Reduction of aflatoxin B$_1$ 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: 10.14455/DOA.res.2014.107

Abstract

The aim of this study was to utilize the selected plants *Allium sativum*, *Occimum tenuiflorum* and *O. basillicum* to decontaminate aflatoxin B$_1$ (AFB$_1$) 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 AFB$_1$ standard in test tube. The result showed that extract of *A. sativum*, *O. tenuiflorum* and *O. basillicum* could degrade AFB$_1$ 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 AFB$_1$ 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 AFB$_1$ production. Amount of AFB$_1$ was determined by ELISA technique at 7, 10, 15 and 20 days after plant extracts application. Extraction of *A. sativum* caused high percentage of AFB$_1$ 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 AFB$_1$ contaminated corn and peanut at 3,000 g were also tested. Percentage of AFB$_1$ reduction in corn was not different when 3 plant extracts were applied. However, 3 plant extracts significantly affected on reduction of AFB$_1$ 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% AFB$_1$ 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 AFB$_1$ in peanut. Hence, *A. sativum*, *O. tenuiflorum* and *O. basillicum* extracts can be utilized to reduce AFB$_1$ contamination as biological control.

Keywords: aflatoxin B$_1$ reduction, plant extract, corn, peanut