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COMMON FUNGI (MOLD) SOURCES

- Acremonium:*** *Acremonium spp.* is fungi commonly isolated from plant debris and soil. *Acremonium* can cause both allergic reactions and participate in human disease. This fungus can cause opportunistic infections in immunocompromised patients, such as bone marrow transplant recipients. Infections of artificial implants due to *Acremonium spp.* are occasionally observed. Since *Acremonium spp.* is cosmopolitan in nature, it is also encountered as contaminants. Thus, its isolation in culture requires cautious evaluation.
- Auerobasidium:*** This is one of several genera of "black yeasts", characterized by mostly slow-growing, black, pasty colonies found both indoors and out. The spores are produced in great masses along the filaments and occur on short lateral branches or pegs. When the spores are released they leave minute roughened scars. Black yeasts occur in many habitats; some species may even cause human disease. They have many of the characteristics of *Pullularia* (refer to that section for more details).
- Alternaria:*** Parasites or saprophyte on plants and plant material, found all year. Indoors, it is often found in carpets, textiles, and on horizontal surfaces in building interiors. Often found on window frames. Outdoors it may be isolated from samples of soil, seeds and plants. It is commonly found in outdoor samples across the United States.
- Aspergillus:*** Commonly seen in damp hay and grain, damp cloth, leather goods, decaying plant and vegetable matter. Commonly found indoors if water damage occurs. Prefers warm soils, grain and in the secondary decay of vegetation. Associated with respiratory complaints in indoor contamination. Can produce the toxin petulin, which may be associated with disease in humans and other animals.
- Botrytis:*** It is parasitic on plants and soft fruits. Found in soil and vegetables.
- Cephalosporium:*** A cosmopolitan fungi commonly isolated from plant debris, and soil.
(Acremonium)
- Chaetomium:*** Found on damp paper, fabric, and straw. It has been found on paper in sheetrock
- Curvularia:*** Flower blight and leaf spot. Common in the Sacramento Valley.
- Epicoccum:*** It is found in plants, soil, grains, textiles and paper products.
- Fusarium:*** A common soil fungus. It is found on a wide range of plants. It is often found in humidifiers. Several species in this genus can produce potent trichothecene toxins. The trichothecene (scirpene) toxin targets, the following systems: circulatory, alimentary, skin and nervous. Produces vomitoxin on grains during unusually damp growing conditions. Symptoms may occur either through ingestion of contaminated grains or possibly inhalation of spores. The genera can produce hemorrhagic syndrome in humans (alimentary toxic aleukia). This is characterized by nausea, vomiting, diarrhea, dermatitis, and extensive internal bleeding.
- Geotrichum:*** A common contaminant of grains, fruits, dairy products, paper, textiles, soil and water, and often present as part of the normal human flora.
- Gliocladium:*** Decaying wood and decomposing plant debris and any damp canvas, paper, and cardboard.

Helminthosporium: Leaf spot on grasses and crops such as soybeans, rice, and wheat.

Hormodendrum: Most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter. The numbers are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is a common allergen. Indoor *Cladosporium sp.* (*Hormodendrum*) may be different than the species identified outdoors. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. A wide variety of plants are food sources for this fungus. It is found on dead plants, woody plants, food, straw, soil, paint and textiles.

Microsporium: *Microsporium* is a fungus found in a wide range of environments both indoors and outdoors. While the natural habitat of some of the *Microsporium spp.* is soil (the geophilic species), others primarily affect various animals (the zoophilic species) or human (the anthropophilic species). Some species are isolated from both soil and animals (geophilic and zoophilic). Most of the *Microsporium spp.* are widely distributed in the world while some have restricted geographic distribution.

Individuals with chronic exposure to the toxin produced by this fungus reported cold and flu symptoms, sore throats, diarrhea, headaches, fatigue, dermatitis, intermittent local hair loss and generalized malaise. The toxins produced by this fungus will suppress the immune system affecting the lymphoid tissue and the bone marrow. Animals injected with the toxin from this fungus exhibited the following symptoms, necrosis and hemorrhage within the brain, thymus, spleen, intestine, lung, heart, lymph node, liver, and kidney. Affects by absorption of the toxin in the human lung are known as pneumomycosis.

Mucor: Often found in soil, dead plant material, horse dung, fruits and fruit juice. It is also found in leather, meat, dairy products, animal hair and jute. Causes sweet potato rot.

Mycogone: A fungus that feeds on other fungi such as mushrooms. It is characterized by a bubble on the mushroom filled with a clear fluid, which gives it the name "wet bubble."

Neurospora: Is a classification of several types of yeast and filamentous fungi. It grows under tree bark, on shrubs and various plants that have been burned or killed by wildfire. This fungus lives in temperate regions, which are often cold or dry.

Nigrospora: Found on ripe fruit rot and in rice straw

Paecilomyces: A cosmopolitan filamentous fungus that inhabits the soil, decaying plants, and food products. Some species of *Paecilomyces* are isolated from insects. *Paecilomyces* is usually considered as a contaminant but may also cause infections in humans and animals.

Penicillium: A common indoor contaminant if water damage occurs. A wide number of organisms have placed in this genera. Often found in aerosol samples. Commonly found in soil, food (cheese, fruits, breads), cellulose, leather, fabrics and grains. It is also found in paint and compost piles (Plant rot). It may cause hypersensitivity pneumonitis, allergic alveolitis in susceptible individuals. It is commonly found in carpet, wall paper, and in interior fiberglass duct insulation. Some species can produce mycotoxins.

Phoma: A common indoor air allergen. The species are isolated from soil and associated plants (particularly potatoes). Produces pink and purple spots on painted walls. It may have antigens, which cross-react with those of *Alternaria sp.* It will grow on butter, paint cement and rubber. Found on books and paper.

Phycomyces: A filamentous fungus that is very light sensitive. This fungus grows in a very wet environment, including standing water. It is so sensitive to light that its spores move to be in it.

Puccinia: A Rust or brown/red "leaf spot" found on many plants. Rusts are very common, particularly in agricultural areas. They have both wet and dry spores. Wind disperses the different types of rusts and smuts such as urediospores, teliospores,

basidiospores, and aeciospores. The basidiospores and aeciospores have an active spore release mechanism. Rusts do not grow indoors unless their host plants are present. They are parasitic plant pathogens and need a living host for growth. Rust urediospores and teliospores are airborne; they are distinctive and readily identifiable on spore trap slides.

Pullularia: Plant leaves especially in the fall. Also found on painted surfaces, wallpaper, and any paper if damp.

Rhizopus: Vigorous growth on plant debris in gutters, forests, and farms. A cosmopolitan mold found almost anywhere there is organic material and moisture; even meats and breads.

Rhodotorula: A reddish yeast typically found in moist environments such as carpeting, cooling coils and drain pans. In some countries it is the most common yeast genus identified in indoor air.

Saccharomyces: Bakers yeast. Found in kitchens, flour etc.

Scopulariopsis: *Scopulariopsis* is a filamentous fungus that inhabits soil, plant material, feathers, and insects. It is distributed worldwide. While *Scopulariopsis* is commonly considered as a contaminant in sampling, it may cause allergy in humans. *Scopulariopsis spp.* may also cause various infections in humans. It is among the fungi that cause onychomycosis especially of the toe nails. Skin lesions, mycetoma, invasive sinusitis, keratitis, endophthalmitis, pulmonary infections, endocarditis, brain abscess and disseminated infections due to *Scopulariopsis spp.* have been reported. Invasive *Scopulariopsis* infections are seen mainly in immunocompromised hosts, such as bone marrow transplant recipients. These infections are highly mortal.

Spondylocladium: Found in decaying plant material, especially potatoes.

Sporotrichum: A filamentous fungus widely distributed in decaying wood and soil. It is commonly considered a contaminant in gardens.

Stachybotrys: Several strains of this fungus (*S. atra*, *S. chartarum* and *S. alternans* are synonymous) may produce a trichothecene mycotoxin- Satratoxin H - which is poisonous by inhalation. The toxins are present on the fungal spores. This is a slow growing fungus on media. It does not compete well with other rapidly growing fungi. The dark colored fungi grows on building material with a high cellulose content and a low nitrogen content. Areas with a relative humidity above 55% and are subject to temperature fluctuations are ideal for toxin production.

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

There is controversy about toxigenic effects through inhalation of spores or mycelia.

Stemphylium: Leaf spot on gladiolus, clover, lilac, pea, tomato, corn, squash. On variety attacks cellulose such as wet fabrics and paper.

- Streptomyces:*** Often found in soil. It is a slow growing fungus and is characterized by its earthy odor and chalky appearance.
- Syncephalastrum:*** A filamentous fungus that is commonly isolated from soil and animal feces particularly in tropical and subtropical areas.
- Trichoderma:*** It is commonly found in soil, dead trees, pine needles, paper, unglazed ceramics. Grows readily on damp cotton and wool and in damp areas of basements.
- Trichophyton:*** *Trichophyton* is a *dermatophyte*, which inhabits the soil, humans or animals. *Trichophyton* is one of the leading causes of hair, skin, and nail infections in humans. Related to its natural habitats, the genus includes *anthropophilic*, *zoophilic*, and *geophilic* species. Some species are cosmopolitan. Others have a restricted geographic distribution. *Trichophyton concentricum*, for example, is endemic at Pacific Islands, Southeast Asia, and Central America.
- Ustilago:*** *Ustilago* is a yeast that inhabits the soil and plant material. It is a pathogen of seeds and flowers of cereals, wheat, corn, and grasses. Its association with human disease is unclear and it has been isolated as the causative agent in only a very few reports. It is a known allergen however in selected circumstances.
- Verticillium:*** A widely distributed filamentous fungus that inhabits decaying vegetation and soil.