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Comparative efficacy of pineapple leaves and two patent anthelmintics (Albendazole and Ivermectin) against Ascariasis in indigenous chicken

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Abstract

The aqueous extract of pineapple leaves and patent anthelmintics albendazole (Benazol®) and ivermectin (Vermic®) were assessed against acaridae in indigenous chicken. Among these, extract of pineapple leaves was administered @ of 1 gm/kg body weight for seven consecutive days while albendazole @ full 50 mg/kg body weight for 3 days, and ivermectin @ 0.2 mg/kg body weight s/c given as a single dose. Results showed that pineapple leaves extract caused gradual increase of 100 % efficacy up to day 28th of treatment. Haematological analysis revealed that the aqueous extract of pineapple leaves did not show any adverse effect on blood parameter in treated birds. But Benazol® and Vermic® were effective. Pineapple leaves is considering more suitable one. It should be given conclusion that pineapple leaves were effective against ascariasis in chicken.

Keywords: Comparative efficacy, Pineapple leaves extract, Albendazole and Ivermectin, Ascariasis, Indigenous chicken

Introduction

Livestock and chicken in Bangladesh are firmly integrated into the economic structure and village life. The nation is under the greatest threats of malnutrition and poverty. Sustainable chicken industry development could play a revolutionary role in the elimination of poverty by self-employment and remove malnutrition problems from the society. According to DLS (1998), total contribution of livestock sector GDP is approximately 6.5 percent. About 20 percent of people are provided by full time employment and 50 percent are partial employment (Alam, 1993).

According to Pundit (1995), the annual growth rate of livestock sector raised from 2.2% in 1990-1991 to 3.6% in 1991-1992 and then to about 5% in 1992-1993. There are various types of anthelmintics, which are being frequently used for deworming of animals and birds in Bangladesh such as Fenbendazol (paraclear®), Piperazine citrate (Avipar®), Albendazole (Benazole®) and Ivermeetin (Vermic®). The increasing demand of animal protein and the economic benefits obtained through chicken raising in both backyard and conventional farmers systems have created a great deal of interest among farmers in these days. But poultry farming in Bangladesh are facing various hindrances. Among these, parasitic infections perhaps play a vital role. The high percentage of chicken mortality due to various diseases including parasitic one, is a discouraging factor for the farmers who want to raise more chicken. Islam and Shaikh (1967) reported that both internal and external parasites are present in chicken of Bangladesh.

Ascariasis is a common problem of chicken in the tropical and subtropical countries of the world. Among gastro-intestinal nematodes, ascarid infection ranks top position in Bangladesh. Ascariasis is causing an appreciable loss to chicken population in Bangladesh. It is very difficult to find chicken flock that rear in free ranging system of this country free from ascarids infection. The economic losses due to ascariasis in chicken may be produced in different ways, such as, loss of meat, egg and loss due to death.

A good spectrum of effective anthelmintics is available in market. Among them Piperazine citrate, Levamisole, Albendazole, Ivermectin is widely used for the treatment of ascariasis in chicken. Besides patent anthelmintics, now a day's indigenous medicinal plants are also used as anthelmintics. On the other hand, there are several indigenous medicinal plants such as Neem, Pineapple, Tobacco, which have anthelmintic action. Among them, Pineapple leaves is pioneer one. (Mostofa, 1983; Sivdas, 1980; Safique 1983; Mannan, 1997; Nath, 1983; Dutta and Hazareka, 1976).

On the basis of faecal egg count, 40 native chickens heavily infected with parasites were selected and purchased from different villages of Kotoali thana of Mymensingh district. The chicken was allowed for acclimatization to take rest for 7 days. The age and body weight of all selected chicken ranged from 60 to 210 days and 300 to 500 gm respectively. The chicken was supplied with normal diet and water.

Benazol[®] (Albendazole) and Vermic[®] (Ivermectin) were purchased from local Pharmacy.

Pineapple leaves (*Ananus comosus*) were collected from "Medicinal garden" of Department of Pharmacology, Bangladesh Agricultural University, Mymensingh.

To obtain 10% aqueous extract; 20 gm of pineapple leaves were thoroughly washed in tap water. The leaves were cut into small pieces with the help of knife, there after, the fleshy parts were mixed with the help of mortar and pastels. The extract was made up to 20 ml by adding distilled water and filtered it through a piece of clean silk cloth.

All the 40 infected experimental chicken randomly divided into four groups, comprising of ten chickens in each and marked as groups A, B, C and D.

Group A: Normal control no treatment was given.

Group B: Each chicken of this group was treated with Pineapple leaves extract @ 1 gm/kg body weight p.o. by dropper for consecutive seven days.

Group C: Each chicken of this group was treated Benazol[®] (Albendazole) @50 mg/kg body weight through drinking water or by dropper for consecutive three days.

Group D: Each chicken of this group was administered Vermic[®] subcutaneously @0.2mg/kg body weight by tuberculin syringe for single dose.

Blood was collected with sterile syringe and needle from neck vein of the chicken just pair to treatment at day 0, day 14 and day 28. Immediately after collection, blood was transferred to sterile tube containing anticoagulant (4% sodium citrate solution) at a ratio of 1:10, and within two hours collection, blood was analysed for total erythrocyte count (TEC), haemoglobin content (Hb), packed cell volume (PCV), total leukocyte count (TLC) were done as described by Coffin, 1953.

Results and Discussion

Anthelmintic activity of pineapple leaves extract might cause reduction of parasitic loads in infected chickens as like selected patent drugs do. As a result, chickens properly utilised feed nutrients and consequently this imparts the improvement of total erythrocyte count.

The results of the effect of one indigenous medicinal plant and 2 patent drugs on different haematological parameters were shown in the Table1.

Total erythrocyte count (TEC, million/cu.mm³): Treatments with pineapple leaves extract, Benazol® (albendazole) and Vermic® (ivermectin) caused significantly increased total number of erythrocyte (TEC) in chicken of group B, C and D, but the significant increased of TLC values observed on day 28 in all group of chicken except group A. This increased values might be complete destruction of parasites by the anthelmintic action. As a result absorption of nutrients was held properly and TEC was gradually improved. But in control group A, TEC was decreased due to effect of parasitic infection on hematopoietic system and erythrocyte.

Hemoglobin count (Hb): Haemoglobin levels were significantly increased in group B, C and D but in group A haemoglobin levels was decreased.

Packed cell volume (PCV): Packed cell volume of chicken blood was significantly increased in group B, C and D. The highest value was observed on 28th day in group B.

Erythrocyte sedimentation rate (ESR): On day 14, ESR was almost remained unchanged in all the treated chickens except In-Group B where it was increased. On the contrary, ESR was decreased in all the treated chickens on day 28. Control group showed drastic reduction of ESR on day 14, though in became unchanged on day 28.

Erythrocyte sedimentation rate (ESR) was observed that more or less same in normal control group because in this group was not given any treatment expect feed. But in group B (Pineapple leaves extract@1 gm/kg body weight), group C (Benazol @ 50gm/kg body weight) and group D (Vermic@ 500µg/kg body weight) was given orally in chicken and found that ESR reduced from day 14 in all treated groups. The highest reduction of ESR was found on 28th day all treated groups

Table 1. The effect of two patent drugs, Benazol® (albendazole), Vermic® (ivermectin) and one indigenous plant (Pineapple leaves) on deferent hematological parameters in chickens

Group	Day 0					Day 14					Day 28				
	TEC million/cu mm	Hb gm%	PCV%	ESR/ 1 st hr	TLC 10 ³ /mm ³	TEC million/cu mm	Hb gm%	PC V%	ESR/1 st hr	TLC 10 ³ /mm ³	TEC million/cu mm	Hb gm%	PCV%	ESR/ 1 st hr	TLC 10 ³ /mm ³
A	3.104 ± 0.017	9.36 ± 0.067	19.98 ± 0.16	0.62 ± 0.12	10.02 ± 0.11	3.00NS ± 0.017	8.76NS ± 0.074	18.34 NS ± 0.23	0.480N S ± 0.12	10.12 NS ± 0.06	2.98 NS ± 0.010	8.46 ± 0.147	17.1 ± 0.27	0.485 ± 0.045	10.52 ± 0.11
B	3.758 ± 0.12	10.1 ± 0.123	22.2 ± 0.15	0.48 ± 0.13	7.6 ± 0.11	3.794** ± 0.29	11.02** ± 0.097	23.02* * ± 0.213	0.5 ± 0.07	7.42** ± 0.11	3.948NS ± 0.016	12.76 NS ± 0.117	23.14* * ± 0.14	0.48** ± 0.12	7.32NS ± 0.08
C	3.752 ± 0.019	10.34 ± 0.001	20.5 ± 0.070	0.5 ± 0.09	7.48 ± 0.1	3.858** ± 0.018	11.1** ± 0.114	22.00* * ± 0.2	0.52 ± 0.13	7.24** ± 0.04	4.198NS ± 0.016	11.84 NS ± 0.117	23.08* * ± 0.21	0.46** ± 0.09	7.18 NS ± 0.53
D	3.724 ± 0.0093	10.48 ± 0.15	20.52 ± 0.14	0.5 ± 0.07	7.96 ± 0.11	3.744** ± 0.015	11.14** ± 0.12	21.06* * ± 0.129	0.5 ± 0.14	7.74** ± 0.1	3.892NS ± 0.012	12.5N S ± 0.19	22.42* * ± 0.21	0.44** ± 0.09	7.58 NS ± 0.08

** means p<0.01 level of significance

NS means not significant

Total leukocyte counts (TLC)

Pineapple leaves extract @ 1 gm/kg body weight, Benazol @ 50gm/kg body weight and Vermic @ 500µg/kg body weight was given orally in chicken and found that the reduction of TLC stated from day 15 in all treated groups. TLC was found on 28th day in all groups.

Present hematological study found that TEC/cumm, Hb (gm%) and PCV (%) were increased Significantly. Whereas ESR and TLC (10^3mm^3) were decreased after treatment with two patents drugs namely Benazol® and indigenous plant Pineapple leaves extract. The earlier works of Islam, *et al.* (2003), supported these findings.

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