



Occupational exposure to fungi and mycotoxins - Overview of different studies developed in Portugal

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As in all European countries, Portuguese employers are obliged by legal requirements to assess and prevent exposure to chemical, physical and biological risks (Directive 89/391/EEC). However, the health risks of biological origin are frequently less recognized and, thus, under reported. This study intends to present an overview from the assessments of fungal contamination and mycotoxins performed in three different occupational environments (Firefighters headquarters - FFH; Waste collection trucks – WCT and; Cemeteries - CM). Active sampling (impaction and impingement methods) and several passive sampling methods (swabs, settled dust, settled dust filters, electrostatic dust cloths – EDC, cleaning materials,...) were employed. Azole resistance screening, the molecular detection of *Aspergillus* sections, as well as mycotoxin analysis were also conducted. Regarding FFH it was raised concern regarding the following findings: a) microbial contamination didn't comply with Portuguese IAQ legal requirements in most of the FFH (fungal load 45.45%); b) fungal exposure through inhalation underlining a possible risk factor for respiratory diseases; c) prevalence of *Aspergillus* sp. in cleaning materials that might represent a potential source of cross-contamination; d) widespread of *Aspergillus* section *Fumigati* in all the FFH analysed; e) trend of multidrug resistance found among fungi with focus on *Fumigati* isolates; and f) detection of several mycotoxins (fumonisin B2, nivalenol, mycophenolic acid and sterigmatocystin). Concerning WCT *Aspergillus* sp. (4.18 %) was one of the most prevalent species. *Aspergillus* section *Fumigati* was detected in 5 samples. Mycotoxins were detected in filters (N=1) and in settled dust samples (N=16). The mycotoxin detected in the filter was fumonisin B1 and the most detected in settled dust was mycophenolic acid. Sterigmatocystin, deoxynivalenol and zearalenon were detected in only one sample each. In what concerns CM, *Aspergillus* sp. presented the highest counts in DG18 (18.38%) and it wasn't observed in azole-supplemented SDA media. Mycophenolic acid was detected in one settled dust sample.

Overall, our study reveals that a comprehensive sampling approach using active and passive sampling methods and combined analytic methods (i.e., culture-based and molecular) is an important asset in microbial exposure assessments. Furthermore, in all the three occupational environments mycotoxins were detected unveiling this occupational health threat.

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