

Original Research Article

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Effect of Dietary Supplementation of *Polyalthia longifolia* Leaf Meal on Alanine Transaminase (ALT) and Aspartate Transaminase (AST) Levels in Broiler Chicken

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ABSTRACT

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An experiment was designed to study the effects of dietary supplementation of *Polyalthia longifolia* leaf meal on alanine transaminase (ALT) and aspartate transaminase (AST) enzyme levels in broiler chicken. A total of one hundred twenty (n=120) day old commercial broiler chicks were procured and randomly distributed in to three treatment group (T₁, T₂ and T₃), each treatment had four replicates with ten chicks per each replicate. A completely randomized design was used and the experiment lasted for six weeks. T₁ was served as control. T₂ and T₃ were fed with *Polyalthia longifolia* leaf meal at 0.1 and 0.2 per cent levels. Body weight and feed consumption were recorded at weekly intervals. At the end of sixth week, blood samples were collected from four birds each treatment for enzymological assay. The enzymes assayed were alanine transaminase (ALT) and aspartate transaminase (AST). Dietary supplementation of *Polyalthia longifolia* leaf meal at 0.1% and 0.2% levels significantly (P<0.01) reduced the levels of AST and ALT. It was concluded that *Polyalthia longifolia* has hepato-protective properties.

Introduction

The poultry industry is one of the most dynamic Indian agribusiness trades. In modern poultry production, the rapid growth rate in broilers imposes severe stress on birds, which leads to poor performance and high mortality among chicken. Oxidative stress is the major cause of reduction in growth rate in broilers and increases incidence of infectious and metabolic diseases in poultry. Oxidative stress causes hepatic cell damage which results in increased circulatory levels of ALT and AST. Recently, there is an increased demand for using natural feed additives like

herbs and medicinal plants to overcome the adverse effect of oxidative stress on broiler performance. *Polyalthia longifolia* (Ashoka) is one of the most important indigenous medicinal trees with linear-lanceolate leaves. Pharmacological studies on leaves of this tree proved effective in skin disease, hepato-protective activity and antimicrobial activity (Balamuruganvelu *et al.*, 2014). To lessen the adverse effects of the synthetic feed additives on bird as well as on consumer's health; many of the herbal growth stimulators now a days are being used as an alternative feed additives

in the poultry ration (Srivastava *et al.*, 2012). The present experiment was designed to assess the effects of various levels of *Polyalthia longifolia* leaf meal supplemented to broilers diet on alanine transaminase (ALT) also called serum glutamic pyruvic transaminase (SGPT) and aspartate transaminase (AST) also called serum glutamicoxaloacetic transaminase (SGOT) levels in broilers.

Materials and Methods

A total of one hundred and twenty numbers of day old commercial broiler chicks (BV-400) were procured and randomly distributed in to three groups (T₁, T₂ and T₃), each group had four replicates with ten chicks per each replicate and were assigned to the following dietary treatments,

T₁ – Standard broiler ration (SBR) as per BIS (2007) specifications – Control

T₂ – SBR + 0.1 per cent of dried *Polyalthia longifolia* leaf meal

T₃ – SBR + 0.2 per cent of dried *Polyalthia longifolia* leaf meal

The chicks were wing banded and weighed individually. The birds were reared in deep litter system under standard managerial practices from day-old to six weeks of age.

The leaves of *Polyalthia longifolia* collected were, washed in tap water and dried under shade, dried leaves were ground finely with the help of a grinder and the leaf meal was supplemented as above to the standard broiler diet. The broiler pre-starter, starter and finisher diets were fed ad libitum to the birds.

Blood samples were collected at the end of sixth week for estimation of alanine

transaminase (ALT) and aspartate transaminase (AST). The level of ALT and AST were measured by using Liqui CHEK kit (kits supplied by Agappe diagnostics, Agappe Hills, Ernakulam-683562, Kerala). Statistical analysis of the data was carried out by one way ANOVA as per Snedecor and Cochran (1994) by using SPSS 24.

Results and Discussion

The mean serum ALT and AST values of broilers at sixth week of age as influenced by dietary supplementation of *Polyalthia longifolia* leaf meal is presented in Table 1. In the present study, dietary supplementation of *Polyalthia longifolia* leaf meal at 0.1% (T₂) and 0.2% (T₃) level significantly ($p < 0.01$) decreased serum ALT and AST levels.

The results of present study are in accordance with the earlier reports of Emadi and Kermanshahi (2007) who could observe that the supplementation of turmeric rhizome powder in broiler diet, resulted in significantly ($p < 0.05$) reduced levels of ALT (Alanine amino-transferase) and ALP (Alkaline phosphatase) enzyme.

Vidhyarthi *et al.*, (2008) also observed significant ($p < 0.05$) decrease in ALT levels with dietary supplementation of herbal growth promoter at different level in broilers.

Atul Prakash *et al.*, (2009) also reported that there was significant reduction in ALT (Alanine amino-transferase) and AST (Aspartate amino-transferase) enzyme activity in lead toxicity induced cockerels after treatment with tulsi. Similarly, Sapkota and Upadhyaya (2009) and Patankar *et al.*, (2011), observed that AST values were significantly ($p < 0.05$) lower with dietary supplementation of *Ocimum sanctum* leaf (Tulsi) powder at 0.5% levels in broilers.

Table.1 Effect of *Polyalthia longifolia* leaf meal on ALT and AST values in broiler chicken

| Treatment | ALT (U/L) | AST (U/L) |
|--|---------------------------|----------------------------|
| T ₁ - Control diet | 12.96 ^a ± 0.76 | 191.88 ^a ± 6.99 |
| T ₂ - 0.1% <i>Polyalthia longifolia</i> | 8.01 ^b ± 0.26 | 153.88 ^b ± 9.27 |
| T ₃ - 0.2% <i>Polyalthia longifolia</i> | 7.76 ^b ± 0.44 | 147.63 ^b ± 4.57 |
| p-value | 0.004* | 0.004* |

*Means bearing different superscripts in the same column differ significantly (p<0.01)

On the contrary kumara *et al.*, (1994) concluded that *Curcuma longa* supplementation in the broiler diet resulted in no significant difference in ALT and AST levels. The results obtained in the present study revealed that the dietary supplementation of *Polyalthia longifolia* leaf meal at 0.1% and 0.2% levels were found to be more effective in reducing ALT and AST levels when compared to control group. The values showing normal satisfactory liver function from dietary supplementation of *Polyalthia longifolia* leaf meal as compared to control group. These results clearly indicated that *Polyalthia longifolia* (Ashoka) has hepato-protective properties.

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