

Coffee production – An occupational setting where exposure to mycotoxins need to be recognized and prevented

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Introduction

Coffee production involves different processes until being available as beverage involving several workers worldwide.

Mycotoxins exposure may occur in this occupational setting since coffee beans are frequently contaminated with these fungal secondary metabolites due the crop infection by toxigenic fungi that commonly infect the plant during the various production stages (1).

Objective

A study was developed in two milling industries located in Brazil aiming to evaluate workplace contamination with mycotoxins.

Results

- **Settled dust samples:** Fumonisin B1 (FB1), ochratoxin A (OTA) and B (OTB), mycophenolic acid (MA) and zearalenon (ZEA) were detected; MA present in all the samples with the higher concentrations.
- **RPE:** FB1, FB2, OTA and MA; MA the most prevalent mycotoxin; FB2 reached the higher concentration.
- **Coffee beans:** Aflatoxin B2 (AFB2), FB2, OTA and MA. MA was the most prevalent with higher concentrations.

Conclusion

The coffee industries shown workplace contamination with multiple mycotoxins causing workers exposure by inhalation, dermal absorption and even ingestion. Mycotoxins should be considered as a hazard present in this occupational setting requiring the adoption of risk management measures.

Methods

1. Samples

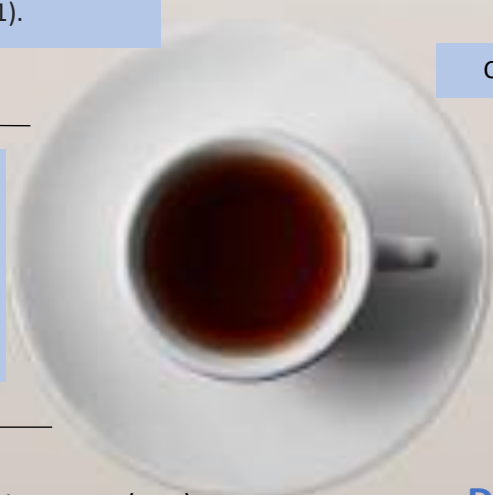
Settled dust (N= 20)



Respiratory protection equipment filters (RPE) (N= 20)



Coffee beans (N= 18)



2. Analysis

Mycotoxins were analyzed by an LC-MS/MS system. Separation and detection was carried out using high performance liquid chromatograph (HPLC) Nexera (Shimadzu) with a mass spectrometry detector API 4000 (Sciex).

Discussion

- A multi-sampling campaign should be the approach to follow (2).

Table 1 - Key aspects to considered when assessing occupational exposure to mycotoxins (2)



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References: 1) Viegas C, et al. (2022) <https://doi.org/10.3390/ijerph192013488>; 2) Viegas S, et al. (2020). <https://doi.org/10.3390/toxins12080513>.