

## **Development and validation of a UHplc-MS/MS method for the analysis of mycotoxins in onion**

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The *Fusarium* species causing Fusarium basal rot (FBR) in onion may also produce mycotoxins that are potentially harmful to humans and animals. The main mycotoxins produced by *Fusarium oxysporum* and *Fusarium proliferatum* are beauvericin (BEA), moniliformin (MON) and fumonisins B1, B2 and B3 (FB1, FB2 and FB3). A multiple reaction monitoring technique with ultra-high performance liquid chromatography tandem mass spectrometry (MRM UHPLC-MS/MS) for onion matrix was established to study these mycotoxins in the harvested onions. In the in-house validated protocol the onion samples were extracted with methanol:water (3:1) using magnetic stirring for 15 minutes. No cleanup of extracts was needed prior to analysis. The target mycotoxins were separated on an Acquity UPLC system BEH C18 column with gradient elution. Mycotoxins were identified and quantified using <sup>13</sup>C-FB1 as internal standard. FBs and BEA were determined directly from the filtered extracts by ES<sup>+</sup> ionization with at least two MRMs whereas MON required sample concentration prior to analysis and ES<sup>-</sup> ionization with one usable MRM. Minor matrix effect was compensated using multipoint matrix-matched calibration curves with uninfected onion sample. For the mycotoxins studied, a good linearity was obtained ( $R^2 \geq 0.99$ ) and the recoveries were in the range of 67-122%, with the highest standard deviation for MON, 22%. The limits of quantification were from 2.5 to 10 ng g<sup>-1</sup> in onion matrix. The method was successfully employed for the analysis of mycotoxins in harvested onions showing FBR symptoms and found to be infected with *F. oxysporum* and *F. proliferatum*.

### **Biography**

Sari Rämö (M.Sc.) is the first year PhD student in PCS program at the University of Turku and works as a research scientist in Natural Research Institute Finland (Luke). She has over 20 years experience about mycotoxin analysis in cereals by gas chromatography - mass spectrometry (GC-MS). She has focused on analysing mycotoxins in onion and grass silage by liquid chromatography - mass spectrometry (LC-MS) during last five years. She has published 20 peer-reviewed scientific articles, the last one about Fusarium-toxins in onion. Her supervisor, Satu Latvala (PhD) has studied *Fusarium* fungi in different plants by molecular biology methods.