

Reduction of aflatoxin B₁ in corn and peanut by plant extracts

Chinaphuti, A.*, Wanasirakul, S.#, Aukkasarakul, S.

Postharvest and Processing Research and Development Office, Department of Agriculture, Chatuchak, Bangkok, Thailand

*Corresponding author, Email: amarachina@yahoo.com

#Presenting author, Email: suphi.w@doa.in.th

DOI: xx.xxxx/xxx.2014.xxx.xxx.xxx

Abstract

The aim of this study was to utilize the selected plants *Allium sativum*, *Occimum tenuiflorum* and *O. basillicum* to decontaminate aflatoxin B₁ (AFB₁) in corn and peanut as biological control. The experiment was conducted to confirm the efficacy of plant extracts at the concentration 1:1 to directly degrade AFB₁ standard in test tube. The result showed that extract of *A.sativum*, *O. tenuiflorum* and *O. basillicum* could degrade AFB₁ by 83.12, 90.04 and 56.60% respectively after 7 days of incubation. The efficacy of 3 plant extracts were tested for decontamination of AFB₁ in corn and peanut at 300 g sample size. Spores of *Aspergillus flavus* were introduced to the tested samples 7 days prior to plant extracts application in order to enhance AFB₁ production. Amount of AFB₁ was determined by ELISA technique at 7, 10, 15 and 20 days after plant extracts application. Extraction of *A. sativum* caused high percentage of AFB₁ reduction at 56.59, 58.76, 78.08 and 78.34% respectively. Whereas low percentage of reduction was found in *O. tenuiflorum* and *O. basillicum* extracts. Large scale of naturally AFB₁ contaminated corn and peanut at 3,000 g were also tested. Percentage of AFB₁ reduction in corn was not different when 3 plant extracts were applied. However, 3 plant extracts significantly affected on reduction of AFB₁ in peanut at 7 and 15 days after application. At 15 days *A. sativum*, *O. tenuiflorum* and *O. basillicum* resulted in 59.37, 53.59 and 67.12% AFB₁ reduction respectively. Therefore, *A. sativum* was selected for the further study in appropriate form for application. Grinded fresh and dried powder of *A.sativum* were tested. *A. sativum* extract had the highest efficacy in reduction of AFB₁ in peanut. Hence, *A. sativum*, *O. tenuiflorum* and *O. basillicum* extracts can be utilized to reduce AFB₁ contamination as biological control.

Keywords: aflatoxin B₁ reduction, plant extract, corn, peanut