

**TITLE:** AERIAL CONTAMINATION BY FILAMENTOUS FUNGI IN COMMERCIAL AIRCRAFT

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**ABSTRACT:**

In environments with air-conditioned indoor air, the presence of fungi can cause damage to the occupants health. Risks arise from exposure to fungal spores and secondary metabolism products such as mycotoxins. Commercial aircraft like any other air-conditioned environment can have compromised air quality, directly affecting the health of passengers and crew on board. The objective of this study was to evaluate airborne indoor air contamination in commercial aircraft, verifying the occurrence of potentially pathogenic fungi in humans. Air samples were collected from aircraft during the interval between the landing and the next takeoff. After the collection, the plates were taken to the laboratory for growth and isolation of the colonies. Fungal isolates were purified and identified based on the morphological characteristics, observing macroscopic and microscopic structures. Samples were also subjected to the screening for mycotoxin production by means of a rapid test using coconut milk agar medium and fluorescence halo observation when submitted to ultraviolet light. After analysis, 20 fungal species were identified: *Aspergillus sydowii*, *Aspergillus fumigatus*, *Aspergillus ustus*, *Aspergillus avenaceus*, *Aspergillus clavatus*, *Aspergillus versicolor*, *Aspergillus oryzae*, *Penicillium spinulosum*, *Penicillium aurantiogriseum*, *Penicillium decumbens*, *Penicillium oxalicum*, *Penicillium citrinum*, *Penicillium verruculosum*, *Cladosporium herbarum*, *Cladosporium cladosporioides*, *Paecilomyces variotii*, *Paecilomyces lilacinus*, *Curvularia clavata*, *Acremonium potronii* and *Tritirachium oryzae*. Of the 20 species identified, 11 (55%) are considered pathogenic, allergenic and/or toxigenic according to NR32/Ministry of Labor/2005. The positive species for mycotoxin production were *A. sydowii*, *P. verruculosum*, *P. spinulosum* and *A. ustus*. Some of the fungi identified are potential human pathogens and important producers of allergens that are related to various respiratory problems. The production of mycotoxins has been verified in some isolates, which increases the risks to the health of the occupants inside the cabin environments. The results demonstrated a large fungal diversity occurring in the air within commercial aircraft, including some clinically important species. Thus, the need for continuous monitoring of air quality becomes extremely necessary in this specific environment since air travel contributes significantly to the spread of infectious diseases.

**Keywords:** Aircraft, bioaerosols, indoor air quality, pathogenic fungi

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