



STUDIES ON PREVALENCE OF ASCARIASIS IN INDIGENOUS CHICKENS IN GAIBANDHA DISTRICT AND TREATMENT BY PINEAPPLE LEAVES EXTRACT

Mst. Kamrunnaher Akter¹, ABM Jalal Uddin^{1*}, Maksudur Rashid¹, Fahima Binthe Aziz², Md. Bazlar Rashid² and Mahmudul Hasan²

¹Department of Livestock Services (DLS), Bangladesh; ²Department of Physiology and Pharmacology, Hajee Mohammad Danesh Science and Technology University, Dinajpur-5200, Bangladesh

*Corresponding author: ABM Jalal Uddin; E-mail: abulbasar47@gmail.com

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ABSTRACT

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Ascariasis is very common in indigenous chicken causing retarded growth, low productivity and mortality. Considering the problem of *Ascaridia galli* in chickens, anthelmintic resistance, high cost and human health hazard of chemical anthelmintic the use of medicinal plant is an alternative choice. The study was conducted to determine the incidence of ascariasis in Polashbari upazilla of Gobindhaganj district during July to November 2012 and subsequently evaluated the efficacy of pineapple (*Ananus comosus*) leaves extract against ascariasis infected chickens. Out of 500 chickens examined for presence of *A. galli* infestation by faecal sample examination, 365 hens and 135 cocks. The 292 female (80%) and 119 male (88.15%) were found infected with *A. galli*. The highest infection rate 95.26% was found in 60 to 90 days of age group. Infected chickens were treated with pineapple leaves extract @ 1ml/kg body weight per OS for 7 consecutive days. The efficacy of anthelmintic treatment was evaluated by counting fecal egg per gram (EPG) compared with pretreatment values. Body weight and hematological changes of each chicken was recorded in pre and post treatment. In the untreated control chickens the average EPG increased from 300 ± 11.07 to 340 ± 13.96 . The average EPG reduced from 300 ± 11.07 to 60 ± 7.40 within 28 days of pineapple treatment. The mean body weight gain in treated chicken was significantly ($p < 0.01$) higher than the control. Pineapple leaves extract increased the TEC, Hb and PCV and decreased TLC and ESR values of chickens. But in control group TEC, Hb and PCV decreased and TLC and ESR values increased. It may be concluded that pineapple leaves extract treatment effectively reduced the ascariasis load in chicken and improved body weight.

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www.agroaid-bd.org/ralf, E-mail: editor.ralf@gmail.com

INTRODUCTION

Poultry is a promising sector in Bangladesh which is increasing day by day. Poultry production is hindered by many problems among which various diseases namely bacterial, viral and parasitic infections are the most important (Ojok, 1993). In fact poultry of Bangladesh are infested with various parasites (Sarkar, 1976). Management system plays an important role in the occurrence of parasitic disease. The parasitic load leads to lower productivity, retarded growth rate and death of birds (Barger, 1982; Sykes, 1994). Ascariasis caused by *Ascaridia galli* is a common parasitic problem of chicken both in rural and farm conditions in Bangladesh (Islam and Shaikh, 1967; Haq, 1986). *A. galli* causes extensive economic losses in different ways such as loss of weight gain, meat production, egg production and death of birds (Kamal, 1989). Piperazine citrate is widely used for the treatment of ascariasis in chickens. The use of anthelmintics by farmers for poultry parasite is not usual and strategic. Frequent and improper use of anthelmintics increases the resistant population of nematodes (Waller *et al.*, 1987). Furthermore the withdrawal period of anthelmintic is not maintained for consumption of poultry in Bangladesh which can cause significant health threat. Therefore, the use of safe and cost effective alternative approach for treatment of poultry parasite is necessary. There are several indigenous medicinal plants have anthelmintics action and used against both ecto and endoparasites in Bangladesh (Mostofa, 1983; Mannan *et al.*, 1997). Pharmacological actions along with therapeutic trial of these plants may be studied experimentally, which might prove worthy of medical value. Pineapple leave extract is used as anti-inflammatory, anti bacterial and anthelmintic agent (Mostofa, 1983 and Amin *et al.*, 2009). Considering the diversified pharmacological function of pineapple the present study was designed to evaluate the efficacy of pineapple leave extract on ascariasis in indigenous chicken.

MATERIALS AND METHODS

The experiment was conducted at the Department of Physiology and Pharmacology, Hajee Mohammed Danesh Science and Technology University, Dinajpur and Upazila Livestock Office, Palashbari, Gaibandha, during the period from July to November, 2012

Study area and sampling

A total of 500 native chickens (*Gallus gallus domesticus*) of 2 to 7 months age from different villages of Palashbari Upazila of Gaibandha District were examined to study the prevalence according to sex, age and location. Fecal samples were collected from the cloaca during early in the morning. The sample were packed within polythene bags and sent as soon as possible to the laboratory for examination. Direct smear method and Stoll's ova counting technique were used for fecal sample examination following the procedure described by Urquhart (2003) and Soulsby (1982).

Experimental bird

Fourty five indigenous chickens having infection with *Ascaridia galli* were selected for this experiment. The chickens were allowed to take rest for 7 days for adaptation. The experiment was carried out in upazila livestock office, Palashbari, Gaibandha. The age and body weight of chickens ranged from 2 to 7 months and 300 to 500 gm, respectively. The chickens were supplied with normal diet and water.

Fecal eggs count

For determination of infectivity, fecal samples were collected and eggs were counted by Stoll's ova counting technique and direct smear method through microscopy following the procedure described by Rahman *et al.* (1996) and Soulsby (1982). At least three slides from each faecal sample were examined.

Drug and plant

Pineapple leaves (*Ananus comosus*) were collected from the horticulture garden of the University. Ten percent (10%) water extract of pineapple leaves was prepared freshly, 20 gm pineapple leaves was grinded in mortar and pestle, the extract was made in 20ml water. The extract was then administered 1ml/kg orally by dropper.

Experimental design

All the 30 chickens randomly divided into 2 groups (control and treatment). Control group was without treatment and treatment group was treated with pineapple leaves extract. Pineapple leaves extract was administered orally @ 1 ml/kg bwt by dropper by 7 consecutive days. All the chickens of treated and control groups were closely observed for 28 days after treatment and on body weight, feeding efficiency, feather coat.

Hematological examination

Blood samples were collected from the wing vein of chicken of both control and treated groups at pre-feeding and during feeding (28 days) period at 7 days interval. Total erythrocytes count (TEC), Erythrocytes sedimentation rate (ESR), Packed cell volume (PCV) and Total leukocyte count (TLC) were performed as per methods described by Schalm *et al.* (1975). Hemoglobin estimation was performed as per method described by Coffin (1955).

Postmortem examination

Before treatment three chickens from each group were also slaughtered to count the number of parasites (Ascarids) and to see if there were any pathological changes present. After treatment three chickens from each group were slaughtered to count number of parasites (*A. galli*) and to see if there were any pathological changes present on 14th and 28th day of treatment.

Statistical analysis

Comparison of the mean values of the treatment against those of the control was performed by Student's t-test and the level of probability considered significant when $p < 0.05$.

RESULTS AND DISCUSSION

Out of 500 chickens 365 were hens and 135 were cocks. Among the female 292 (80%) and male 119 (88.15%) birds were found infected with *A. galli*.

Prevalence of ascariasis

The prevalence of ascariasis in chickens indifferent villages of Palashbari upazila of Gaibandha district is presented in table 1. The highest (93%) and lowest (74.74%) prevalence of ascariasis were recorded in village Andua and Nuniagari, respectively.

Table 1. Incidence of ascariasis in chickens of different age groups of Palashbari upazila of Gaibandha District

Category	Category-1 (2-3 months)	Category-2 (above 3-5 months)	Category-3 (above 5-7 months)	Total
Number of chicken examined	190	180	130	500
Number of infected chicken examined	181	167	72	420
Rate of infection (%)	95.26	92.78	55.38	84

A significant higher incidence (95.26%) of the infection was recorded in chickens between 2-3 months of age, followed by 92.78% and 55.38% between age group of 3-5 months and 5-7 months respectively. Similar findings have reported by Sarker *et al.* (2009), Gauly *et al.* (2005), Romanenko *et al.* (1985). The results indicate that the rearing or management system in different village and age factors played an important role in ascariasis in chicken.

Effect on body weight

The effect of pineapple leaves on body weight was observed for 28 days at 7 days interval. Mean body weight of each group of chickens at pretreatment and post treatment period is presented in table 2.

Table 2. Effects of pineapple leaf extract on body weight (gm) in chicken at different treatment period.

Group of chicken	0 day	7 th day	14 th day	21 st day	28 th day	Mean weight gain (%)
Control	402.466±3.65	398.241± 3.88	405.53± 3.58	403.413 ±3.54	406.06±3.46	0.89
Pineapple leaves extract @ 1gm/kg bwt orally	430.03± 5.29	431.99± 5.92	437.79± 5.19	439.07 ± 5.56*	446.09*±5.26	3.74

Values given above the represent the mean ± SE of 5 chickens

Table 3. Effects of pineapple leaf extract on fecal egg count.

Group of Chickens	0 day	14 th day	28 th day
Control	300 ± 11.07	320 ±11.42	340 ± 13.96
Pineapple leaves extract@ 1gm/kg bwt orally	300 ± 11.07	140 ± 7.40	60 ± 7.40

Values given above the represent the mean ± SE of 5 chickens

Effect on parasite

Pineapple leaves extract against ascariasis showed reduction of EPG count on 14th and 28th day in the treated group of chickens whereas EPG count was increased in control group (Table 3). The data showed that pineapple leaves extract was found to be about 53% effective within 14 days of treatment and 80% effective within 28 days of treatment. These results are in agreement with earlier reports of Patra *et al.* (2010), Amin *et al.* (2009), Sujon *et al.* (2008), Islam *et al.* (2005), Khalid *et al.* (2005) and Khatun *et al.* (1995).

Table 4. Effects of pineapple leaf extract on number of parasites in chickens.

Group of chicken	Pre-treatment (No.)	After drug administration (post-treatment) (No.)	
	0 day	14 th day	28 th day
Pineapple leaves extract @ 1gm/kg bwt	8±1.63	3±1.32	1±1.31
Control	10±1.41	14±1.41	15±1.90

Values given above the represent the mean ± SE of 3 chickens

Effect on hematological parameters

On day '0' the mean value of initial body weight of treated group was 430.03±5.29 gm and on the 28th day of post treatment, the mean value of body weight was 446.096±5.26 gm. The body weight was significantly ($p<0.05$) increased (3.74% on 28th) at post treatment period compared to pretreatment. But percentage of body weight gain of the control group was very negligible as 0.89% on 28th day. The present findings support the earlier observation of Hoque *et al.* (2006), Khalid *et al.* (2005), Islam *et al.* (2004, 2005), Khatun *et al.* (1995).

Table 5. Effects of pineapple leaf extract on TEC (million/cu mm) in indigenous chickens in different treatment period

Blood Parameters	Group	0 day	7 th day	14 th day	21 st day	28 th day
TEC (million/cu mm)	Pineapple Treated	3.53±0.26	3.53±0.26	3.56±0.265	3.61±0.29	3.7±0.13
	Control	3.20±0.32	3.17±0.46	3.056±0.34	3.12±0.30	2.96±0.19
Hemoglobin (gm%)	Pineapple Treated	9.48±0.54	9.52±0.47	9.6±0.38	9.6±0.35	9.8±0.53
	Control	9.14±0.68	8.96±0.57	8.9±0.50	8.88±0.51	8.82±0.50
PCV (% 30 minutes)	Pineapple Treated	19.36±0.88	20.86±0.84	20.92±0.78	21.64±0.78	22.38±0.65
	Control	20.46±0.88	20.02±0.78	19.8±0.78	19.12±0.93	18.22±0.69
ESR (mm/1 st hour)	Pineapple Treated	0.5±0.27	0.44±0.34	0.48±0.29	0.42±0.36	0.4±0.32
	Control	0.62±0.39	0.56±0.4	0.6±0.32	0.58±0.29	0.48±0.29
TLC (10 ³ /mm ³)	Pineapple Treated	7.66±0.64	7.60±0.45	7.56±0.30	7.53±0.28	7.43±0.39
	Control	10.23±0.69	10.32±0.75	10.37±0.71	10.41±0.64	10.49±0.81

Values given above the represent the mean ± SE of 5 chickens

The administration of pineapple leaves extract increased the TEC, Hb and PCV and reduced TLC and ESR values of chicken. But in non treated control group, TEC, Hb and PCV were decreased and TLC and ESR values were increased. The maximum reduction or increased values were observed at 28th day of post treatment. Changes in hematological parameters were similarly reported by other researchers (Hoque *et al.*, 2006; Islam *et al.*, 2005; Khatun *et al.*, 1995).

Postmortem examination

There was no significant pathological change in any internal organs of the chicken of the treated groups. Reduction of parasite count was found on 14th and 28th day in the group of chicken treated with pineapple extract. The highest reduction of number of parasites was recorded on 28th day of treatment. On the other hand, number of parasites was increased day by day in control group A. This findings support the earlier observation made by Gauly *et al.* (2005) and Malakhov (1988).

Effect on feeding efficiency

Treatment of chicken with pineapple leaves extract significantly increased feeding efficiency of the chickens. But feeding efficiency decreased gradually in chickens of control group.

Effect on feather coat

The feather coats of all treated chicken were observed smooth and shiny at 28th day of Post treatment period. Rough and discoloured feather coats observed in non treated control were due to severe parasitic infestation. *A. galli* is prevalent in indigenous chicken in different villages of Gaibandha district which suggest treating the infested chicken with effective anthelmintics and implementing regulars deworming program of chicken in the study areas. Pineapple leaves showed highly encouraging efficacy as an

anthelmintics. Considering the availability and low cost pineapple leaves can be used to treat chicken ascariasis. Since this study is a preliminary work in a small population of chicken further studies must be carried out to evaluate the adverse effects, bio-chemical analysis of pineapple leaves against ascariasis in chickens.

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