

## ABSTRACT

Aflatoxin contamination of grain has continued to pose a significant threat to sustainable food security and trade worldwide. In the field, there are incidences of varying contamination levels in grain within the same niche. We hypothesize that the variation could be due to fungal species interaction at the kernel level. Seventeen isolates (14 *Aspergillus flavus* and 3 *Aspergillus parasiticus*) from Eastern Kenya were selected and confirmed for toxigenicity using Dichlorvos-Ammonia method, then cultured based on their isolation frequencies and coexistence in nature. The fungi were co-cultured using maize kernels as growth substrate, which was then used to estimate aflatoxin produced in a competitive ELISA. A one-sample two-tailed t-test was carried out to determine the degree of significance in aflatoxin production. Eight isolates were non-toxicogenic, while nine were toxicogenic. When co-cultured with some nontoxicogenic isolates such as *A. parasiticus* (2EM0601), the most toxicogenic *A. flavus* isolate (1EM1901) significantly increased aflatoxin production, while it reduced with others. These observations warrant investigation on the interaction of *Aspergillus* species in culture especially given their diverse toxicogenic potential. We concluded that colony-mediated aflatoxin production could explain the variations of toxin levels observed in freshly collected field samples.

**Keywords:** Toxigenicity, aflatoxins, fungal interactions, *Aspergillus*, Dichlorvos-Ammonia.