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APPLICATION OF *MORINGA OLEIFERA* IN POUTLRY: A REVIEW

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ABSTRACT

Herbal products have been a form of medicine from time immemorial. Chicken meat is an important source of animal protein and the commercial poultry industry is developing at a great pace to cater for the increasing demand. Use of herbal feed supplements to improve the health and productivity of poultry is being concentrated in the recent years. *Moringa oleifera* is a tree commonly found in various parts of the world with lot of nutritional and medicinal value. The use of *M.oleifera* leaves as a supplement in poultry is reviewed in this article.

Keywords: Medicine, *Moringa oleifera*, leaves.

INTRODUCTION

Agriculture and livestock contribute greatly to the world gross domestic product (GDP), especially in the developing countries where they retain a fundamental role for the economic sustenance of millions of people. In India, poultry industry is booming and emerging as the world's second largest market with a growth of 12-15% year on year. Chicken meat is an important source of animal protein both in rural and urban areas and owing to their relatively low fat and cholesterol contents than other meat, chicken meat is considered as a healthy animal food [1].

Use of synthetic feed additives to enhance growth of poultry is expensive. Further synthetic products have the disadvantage of producing adverse effects both in birds and in consumers. Use of antibiotic growth promoters have been banned in many countries as their indiscriminate use leads to development of antibiotic resistant pathogenic bacteria. Hence the

use of herbal feed supplements has gained momentum as they are believed to be safer with less side effects. Such herbal supplements are shown to improve feed efficiency, weight gain, act as antioxidants, immunostimulants and antibacterials[2,3]. The present article is aimed to review the benefits of supplementing *M.oleifera* to broilers.

Moringa Oleifera

Moringa oleifera Lam (Synonym: *Moringa pterygosperma Gaertner*) belongs to a monogenic family, *Moringaceae.* The tree is considered to have its origin in Agra and Oudh in the northwest region of India, South of Himalayan mountains. The leaves and fruits of *M.oleifera* (also known as the horseradish tree, drumstick tree, benzolive tree, kelor, marango, monger, moonga, mulangay, nebeday, saijhan, sajna or ben oil tree) are used as food [4].

Biological importance of *Moringa oleifera*

All parts of *Moringa* tree are edible. It is a rich source of carotenoids, calcium, iron and minerals. The seed kernel contains on an average 40 percent by weight of oil, with palmitic, stearic, behenic and oleic acids. *Moringa* species are rich in fairly unique group of phytochemicals, glucosinolates and isothiocyanates[4,5]. Reports indicate a wide range of biological properties for *M.oleifera* leaves and are given in Figure 1.

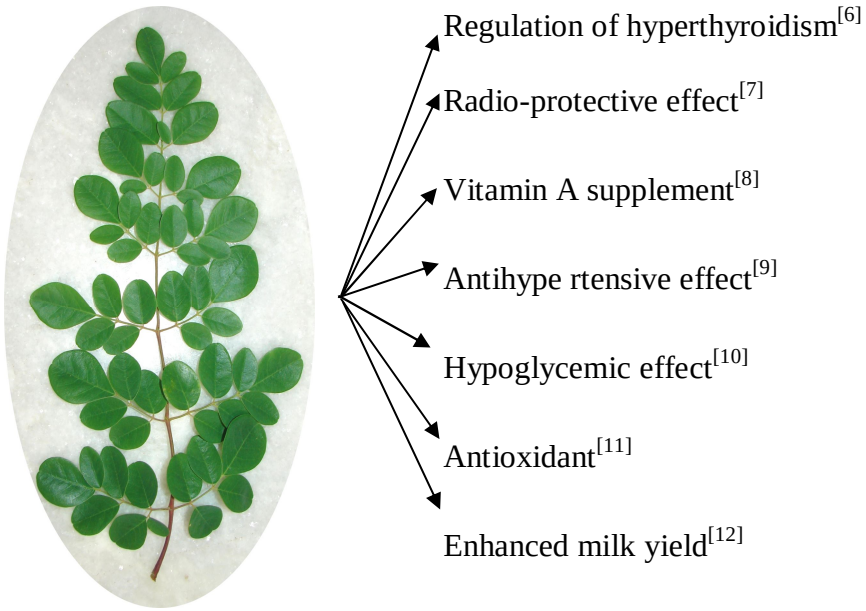

Fig.1.Biological properties of *M.oleifera leaves*

Application of *M.oleifera* leaves in poultry

In the recent years, the application of *M.oleifera* leaves as growth promoters, anti aflatoxic agents and coccidiostats have been studied and published.

***M.oleifera* leaves and production performance**

In India, young leaves of *M.oleifera* are used as cattle fodder to improve milk yields by farmers[13]. In Zimbabwe, the leaves are used as animal feed[14]. *Moringa oleifera* aqueous leaf extract given at concentrations 30 ml, 60 ml and 90 ml via drinking water has been shown to significantly improve the actual live weight, feed conversion ratio (FCR) and return of investment (ROI) of Cobb broilers [3]. Inclusion of *Moringa oleifera* meal as protein supplement in broiler diets at 25% inclusion level produces broilers of similar weight and growth rate compared to those fed under conventional commercial feeds[15]. Further, Verma *et al.*[16] have demonstrated the inhibition of lipid peroxidation in chicken liver homogenates by the whole plant extract of *Moringa oleifera*, indicating their antioxidant effect in preserving chicken meat.

***M.oleifera* leaves and aflatoxin toxicity**

Aflatoxins, produced by *Aspergillus* fungi are common contaminants of livestock feeds. The most common aflatoxins in feed are aflatoxin B1 (AFB1), aflatoxin B2 (AFB2), aflatoxin G1 (AFG1), aflatoxin G2 (AFG2). Consumption of such contaminated feed affects liver and kidney and leads to damage [17]. Poultry are highly susceptible to the toxic effects of aflatoxins. In addition to health losses, aflatoxins cause economic losses in poultry in terms of reduced productivity such as a reduction in feed conversion ratio, lowered egg production, reproductive effects, susceptibility to infections and increase in mortality [18].

In poultry, oxidative stress and liver damage are the major causes of aflatoxin toxicity [19]. Aflatoxin feeding increased lipid peroxidation products and reduced the antioxidant enzymes Superoxide dismutase, catalase and glutathione peroxidase in liver. Supplementation of *M.oleifera* leaves to diet significantly reduced the adverse effects of aflatoxin on blood biochemical parameters and liver lipid peroxidation and antioxidant status and exerted protective effect against aflatoxin toxicity in broilers [20]. Similar effect has also been reported in experimental animals [17].

***M.oleifera* leaves and coccidiosis**

Avian coccidiosis is one of the most important dreadful diseases of poultry worldwide. Coccidiosis cuased by *Eimeria* species cause huge economic losses in poultry and this includes the costs for treatment of birds, reduced productivity and losses due to mortality of birds. The intensive use of anticoccidial drugs has led to the development of resistance [21]. Recently Ola-Fadunsin and Ademola[22] studied the effect of acetone extract of *M. oliefera* to inhibit coccidiosis.The findings revealed improved body weight and increase in the values of their haematological parameters on supplementation of *M. oliefera* in *Eimeria* infected birds.

CONCLUSION

Moringa oleifera leaves exhibit growth promoting, antioxidant, hepatoprotective and antibacterial effects in poultry. As they are available in plenty they could be utilized for the improvement of poultry.

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