

# Fungal Library

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This library is provided for your reference.

- **Alternaria**
- **Aspergillus**
- **Cladosporium**
- **Epicoccum**
- **Stachybotrys**

## Alternaria



**Alternaria** species are plant pathogens and common allergens that are abundant in both indoor and outdoor environments.

**Habitat:** In nature, it is commonly found in soil, seeds and plants and is known as one of the major plant pathogens. Indoors it is commonly found in water damaged buildings growing on carpets, textiles, drywall and horizontal surfaces such as window frames.

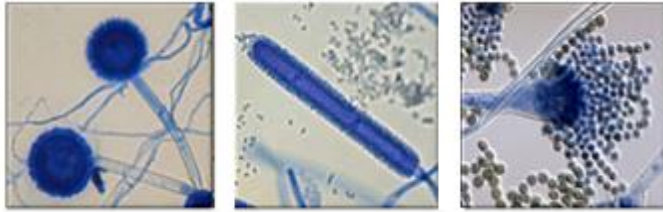
**Microscopic Appearance:** *Alternaria* is most often formed in chains. They are typically club-shaped and are highly septate, with divisions in both vertical and horizontal planes. The spore surfaces are usually smooth.

**Macroscopic Appearance:** Species produce olive-green to brown or black colonies and the reverse color on MEA and SAB agar is brown to black.

**Health Effects:** A common allergen and has been associated with hypersensitivity pneumonitis. It may be an agent of onychomycosis, cutaneous infection and chronic sinusitis, principally in the immunocompromised patients. *Alternaria* is capable of producing toxic metabolites which may be associated with disease in humans or animals. *Alternaria* has a unique group of mycotoxins, including alternariols, altenuenes, altertoxins, tenuazonic acid and AAL toxins.

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## Aspergillus



***Aspergillus* species** are ubiquitous in nature and are one of the most common genera of mold found both indoors and outdoors.

**Habitat:** Commonly found in soil and in the air. It can be found indoors growing on wet cellulose containing materials and is found outdoors on decaying plant material.

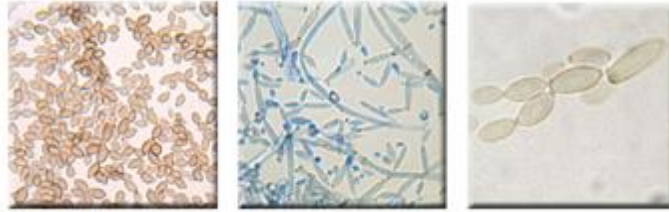
**Microscopic Appearance:** *Aspergillus* has spores that grow in chains from phialides that emerge from a central vesicle. The shape of the vesicles and the placement of the phialides on the vesicles vary from species to species.

**Macroscopic Appearance:** *Aspergillus* colonies grow quickly and are downy to powdery in texture. Surface colors cover a wide range of colors from green to grey sometimes with white edges or yellow areas, and some species are brown to black. The reverse color is usually colorless to pale yellow.

**Health Effects:** Known to be allergenic and many species also produce mycotoxins and carcinogens. They are a common cause of extrinsic asthma and hypersensitivity pneumonitis. Many species are opportunistic pathogens and are known to cause sinus lesions, ear infections, respiratory infections, and invasive systemic disease. *Aspergillus* species are the most common filamentous mold to cause infection and disease in humans.

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## Cladosporium



**Cladosporium** is a genus of fungi including some of the most common indoor and outdoor molds. Their numbers are greatly reduced in the winter and increase significantly in the summer. Outdoor numbers often spike in the late afternoon and early evening.

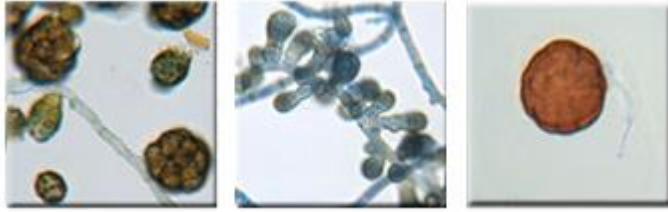
**Habitat:** In nature, *Cladosporium* is found on living and dead plants, woody plants, food, and soil. Some species are plant pathogens, while others parasitize other fungi. The spores are wind-dispersed and they are often extremely abundant in outdoor air. Indoors it is commonly found on the surface of the fiberglass liner in HVAC supply ducts. It is also commonly found on window sills and casings, drywall, and air conditioning coils.

**Microscopic Appearance:** *Cladosporium* has golden brown pigmented conidia (spores) that are formed in simple or branching chains. They vary greatly in size and shape (ovoid, lemon-shaped, oblong, and spherical).

**Macroscopic Appearance:** Species produce olive-green to brown or black colonies and the reverse color on MEA and SAB agar is black. **Health**

**Effects:** *Cladosporium* species are rarely pathogenic to humans, but have been reported to cause infections of the skin and toenails. Prolonged exposure to elevated spore concentrations can elicit chronic allergic reactions leading to hypersensitivity pneumonitis, asthma and allergic rhinitis. Prolonged exposure to spores may lead to suppression of the immune system which allows other opportunistic viruses and bacteria to infect the host. *Cladosporium* species produce no major mycotoxins of concern, but do produce volatile organic compounds (VOCs) associated with odors.

## Epicoccum



***Epicoccum*** species are plant pathogens and may be an allergen. They are common in both indoor and outdoor environments.

**Habitat:** Commonly found in soil and in the air. It can be found indoors growing on wet drywall and on window sill and wood framing. It is found outdoors on decaying plant material and is a common cause of leaf spot on many plants.

**Microscopic Appearance:** *Epicoccum* has hyphae that grow in dense masses and the mature spores are septate, rough and warty and are brown in color.

**Macroscopic Appearance:** *Epicoccum* grows fairly quickly and produces woolly to cottony colonies. They are yellow to orange in color and turn brown to black with age. They sometimes produce a diffusible pigment that turns the agar yellow.

**Health Effects:** There are no cases of documented infection and the allergenic properties are poorly studied.

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## Stachybotrys



**Stachybotrys** species are plant pathogens and common allergens that are abundant in both indoor and outdoor environments.

**Habitat:** Commonly found in soil and on decaying plant material. It is cellulolytic, and can be found indoors on wet materials containing cellulose, such as wallboard, ceiling tile, and other paper-based materials. It is found outdoors on decaying plant material although it is rarely detected on outdoor air samples.

**Microscopic Appearance:** *Stachybotrys* is formed in clumps that adhere to each other at the ends of flattened phialides. These phialides are usually pigmented, cylindrical in shape, and are swollen at the distal end.

**Macroscopic Appearance:** *Stachybotrys* produces cottony colonies that are white initially, with time they turn black on top and on the reverse,

**Health Effects:** Allergenic properties are poorly studied and no cases of infection have been reported in humans. They do however produce potent tricothecene mycotoxins. The toxins produced by this fungus can suppress the immune system affecting the lymphoid tissue and the bone marrow. The mycotoxin is also reported to be a liver and kidney carcinogen.