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### PROMINENT ELICITATION OF NON-SPECIFIC IMMUNE RESPONSE IN BROILER CHICKS ADMINISTERED ORALLY WITH *MORINGA OLEIFERA* LEAF EXTRACT IN OPTIMUM MIXTURE WITH FEED AKHOURI S<sup>1</sup>, PRASAD A<sup>1</sup>, GANGULY S<sup>2</sup>

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**Abstract:** The aqueous extract and dried powder of *Moringa oleifera* leaf were investigated for its immunostimulatory effect in broiler chick. It was evaluated on the basis of percentage of formazan positive cell in blood samples and skin sample collected at the end of reaction. Fifty (50 No.) day-old chicks were kept into 5 groups each contain 10 chicks. First two treatment groups (T<sub>1</sub> and T<sub>2</sub>) were fed with aqueous extract and dried powder of *M. oleifera* respectively each @ 250 mg/kg b.wt. For comparison, a levamisole fed group T<sub>3</sub> was included, to compare the immunomodulatory effect of the preparations of *M. oleifera* with that of a known positive immunomodulator, which is fed @ 10 mg/kg b.wt. The other two groups T<sub>4</sub> and T<sub>5</sub> included in the experimental design served as the vaccinated and unvaccinated control groups respectively. The effect of treatment was recorded from day 14<sup>th</sup> day. In the skin sections from day 14 up to day 42 more infiltration of mononuclear cells was observed in levamisole treated group followed by herbal preparation fed (treated) groups, followed by control group in skin section collected at the end of experiment. No mortality was recorded in the treated groups. *M. oleifera* showed stimulatory effect on non-specific immune response in chicks.

**Keywords:** Immunostimulatory effect, *Moringa oleifera*, Non-specific immunity

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## INTRODUCTION

Moringa or Sahijan is also known as Drumstick tree or Horseradish tree which is a versatile tree useful not only for human being but also for animal.

The botanical name of Moringa is *Moringa oleifera*. It belongs to family *Moringaceae*. The Moringa plant originated initially in the northern part of India and soon move to southern part. The plant kingdom represents a rich storehouse of organic compounds, many of which have been used for medicinal purpose. A number of Indian medicinal plants and various rasayans have been claimed to have immunomodulatory activities. Moringa is one of the important plant mentioned in all medicinal herbs<sup>1,2</sup>.

The aqueous extract of the mature flowers of *M. oleifera* contain free natural sugars, D-mannose and D-glucose in the ratio of 1:5 and two unidentified carbohydrate bearing material along with protein and ascorbic acid<sup>3</sup>. The leaves of Moringa also contain same compound as well as niazirin and niazirin<sup>4</sup>. The leaves have high protein content of 27% and are rich in vitamins A and C, calcium, iron and phosphorus. The Bureau of plant industry, in its report, stated that weight per weight, Moringa leaves have the calcium equivalent to 4 glasses of milk, the vitamin C content of 7 oranges, potassium of 3 bananas, 3 times the iron of spinach, 4 times the amount of vitamin A in carrots, and 2 times the protein in milk<sup>2</sup>.

The present study was carried out to assess and evaluate the effect of *M. oleifera* leaf in non-specific immune response in broiler chicks.

## MATERIALS 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 at Faculty of Veterinary Science & Animal Husbandry, BAU, Ranchi. The chicks were divided into 5 equal groups each containing 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.

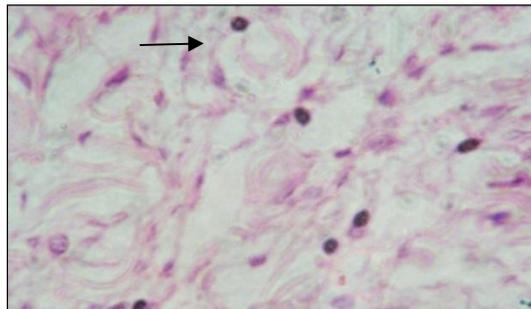
*Group 5:* The chicks were neither fed any extract of *M. oleifera* nor were vaccinated against Newcastle disease (ND). This group served as control.

Non-specific immune response of macrophages was assessed by tissue section collected during delayed hypersensitivity reaction with the same method as per Culling *et al.*<sup>5</sup> with certain modifications.

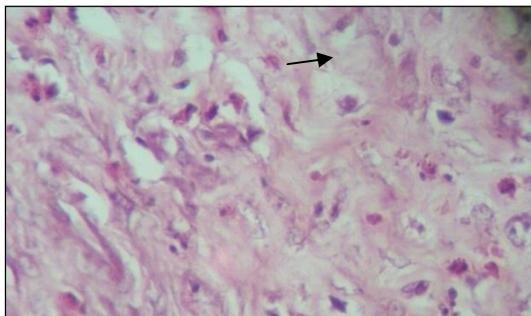
For counting formazan granules the skin samples were incubated in Nitroblue tetrazolium dye (0.2% NBT in PBS) and then fixed in 10% formalin. The fixed tissue was processed and stained with H & E method<sup>6</sup>.

## RESULTS AND DISCUSSION

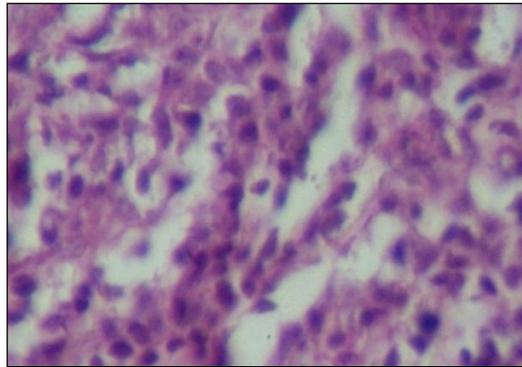
Histopathological examination of tissue section revealed more formazan positive cells in levamisole treated group followed by Moringa treated group, vaccinated control and unvaccinated control group (**Figs. 1-5**). It clearly supported the relative stimulation of non-specific immune response among all the groups as reported by Culling *et al.*<sup>5</sup> and Culling<sup>6</sup>.



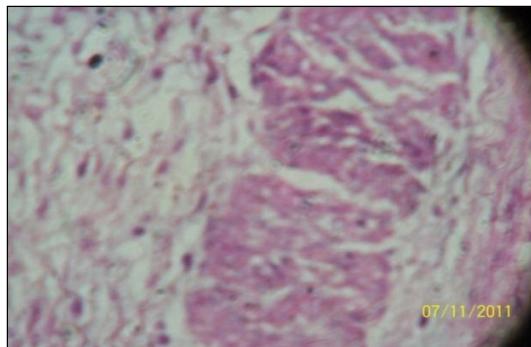
**Fig.1.** Formation of formazan positive cells in Group T<sub>1</sub> (H&E x 100)



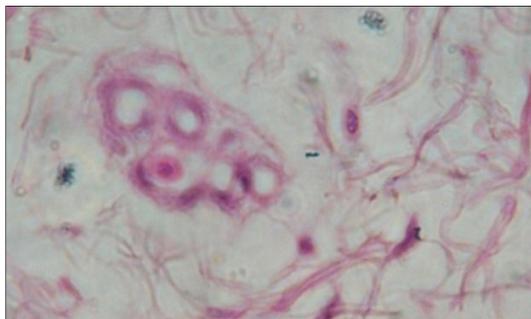
**Fig.2.** Formation of formazan positive cells in Group T<sub>2</sub> (H&E x 100)



**Fig.3.** Formazan positive cells in Group T<sub>3</sub> (H&E x 100)



**Fig.4.** Formazan positive cells in Group T<sub>4</sub> (H&E x 100)



**Fig.5.** Formazan positive cells in Group T<sub>5</sub> (control) [H&E x 100]

## CONCLUSION

Effect of aqueous extract and dried powder of *M. oleifera* leaf treatments on non-specific immune response showed stimulatory effect. No mortality was recorded in tested groups. Hence, *M. oleifera* was safely recommended as a immunostimulant.

## ACKNOWLEDGEMENTS

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