eurofins | Built Environment Testing

Summary List of Fungi Included in this Glossary Report

Alternaria sp.
Ascospores
Aspergillus sp.
Basidiospores
Chaetomium sp.
Cladosporium sp.
Curvularia sp.
Drechslera, Bipolaris, and Exserohilum group
Epicoccum sp.
Memnoniella sp.
Myxomycetes
Penicillium sp.
Pithomyces sp.
Rusts
Smuts
Stachybotrys sp.
Ulocladium sp.

Alternaria sp.

Mitosporic fungus. Hyphomycetes. Anamorphic Pleosporaceae.

Distribution
Ubiquitous;
cosmopolitan.
Approx. 40-50 species.

Where Found
Soil, dead organic debris, on food stuffs and textiles. Plant pathogen, most commonly on weakened plants.

Mode of Dissemination
Dry spore.
Wind.

Allergen
Commonly recognized.
Type I allergies (hay fever, asthma).
Type III hypersensitivity pneumonitis: Woodworker's lung, Apple store hypersensitivity.
May cross react with Ulocladium, Stemphylium, Phoma, others.

Potential Opportunist of Pathogen
Nasal lesions, subcutaneous lesions, nail infections; the majority of infections reported from persons with underlying disease or in those taking immunosuppressive drugs. Most species of Alternaria do not grow at 37oC.

Potential Toxin Production
A. alternata produces the antifungal alternariol. Other metabolites include AME (alternariol monomethylether), tenuazonic acid, and altertoxins (mutagenic).

Growth Indoors
On a variety of substrates.
Aw=0.85-0.88 (minimum for various species)

Industrial Uses
Biocontrol of weeds and other plants.

Other Comments
One of the most common fungi worldwide.

Characteristics: Growth/Culture
Grows well on general fungal media. Colonies are dark olive green to brown, floccose to velvety (heavily sporulating). Colonies become pleomorphic over time, and lose the ability to sporulate with subsequent transfer.

Notes on Spore Trap Recognition
Distinctive. Young spores or spore fragments may be confused with Ulocladium, Pithomyces, Stemphylium, or Epicoccum. (Some Alternaria species cannot be separated from Ulocladium.)

Notes on Tape Lift Recognition
Distinctive. Readily identifiable on tape lift samples.

Ascospores

Spore category. Produced by morels, truffles, cup fungi, ergot and many micro-fungi.

Distribution
Ubiquitous.
More than 3,000 genera.

Where Found
Saprophytes and plant pathogens. Found everywhere in nature.

Mode of Dissemination
Spores are predominantly forcibly discharged during periods of high humidity or rain.

Allergen
Highly variable, dependent on genus and species. Poorly studied.

Potential Opportunist of Pathogen
Dependent on genus and species, but the vast majority do not cause disease.

Potential Toxin Production
Very many, dependent on genus and species.

Growth Indoors
The cellulolytic ascomycetes Chaetomium and Ascotricha are frequently found growing indoors on damp substrates.

Industrial Uses
Dependent on genus and species.

Other Comments
Some of the common asexual fungi such as Penicillium and Aspergillus produce sexual forms under certain conditions; these are classified in the ascomycete group and given distinct names. For example, the most common sexual forms of Penicillium are Talaromyces and Eupenicillium; the most common sexual forms of Aspergillus are Eurotium and Emericella.

Characteristics: Growth/Culture
While some ascomycetes sporulate in culture (Chaetomium, Pleospora), many are parasitic plant pathogens, and sporulate (grow) only on living host plants.

Notes on Spore Trap Recognition
Many ascospores are distinctive. Many others will be classified as "other colorless." In general, ascospores are recognizable by the fact that they have no attachment points, and are sometimes enclosed in gelatinous sheaths or within a sac.

Notes on Tape Lift Recognition
Many ascomycetes are distinctive, and readily identified on tape samples, especially if fruiting bodies are present.

Aspergillus sp.

Mitosporic fungus. Hyphomycetes.Teleomorphs (sexual state): Eurotium, Neosartorya, Emericella (Ascomycetes).

Distribution

Ubiquitous;
cosmopolitan.
Approx. 200 species.

Where Found

Soil, decaying plant debris, compost piles, stored grain.

Mode of Dissemination

Dry spore.
Wind.

Allergen

Common.
Type I allergies (hay fever, asthma).
Type III hypersensitivity pneumonitis: Humidifier lung, Malt worker's lung, Compost lung, Wood trimmer's disease, Straw hypersensitivity, Farmer's lung, Oat grain hypersensitivity, others.
Other: A. fumigatus: allergic bronchopulmonary aspergillosis (ABPA), allergic fungal sinusitis.

Potential Opportunist of Pathogen

Respiratory, invasive, cutaneous, ear, and corneal disease. Severe, invasive disease is usually associated with immunosuppressed hosts. Many species grow at 37oC (body temperature).
A. fumigatus: fungus ball and invasive disease.
A. flavus: nasal sinus lesions, invasive disease.
A. niger: "Swimmer's ear," and invasive disease.

Potential Toxin Production

Partial list:
A. flavus: aflatoxin B1 & B2, cyclopiazonic acid, kojic acid
A. fumigatus: ergot alkaloids, fumigaclavines, gliotoxin, fumigatoxin, fumigillin, fumitremorgens, helvolic acid, tryptoquivaline tremorgens, verruculogen.
A. niger: malformin C, oxalic acid.
A. ustus: austocystins.
A. versicolor: aspercolorin, averufin, cyclopiazonic acid, sterigmatocystin, versicolorin.

Growth Indoors

On a wide range of substrates. Water requirements range widely (dependent on species).
Aw=0.71-0.94 (minimum for various species).

Industrial Uses

Many, including practical applications in food production. For example, A. oryzae is used to ferment soybeans to soy sauce. A. terreus produces mevinolin which is able to reduce blood cholesterol; A. niger is used in the bread and beer making industries (enzyme production) and also is able to decompose plastic. A. niger and A. ochraceus are used in cortisone production.

Other Comments

Aspergillus is one of the most common fungal genera, worldwide, and Aspergillus fumigatus is one of the most common species found.

Aspergillus sp.

(continued)

Characteristics: Growth/Culture

Aspergillus species grow well on general fungal media. Some xerophilic species prefer dryer conditions.

Notes on Spore Trap Recognition

Free spores are indistinguishable from Penicillium, and other genera with small round to oval colorless spores. Penicillium/Aspergillus spores may have remnants of cell wall connections.

Notes on Tape Lift Recognition

If sporulating structures are present, Aspergillus is readily identifiable on tape samples. Old growth or samples with very large numbers of spores may not contain structures necessary for identification and are reported as "spores typical of Penicillium/Aspergillus."

Basidiospores

Spore category. Produced by mushrooms, puffballs, shelf fungi, rusts, smuts, and many other fungi.

Distribution
Ubiquitous;
cosmopolitan.
Approx. 1,200 genera.

Where Found
Saprophytes and plant pathogens.
Gardens, forests, woodlands.

Mode of Dissemination
Wind; spore release (active mechanism) during periods of high humidity or rain.

Allergen
Probably common.
Type I allergies (hay fever, asthma).
Type III hypersensitivity pneumonitis: Lycoperdonosis (puffball spores), Mushroom culture hypersensitivity.

Potential Opportunist of Pathogen
Asexual forms may cause rare opportunistic infections.
The yeast Cryptococcus neoformans is a basidiomycete.

Potential Toxin Production
Mushroom toxicosis (poisoning) is usually a result of ingestion of the following toxins: amanitins, monomethyl-hydrazine, muscarine, ibotenic acid, psilocybin.

Growth Indoors
Serpula lacrimans, 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.

Industrial Uses
Many mushrooms are edible, and very important in the food industries.

Other Comments
Occasionally, a benign, non-wood rotting mushroom will fruit inside a building, growing in some unique ecological niche if enough moisture is present.
If mushrooms are found growing indoors we ask clients to submit the entire mushroom for identification.

Characteristics: Growth/Culture
Most Basidiomycetes will not fruit on laboratory media. Many will form arthrospores or sterile mycelia on laboratory media.

Notes on Spore Trap Recognition
Most basidiospores have a distinctive asymmetrical attachment point. Many basidiomycetes have recognizable spores. Serpula, the agent of dry rot, with tan-orange basidiospores, can sometimes be identified on spore trap slides.

Basidiospores

(continued)

Notes on Tape Lift Recognition

Except for the occasional finding of Serpula (above), basidiospores are rarely found on tape lifts, except as a part of normal influx of outdoor spores.

Chaetomium sp.

Ascomycete.

Distribution
Ubiquitous;
cosmopolitan.
Approx. 81 species.

Where Found
Soil, seeds, cellulose substrates, dung, woody and straw materials.

Mode of Dissemination
Spores are formed inside fruiting bodies. Spores are forced out an opening and spread by wind, insects, water splash.

Allergen
Not well studied.
Type I allergies (hay fever, asthma).

Potential Opportunist of Pathogen
Uncommon agent of onychomycosis (nail infection).

Potential Toxin Production
Chaetomin. Chaetomium globosum produces chaetoglobosins. Sterigmatocystin is produced by rare species. Other compounds produced (which may not be mycotoxins in the strict sense) include a variety of mutagens.

Growth Indoors
Widespread, cellulolytic, very commonly found on damp sheetrock paper.

Industrial Uses
Used in textile testing and the production of cellulase.

Other Comments
None.

Characteristics: Growth/Culture
Grows and sporulates on general fungal media, may need 8-20 days for fruiting body production and sporulation.

Notes on Spore Trap Recognition
Distinctive. Chaetomium globosum has small brown "lemon" or "football-shaped" ascospores.

Notes on Tape Lift Recognition
Distinctive and readily identifiable on tape lifts.

Cladosporium sp.

Mitosporic fungus. Hyphomycetes. Teleomorphs (sexual state): Mycosphaerella, Venturia (Ascomycetes).

Distribution
Ubiquitous;
cosmopolitan.
Approx. 28-40 species. One of the most common genera, worldwide.

Where Found
Soil of many different types, plant litter, plant pathogen, leaf surfaces, old or decayed plants.

Mode of Dissemination
Dry spore (formed in very fragile chains, easily dispersed).
Wind.

Allergen
Common and important allergen.
Type I allergies (hay fever, asthma).
Type III hypersensitivity pneumonitis: Hot tub lung, Moldy wall hypersensitivity.

Potential Opportunist of Pathogen
Generally, non-pathogenic. One species, Cladosporium carrionii, is an agent of chromoblastomycosis in subtropical and tropical regions (grows at 35-37oC).

Potential Toxin Production
Cladosporin, emodin.
(Neither are highly toxic.)

Growth Indoors
Widespread, on many substrates, including textiles, wood, moist window sills. Grows at 0oC, and so is associated with refrigerated foods.
Aw=0.85-0.88 (minimum for various species).

Industrial Uses
C. herbarum produces enzymes which are used in the transformation of steroid intermediates such as pregnenolone and progesterone, biologically important hormones used in the industrial production of oral contraceptives.

Other Comments
G.S. deHoog & J. Guarro have placed species associated with human infection in a new genus Cladophialophora, i.e. Cladophialophora carrionii, C. bantiana. Older medical texts refer to this fungus by its former name Hormodendron species.

Characteristics: Growth/Culture
Grows on all general fungal media. Some species sporulate better than others, and some may need cycles of light in order to produce spores.

Notes on Spore Trap Recognition
Distinctive, with wide variation in size and shape. Spores with dark attachment scars and some olive to brown pigmentation are identified as Cladosporium.

Cladosporium sp.
(continued)

Notes on Tape Lift Recognition
Distinctive, readily identifiable on tape lifts.

Curvularia sp.

Mitosporic fungus. Hyphomycetes. Teleomorph (sexual state): Cochliobolus (Ascomycete).

Distribution
Ubiquitous;
cosmopolitan.
More commonly found in tropical, subtropical regions.
Approx. 30 species.

Where Found
Plant debris, soil, facultative plant pathogens of tropical or subtropical plants.

Mode of Dissemination
Dry spore.
Wind.

Allergen
Common.
Type I allergies (hay fever, asthma).
Other: A relatively common cause of allergic fungal sinusitis.

Potential Opportunist of Pathogen
Occasionally a cause of onychomycosis, ocular keratitis, sinusitis, mycetoma, pneumonia, endocarditis, cerebral abscess, and disseminated infection. Most cases are from immunocompromised patients.

Potential Toxin Production
Not known.

Growth Indoors
Yes, on a variety of substrates.

Industrial Uses
Not known.

Other Comments
None.

Characteristics: Growth/Culture
Grows well on general fungal media; most isolates need "light/dark cycling" for sporulation. Colonies are shades of gray to brown.

Notes on Spore Trap Recognition
Distinctive; large second or center cell gives conidia pronounced curved shape. Conidia from species with less pronounced curve may be misidentified. Some Drechslera spores are similar.

Notes on Tape Lift Recognition
Distinctive, readily identifiable on tape lifts.

Drechslera, Bipolaris, and Exserohilum group

Mitosporic fungi. Hyphomycetes. Teleomorphs (sexual state): Pyrenophora, Cochliobolus, Setosphaeria (Ascomycetes).

Distribution

Ubiquitous;
cosmopolitan.
Some species are more commonly found in tropical or subtropical areas.
Drechslera: Approx. 20 species.
Bipolaris: Approx. 20 species.
Exserohilum: Approx. 8 species.

Where Found

Plant debris, soil. Plant pathogens of numerous plants, particularly grasses.

Mode of Dissemination

Dry spore.
Wind.

Allergen

Common.
Type I allergies (hay fever, asthma).
Other: Most commonly reported cause of allergic fungal sinusitis.

Potential Opportunist of Pathogen

Occasionally a cause of phaeohyphomycosis, including keratitis, sinusitis, and osteomyelitis. These infections most often occur in immunocompromised persons, although infections also occur in normal hosts. One case of brain abscess reported in an immunocompromised patient.

Potential Toxin Production

Not known.

Growth Indoors

Yes, on a variety of substrates.

Industrial Uses

Not known.

Other Comments

None.

Characteristics: Growth/Culture

Grows well on general fungal media although many isolates need "light/dark cycling" for sporulation. Colonies are shades of dark gray to brown.

Notes on Spore Trap Recognition

Group includes Drechslera, Bipolaris, Exserohilum and the rare Helminthosporium. Members of this group can best be differentiated in culture.

Notes on Tape Lift Recognition

This group is readily identifiable on tape lifts.

Epicoccum sp.

Mitosporic fungus. Hyphomycetes.

Distribution
Ubiquitous;
cosmopolitan.
Two species.

Where Found
Plant debris, soil. Secondary invader of damaged plant tissue.

Mode of Dissemination
Dry spore.
Wind.
Spores also released by hygroscopic movement.

Allergen
Common.
Type I allergies (hay fever, asthma).

Potential Opportunist of Pathogen
No cases of infection have been reported in humans or animals.

Potential Toxin Production
Antibiotic substances produced: flavipin, epicorazine A & B, indole-3-acetonitrile.

Growth Indoors
Yes, on many different substrates including paper, textiles, and insects.
Aw=0.86-0.90 (minimum).

Industrial Uses
None known.

Other Comments
None.

Characteristics: Growth/Culture
Grows well on general fungal media, although sporulation may be strain dependent. Colonies typically have orange reverse pigment.

Notes on Spore Trap Recognition
Intact spores are distinctive. Young spores or spore fragments may be confused with Ulocladium, Stemphylium or possibly Alternaria. Commonly found in outdoor air.

Notes on Tape Lift Recognition
Distinctive, readily identifiable on tape lifts.

Memnoniella sp.

Mitosporic fungus. Hyphomycetes.

Distribution
Cosmopolitan.
Approx. 5 species.

Where Found
Plant litter, soil, many types of plants and trees.

Mode of Dissemination
Dry spore.
Wind.

Allergen
Not studied.

Potential Opportunist of Pathogen
Not known.

Potential Toxin Production
Trichothecenes (trichodermol and trichodermin) and griseofulvins. Trichothecene toxicity is due to the ability to bind ribosomal protein. Griseofulvin has been made commercially available as an anti-dermatophyte drug.

Growth Indoors
Yes, on a variety of substrates.
Cellulolytic.

Industrial Uses
Not known.

Other Comments
Very closely related to Stachybotrys.
M. echinata produces acetic acid.

Characteristics: Growth/Culture
Grows on general fungal media, forming dark gray to black colonies. In Memnoniella the spores do not slime down but are held in long chains.

Notes on Spore Trap Recognition
Distinctive. Frequently found in conjunction with Stachybotrys species.

Notes on Tape Lift Recognition
Distinctive, readily identifiable on tape lifts.

Myxomycetes

Taxonomic fungal category. Slime molds.

Distribution

Ubiquitous;
cosmopolitan.
Approx. 45 genera.

Where Found

Decaying logs, stumps and dead leaves, particularly in forested regions.

Mode of Dissemination

These organisms have both dry and wet spores.
Wind disperses the dry fruiting body spores, whereas the wet amoebic phase is motile.

Allergen

Type I allergies (hay fever, asthma).
(Lycogala used in one skin test survey.)

Potential Opportunist of Pathogen

No reports of human infection.

Potential Toxin Production

None.

Growth Indoors

Occasionally found indoors.

Industrial Uses

None known.

Other Comments

The myxomycetes have an interesting life cycle which includes a wet spore phase and a dry spore phase. When conditions are favorable, they move about like amoebae, resembling primitive animals. When conditons are not favorable they form a resting body (sclerotium) with dry, airborne spores. The myxomycetes are not considered to be true fungi.

Characteristics: Growth/Culture

The myxomycetes do not grow on general fungal media.

Notes on Spore Trap Recognition

While a few are distinctive, many of the myxomycete spores are difficult to distinguish from the smuts. These spores are placed in our group "smuts, myxomycetes, Periconia," due to their similar "round, brown" morphology.

Notes on Tape Lift Recognition

Occasionally seen and identified on tape lifts. Distinctive especially when fragments of the lacy fruiting bodies are present.

Penicillium sp.

Mitosporic fungus. Hyphomycetes. Teleomorphs (sexual state): Eupenicillium, Talaromyces (Ascomycetes).

Distribution
Ubiquitous;
cosmopolitan.
Approx. 200 species.

Where Found
Soil, decaying plant debris, compost piles, fruit rot. P. glabrum has been isolated from diesel fuel.

Mode of Dissemination
Dry spore.
Wind, insects (fungus serves as a food source for storage mites).

Allergen
Common.
Type I allergies (hay fever, asthma).
Type III hypersensitivity pneumonitis: Cheese washer's lung, Woodman's lung, Moldy wall hypersensitivity.

Potential Opportunist of Pathogen
One species of Penicillium species, P. marneffei, is a cause of human infection. It has not yet been found in the United States.

Potential Toxin Production
Various toxins by different species: penicillic acid, peptide nephrotoxin, viomellein, xanthomegin, xanthocillin X, mycophenolic acid, roquefortine C & D, citrinin, penicillin, cyclopiazonic acid, isofumigaclavine A, penitrem A, decumbin, patulin citreoviridin, griseofulvin, verruculogen, ochratoxin, chrysogine, and meleagrin.

Growth Indoors
Widespread. Commonly found in house dust. Grows in water damaged buildings on wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint. Also found in blue rot of apples, dried foodstuffs, cheeses, fresh herbs, spices, dry cereals, nuts, onions, and oranges.
Aw=0.78-0.86 (minimum for various species).

Industrial Uses
Roquefort and camembert cheese, salami-sausages starter culture; anti-bacterial antimicrobial penicillin, and anti-fungal antimicrobial griseofulvin.

Other Comments
Penicillium is one of the most common fungal genera, worldwide.
Microbial volatile organic compounds (MVOCs) produced: Penicillium commune produces 2-methyl-isoborneol, a heavy musty odor.

Characteristics: Growth/Culture
Grows readily on general fungal media. Colonies are usually shades of blue, green, and white.

Notes on Spore Trap Recognition
Free spores are indistinguishable from Aspergillus and other genera with small round to oval colorless or slightly pigmented spores.
Penicillium/Aspergillus spores may have remnants of cell wall connections.

Penicillium sp.

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Notes on Tape Lift Recognition

Penicillium is readily identifiable on tape samples if sporulating structures are present. Old growth or samples with high numbers of spores may not exhibit sporulation structures necessary for identification and are therefore reported as "spores typical of Penicillium/Aspergillus."

Pithomyces sp.

Mitosporic fungus. Hyphomycetes. Teleomorph (sexual state): Leptosphaerulina (Ascomycete).

Distribution
Ubiquitous;
cosmopolitan.
Approx. 15 species.

Where Found
Common on dead leaves of more than 50 different plants, especially leaf fodders. Soil, grasses.

Mode of Dissemination
Dry spore.
Wind.

Allergen
Not studied.

Potential Opportunist of Pathogen
No reports of infections.

Potential Toxin Production
Sporidesmin.

Growth Indoors
Rarely found growing indoors.
Can grow on paper.

Industrial Uses
Not known.

Other Comments
Pithomyces chartarum is one of the causes of facial eczema in sheep in New Zealand.

Characteristics: Growth/Culture
Grows readily on general fungal media; sporulation may be slow, and may require a "light/dark cycle." Colonies are shades of tan to brown.

Notes on Spore Trap Recognition
Distinctive multicelled, brown conidia of Pithomyces chartarum are recognizable on spore trap slides. Other species are common but more difficult.

Notes on Tape Lift Recognition
Distinctive.
Rarely found on tape lifts.

Rusts

Fungal group. Uredinales. Basidiomycetes.

Distribution
Ubiquitous;
cosmopolitan.
Approx. 14 families, 105 genera and 5,000 species.

Where Found
Grasses, flowers, trees and other living plant materials.

Mode of Dissemination
Rusts have both wet and dry spores. Wind disperses the urediospores, teliospores, basidiospores, and aeciospores. The basidiospores and aeciospores have an active spore release mechanism.

Allergen
Type I allergies (hay fever, asthma).

Potential Opportunist of Pathogen
No reports of human infection.

Potential Toxin Production
Not known.

Growth Indoors
Rusts do not grow indoors unless their host plants are present. They are parasitic plant pathogens and need a living host for growth.

Industrial Uses
Not known.

Other Comments
Rusts are members of the Basidiomycetes class. They have a complex life cycle, producing five different spore types in two different plant hosts. Spore types include: basidiospores, pycniospores, aeciospores, urediospores, and teliospores.

Characteristics: Growth/Culture
Rusts do not grow on ordinary laboratory media. They require a living host plant for growth.

Notes on Spore Trap Recognition
Rust urediospores and teliospores are airborne; they are distinctive and readily identifiable on spore trap slides.

Notes on Tape Lift Recognition
Urediospores and teliospores are distinctive and readily identifiable on tape lifts. They may be found in dust as part of the normal influx of outdoor microbial particles.

Smuts

Fungal category. Ustilaginales. Basidiomycetes.

Distribution
Ubiquitous;
cosmopolitan.
Two families, 50 genera, and 950 species.

Where Found
On cereal crops, grasses, weeds, other fungi, and on other flowering plants.

Mode of Dissemination
Wind disperses the powdery brown teliospores of smut.

Allergen
Type I allergies (hay fever, asthma).

Potential Opportunist of Pathogen
No reports of human infection by the plant parasitic forms.

Potential Toxin Production
Not known.

Growth Indoors
Smuts do not usually grow indoors. They are parasitic plant pathogens that require a living host for the completion of their life cycle.

Industrial Uses
Not known.

Other Comments
Smuts are members of the Basidiomycetes and have two spore types: teliospores (dry, powdery stage) and basidiospores (yeast stage).

Characteristics: Growth/Culture
The airborne phase (teliospores) of smut requires a living host for growth and will not develop on laboratory media. The yeast phase (basidiospores) is saprophytic and will grow on general fungal media.

Notes on Spore Trap Recognition
Smut teliospores cannot easily be distinguished from the myxomycetes and certain species of Periconia. They are reported in the "round, brown" spore category: "Smuts, Periconia, myxomycetes."

Notes on Tape Lift Recognition
The teliospores of smuts are somewhat distinctive en masse. They are found in dust as part of the normal influx of outdoor particles.

Stachybotrys sp.

Mitosporic fungus. Hyphomycetes.

Distribution

Ubiquitous;
cosmopolitan.
Approx. 15 species.

Where Found

Soil, decaying plant substrates, decomposing cellulose (hay, straw), leaf litter, and seeds. Growth not influenced by soil pH or copper; growth enhanced by manure.

Mode of Dissemination

Wet spore.
Insects, water splash.
Wind when dried out.

Allergen

Not well studied.
Type I allergies reported.

Potential Opportunist of Pathogen

No reports of human infection. (No species grow well at 37oC.)

Potential Toxin Production

Macrocyclic trichothecenes: verrucarin J, roridin E, satratoxin F, G & H, sporidesmin G, trichoverrol; cyclosporins, stachybotryolactone.
Stachybotrys mycotoxicosis: human toxicosis has been described; may be characterized by dermatitis, cough, rhinitis, itching or burning sensation in mouth, throat, nasal passages and eyes. The best described toxicoses are from domestic animals that have eaten contaminated hay and straw or inhaled infected material from contaminated bedding.

Growth Indoors

Commonly found indoors on wet materials containing cellulose, such as wallboard, jute, wicker, straw baskets, and other paper materials. (See "Characteristics: Growth/Culture").
Aw=0.94

Industrial Uses

Not known.

Other Comments

Many human reports of Stachybotrys toxicosis are anecdotal. Stachybotrys mycotoxicosis is currently the subject of toxin research.

Characteristics: Growth/Culture

Grows well on general fungal media. Stachybotrys is slow growing as compared to Penicillium and other common mold genera, and may not compete well in the presence of other fungi. However, when water availability is high for prolonged periods on environmental material, Stachybotrys may gradually become the predominating mold, especially on cellulose containing materials.

Stachybotrys sp.

(continued)

Notes on Spore Trap Recognition

Spores of the species S. chartarum are distinctive, and not easily confused with other genera. Carbon fragments which may be oval and of similar size may sometimes be confused with S. chartarum.
Memnoniella and Gliomastix produce spores with similar gray black pigment.
Note: Spore trap samples are more likely to demonstrate the presence of Stachybotrys than culturable samples (Andersen).

Notes on Tape Lift Recognition

Distinctive, readily identifiable on tape lift samples. Direct microscopic observation of samples is often necessary as Stachybotrys may be missed if only culture methods are used.

Ulocladium sp.

Mitosporic fungus. Hyphomycetes.

Distribution
Ubiquitous;
cosmopolitan.
Approx. 9 species.

Where Found
Soil, dung, paint, grasses, fibers, wood, decaying plant material, paper, and textiles.

Mode of Dissemination
Dry spore.
Wind.

Allergen
Major.
Type I allergies (hay fever, asthma).
Ulocladium cross-reacts with Alternaria, adding to the allergenic burden of Alternaria-sensitive patients.

Potential Opportunist of Pathogen
Rare subcutaneous tissue infection.

Potential Toxin Production
Not known.

Growth Indoors
Widespread. Found on gypsum board, paper, paint, tapestries, jute, other straw materials. Ulocladium has a high water requirement.

Industrial Uses
Not known.

Other Comments
None.

Characteristics: Growth/Culture
Grows well on all general fungal media. Colonies are dark brown to rusty brown, granular to velvety. Geniculate sporulating structures can be observed with the stereoscope.

Notes on Spore Trap Recognition
Distinctive brown spores. Young spores or spore fragments may be confused with Alternaria, Pithomyces, and others, although Alternaria usually has shades of olive green pigment.

Notes on Tape Lift Recognition
Distinctive, readily identifiable on direct observation. Certain species may form rudimentary beaks and short chains which may be confused with Alternaria.