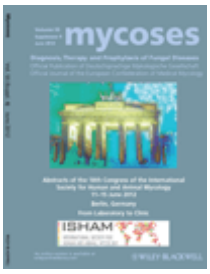
Mycoses



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Fungi, MVOCs and dust exposure assessment in poultry production

S. Viegas,1 R. Sabino,2 C. Verissimo,2 A. Monteiro1 and C. Viegas1

1ESTeSL, Environmental Health, Lisbon, Portugal; 2INSA, Mycology Laboratory, Lisbon, Portugal

Agricultural workers especially poultry farmers, are at increased risk of occupational respiratory diseases. In poultry production besides fungi microbial volatile organic compounds (MVOCs) are also present due to compounds released during fungal metabolism. Dust is also one of the risk factors present in animal housing and is comprised by poultry residues, fungi and feathers. A study was developed aiming to assess occupational exposure to fungi, MVOCs and dust in seven poultry units located in Portugal. Exposure assessment was performed in winter season because normally ventilation rates are lower, in order to measure the highest extent of exposure. Five air samples of 50 l were collected through impaction method at 140 l min-1, at one meter

height, on to malt extract agar with the antibiotic chloramphenicol (MEA). MVOCs concentrations were measured in all of them and it was used a directreading equipment (Multirae) with a 10.6 eV lamps. In addition, particles concentration measurement was performed in 5 different sizes (PM0.5; PM1.0; PM2.5; PM5.0; PM10) with a portable direct-reading equipment (Lighthouse, model 3016 IAQ). Regarding fungal load in the air from the seven poultry farms, the highest value obtained was 24040 CFU/m3 and the lowest was 320 CFU m-3. Twenty eight species/genera of fungi were identified, being Scopulariopsis brevicaulis (39.0%). From the Aspergillus genus, Aspergillus flavus (74.5%) was the most frequently detected species. There was a significant correlation ($r = 0.487$; $P = 0.014$) between temperature and the level of fungal contamination (CFU m-3). MVOCs values ranged from 0.0 ppm to 1.7 ppm with pavilions with natural ventilation presenting higher results. Particles with bigger sizes were detected in higher concentrations, particularly PM5.0 and PM10. This occupational setting presents a mixture of biological and chemical exposures, which difficult health risk assessment. We also have to consider that particles can be a vehicle and a promoter for fungi exposure. The evidence of possible negative health effects related with these exposures suggests a need of preventive and protective measures.

Keywords: Poultry; fungi; MVOCs; poultry dust; occupational exposure; exposure assessment.