

Title Early detection of toxigenic fungi on maize by hyperspectral imaging analysis

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Abstract

Fungi can grow on many food commodities. Some fungal species, such as *Aspergillus flavus*, *Aspergillus parasiticus*, *Aspergillus niger* and *Fusarium* spp., can produce, under suitable conditions, mycotoxins, secondary metabolites which are toxic for humans and animals. Toxigenic fungi are a real issue, especially for the cereal industry. The aim of this work is to carry out a non destructive, hyperspectral imaging-based method to detect toxigenic fungi on maize kernels, and to discriminate between healthy and diseased kernels. A desktop spectral scanner equipped with an imaging based spectrometer ImSpector– Specim V10, working in the visible-near infrared spectral range (400–1000 nm) was used. The results show that the hyperspectral imaging is able to rapidly discriminate commercial maize kernels infected with toxigenic fungi from uninfected controls when traditional methods are not yet effective: i.e. from 48 h after inoculation with *A. niger* or *A. flavus*.