Toxicological evaluation of *Aureobasidium pullulans* var. *pullulans*-induced mycotoxicosis in animal model

Ankit Kumar,

Animal Mycology Laboratory, Department of Zoology, MMV, Banaras Hindu University, Varanasi, India

**Objectives:** The genus *Aureobasidium* includes 14 species, amongst which *Aureobasidium pullulans* is the most well-known species. *Aureobasidium pullulans* includes two well-documented varieties found in indoor environments and associated with health issues: *A. pullulans* var. *pullulans* and *A. pullulans* var. *lapislmae*. *Aureobasidium pullulans* is a mold belonging to the family Dothideomycetes. It colonizes nails, hair, and skin in humans. Deliberate immune reactions may occur in humans, like hypersensitivity pneumonitis and allergies. Respiratory allergy results may lead to high levels of *Aureobasidium* in the air. The metabolites of this mold, like mycotoxins, are known to cause toxic-irritant effects. In view of this, the present study evaluates the effects of the toxic secondary metabolites of *A. pullulans* var. *pullulans* (CBS 777.93) in a murine model.

In order to examine the toxicological potential of *A. pullulans* pululans (CBS 777.93) for the production of mycotoxins, an understanding of its mode of action in an animal model is necessary. In the present study, we report the mycotoxicological activity of *A. pullulans* pululans (CBS 777.93) in experimental mice.

**Methods:** Mycotoxins isolated from *A. pullulans* pululans (CBS 777.93) were used for the experimental induction of mycotoxicoses in Swiss mice (C57H/H chain). The mycotoxin was administered intraperitoneally (IP) and intramuscularly (IM). To assess the toxic effects of the *A. pullulans* mycotoxins, eight organs, namely bone, lungs, kidney, spleen, stomach, heart, brain, and testis, were taken into consideration. The hematological, histopathological, and biochemical aspects of *A. pullulans*-induced mycotoxicoses were investigated.

**Results:**
- Behavioral observations: A significant decrease in the consumption of food in both IN and IP groups was noted.
- Anatomical observations: Gross lesions on the liver and lungs and the presence of cyan or purplish were noted on autopsy in both groups. Likewise, relative organ body weight percentage also increased in all the organs except the testis.
- Hematological analysis: Leukocytosis and neutrophilia were observed in IP as well as IN groups.
- Biochemical analysis: Electrolytes (sodium and potassium), uric acid, and creatinine levels were increased in all the organs except the testis.
- Histopathological analysis: Hematopathological changes characterized by inflammation and mycotic alveolitis in the liver, edema in the lungs, bile duct hyperplasia in renal tissue, angioinflammatory in the spleen, and interstitial pneumonia in gastric tissue, neurovascular anomalies in the brain, and degeneration in the testis were observed.
- Cell apoptosis factor: The reduced activity of caspase-3 enzyme was noted in both the mycotoxicosis-induced groups.

**Conclusion:** Thus, from the present study, we concluded that mycotoxins isolated from *A. pullulans* (CBS 777.93) demonstrated toxicity in all eight organs, with the testis and lungs being the worse affected organs. Even at a very small concentration and short exposure, the mycotoxins caused severe damage to the vital organs. New risk assessment approaches should be considered to investigate the toxicological interactions of *A. pullulans* mycotoxins in the indoor environment and in animal models.

Feline sporotrichosis: an emerging disease in the Brazilian side of the Southern Triple Border

Carolina Prado1, Luciana Chioy3, Carolina Sabó7, Regidey Cogniti6, Guilherme Reis7, Marián Geraldó1, Émanuel Raúzolli1, Bruno Lustosa2, Daniel Schröder6, Patasela Santos1, Flavia Trench2, Vânia Vicente2, Walfrido Sóbode6, Fábio Quatáro Tellez4

1Department of Veterinary Medicine, Federal University of Paraná, Curitiba, Brazil
2Department of Veterinary Medicine, Federal University of Santa Catarina, Santa Catarina, Brazil
3Brazilian Federal University of Technology, Brazil
4Federal University of Latin American Integration, Brazil
5Brazilian Federal University of Technology, Brazil
6Brazilian Federal University of Technology, Brazil
7Brazilian Federal University of Technology, Brazil
8Brazilian Federal University of Technology, Brazil

**Objectives:** The objective of this work is to alert about the emergence of feline sporotrichosis on the Brazilian side of the Southern Triple Border (Brazil, Paraguay, and Argentina).

**Methods:** From July 2021 to March 2022, biological samples and clinical-epidemiological data were collected from 57 domestic cats with typical sporotrichosis lesions and rodents of Iguassu Falls (Par). The cats were collected through notification of the citizens themselves, health agents of Zoonosis Control Center of Iguassu Falls (CCZ-Iguassu), veterinarians from private veterinary clinics and hospitals, and the receipt of suspected animals by CCZ-Iguassu. From the samples, direct mycological examinations and fungal cultures were performed and a set of 10 fungal isolates from the mycological tests were selected for molecular analysis based on calmodulin (CAL) gene sequences. From each collection point, the geographic coordinate was taken using the Google Earth® program and the Quantum GIS software (QGIS) was used to assemble the maps.

**Results:** Of the 57 samples taken, 45 were considered positive in the microbiological tests (Fig. 1), and the first 10 isolates were identified as *S. brasiliensis*. Based on clinical-epidemiological and geographic data (Fig. 2), the following problems associated with feline sporotrichosis in this region were identified: the presence of *Sporothrix schenckii* positive cats in high-density regions of the population's (towards the Foz do Iguaçu region), as well as the presence of positive animals in the Department of Veterinary Medicine of Foz do Iguaçu (CCZ-Iguassu), veterinarian's offices, and the Department of Veterinary Medicine of Foz do Iguaçu (CCZ-Iguassu), veterinarian's offices.

**Conclusion:** For being a region of the triple front, there are many differences in political, administrative, and operational aspects between the Public Health systems of the three countries. With Paraguay and Argentina, the political-administrative-operational cooperation is configured as a great node aimed at the development of health actions in an adequate way to the needs at a local-regional level and, above all, on time for the implementation thereof. With the structural diagnosis provided for this study it is possible to understand the factors that influence the emergence of the disease in Iguassu Falls contributing to the development of programs and specific actions, focusing on raising the population's awareness of unknown practices for animals, free diagnosis for animals (dogs and cats) suspected of sporotrichosis, and treatment with a free supply of medication for patients with a confirmed diagnosis of sporotrichosis.