

MYCOTOXINS FROM FUNGI ON MAIZE

G. RAMA DEVI AND H. POLASA
Department of Microbiology, Osmania University,
Hyderabad 500 007, India.

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)³ and ochratoxin (30 to 50 ppb)⁴. 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° 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 salt 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 disinfecting the surface of the seeds with 0.1% mercuric chloride and subsequent washings with sterile distilled water. Fungi from these isolations were purified and identified in our laboratory⁵ and subsequently were confirmed by a local mycology laboratory. The toxin extraction from the infected maize samples was carried out by multi mycotoxin method⁶, and qualitative and quantitative estimations were done⁷. The following results were obtained.

The surface washings of fifty grain samples gave high count of fungi ($14-540 \times 10^3$ /g of sample), indicating high level of external contamination. The disinfected seeds also showed infection with the same type of fungi, indicating the invasion of the fungi inside the grains. The contaminated mycoflora 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 G), Ochratoxin and Sterigmatocystin. Out of fifty samples analyzed, five samples were contaminated with aflatoxin (four with B₁ and one with B₁, B₂ and G). 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 ppb⁸. The level of ochratoxin contamination ranged from traces to 187 ppb, whereas sterigmatocystin was detected from traces to 150 ppb.

Thus, the present study showed as much as 28% of the maize samples of poultry feed contaminated with three mycotoxins. This warrants screening of the maize to be used for poultry feed, for mycotoxins.

23 November 1981.

1. Purchase, I. F. H., *Mycotoxins*, 1974, Elsevier, Amsterdam.
2. Krishnamachari, K. A. V. R., Bhat, R. V., Nagarajan, V. and Tilak, T. B. G., *Lancet*, 1975, **1**, 1061.
3. Bilgrami, K. S., Prasad, T., Misra, R. S. and Sinha, K. K., Final Report, I.C.A.R. Project, Post Graduate Department of Botany, Bhagalpur University, 1977-1980.
4. Rati Rao, E., Basappa, S. C. and Sreenivasamurthy, V., *J. Food Sci. Technol.*, 1979, **16**, 113.
5. Raper, K. B. and Fennell, D. L., *The genus aspergillus*, 1965 Williams and Wilkins, Baltimore.
6. Roberts, B. A. and Patterson, D. S. P., *J. Assoc. Official Anal. Chem.*, 1975, **58**, 1178.
7. Seitz, L. M. and Mohr, H. E., *Cereal Chem.*, 1977, **54**, 179.
8. Krogh, P., *Mycotoxins in food stuffs*, (3rd IUPAC Symposium), (ed.), M. Jemmali, (Pergamon Press, Paris), 1976.