

Quantification of multiple fungal toxins in cereal food using liquid chromatography tandem mass spectrometry

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Filamentous fungi belonging to *Alternaria*, *Aspergillus*, *Fusarium* and *Penicillium* genera are known to synthesize secondary metabolites known as mycotoxins. Mycotoxins adversely affect agricultural products, humans and animals. Maize is one of the most essential staple foods worldwide and susceptible to a wide variety of mycotoxins. A total of 22 mycotoxins were quantified in maize (24), sorghum (8), wheat (3) and porridge (20) samples from Limpopo Province in South Africa using liquid chromatography-tandem mass spectrometry (LC-MS/MS). Twelve (12) out of 22 mycotoxins were detected in maize, maize porridge, sorghum and wheat, including α -Zearalenol (89%), fumonisin B3 (FB3) (84%), fumonisin B1 (FB1) (80%), tenuazonic acid (TeA) (78%), ochratoxin B (42%), deoxynivalenol (12%), ochratoxin A (11%), 3-Acetyldeoxynivalenol (7%), sterigmatocystin (6%), 15-Acetyldeoxynivalenol (2%), cyclopiazonic acid (2%) and aflatoxin B2 (2%). Fumonisin (FB1 and FB3) exceeded the maximum level of European Commission Regulations. There is a substantial need to monitor the incidence of mycotoxins and emerging mycotoxins in food commodities as a high concentration of FB1 (2153 ppb) and TeA (292.7 $\mu\text{g}/\text{kg}$) was detected in maize and sorghum, respectively. The occurrence of multi-mycotoxins inclusive of emerging mycotoxins with no regulation may result in health implications on humans. The occurrence of these mycotoxins further encourages frequent analyses, their co-occurrence in the samples poses a significant threat to public health and more emphasis should thus be placed on reducing the contamination levels of these toxins in staples.

Conclusion: The occurrence of multi-mycotoxins inclusive of emerging mycotoxins with no regulation may result in health implications on humans. The occurrence of these mycotoxins further encourages frequent analyses, their co-occurrence in the samples poses a significant threat to public health and more emphasis should thus be placed on reducing the contamination levels of these toxins in staples.

Biography:

Shandry Tebele has completed her MSc (Biotechnology) at the age of 25 years from University of Johannesburg. She is currently pursuing PhD at the prestigious University of Cape Town in South Africa. She has presented twice in



AOAC Sub-Saharan meeting and won a Young Scientist Award. Her manuscript is under review in a reputed journal and she has presented her research project in Departmental postgraduate seminars.

Speaker Publications:

- Shandry Tebele et al; Quantification of multi-mycotoxin in cereals (maize, maize porridge, sorghum and wheat) from Limpopo province of South Africa; September 2020.
- Shandry Tebele et al; RDietary exposure assessment of multiple mycotoxins detected in maize and porridge; November 2019.
- Shandry Tebele et al; Occurrence of microorganisms, aflatoxin, ochratoxin, and heavy metals in paddy and rice; October 2019
- Shandry Tebele et al; Mycotoxins in staple food; September 2020
- Shandry Tebele et al; ; Desiccation tolerant plants; May 2020

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