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Studies on mycotoxins in poultry feeds: Ochratoxin A and its impact on poultry production in Telangana state, India

Vanteru Krishna Reddy, A Rajender Reddy, D Parvathi and S Ram Reddy
Kakatiya University, India

Feeds and feed ingredients of poultry are excellent media for the growth and proliferation of different moulds. As such, fungal contamination of feed and feed ingredients is a global problem. Moulds, while growing, produce a broad range of mycotoxins in poultry feeds. A recent survey conducted in different parts of the world revealed that overall, 72% of the feed and feed ingredient samples contained detectable amounts of different mycotoxins. However, such type of studies are lacking from this region. Hence an extensive study was undertaken to assess the incidence of mycotoxigenic fungi in different feed ingredients, such as maize seeds, sorghum seeds, groundnut cake, sunflower meal, soybean meal, deoiled rice bran and fish meal. Analysis of these ingredients revealed that species of *Aspergillus*, *Fusarium*, *Penicillium*, *Alternaria*, *Chaetomium* and *Cladosporium* are common mycotoxigenic moulds associated with these feed ingredients. The most common mycotoxins elaborated by these moulds are aflatoxins, trichothecenes, penitrems, citrinin, patulin, zearalenone, T-2 toxin and cyclopiazonic acid. Ochratoxin A (OTA), elaborated by *Aspergillus ochraceus*, *Penicillium viridicatum* and *P. nordicum*, is the second most important mycotoxin and widely encountered in animal feeds and human foods. Biological effects of OTA include nephrotoxicity, neurotoxicity, teratogenicity, carcinogenicity, immunotoxicity in animals and human systems. The most visible effects of OTA on chicks are decreased egg production, immunosuppressive effects, reduced rates of weight gain and increased mortality. Our investigations revealed that OTA producing molds are commonly associated with the poultry feeds. Most samples were found to be contaminated with more than one mycotoxins. Farm mixed feed samples were found to be with more OTA contamination than the commercial brands. Investigations on biological effects of OTA on chicks have revealed a spectrum of effects. There was a linear decrease in infested feed intake and body weight. However, increase in liver and kidney weight was recorded. A gradual decrease in the serum proteins and serum albumins was observed. In contrast, there was a significant increase in serum bilirubins, SGPT, SGOT when compared to controls. Hematological studies pointed out a depletion in RBC count, WBC, Hb, and lymphocyte proportion, while increase in the percentage of neutrophils, monocytes, and basophils. Significant changes in the biochemical composition of various organs like kidney, liver and heart were noticed. Histopathological studies of kidney revealed enlarged Bowman's space and dilated renal tubules. Liver necrosis due to pycnosis was also observed. In summary, our investigations indicated adverse effects of OTA on feed consumption and multiple effects on different organs and metabolic functions, ultimately leading to morbidity and mortality of chicks fed with infested feed.

Biography

Vanteru Krishna Reddy, Associate Professor of Botany, Kakatiya University, Warangal, Telangana, India. He worked as NSS Programme Officer, Additional Controller of Examinations, Head, Department of Botany and presently Chairman, Board of Studies in Botany. He has 20 years of teaching and 25 years of Research experience. He published 90 research papers in National and International reputed journals. He is author of 7 books and presented 40 research papers in National and International seminars and conference. He visited USA and Sri Lanka. So far four doctoral students have completed their Ph.D. degrees under his supervision and another 4 are perusing.

vkreddyku@gmail.com

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