Effect of probiotic containing *Saccharomyces boulardii* on experimental ochratoxicosis in broilers: hematobiochemical studies

S. B. Agawane*, P. S. Lonkar

*Department of Pathology, Bombay Veterinary College, Mumbai, India*

In the present investigation, the toxicopathological effects of ochratoxin A of 0.5 ppm on hematobiochemical parameters of broilers were studied with efficacy of dietary concentration of probiotic containing yeast culture *Saccharomyces boulardii* of 10 mg/kg of feed. One hundred twenty day old chicks were randomly divided into four groups, thirty chicks each. Groups A and C chicks were offered normal feed and that added with probiotic *Saccharomyces boulardii* respectively. The birds in group B were fed ochratoxin A of 0.5 ppm of feed. Where as, the birds of group D, were fed with ochratoxin A of 0.5 ppm along with probiotic *Saccharomyces boulardii* of 10 mg/kg of diet. Hematological studies carried revealed significant decrease in the haemoglobin and packed cell volume in birds of group B and reduced effect in birds of group D due to probiotic. Biochemical profiles revealed significant improvement in probiotic treated group D when compared with decreased values of Total protein, albumin, globulin and increased levels of serum creatinine and SGPT in birds of groups B.

**Key words:** *Saccharomyces boulardii*, ochratoxin A, hematological, biochemical

**Introduction**

In India, poultry industry has developed leaps and bound from a small-scale backyard venture to the status of full-fledged, modernized, agro-based industry. India ranks 4th in egg production and 19th in broiler production with annual turnover of Rs. 65 billion [5]. One of the most effective ways for a profitable poultry industry is to reduce the input cost. Feed is the major input in poultry production constituting 70-75% of total cost of broiler production. Poor quality or damaged feed may results in poor production and discarding of such feed will be additional monetary loss. The mycotoxins are considered as serious obstacle in realizing the full genetic potential of the poultry. Several species of fungi infect grain and forage crops growing in the field, during harvest, transportation and while in the storage and produces mycotoxins. More than 300 different types of mycotoxins have been identified and many more are undiscovered. One species of mould can produce different mycotoxins. Conversely, different moulds can produce the same mycotoxin [11]. Among the mycotoxins, ochratoxin and aflatoxin occupy important position in causing mycotoxicosis in poultry.

Reports on ochratoxicosis are frequent in India and it is understood as an emerging problem for human, livestock and poultry, requiring proper attention [7,9]. Ochratoxicosis decrease the profitability in poultry industry by decreasing growth rate, egg production and increasing susceptibility to diseases. Several methods have been tried in past to detoxify the feed ingredients from toxic fungal metabolites, [16]. This includes physical, chemical, nutritional and biological methods. Advances made in the field of biotechnology, in last decades, have resulted in development of newer strategies for tackling the problem of mycotoxins [1,12,19] Practical and cost effective methods to prevent ochratoxicosis in poultry field are in great demand.

Studies indicate that *Saccharomyces boulardii* is effective against ochratoxicosis in poultry [3,4]. The same was tried against ochratoxin A to ascertain its efficiency in reducing its adverse effect in broilers.

**Materials and Methods**

The present research work was conducted at Department of Pathology, Bombay Veterinary College, Parel, Mumbai, India.

**Production of Ochratoxin**

**Source of organism:** *Aspergillus ochraceus* NRRL 3147 culture maintained at the Department of Pathology, Nagpur Veterinary College, Nagpur, India was used as source.

**Procedure of ochratoxin production:** Ochratoxin was produced on broken wheat by using *Aspergillus ochraceus*
NRRL 3147 culture as suggested by Trenk et al. [22].
Overnight soaked broken wheat (50 g + 25 ml tap water) was autoclaved at 121°C for 20 minutes and inoculated with fungal spore suspension. The inoculum was incubated for 12 days at room temperature in dark place with vigorous shaking once a day to break the brown mycelial mass. By using sterile wireloop, the mycelial growth from flask was collected and inoculated on SDA (Sabraoud Agar) plate for isolation and identification of Aspergillus ochraceus. Colonies of Aspergillus ochraceus were observed on SDA plate. Staining with lactophenol cotton blue stain did microscopic examination. The fermented wheat was autoclaved to kill the spores and dried at 80°C in hot air oven, overnight. The dried material was powdered and stored in the dark place for further use.

**Quantification of Ochratoxin:** The representative samples of feed were analyzed for the quantification of ochratoxin A, by thin layer chromatography (TLC) [2].

**Procedure**
Steps of quantification of ochratoxin A are as follows
1. Collect 40 - 50 gram broken wheat (sample) in beaker.
2. Add 10 gram cellite, 2 gram NaCl, 110 ml methanol and 90 ml distil water in it.
3. Shake it for half an hour.
4. Filter it through Whatman filter paper No.1.
5. Collect 50 ml filtrate.
6. Put it in separating funnel.
7. Add 50 ml hexane in it.
8. Shake it for five minutes in separating funnel.
9. After shaking collect the lower feed sample layer in beaker.