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Popular Article

## Aspergillosis: A Mycotic Zoonotic Disease

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### Abstract

*Aspergillus* species are among the most prevalent of the saprophytic moulds. Despite the genus having more than 190 species, only a small portion of these have been linked to opportunistic infections in both animals and people. The species that invades tissue the most frequently is *Aspergillus fumigatus*. Aspergilli are common soil inhabitants and are also found in large numbers in decomposing organic matter. *Aspergillus fumigatus* often occurs in overheated, poor-quality hay and in compost heaps. Spores of *Aspergillus* species are present in dust and air. It causes respiratory infections that are contracted through spore inhalation

**Keywords:** Aspergillosis, Mycotic zoonosis, *Aspergillus fumigatus*, pneumonia

### Etiology

*A. fumigatus* is the most prevalent species of the genus *Aspergillus*, which also includes important species such as *A. flavus*, *A. nidulans*, *A. niger* and *A. terreus*. According to Denning, *A. fumigatus* accounts for around 90% of cases of invasive aspergillosis. Aspergilli are aerobic and grow rapidly, forming distinct colonies after incubation for 2 to 3 days. The colour of the obverse side of colonies, which may be bluish-green, black, brown, yellow or reddish, varies with individual species and with cultural conditions. The tip of the conidiophore enlarges to form a vesicle which becomes partially or completely covered with flask-shaped phialides.

### Epidemiology

The illness affects both humans and a wide range of animals, including dogs, cats, horses, cattle, sheep, pigs, sheep and poultry. The organism is found everywhere. Exogenous fungus found



in soil or organic debris is the cause of illness. The respiratory system is the main route by which the organism enters the body.

### Symptoms in animals

Prior to spreading to other body organs in animals, the fungus initially colonise the lungs. Coughing, sneezing, nasal discharge, and fever are symptoms that are comparable to those of pneumonia. As a result of placentitis brought on by the infection, cows, buffaloes, mares and pigs may experience miscarriages. Acute or chronic pulmonary aspergillosis in chicken, initially affecting the bronchi and then other key organs, is the outcome of the infection. The birds exhibit a decline in health, fast breathing, diarrhoea, fever and restlessness (Brooders pneumonia). In horse it causes guttural pouch mycosis.

### Symptoms in humans

The illness affects men intermittently and typically starts in the lungs before spreading to other organs. Typically, clinical symptoms point to a respiratory infection.

### Diagnostic procedures

1. Based on specific clinical conditions.
2. Endoscopic examination can be used to detect lesions in the nasal cavity and guttural pouch.
3. Biopsy specimens or tissues taken at postmortem and *Aspergillus* species must be isolated from specimens. Tissue sections stained by methenamine silver or by the PAS method may reveal hyphal invasion.
4. For isolation, small tissue specimens are applied to the scarified surface of Sabouraud dextrose agar and incubated aerobically at 37°C for 2 to 5 days. Hyphae grow from specimens to form colonies.

### Identification criteria:

- Colonial morphology
- Appearance of sporing heads including conidia.
- Growth at 45°C to 50°C (thermotolerant species).
- Molecular procedures, such as the polymerase chain reaction technique, are being developed to detect *A. fumigatus* in clinical specimens
- Serological tests are based on growth-phase or hyphal specific antigens of *A. fumigatus*. As a consequence of constant exposure, most animals develop antibodies to conidial antigens. In dogs, the most reliable serological test is considered to be the ELISA.



### **Treatment**

The antifungal drugs amphotericin B and itraconazole have efficacy against *Aspergillus*, however their effectiveness in humans varies.

### **Prevention and Control**

In order to prevent and control disease in animals and birds, it is important to provide animals with properly processed, mold-free feed and litter, dispose of contaminated litter appropriately, and clean equipment, pens and sheds. Farm employees who care for animals should avoid touching infected objects.

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