Portuguese groceries: A compreehensive occupational exposure assessment to fungal contamination

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To our knowledge, there has been no research on the occupational exposure of grocery employees. This study aimed to characterize the microbial contamination in 15 grocery stores in Cascais, Portugal, by passive sampling. The molecular detection of *Aspergillus* sections, as well as mycotoxin analysis, screening of azole resistance and cytotoxicity measurement was also conducted to better estimate the health risks of exposure and to identify possible relations between the risk factors.

Electrostatic dust cloths (EDC) and surface swabs were used on 3 sampling sites: checkout, fruits/vegetable, and warehouse/dispenser. Fungal contamination was characterized by culture-based methods, through the inoculation onto two different culture media: malt extract agar (MEA) supplemented with chloramphenicol (0.05 %) and dichloran-glycerol agar (DG18). Screening of azole resistance was performed by inoculation of EDC extracts´ in azole-supplemented Sabouraud dextrose agar (SDA) media, according to EUCAST guideline. A total of 39 samples were screened for mycotoxins contamination. EDC's cytotoxicity (IC50) was assessed in lung epithelial (A549) and liver carcinoma (HepG2) human cells, in the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT) assay. The highest fungal contamination was obtained from fruits/vegetables in swabs (76 % MEA; 71 % DG18). The most prevalent genera in swabs was *Cladosporium* sp. (54 % MEA). Regarding EDC, besides *Penicillium* sp. (63 %) the most prevalent were *Aspergillus* sections *Circumdati* (25 %) and *Aspergilli* (35 %). *Penicillium* sp. was highly prevalent in the checkout (61 % SDA; 87 % voriconazole), and warehouse/dispenser sectors (73% voriconazole; 52% posaconazole). *Circumdati* and *Fumigati* were the most prevalent *Aspergillus* sections in fruits/vegetables (73 % and 64 % in voriconazole, respectively). Four mycotoxins (fumonisin B1, B2, B3) were detected simultaneously in most of the 36 samples. Two out of 39 EDC samples exhibited an IC50 of 10 mm^2/ml: one (M7F/L) in A549 cells, and another (M8A) in HepG2 cells.

Identifying the variables that influence the fungal and mycotoxins contamination of groceries environment is of upmost importance to prevent human exposure (workers and consumers) to these risk factors when using a One Health approach.

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