi that cause the destruction of cellulose layers in wood fibers and are associated with very wet wood.

Phoma species – indicates *Phoma* pycnidia were present on the sample. The presence of this structure implies the fungus is actively growing on the sample. *Phoma* species have been isolated from cellulosic substrates, and are hydrophilic. Some species are toxigenic and allergenic.

Phoma spores – have been isolated from cellulosic substrates, and are hydrophilic. Some species are toxigenic and allergenic.

Phragmospore – is a spore type with 2 or more transverse septa such as *Curvularia* and *Drechlera* species.

Pigmented mycelial fragments – indicate coloured mycelial fragments were found on the sample. This may suggest mold presence/growth on or near the sample.

Pithomyces spores – are found in outdoor air samples; however some species have also been found indoors growing on building materials. *Ulocladium* or *Alternaria* spores are often misidentified as *Pithomyces* spores.

Rhizopus spores – have been isolated from a wide range of substrates.

Rust spores – during the summer and fall months it is common to find rust spores in outdoor air samples.

Scolecospore – a very long spore.

Scopulariopsis spores – have been isolated from a wide range of substrates, some species have been isolated from building materials.

Smuts, Myxomycetes, *Periconia* species – are undiffentiable by direct microscopy. During the summer and fall months it is common to find these spores in outdoor air samples.

Sordaria spores – are uncommon fungi recovered from dung and soil.

PARACEL LABORATORIES LTD.

Species Ecology List

Stemphylium spores – are phylloplane fungi that are less common in outdoor air samples. *Monodictys* or *Ulocladium* spores are often misidentified as *Stemphylium* spores.

Stachybotrys species – indicates the *Stachybotrys* sporulating structure was present on the sample. This implies the fungus was actively growing on the sample. High exposure to some species may cause lung disease. They are hydrophilic molds that are isolated from materials containing cellulose, including the paper-side of wallboard and very wet wood. While the spores of this species are frequently not viable in samples that have not been wet in the recent past, they remain toxigenic and allergenic. Some species are known to produce mycotoxins.

Stachybotrys spores – high exposure to some species may cause lung disease. They are hydrophilic molds that are isolated from materials containing cellulose, including the paper-side of wallboard and very wet wood. While the spores of this species are frequently not viable in samples that have not been wet in the recent past, they remain toxigenic and allergenic. Some species are known to produce mycotoxins. *Memnoniella*, *Gliomastix* or *Periconia* spores are often misidentified as *Stachybotrys* spores.

Trichoderma spores – are soft-rot fungi, which degrade the cellulose fibers in wood. These fungi have been found growing on variety of building materials. Some species are known to produce potent mycotoxins.

Torula spores – have been isolated from a wide range of substrates. *Dendryphion* or *Dwayabeeja* spores are often misidentified as *Torula* spores.

Ulocladium spores – are phylloplane fungi that are common in outdoor air samples, however, some species have been found growing on wet building materials. *Alternaria*, *Monodictys* or *Pithomyces* spores are often misidentified as *Ulocladium* spores.

Yeast – have been found growing in high humidity environments and have a tendency to cluster.

Non-Fungal Particulates Identified by Direct Microscopic Exam

Actinomycetes – are a group of Gram positive, spore forming, filamentous bacteria. These bacteria are commonly found growing on insulation and are known to cause hypersensitivity pneumonitis. Actinomycetes are also known to be allergenic while some species are known to be infectious.

Bacterial smear – these tend to form clusters or smears on samples. High levels of bacteria maybe associated with many illnesses. High concentrations of Gram negative bacteria are associated with flu-like symptoms.

Pollen – during the summer months it is common to find pollen in outdoor air samples. Various pollens are known to be allergenic.

PARACEL
LABORATORIES LTD.

Species Ecology List

Common Fungi Identified in Culture

Absidia corymbifera – has been isolated from a wide range of substrates.

Acremonium species – are hydrophilic molds with some species sometimes found on wet building material.

Acremonium butyri – is a hydrophilic mold isolated from leaf litter, soil and dead wood.

Acremonium strictum – is a hydrophilic mold commonly found on wet building material. It has been found growing on wet insulation, wallboard, wood and ceiling tiles.

Alternaria species – most isolates in air samples are *A. alternata* but other species cause plant diseases which are common in outdoor air samples.

Alternaria alternata – is a phylloplane species that is common in outdoor air samples. *A. alternata* is known to be produce allergens while exposure has been shown to cause asthma attacks. This fungus is rarely found growing on wallboard yet commonly found on manufactured wood and ceiling tiles.

Ascomycetes – is a phylum of fungi characterized by their production of spores in sacs. During the summer months it is common to find ascomycetes in outdoor air samples while some ascomycetes have been found growing in the indoor environment.

Aspergillus species – have been isolated from a wide variety of building materials, some species from this genus are known to be allergenic and toxigenic.

Aspergillus auricomus – has been occasionally isolated from soil samples.

Aspergillus candidus – has been isolated from a wide range of substrates, mostly from tropical and subtropical regions. This fungus has rarely been isolated from ceiling tiles.

Aspergillus clavatus – is not found growing on building materials but is associated with stored grains and seeds. This fungus is rarely pathogenic and produces known mycotoxins.

Aspergillus flavus – is known to produce a very potent carcinogen but is rarely found growing on building materials. It is a common contaminant of peanuts and in Canada is a rare cause aspergillosis in immuno-compromised individuals.

Aspergillus fumigatus – is a facultative human pathogen known to cause aspergillosis in immuno-compromised individuals, as well as patients with cystic fibrosis or leukemia. *A. fumigatus* produces a wide array of mycotoxins and allergens. It is a thermophilic fungus commonly found in wood piles and leaf litter as well as in bat and bird droppings. This mold rarely grows on building materials unless on warm surfaces (areas or materials that get damp and are warm from heat sources such as hot water pipes or steam pipes).Its occurrence must be controlled in hospital settings particularly those which are under construction or renovation.

Aspergillus japonicus – is an uncommon species that has been isolated from very wet organic substrates.

Aspergillus niger – has been isolated from a wide range of substrates, it also is a common degrader of organics (food spoilage). *A. niger* is rarely isolated from building materials.

PARACEL
LABORATORIES LTD.

Species Ecology List

Aspergillus niveus – is uncommon but found on a wide range of substrates.

Aspergillus ochraceus – has commonly been isolated from wood but is rarely found on wallboard. *A. ochraceus* has also been isolated from foods such as coffee and grains. This fungus is known to produce a major toxin but it does not produce this toxin when growing on building material.

Aspergillus paradoxus – is an uncommon fungus isolated from soil.

Aspergillus penicillioides – is a xerophilic fungus that has been isolated from a wide range of substrates including house dust.

Aspergillus restrictus – is a xerophilic that has been isolated from a wide range of substrates.

Aspergillus sclerotiorum – has been isolated from a wide range of substrates, mostly from tropical and subtropical regions.

Aspergillus sydowii – has been commonly isolated from insulation, wallboard, wood and textile samples.

Aspergillus terreus – is rarely a facultative pathogen, hydrophilic fungus sometimes found on wood and textile samples.

Aspergillus unguis – has been isolated from soil and has rarely been isolated from building materials.

Aspergillus ustus – has commonly been isolated from insulation, wallboard and wood.

Aspergillus versicolor – is a salt tolerant moderate xerophile which is commonly found growing on wet wallboard, wood and ceiling tile. It is known to produces a potent mycotoxin.

Aspergillus wentii – has been isolated from a wide range of substrates.

Aureobasidium pullulans – is a phylloplane species which is common in outdoor air samples however; it has been found growing on insulation, wallboard and textile. *A. pullulans* is commonly isolated in both bathrooms and kitchens.

Black yeast – not a taxonomic but phenotypic description of a number of yeasts with black pigmentation found in outdoor air.

Botrytis species – are plant pathogens found in humid regions. They have been isolated from soil and are commonly found on vegetation.

Botrytis cinerea – is a plant pathogen found in humid regions. It has been isolated from soil and is commonly found on vegetation.

Chrysonilia sitophila – is associated with food products which has rarely been isolated from textiles and wallboard.

Cladosporium species – are phylloplane fungi which are common in outdoor air samples however, some species have been found growing on wet building materials.

Cladosporium cladosporioides – is a phylloplane species that is common in outdoor air samples.

Cladosporium herbarum – is a phylloplane species that is common in outdoor air samples which is known to produce a variety of allergens.

Cladosporium macrocarpum – is a phylloplane species that is common in outdoor air samples.

Cladosporium oxysporum – is a phylloplane species that is common in outdoor air samples. It is more common in the tropics and is associated with rotting organic material.

PARACEL LABORATORIES LTD.

Species Ecology List

Cladosporium sphaerospermum – is a phylloplane species that is common in outdoor air samples however; it has commonly been isolated from wallboard, wood, textiles and ceiling tiles.

Chaetomium species – are hydrophilic, soft rot fungi commonly found growing on very wet wood. Some species are known to produce mycotoxins.

Chaetomium globosum – is a hydrophilic, soft rot fungus commonly found growing on very wet wood. It can also be found growing on wet wallboard and textile samples. Some strains of *C. globosum* are known to produce mycotoxins. Detection of this fungus indoors is an indication of likely water damage within the building under investigation.

Cunninghamella species – have been isolated from a wide range of substrates.

Cunninghamella elegans – has been isolated from a wide range of substrates.

Curvularia species – are phylloplane fungi common in outdoor air samples.

Curvularia lunata – is associated with decaying wood in temperate environments.

Dendryphiella species – are phylloplane fungi, and known plant pathogens.

Drechslera species – are phylloplane fungi that are less common in outdoor air samples.

Emericella nidulans – has commonly been isolated from wallboard and wood samples.

Epicoccum nigrum – is a phylloplane species that is common in outdoor air samples.

Eupenicillium shearii – is a common soil fungus, with widespread distribution.

Eurotium species – are moderate xerophiles that have been isolated from a wide range of substrates such as insulation, wood and wallboard.

Eurotium amstelodamii – is a moderate xerophile that has been isolated from a wide range of substrates such as insulation, wood, textiles and wallboard.

Eurotium chevalieri – is a moderate xerophile that has been isolated from a wide range of substrates but is rarely isolated from building materials.

Eurotium herbariorum – is a moderate xerophile that has been isolated from a wide range of substrates such as insulation, wallboard and wood. *E. herbariorum* is also frequently found in settle house dust.

Eurotium repens – is a moderate xerophile that has been isolated from a wide range of substrates such as wallboard insulation, and wood.

Eurotium rubrum – is a moderate xerophile that has been isolated from wallboard.

Fusariella species – are phylloplane fungi that are less common in outdoor air samples.

Fusarium species – are plant pathogens commonly found in outdoor air samples. Species identification for this genus usually requires special culture media.

Geomyces pannorum – has infrequently been isolated from wallboard and ceiling tile.

Geotrichum candidum – is a facultative pathogen associated with standing water.

PARACEL
LABORATORIES LTD.

Species Ecology List

Gliomastix species – have been isolated from plant material.

Graphium species – have been isolated from plant material.

Memnoniella echinata – is sometimes mistakenly called *Stachybotrys echinata* due to its dark black spores yet its spores are produced in chains rather than slimy masses. This fungus is commonly found with *Stachybotrys chartarum*, grows on wet wallboard and is known to produce mycotoxins. Detection of this fungus indoors is an indication of water damage within the building under investigation.

Monilia species – are widespread soil fungi.

Mucor species – have been isolated from a wide range of substrates.

Mucor hiemalis – has been isolated from a wide range of substrates.

Mucor plumbeus – has been isolated from a wide range of substrates.

Mucor racemosus – has been isolated from a wide range of substrates.

Neosartorya fischeri – has been isolated from a wide range of substrates.

Nigrospora species – are phylloplane fungi that are less common in outdoor air samples.

Non-sporulating isolates – are fungi where no sporulation occurs, therefore making proper identification difficult. These tend to be either ascomycetes or basidiomycte fungi that require specific growth conditions. Non-sporulating isolates are listed by colony appearance to allow indoor/outdoor comparisons to be made.

Non-sporulating isolates with clamp connections – are found on wood and are invariably basidiomycetes which are wood rot fungi.

Paecilomyces species – have been isolated from a wide range of substrates. Some species are known facultative pathogens that produce cytotoxic volatiles.

Paecilomyces lilacinus – has rarely been isolated from wood.

Paecilomyces marquandii – has been isolated from soil and a wide range of substrates.

Paecilomyces niveus – is a xerophilic fungus usually isolated from soil.

Paecilomyces variotii – is a heat resistant thermophile that is acid and salt tolerant. This fungus is known to grown on insulation, wallboard and wood. It is rarely a facultative pathogen and produces cytotoxic volatile compounds.

Penicillium species – have been isolated from a wide variety of building materials, some species from this genus are known to be allergenic and toxigenic.

Penicillium aurantiogriseum – is a salt tolerant, moderate xerophile known to grow on wet wallboard, insulation and wood. *P. aurantiogriseum* is known to produce a variety of mycotoxins.

Penicillium bilaii – has been isolated from a wide range of substrates.

Penicillium brevicompactum – is a salt tolerant, moderate xerophile known to grow on wet wallboard, textiles and wood. *P. brevicompactum* is known to produce a variety of mycotoxins.

Penicillium canescens – is a soil fungus with world wide distribution that is rarely isolated from wood and insulation.

PARACEL
LABORATORIES LTD.

Species Ecology List

Penicillium chrysogenum – is famously known as the fungus in which the antibiotic penicllin was discovered. It is commonly found growing on wallboard, insulation, wood, ceiling tiles and textiles but it also grows on food products. *P. chrysogenum* is known to produce a variety of mycotoxins and allergens. Some strains taken from indoor environments have been shown to produce penicillin.

Penicillium citreonigrum – is an uncommon soil fungus with wide distribution that is rarely isolated from wood.

Penicillium citrinum – has been isolated from a wide range of building materials including wallboard, wood ceiling tiles and textiles.

Penicillium commune – is commonly found growing on wallboard, wood, ceiling tile and textiles.

Penicillium corylophilum – has been isolated from wood, ceiling tile and textiles.

Penicillium crustosum – is a salt and acid tolerant, moderate xerophile which rarely grows on building materials but is known to produce a variety of mycotoxins.

Penicillium decumbens – is a moderate xerophile which has been isolated from insulation, wallboard, wood, ceiling tile and textiles.

Penicillium digitatum – has been isolated from orange peels, and is known to cause the rotting of citrus fruit.

Penicillium echinulatum – is uncommon and has been isolated from a wide range of substrates.

Penicillium expansum – is commonly found on fruit and has been isolated from wallboard.

Penicillium fellutanum – is a moderate xerophile which has been isolated from insulation, wallboard and wood.

Penicillium funiculosum – is salt tolerant and has infrequently been isolated from wood.

Penicillium glabrum – has been is a common degrader of organic materials which has been isolated from insulation, wood and ceiling tile.

Penicillium griseofulvum – has been isolated from insulation, wallboard, wood and ceiling tile.

Penicillium islandicum – is an obligate citrus pathogen, uncommonly found in North America.

Penicillium italicum – has been isolated from rotting citrus fruits and occasionally from soil.

Penicillium janczewskii – is a soil fungus with world wide distribution.

Penicillium janthinellum – is an acid and salt tolerant fungus which is also heat resistant. This fungus is frequently found growing on wall board, insulation and wood samples. It has rarely been reported to cause invasive fungal disease.

Penicillium lividum – has widespread distribution; isolated particularly from woodland soils.

Penicillium melinii – is an uncommon soil fungus with widespread distribution.

Penicillium miczynskii – has been isolated from a wide range of substrates.

Penicillium minioluteum – has been isolated from a wide range of substrates, particularly soil. *P. minioluteum* is also found growing on wallboard, wood and textiles.

Penicillium olsonii – has been isolated from a wide range of substrates, including wallboard and wood.

PARACEL
LABORATORIES LTD.

Species Ecology List

Penicillium oxalicum – has been isolated from a wide range of substrates, including wallboard, wood and textiles.

Penicillium paxilli – has been isolated from soil.

Penicillium pinophilum – has been isolated from a wide range of substrates.

Penicillium purpurogenum – has been isolated from a wide range of substrates, including wallboard, wood, ceiling tiles and textiles.

Pencillium roqueforti – is used for the production blue cheese but is not found growing on building material. *P. roqueforti* is an acid tolerant, spoilage fungus with widespread distribution. Presence in indoor samples may be an indication of rotting food products.

Penicillium restrictum – has been isolated from a wide range of substrates.

Penicillium rugulosum – has been isolated from wallboard and wood.

Penicillium sclerotiorum – has been isolated from a wide range of substrates.

Penicillium simplicissimum – has been isolated from a wide range of substrates, including wallboard, wood, textiles and insulation.

Penicillium solitum – has been isolated from a wide range of substrates, including insulation, wallboard, wood and textiles.

Penicillium spinulosum – has been isolated from a wide range of substrates, including insulation, wallboard wood and ceiling tiles.

Penicillium thomii – has been isolated from a wide range of substrates, including insulation and wallboard.

Penicillium variabile – has been isolated from wallboard, wood, ceiling tiles and textiles.

Penicillium verrucosum – has been isolated from a wide range of substrates and rarely from textiles.

Penicillium viridicatum – is a salt tolerant, moderate xerophile which is sometimes found growing on insulation and is known to produce a variety of mycotoxins.

Penicillium waksmanii – is an uncommon soil fungus with widespread distribution which has rarely been isolated from wood.

Periconia cambrensis – is associated with decaying wood in temperate environments.

Periconia species – are associated with decaying wood in temperate environments.

Phialophora species – are soft-rot fungi that cause the destruction of cellulose layers in wood fibers and are associated with very wet wood.

Phialophora bubakii – has been isolated from insulation.

Phialophora melinii – is a soft-rot fungus that causes the destruction of cellulose layers in wood fibers and is associated with very wet wood. *P. melinii* has also been isolated from insulation.

Phoma species – are hydrophilic fungi that are rarely found growing on building material. Some species are known to produce mycotoxins and allergens. This genus of fungi are rarely identified to species level due difficulties in species differentiation.

PARACEL
LABORATORIES LTD.

Species Ecology List

Phylloplane species – are common in outdoor air samples however; some species have been found growing on wet building materials.

Pink yeasts – not a taxonomic but phenotypic description of a number of yeasts with red pigmentation found in outdoor air and possibly in dirty standing water.

Pithomyces species – are found in outdoor air samples; however some species have also been found indoors growing on building materials.

Pithomyces chartarum – is a phylloplane species that is common in outdoor air samples however; it has been found growing on wood and ceiling tiles.

Rhizopus species – have been isolated from a wide range of substrates.

Rhizopus stolonifer – has been isolated from a wide range of substrates.

Scopulariopsis species – have been isolated from a wide range of substrates with some species being isolated from a variety of building materials.

Scopulariopsis brevicaulis – has been isolated from wallboard, wood, ceiling tiles and textiles.

Scopulariopsis brumptii – has been isolated from wallboard, textiles and wood.

Scopulariopsis candida – has been isolated from wallboard, wood and textiles.

Sordaria species – are uncommon fungi recovered from dung and soil.

Sporobolomyces roseus – is a phylloplane, basidiomycetous yeast which is pink or red and found on the surface of leaves.

Stachybotrys chartarum – known as the "toxic black mold" which has gained much media attention. This hydrophilic fungus grows readily on the paper-side of very wet wallboard but the spores quickly lose viability following the wetting event, thereby causing it to sometimes be overlooked using culturable only methods. *S. chartarum* is known to produce potent mycotoxins and is allergenic. In 2003 it was split into two species based on morphological and molecular taxonomic differences, with the new species named *S. chlorohalonata*. Detection of this fungus indoors is an indication of likely water damage within the building under investigation.

Stachybotrys chlorohalonata – in 2003 was split from a description of *S. chartarum* that included both taxa. This fungus also produces a variety of mycotoxins and is commonly found growing on the paper side of wet drywall. Detection of this fungus indoors is an indication of likely water damage within the building under investigation.

Stemphylium species – are phylloplane fungi that are less common in outdoor air samples.

Syncephalastrum racemosum – has been isolated from a wide range of substrates, mostly from tropical and subtropical regions. *S. racemosum* has also been isolated from insulation and textiles.

Talaromyces flavus – is a rare species isolated from a wide range of substrates.

Talaromyces luteus – has been isolated from a wide range of substrates.

PARACEL
LABORATORIES LTD.

Species Ecology List

Talaromyces wortmanii – has been isolated from a wide range of substrates.

Torula herbarum – has been isolated from a wide range of substrates.

Torula species – have been isolated from a wide range of substrates.

Trichoderma species – are soft-rot fungi, which degrade the cellulose fibers in wood. These fungi have been found growing on variety of building materials. Some species are known to produce mycotoxins.

Trichoderma harzianum – is a soft-rot fungus, which degrades the cellulose fibers in wood. This fungus has been found growing on wallboard, wood, ceiling tiles and textiles. *T. harzianum* is known to produce a variety of mycotoxins.

Trichoderma konigii – is a soft-rot fungus that degrades the cellulose fibers in wood. This fungus has been found growing on wallboard, wood, and textiles.

Trichoderma viride – is a soft-rot fungus, which degrades the cellulose fibers in wood. This fungus has been found growing on wallboard, wood and textiles. *T. viride* is known to produce a variety of mycotoxins.

Trichothecium roseum – is an uncommon fungus, which rarely is isolated from wallboard.

Tritirachium oryzae – has been isolated from insulation, wood and ceiling tile.

Ulocladium species – are phylloplane fungi that are common in outdoor air samples however, some species have been found growing on wet building materials.

Ulocladium botrytis – is a phylloplane species that is common in outdoor air samples however; it has infrequently been found growing on wood.

Ulocladium chartarum – is a phylloplane species that is common in outdoor air samples however; it has been found growing on insulation, ceiling tile, textiles and wood. Detection of this fungus indoors is an indication of likely water damage within the building under investigation.

Verticillium species – are plant pathogens, but can occur on wood and bark. Some *Verticillium* species have been found growing on building materials.

Wallemia sebi – is an extreme xerophile that grows on organic materials. It has rarely been found growing on wood and is often isolated from dust samples.

Yeasts – have been found growing in high humidity environments.

PARACEL
LABORATORIES LTD.

Species Ecology List

Other Isolates Identified in Culture

Actinomycetes – are a group of Gram positive, spore forming, filamentous bacteria. These bacteria are commonly found growing on insulation and are known to cause hypersensitivity pneumonitis. Actinomycetes are also known to be allergenic while some species are known to be infectious.

Bacteria – most bacteria in indoor air are associated with occupancy; high concentrations of such bacteria are often considered a sign of poor ventilation. Rarely, very high concentrations of Gram negative bacteria are associated with flu-like symptoms due to endotoxin exposure. This arises from poorly-maintained cooling towers or other water-handling systems.

Notes:

Those isolates that are not listed to the species level are cultural variants that could not be identified.

The samples submitted were enumerated and representative isolates transferred to malt extract and Czapek agars for identification.

References & Recommended Reading

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