

***Aspergillus* species and Aflatoxin b1 in soil, maize grain and flour samples from semi-arid and humid regions of Kenya**

Muthomi J. W. 1*, Mureithi B. K.², Chemining'wa G. N.¹, Gathumbi J. K.³, Mutit E. W.¹

¹Department of Plant Science and Crop Protection, Faculty of Agriculture, University of Nairobi, P. O. Box 30197, Nairobi, Kenya. *Author for correspondence (email: james_wanjohi@yahoo.com)

²Ministry of Agriculture, P.O. Box 30028, Nairobi, Kenya. P.O. Box 30197, Nairobi, Kenya.

³Department of Veterinary Pathology, Microbiology and Parasitology, Faculty of Veterinary Medicine, University of Nairobi, P. O. Box 30197, Nairobi, Kenya

Received September 2011; accepted in revised from November 2011

ABSTRACT

Recurrent outbreaks of Aflatoxin (AF) poisoning in maize continue to exacerbate the food security crisis in Sub-Saharan Africa. This study determined the distribution and contamination levels of *Aspergillus* spp. and Aflatoxin B₁ (AFB₁) in soil, maize and maize-based products. Maize grain samples (n=256), semi-processed grain (n=56), flour (n=52), hammer mill dust (n=11), and soil (n=117) were collected during the 2008 and 2009 growing seasons. *Aspergillus* spp. was isolated and AFB₁ was determined by Enzyme-Linked Immunosorbent Assay (ELISA). *Aspergillus flavus* was frequently isolated in maize samples from the semi-arid regions. The frequency of *A. flavus* was higher in semi-processed grain than in whole grain and packed flour samples. AFB₁ was not detected in samples from the humid regions. AFB₁ was detected at levels exceeding the Kenyan legal limit of 10 µg/kg in 20% of the samples, at maximum of 136 µg/kg for semi-processed maize, 77 µg/kg for whole grain and 41 µg/kg for flour sold in open bags. The high temperature and periodic drought prevalent in the semi-arid regions could explain the higher levels of *A. flavus* and AFB₁ contamination in that climate. In addition, unfavourable drying and storage practices may aggravate the problem. Therefore, it is recommended that the careful monitoring of AF be continued.

Key words: *Aspergillus flavus*, aflatoxin B₁, aflatoxicosis, maize