

***Trichoderma afroharzianum* may be an effective alternative to the use of fungicides to inhibit the growth of pathogenic and mycotoxigenic fungi**

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Filamentous fungi occur worldwide as food contaminants and can have serious effects on human and animal health through the formation of toxic secondary metabolites and their pathogenic and allergenic potential. As part of the multidisciplinary cooperation project "AflaZ" (Zero Aflatoxin), between German and Kenyan research institutions, we investigated the potential use of *T. afroharzianum* as a natural biocontrol agent against *Aspergillus flavus* and *Fusarium verticillioides*, two important plant pathogenic and mycotoxigenic fungi.

The fungal species were inoculated in 11 proportionally different concentrations each (*T. afroharzianum* vs. *A. flavus* and *T. afroharzianum* vs. *F. verticillioides*, respectively). The shift in mycotoxin production (aflatoxin B₁, B₂, G₁, G₂ for *A. flavus*; fumonisin B₁ for *F. verticillioides*) observed during the competition was determined by thin-layer chromatography (TLC) and high-performance liquid chromatography (HPLC).

It was found that *T. afroharzianum* (TA) is able to effectively and permanently inhibit the growth of *A. flavus* (AF) and *F. verticillioides* (FV) when grown in a ratio of 10:90 for TA and AF and 60:40 for TA and FV respectively and also overgrow the competing strain. For TA and AF, this could be shown phenotypically and by SEM analysis as well as by absolute DNA quantification using a ddPCR (droplet digital PCR) approach. In case of TA and FV the effectivity of competition could be shown phenotypically and by SEM analysis, while the development of a DNA-based ddPCR system for an absolute quantification of *F. verticillioides* is planned in further studies. In both mycotoxigenic strains, the formation of mycotoxins decreased dramatically in the competitive presence of *T. afroharzianum*.

In this study *T. afroharzianum* could be successfully proven as an effective biocontrol species for reducing the growth and mycotoxin formation of *A. flavus* and *F. verticillioides*.