

## DEVELOPMENT OF AN EFFECTIVE METHOD TO MINIMIZE THE GROWTH OF *Aspergillus flavus* IN MAIZE (*Zea mays*) TO PREVENT AFLATOXIN PRODUCTION

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Next to rice, maize is the most widely cultivated cereal in Sri Lanka important for livelihood of large number of dry zone farmers. At present, cultivation of maize for green cobs is a common practice among farmers and mature dried grains are mainly used in food and feed industry. Although maize is widely grown in the island it has not been able to use same for the food industry as it has been found to be contaminated with high levels of aflatoxin. Aflatoxin is the most potent hepatocarcinogen produced as by the fungus *Aspergillus flavus* which affect the health of human and animals. This study was conducted to develop an effective method to minimize growth of *Aspergillus flavus* in maize to prevent aflatoxin production using GRAS (Generally Recommended As Safe) compounds. Infected maize cobs were collected and fungus was identified as *Aspergillus flavus*. Four GRAS compounds Sodium bicarbonate (SBC), Ammonium bicarbonate, Citric acid and Calcium chloride were tested for the suppression of *Aspergillus flavus* to prevent aflatoxin production. The inhibitory effects of these four compounds on mycelial growth and spore germination of *Aspergillus flavus* were studied in *in vitro* using five different concentrations (1%, 2%, 3%, 4% and 5% (W/V)). The most effective compound was SBC 4% which inhibited the mycelial growth by 85.36% and spore germination by 100%. Effect of SBC 4% was tested for healthy matured cobs and for damaged kernel. Sensory evaluation was performed for treated and non treated maize. Fungus wasn't observed in the healthy matured cobs and successfully controlled in the damaged kernels. SBC provided better control of *Aspergillus flavus* in damaged maize kernels at 4% concentration. According to the sensory evaluation, off flavor, odor and change of color wasn't detected in treated maize compared to non-treated. Results shown that the damages lead to the fungal growth and it can be suggested that the fungal growth and aflatoxin production can be prevented by the application of 4% SBC solution to the damaged cobs separately.

*Key words:* Maize, *Aspergillus flavus*, Aflatoxin, GRAS compounds, Sodium bicarbonate