CO-EXPOSURE TO MYCOTOXINS

THE CASE OF WASTE MANAGEMENT WORKERS

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Introduction

Occupational exposures are characterized by being complex and associated to co-exposure to several contaminants by different exposure routes. Even if exposure occurs to only a chemical agent, it can have different exposure routes and can result in different health effects.

The waste management setting is recognized by the presence of several chemical and biologic agents in the workplaces. Recently, it was reported occupational exposure to Aflatoxin B1 (AFB_1) in one Portuguese waste management industry (Viegas et al., 2015). However, data regarding to fungal burden showed that exposure to other mycotoxins should be expected.

Aim of Study

The aim of the present work was to know if workers from this waste management industry were exposed to other mycotoxins besides AFB_1.

Materials and Methods

The same serum samples from the workers of the previous study that assessed exposure to AFB_1 were consider (n=39). In order to detect and quantify other mycotoxins present in the serum samples, an additional dried blood spot based multi biomarker approach covering 27 mycotoxins and metabolites was applied.

Results and Discussion

From the analytical procedure applied was detected and quantified more two mycotoxins: Enniatin B (EnB) and Ochratoxin A (OTA).

Table 1. OTA and EnB values (ng/ml)

	Median	Range
OTA	0.62	0.36 to 4.99
EnB	0.04	0.01 to 0.15

OTA exposure is occurring probably by consumption of contaminated food. Coffee is probably a source in the group studied since in all the individuals was found 2'R-OTA, an OTA degradation product appearing during coffee roasting (Cramer et al., 2015) (Figure 1).

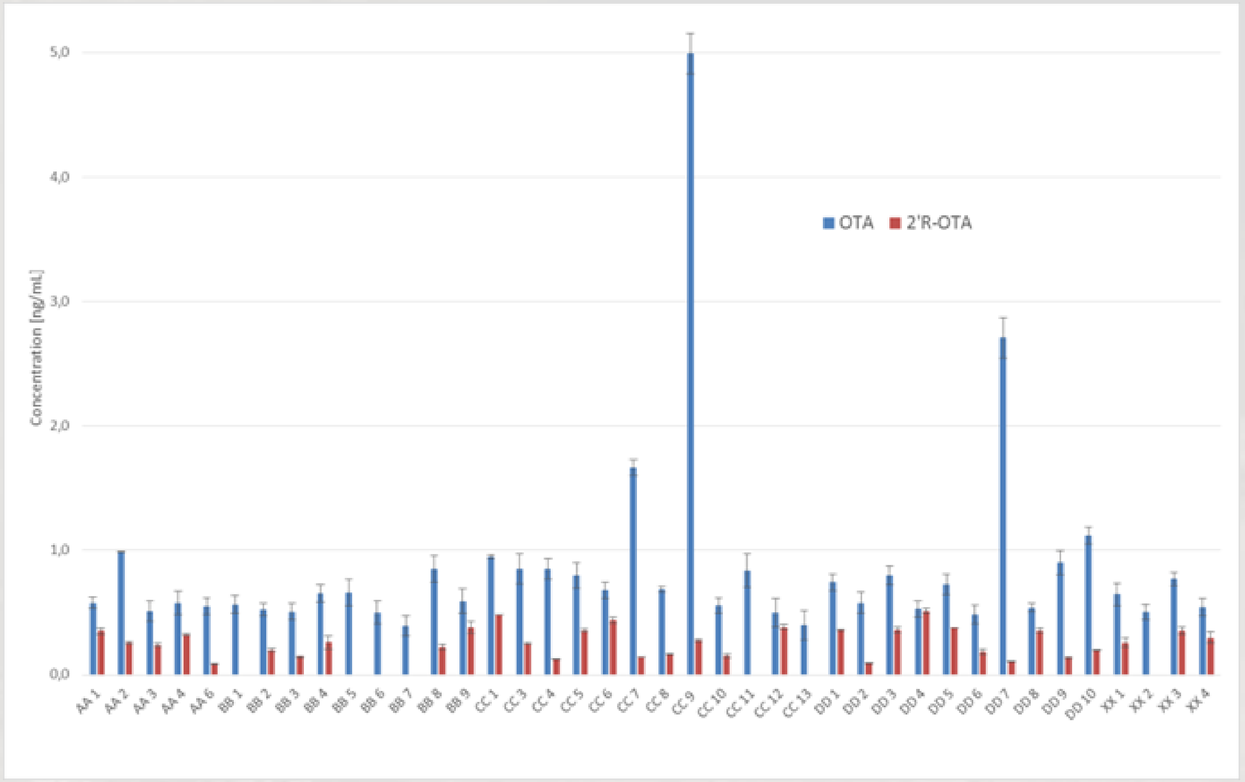
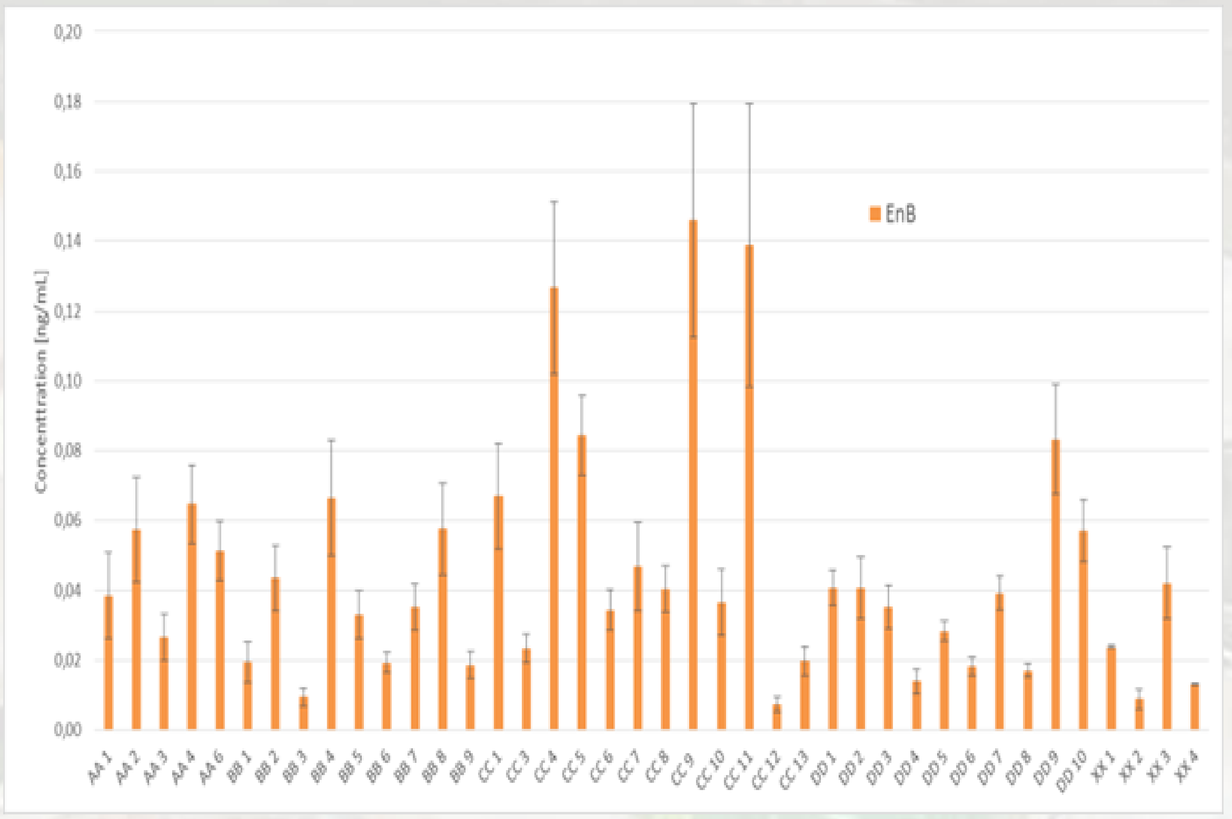


Figure 1. OTA and 2'R-OTA results (ng/ml)

Regarding EnB results, probably exposure is resulting from the consumption of cereal-based foods such as bread and/or breakfast cereals. Results are in line with a previous study developed in Germany (Gerding et al., 2014).



Conclusions

It was possible to conclude that waste management workers were exposed simultaneously to AFB_1, OTA and EnB. However, probably the exposure sources and routes are different because we are dealing with occupational exposure for AFB1 and, in the case of OTA and EnB exposure is occurring probably by food consumption. Interaction between mycotoxins should be considered to perform (cumulative) risk assessment.

References

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