MYCOTOXINS FROM FUNGI ON MAIZE

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Mycotoxins from contaminated cereals and their products have been receiving increasing attention1 and consumption of maize contaminated with mycotoxins had caused acute hepatitis and associated high mortality in Rajasthan and Gujarat2. It is also reported that maize samples contaminated with toxigenic molds have yielded aflatoxin B1 (8 to 1850 ppb) and ochratoxin (30 to 50 ppb)3. In this context a screening of maize samples used as a constituent in poultry feed, for natural mold contaminants and their toxins was carried out.

Maize samples from different poultry feed factories, located in the vicinity of Hyderabad were stored at 0°C for 72 hr to kill the mites. The surface contamination of the grains was determined by washing a known weight of the sample in a known volume of sterile distilled water and then plating an appropriate dilution of the washing on Czapek’s and “malt-malt agar” media. The density of contamination was expressed as the number of fungal colonies grown per gram of sample. For internal contamination, the sterilized seeds were plated on the above media after disintegrating the surface of the seeds with 0.1% mercury chloride and subsequent washings with sterile distilled water. Fungi from these isolations were purified and identified in our laboratory and subsequently were confirmed by a local mycology laboratory. The toxin extraction from the infected maize samples was carried out by muti mycotoxin methods4, and qualitative and quantitative estimations were done. The following results were obtained.

The surface washings of fifty grain samples gave high count of fungi (14-546 x 10^3/g of sample), indicating high level of external contamination. The contaminated mycotoxins mainly consisted of Aspergillus flavus, A. candidus and A. sydowi and Penicillium species.

The analysis of the infected maize samples showed the presence of three toxins; namely aflatoxin (B1, B2, and G1), Ochratoxin and Sterigmatocystin. Out of fifty samples analyzed, five samples were contaminated with aflatoxin (four with B1 and one with B2, B2, and G1). Six samples were contaminated with ochratoxin, whereas three samples were contaminated with sterigmatocystin. The aflatoxin in three samples was above the tolerance level (i.e., 34.40 and 105 ppb). The level of ochratoxin contamination ranged from traces to 187 ppb, whereas sterigmatocystin was detected from traces to 150 ppb.

Thus, this study showed the presence of aflatoxin (B1, B2, and G1), ochratoxin and sterigmatocystin in the contaminated maize samples. This warrants screening of the maize to be used for poultry feed, for mycotoxins.

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