Ethnobotanical Dewormer Composition for Free Range Native Chickens

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Abstract

Study was conducted at the Darag Native Chicken Sub-station at the College of Veterinary Medicine of Capiz State University, Dumarao, Capiz from October 2011 to March 2012. Generally, it aimed to determine the efficacy of combined formulated ethnobotanical anthelmintics and to compare its efficacy with the commercial anthelmintic. A total of seventy five (75) undewormed Darag native chickens aging from 5 months old and above were used as experimental animals in each study. Experimental animals were divided into 5 treatments with 3 replications having 5 chickens per replicate. Results of the study revealed that the use of combined formulated ethnobotanical specifically 2 g/kg BW of formulated Ipil-ipil and Betel nut was found to be effective in treating roundworms of Darag native chickens and was comparable with the effect of commercial dewormer. The cost of Ethnobotanical Anthelmintic per kg is PhP 70.00 while the Commercial Dewormer is PhP 1,200.00. This project is part of the research program entitled "Development of Sustainable Production System for the Darag Chicken (Gallus gallus domesticus Linn.) in Western Visayas".

Keywords: ethnobotanical, dewormer, darag, ipil-ipil seeds, betel nut, combined ethnobotanical anthelmintic

1. Introduction

The native chicken has been and is still an important source of high quality protein food and additional income to small rural farmers. Among the gaps to enhance production and utilization of the native chicken are information related to management systems, feeding and occurrence of parasites and diseases, and the utilization of ethnobotanicals against internal parasites. This information is vital inputs to health program and control of parasitic diseases affecting the free-range native chickens (PCARRD, 2003).

The prevalence of internal parasitism in native chickens throughout the tropics and elsewhere, are recognized as a major constraint to livestock production. Among the different types of helminths, nematodes are the most prevalent and most harmful. Roundworms include common large roundworms (*Ascaridiagalli*) of native chicken, common thread worms (*Capillaria species*) of native chickens, and the cecal worm (*Heterakisgallinarum*) and gape worm (*Syngamus trachea*) in chickens (Soulsby, 1982).

The present high cost of commercial veterinary anthelmintics and its unavailability at the barangay level reduces the potential of native chicken in Western Visayas. However, control which relies entirely on commercial dewormers is being threatened by widespread occurrence of drug resistance (Ozaraga *et al.*, 1991 and 2004).

These circumstances require every possible effort to utilize ethnobotanicals available in the locality. Its utilization can reduce the parasitic burden to tolerable level. These plants contain potential constituents as cheap sources of anthelmintics to complement the commercially manufactured parasitic drugs against internal parasitism (Ozaraga *et al.*, 1991 and 2004).

Ipil-ipil (*Leucaenaleucocephala*, Lam. de wit) is a deep-rooted tree with bi-pinnate leaves, lanceolate leaflets and yellow white flowers in long stalk heads. It is a perennial summer growing plant. The leaves and seeds contain the glucosidemimosine. It has anthelmintic activity (IIRR, 1994).

Betel nut (*Areca catechu* L.) commonly known as Bunga, has an erect trunk, solitary up to 25 m high and mark with annular scars. Mature seeds are vermifuge. Powdered nuts are used as anthelmintic. The nuts contain arecoline which is veterinary anthelmintic (De Padua *et al.*, 1999 and Meyer Jones *et al.*, 1977).

Carica papaya Linn., locally known as papaya. Papain is the substance that is found in *Carica papaya* which can reduce helminth infestation in poultry. Anthelmintic property can be obtained for chicken by feeding 50 papaya seeds (De Padua *et al.*, 1999).

In response to the President P-Noy's Social Contract to the Filipino People, this project will lead to an effective and practical method of controlling internal parasitism in native chickens, reduce production cost, lessen

mortality, thus improve productivity, increase income of the raisers and consequently help in food security and alleviating poverty in Region VI.This project is part of the research program entitled "Development of Sustainable Production System for the Darag Chicken (*Gallus gallusdomesticus*) in Western Visayas".

The study aims to determine the efficacy of combined formulated ethnobotanical anthelmintic and which dosage is the most effective in controlling the internal parasites (roundworms) of Darag native chickens. Furthermore, this study compares the efficacy of formulated ethnobotanical anthelmintic with the commercial anthelmintic.

2. Methodology

The materials utilized in the study include:

Seventy five (75) heads of naturally infested Darag native chickens with roundworms aging 5 months old and above of both sexes, rearing pen, commercial feeds, combined Ipil-Ipil seeds, papaya seeds and betel nuts, grinding machine, knife, chopping board, metric scale, triple beam balance, microscope, test tubes, strainer, funnels, stirring rod, spatula, glass slides, cover slips, sugar solution, fecal containers, feeders, waterers, newspapers, data sheet and camera for documentation.

2.1 Experimental Treatments

The experimental animals were divided into 5 treatments with 3 replications having 5 chickens per replicate. The experimental treatments are as follows: A.) Control, B.) 2 g per kg BW of formulated powderized ipil-ipil and betel nut seeds, C.) 2 g per kg BW of formulated powderized ipil-ipil and papaya seeds, D.) 2 g per kg BW of formulated powderized betel nut and papaya seeds and E.) Commercial anthelmintic.

2.2 Administration of Formulated Powderized Ethnobotanical Anthelmintics

Experimental animals were weighed before the start of the study to get the exact dosage of anthelmintic per treatment. The ethnobotanical anthelmintics were mixed with the feeds given in the morning meal of experimental animals until no left over were left.

2.3 Data Collection

Fecalysis

Pre-treatment fecal examination was done three days before the administration of the ethnobotanical anthelmintic to determine the average egg per gram count of the parasites. Post fecal examination was done on the 7^{th}, 14^{th}, 21^{st}, and 28^{th} day after a single dose of the ethnobotanical anthelmintic. Fecal samples were collected randomly on the mat of the birds early in the morning and brought to the College of Veterinary Medicine Diagnostic Laboratory for fecal examinations. Quantitative examination was determined using the sugar flotation technique. Average egg per gram count was obtained by examining each fecal sample thrice.

2.4 Efficacy of Ethnobotanical Anthelmintic

The efficacy of the combined dewormer was evaluated based on the reduction of worms, which was estimated by establishing egg per gram (epg) counts before and after administering the dewormer. One egg is equivalent to 100 eggs per gram of feces (Coles, 1988).

2.5 Statistical Tool and Analysis

Average Percent Reduction of roundworm egg per gram was obtained by using the following formula:

$$\text{Average Percent Reduction} = \frac{A - B}{A} \quad X\ 100$$

Where:

A= Pre treatment E.P.G. count of roundworm egg

B= Post treatment E.P.G. count of roundworm egg

The data on average percent reduction of roundworm egg per gram was subjected to Analysis of Variance (F-test), where difference among treatment means was analyzed using Least Significant Difference (LSD). The result was interpreted at five and one percent levels of significance.

3. Results and Discussion

Percent reduction of roundworms egg per gram (E.P.G.) as affected by the different dosages of combined ethnobotanical anthelmintic.

The average percent reduction of roundworms as affected by different dosages of combined ethnobotanical anthelmintic is shown in Table 1.0. On the 7th day of post – treatment, the data showed that those birds treated with formulated combined Ipil-ipil and Betel nut had the highest percent reduction of roundworms with a mean of 75.95; followed by those birds treated with commercial dewormer with a mean of 74.93. Analysis of variance further revealed that there was a highly significant difference among treatment means.

The average percent reduction of roundworms egg per gram count on the 14th day post treatment showed that birds treated with formulated combined Ipil-ipil and Betel nut had the highest percent reduction of roundworms with a mean of 78.19; followed by those birds treated with commercial dewormer with a mean of 76.93. Analysis of variance further revealed that there was a highly significant difference among treatment means.

The average percent reduction of roundworms on the 21st day of post – treatment, showed that birds treated with commercial dewormer had the highest percent reduction with a mean of 77.01; followed with combined formulated Ipil-ipil and betel nut with a mean of 75.90. Analysis of variance further revealed that there was a highly significant difference among treatment means.

On the 28th day post treatment, it showed that birds treated with commercial dewormer had the highest percent reduction with a mean of 78.16, followed with combined formulated Ipil-ipil and betel nut with a mean of 74. 79. Analysis of variance further revealed that there was a highly significant difference among treatment means. Least significant difference (LSD) further revealed that Commercial dewormer has the higher percent reduction in egg per gram count but found to be comparable with the combined formulated Ipil-ipil and Betel Nut.

Table 1.The average percent reduction of roundworms egg per gram of (E.P.G.) count in native chicken as affected by different dosages of combined ethnobotanical anthelmintic.

Treatment	Percent Reduction (EPG) Means*			
	7th	14th	21st	28th
A – Control	0.00[a]	0.00[a]	0.00[a]	0.00[a]
B – Ipil-ipil + Betel Nut	75.95[b]	78.19[b]	75.90[b]	74.79[c]
C – Ipil-ipil + Papaya	67.36[b]	69.59[b]	67.53[b]	66.66[b]
D – Betel Nut + Papaya	68.49[b]	68.27[b]	67.43[b]	66.15[b]
E – Commercial Dewormer	74.93[b]	76.93[b]	77.01[b]	78.16[c]

*Treatment means without common superscripts are significantly different (P<0.01).

The price of a single dose of ethnobotanical anthelmintic only cost 0.10 cents (Table 2.0) at a dosage of 2g/kg BW while that of the commercial dewormer cost 0.24 cents at a dose of 0.2g/kg BW. This shows that the ethnobotanical anthelmintic is 0.14 cents cheaper than the commercial dewormer.

Table 2. Price Comparison of Ethnobotanical Anthelmintic and Commercial Dewormer

Ethnobotanical Anthelmintic	Commercial Dewormer
1,000 g = PhP70.00	1,000 g = PhP 1,200.00
Single dose = 2 g/kg BW = 0.10	Single dose = 0.2 g/kg BW = 0.24
Net Difference per Dose = 0.14	

3.1 Guarding the Knowledge Generated through Patent Application

To guard the intellectual rights of this novel work, this project was able to package and registered one dewormer composition as Utility Model by the Intellectual Property Office Philippines through the assistance of Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD's) TTPD and Technology Application and Promotion Institute (TAPI).

4. Conclusions and Recommendations

Based on the results of the study, the following conclusions are made:

1. Combined ethnobotanicals at a dosage of 2 grams per kg bodyweight is effective in treating roundworms of Darag native chicken.
2. The Ethnobotanical anthelmintic is indicated for the treatment and control of roundworms in chickens.
3. The combined formulated ethnobotanicals is comparable to the effect of commercial dewormer.

Based on the results of the study, the researchers recommend that:

1. Combined ethnobotanical anthelmintic with a dosage of 2 g/kg bw can be utilized against roundworms of Darag native chickens.
2. Launch vigorous and massive information, dissemination campaign on the efficacy of Ipil-ipil seeds powder, Betel nut and combined anthelmintic against roundworms of native chickens.
3. Another study on other methods of preparation (liquid form and soluble powder) should be conducted.
4. Commercialization of the identified ethnobotanical anthelmintics.

6. Acknowledgment

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