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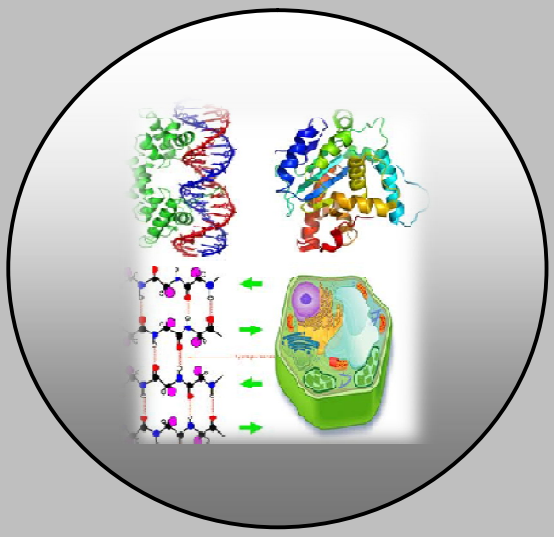

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RESEARCH PAPER

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Moringa oleifera Leaf Extract Imposes Better Feed Utilization in Broiler Chicks

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ABSTRACT

The aqueous extract and dried powder of Moringa oleifera leaf was evaluated on Feed conversion ratio (FCR) in broiler chicks. Fifty no. of day old chicks were kept into 5 groups each contain 10 chicks. First two (T_1 and T_2) were fed with aqueous extract and dried powder of Moringa oleifera respectively each @ 250 mg/kg b.wt. For comparison, a levamisole fed group T_3 was included, to compare the immunomodulatory effect of the preparations of M. oleifera with that of a known positive immunomodulator, which was fed @10 mg/kg b.wt. The other two groups T_4 and T_5 included in the experimental design served as the vaccinated and unvaccinated control groups' respectively. M. oleifera fed groups showed better FCR than levamisole treated groups followed by vaccinated and unvaccinated control groups of chicks. No mortality was recorded in tested groups. Overall M. oleifera showed significant ($P<0.05$) increase in average body weight gain and feed conversion efficiency in the birds.

Keywords: Moringa oleifera, Feed Conversion Ratio (FCR), Immunomodulatory effect and Levamisole.

INTRODUCTION

Moringa oleifera is one of the important plants to be mentioned with priority in medicinal herbs. A folk remedy for catarrh, cancer, gastric ulcer, skin disease, lower blood sugar, nervous condition and diabetes.

It is also used to strengthen lever, eye, brain, gall, and immune system and most important. It is also used to expel intestinal worm. The leaves, flower and pod are used as significant source of vitamins A, riboflavin, nicotinic acid, folic acid, pyridoxine, ascorbic acid, beta carotene, calcium, iron and α-tocopherol (Prasad and Ganguly 2012).

There is need for immunomodulator that can safely and selectively enhance a specific class or subclass of immunocyte in man and animal. In Ayurveda, *M. oleifera*, possesses antimicrobial, antinflammatory, antioxidant, CNS depressant, antihyperlipidaemic, anticancer, antihepatotoxic and anti ulcer property. It can be presumed that the plant working through immune system (Ganguly and Prasad 2010).

MATERIAL AND METHODS

The plant was procured locally and herbal preparations are made. Aqueous extract was made on boiling known amount of Moringa leaf in water and dried powder was made on shadow drying.

Fifty (50 No.) day old Vencobb chicks were procured and maintained under standard farm conditions in Department of Microbiology, Faculty of Veterinary Science & Animal Husbandry, BAU, Ranchi. After providing 7 days of brooding periods, chicks were divided in 5 groups each having 10 chicks**.** The treatment given to the chicks under the 5 groups was as follows:

Group 1: The chicks were treated with aqueous extract of *Moringa oleifera* leaves @ 250mg/kg b.wt. and were vaccinated accordingly as per the vaccination schedule.

Group 2: The chicks were treated with leaf powder of *M. oleifera* @ 250mg/kg b. wt. and were vaccinated accordingly as per the vaccination schedule.

Group 3: The chicks were treated with levamisole @ 10mg/kg b. wt. orally and were vaccinated accordingly as per the vaccination schedule

Group 4: The chicks of this group were not fed with any extract of *M. oleifera* and were vaccinated accordingly as per the vaccination schedule. This group served as positive control.

Group 5: The chicks were neither be fed with any extract of *M. oleifera,* nor were vaccinated against Newcastle disease (ND) vaccine. This group served as control.

Monitoring of feed conversion ratio

The live body weight of chicks was measured at weekly intervals on 1^{st}, 7^{th}, 14^{th}, 21^{st}, 28^{th} and 35^{th}day of experiment. The feed efficiency was calculated in terms of feed conversion efficiency (ratio).

Feed conversion efficiency was measured at weekly intervals on the basis of total feed intake and total gain in body weight. The feed conversion efficiency was interpreted as given below:

$$\text{Feed conversion efficiency (ratio)} = \frac{\text{Total feed consumed (g) in particular period}}{\text{Total body weight gain (g) during same period}}$$

Statistical analysis

All data were subjected to statistical analysis as per standard methods and techniques out lined by Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

The group of chicks fed with *Moringa oleifera* showed a significantly (P<0.05)appreciable feed conversion ratio than the control groups as well as levamisole treated group throughout the period of observation (Table), which might be suggestive of the fact that some of the metabolic by-products of the herbal preparation may have growth promoting properties.

Table. 1 Body weight gain and FCR of treatment groups at different intervals*.

Age (in days)	Particulars	T_1	T_2	T_3	T_4	T_5 (control)
7	Weight gain (in g)	205	205	206	200	195
	FCR	1.76	1.77	1.79	1.8	1.79
14	Weight gain (in g)	230	225	225	220	210
	FCR	1.72	1.71	1.78	1.82	1.85
21	Weight gain (g)	395	389	390	370	370
	FCR	1.77	1.76	1.83	1.88	1.86
28	Weight gain (g)	209	210	200	190.3	190
	FCR	1.54	1.55	1.69	1.7	1.72
35	Weight gain (g)	801	811	801	839.7	820
	FCR	1.8	1.8	1.86	2.03	2.04
Average daily wt. gain (g)		52.57	52.57	52.06	52.00	51
Average FCR		1.718	1.718	1.79	1.846	1.852

(*P<0.05)

The findings of increased body weight gain in the present study by feeding *M. oleifera* leaf extract to broiler chicks have been supported by the reports of Sarag and Khobragade (2003) in which higher live body weight gain in broiler birds were observed after supplementation with *Tinospora cordifolia*, another promising herbal feed supplement in poultry ration.

The findings in this study are also supported by Thatte *et al.* (2001) and Kumari *et al.* (2012) in which they recorded higher body weight gain in mice supplemented with *T. cordifolia and Asparagus racemosus* respectively. Levamisole is also reported to induce increased body weight gain by the studies of Mani *et al.* (2001) and Panda and Rao (1994) in which they had observed and reported the effects of levamisole in broiler chicks infected with infectious bursal disease virus.

CONCLUSION

The present study showed that herbal preparations of *Moringa oleifera* leaf extract can be beneficially used as an effective feed supplement in poultry for its encouraging results in relation to total body weight gain and feed conversion efficiency in the broiler chicks. It can also be used potentially before mass vaccination of the chicks for its property of immunomodulation like levamisole.

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