

## EFFECT OF DIETARY SUPPLEMENTATION OF TRIPHALA ON ANTIBODY TITRE AGAINST NEWCASTLE DISEASE IN BROILER CHICKEN

V. Madhupriya<sup>1</sup>, P. Shamsudeen<sup>2</sup>, G. Raj Manohar<sup>2</sup> and S. Senthilkumar<sup>1</sup>

<sup>1</sup>Department of Poultry Science, Veterinary College and Research Institute,  
Namakkal - 637002

<sup>2</sup>College of Poultry Production and Management, Hosur - 635110  
E-mail: vmadhupriyavet@gmail.com (*Corresponding author*)

**Abstract:** A biological experiment was conducted to study the effect of dietary supplementation of Triphala at 0, 0.025, 0.050, 0.075 and 0.10 per cent on antibody titre against New Castle disease vaccine in broiler chicken. The result of the study revealed that dietary inclusion of Triphala had significantly ( $P < 0.05$ ) increased the antibody titre against Newcastle disease in broiler chicken at and above 0.05 per cent level with highest antibody titre at 0.075 per cent Triphala supplemented group.

**Keywords:** Triphala, Antibody titre, Newcastle disease, Broiler.

The phyto-genic feed additives (PFA) are used now-a-days in the poultry industry as one among the alternatives to antibiotic growth promoters. In addition to the antimicrobial effect of PFAs, they also produce immunomodulatory effects in the birds (Hashemi and Davoodi, 2012). Triphala is a *Tridoshic Rasayana* in Ayurvedic system of medicine containing *Emblica officinalis* (*Amlal Nellikkaai*), *Terminalia chebula* (*Haritakil Kadukkaai*) and *Terminalia bellerica* (*Bibhitakil Thaandrikkaai*) and in which, dried pericarps of the three myrobalans are included at 1:1:1 proportion (AFI, 2002). Triphala has been proved to have antimicrobial, anti-inflammatory, antimutagenic, immunogenic, antipyretic, free radical scavenging, antioxidant, analgesic, wound healing, anticarcinogenic, antistress, adaptogenic, antidiabetic and hypoglycemic activity (Kumar *et al.*, 2016) and hypolipidemic activity (Saravanan *et al.*, 2007). Hence, the study on the immunogenic property has been carried out to study the influence of dietary supplementation of Triphala on antibody titre against Newcastle disease vaccine in broiler chicken.

### Materials and Methods

A biological experiment was conducted using 300 commercial sexed, day-old, broiler chicks and they were randomly grouped into six treatments (T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>, T<sub>5</sub> and T<sub>6</sub>) with five

replicates for each treatment and containing ten chicks per replicate. The chicks were reared in deep litter system in a gable roofed, open sided house, under standard management conditions upto five weeks of age. The birds were vaccinated on day 7 and 21 with NDB<sub>1</sub> and ND LaSota, respectively.

The Triphala was prepared using the ingredient fruits procured from a local traditional medicine shop, powdered and included in the diet. The basal diet is supplemented with 0, 0.025, 0.050, 0.075 and 0.10 per cent Triphala powder (T<sub>1</sub>, T<sub>3</sub>, T<sub>4</sub>, T<sub>5</sub> and T<sub>6</sub>), respectively. The basal diet is provided with 0.004 per cent antibiotic growth promoter – oxytetracycline (T<sub>2</sub>).

Blood samples were collected on 35<sup>th</sup> day of age and they were allowed to clot and centrifuged for 10 minutes at 2000 rpm to separate the serum sample. Antibody titre in the sera against New Castle disease vaccine was estimated by Haemagglutination inhibition test as per method of Alexander (1998). The data collected were subjected to statistical analysis as per the method suggested by Snedecor and Cochran (1989).

### Results and discussion

The mean ( $\pm$  S.E.) antibody titre of broiler chicken against NewCastle disease vaccine ( $\log_2$  value) at 35<sup>th</sup> day of age, as influenced by dietary supplementation of graded levels of Triphala is presented in Table 1.

The result on antibody titre of broiler chicken against NewCastle disease vaccine revealed significant differences ( $P < 0.05$ ) among treatment groups, due to supplementation of Triphala in diet. The groups supplemented with Triphala at 0.075 per cent in diet (T<sub>5</sub>) had significantly ( $P < 0.05$ ) higher antibody titre than the control (T<sub>1</sub>), T<sub>2</sub> and T<sub>3</sub> groups, whereas the treatment groups, T<sub>4</sub> and T<sub>6</sub> did not differ significantly with the higher antibody titre group.

**Table 1.** Mean ( $\pm$  S.E.) antibody titre of broiler chicken against NewCastle disease vaccine ( $\log_2$  value) as influenced by the dietary supplementation of graded levels of Triphala

Treatment	Antibody titre (HI titre against NDV)
T <sub>1</sub>	1.50 <sup>b</sup> $\pm$ 0.31
T <sub>2</sub>	1.70 <sup>b</sup> $\pm$ 0.34
T <sub>3</sub>	1.70 <sup>b</sup> $\pm$ 0.37
T <sub>4</sub>	2.60 <sup>ab</sup> $\pm$ 0.34
T <sub>5</sub>	3.00 <sup>a</sup> $\pm$ 0.39
T <sub>6</sub>	2.40 <sup>ab</sup> $\pm$ 0.43

Value given in each cell is the mean of 10 observations

<sup>a,b</sup> Means within a column with no common superscript differ significantly ( $P < 0.05$ )

The result of present study is in accordance with Srikumar *et al.* (2005), Srikumar *et al.* (2007) and Sabina *et al.* (2009), who proved that Triphala had induced both cellular and humoral immunity in laboratory animals such as, rat or mice. Bhattacharya *et al.* (2015) and Mandal *et al.* (2017) also found similar results of increased humoral response against sheep red blood cells in broiler on phytobiotic supplementation with *E. officinalis*, as one of its ingredients. The results of present study showed that supplementation of Triphala at and above 0.05 per cent in broiler diet improves the immune response by producing higher antibody titre against NewCastle disease vaccine, with the highest antibody titre at 0.075 per cent inclusion in broiler diet.

The presence of phytochemicals in Triphala would possess immunomodulatory effect and thereby improves the immune response. Hence, it could be concluded that the Triphala could be used in diet to improve the immune response in broiler chicken.

### **Conclusion**

It has been concluded that dietary supplementation of Triphala at and above 0.05 per cent improved the immune response by producing higher antibody titre against NewCastle disease vaccine, with the highest antibody titre at 0.075 per cent in broiler diet.

### **References**

- [1] Anonymous. The Ayurvedic formulary of India, part - II, Department of Indian System of Medicine and Homeopathy: New Delhi, 2002.
- [2] Kumar, N.S., A.S. Nair, A.M. Nair and M. Murali, 2016. Pharmacological and therapeutic effects of Triphala – a literature review. *J. Pharmacog. & Phytochem.*, **5**(3): 23-27.
- [3] Saravanan, S., R. Srikumar, S. Manikandan, N.J. Parthasarathy and R.S. Devi, 2007. Hypolipidemic effect of Triphala in experimentally induced hypercholesteremic rats. *Pharm. Soc. Japan*, **127**(2): 385-388.
- [4] Snedecor, G.W. and W.G. Cochran, 1989. Statistical Methods. 8<sup>th</sup> Edn, Iowa state university press, Ames, USA. Iowa - 50010.
- [5] Alexander, D.J., 1998. Newcastle disease diagnosis, Newcastle disease, 1<sup>st</sup> Edn, Kluwar Academic Pub, Bostan. pp. 98-160.
- [6] Bhattacharya, A., P.K. Shukla and M. Shukla, 2015. Effect of polyherbal phytobiotic on the growth, immunocompetence, development of digestive organs and carcass characteristics of commercial broilers. *J. Anim. Res.*, **5**(2): 347-351.

- [7] Mandal, A.H., R. Kulkarni, J.J. Rokade, S.K. Bhanja and R. Singh, 2017. Effect of dietary addition of Amla (*Emblica officinalis*) on performance and HSP70 gene expression in coloured broiler chicken during extreme summer. *J. Anim. Res.*, **7**(2): 233-241.
- [8] Sabina, E.P., M.K. Rasool and L. Mathew, 2009. *In vivo* and *in vitro* immunomodulatory effects of Indian Ayurvedic herbal formulation Triphala on experimental induced inflammation. *Pharm. online*, **2**: 840-849.