

Ampalaya (*Momordica Charantia*) Leaf Extract Against Gastro-Intestinal Parasites of Native Chicken

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Abstract - *The general objective of the study is to determine the effectiveness of ampalaya leaf extract against gastrointestinal parasites of native chicken. Specifically, it aimed to: (1) to evaluate the anthelmintic property of ampalaya leaf extract in the treatment of gastro-intestinal parasites of native chicken; (2) find out the most effective variety of ampalaya leaves as purgatives for native chicken; and (3) to compare the efficacy of ampalaya leaf extract with commercial purgative in the treatment of gastro-intestinal parasites. A total of fifteen (15) experimental native chickens were used in each study which was distributed into five (5) treatments. For study 1 and 2, Commercial purgative (Piperazine dihydrochloride) and commercial purgative (mebendasole, niclosamide and levamisole) were used respectively as positive control. Based on the result of the study, ampalaya leaf extract shows comparable effect to positive control (Piperazine dihydrochloride) in treating and controlling gastro-intestinal parasites of native chicken. However, commercial purgative with triple ingredient (mebendasole, niclosamide and levamisole) shows more effective than the ampalaya extract. The researcher concludes that efficacy of ampalaya leaf extract as purgative is comparable to the effect of commercial purgative with single active ingredient (Piperazine dihydrochloride), commercial purgative with triple active ingredients (mebendasole, niclosamide and levamisole) excelled over the ampalaya extract because of its multi-ingredients.*

Keywords – Ampalaya Leaf Extract, Native Chicken, Purgatives

INTRODUCTION

One of the fastest growing segments of the animal industry is the poultry industry. Chicken, turkeys, ducks, geese and other birds make up a large portion of the meat diet of people in most countries. Poultry meat is generally accepted by most cultures as a wholesome meat for human consumption.

Native chickens are birds that have been domesticated from its wild ancestor. They are medium in size, good layer and their carcasses are well suited for the table. They possessed brown-shelled egg; the skin and shank are either yellow or blank in color. The egg yolk color is darker than purebred, which make it more attractive and palatable to the consumer. The face, comb, wattle and earlobes are red in color. They are usually presented in brown, white, black or combination of color [1].

Other agronomical characteristics of native chicken that usually like most by the farmers are being

resistant to diseases, they can easily adapt themselves to local and even adverse conditions, they are self-supporting and broody. They hatched their own eggs and care of their own chicks until the time that they weaned them.

Meat and eggs of native chickens are preferred by many Filipinos over the country because of their taste, leanness, and pigmentation/color. And in support to the program of the Department of Agriculture in promoting Organic Production of Animals, to reduce the use of chemicals for a healthy life.

The range type of production practice by the farmers/backyard raisers in raising native chickens, make them more exposed and easily infect with gastrointestinal parasites, cause to lower their resistance. The gastrointestinal parasites could affect the performance of the birds, in terms of growth and egg production. In addition to this, parasites serve as stress factor on the normal physiological processes of

the birds making them less resistant to other types of infection [2]. Animals that are infected with parasites consumed more feed per pound of gain. Parasites are feeding either directly or indirectly on the feed supplied by the producers [3].

The most common nematodes/roundworms that infect poultry are the large roundworms or *Ascaridia galli*, small roundworms or *Capillaria* spp., cecal worms or *Heterakis gallinarum* and the gapeworms or *Syngamus tracheae*. All the internal parasites of the digestive system “eat” or absorb through the body wall the digested food of the animal host. Only large number of parasites will cause the birds to become gradually thinner, weaker, paler, and less productive. It lowered also the resistance of the birds thus they become susceptible to diseases which may easily be fatal [4].

In order to solve this problem on gastrointestinal parasites that usually attacked birds, especially those on free range system of production and in support to the project of the Department of Agriculture regarding the organic production of animals. Ampalaya or bitter gourd is introduced to test its effectiveness as herbal purgatives in the treatment/eradication of gastrointestinal parasites in native chickens. Ampalaya is a vegetable grown throughout the Philippines. It is cultivated although wild forms can be found, grows in the remote areas of the country [5].

All parts of the ampalaya plant are utilized for medicine purposes, including the vines, seeds, stalks and fruit, though fruit is the most popular part of the plant [6]. The ampalaya (*Momordica charantia*) plant has bitter taste due to its several biological active compounds, chiefly momordicin I and II, and cucurbitacin B. The plants contain also several bioactive glycosides (including momordicin, charantin, charantosides, goyaglycosides, momordicosides) and other terpenoid compounds (including momordicin-28, momordicinin, momordicillin, momordenol and momordol). It also contains cytotoxic (ribosome-inactivating) proteins such as momorcharin and momordin [7].

The ampalaya (*Momordica charantia*) plant has astringent, vulnerary, antiparasitic/anthelmintic/purgative, antiemetic, antipyretic, cooling and tonic properties, and is traditionally used for these purposes. Folklore uses the leaf juice for cough as a purgative/anthelmintic to expel intestinal parasites and for healing wounds. The juice of the leaves can be used as mild purgatives for children. Decoction of

roots and seeds has been used for urethral discharges. Pounded leaves are used for scalds and in infusion of leaves or leaf juice can be for fevers. Pulverized whole plant is good to apply externally to treat leprosy and malignant ulcers [8].

There has been much research done on the effectiveness of using Ampalaya in the treatment of diabetes and also used in the treatment of skin diseases, sterility in women, as a parasiticide/purgative, and as an antipyretic. Due to this effectiveness of this plant in treating various clinical disorders, the Department of Health of the Philippines recommended as one of the best herbal medicines, it is also a common herb used in Chinese herbology [9].

The result of this study will serve as basis by the poultry raisers, particularly backyard raisers and or game cock raisers in using ampalaya leaves as purgatives. This will also help the World Health Organization in reducing the chemical content of the food eaten by the people which some of the chemical content of commercial drugs administered to animals may have side effects to human. Result will also support the Department of Agriculture in promoting their program on Organic Agriculture production. Animal produce organically are safe to eat rather than those treated chemically.

Ampalaya (*Momordica charantia*) leaf extract is a kind of purgative which is organic in nature, easy to prepare, no over dosages, no side effects both on animals and human, and it is stable in condition. The product and by-products of treated animals are safe for human consumption. Ampalaya leaves are also rich in nutrients needed by the animals for better growth and development and for production. The ampalaya of different varieties are found in any place of the country.

Moreover, the result could pave the way in promoting the use of indigenous purgatives on animal production to reduce production cost and problem on the occurrence of endoparasites in poultry which may lower resistance of the infected birds. It also promotes the utilization of ampalaya in animal production leading to the creation of another marketing outlet for ampalaya. Thus, through this study, both the poultry and ampalaya producers are benefited.

OBJECTIVES OF THE STUDY

The general objective of the study is to determine the effectiveness of ampalaya leaf extract against gastrointestinal parasites of native

chicken. Specifically, it aimed to: (1) to evaluate the anthelmintic property of ampalaya leaf extract in the treatment of gastro-intestinal parasites of native chicken; (2) find out the most effective variety of ampalaya leaves as purgatives for native chicken; and (3) to compare the efficacy of ampalaya leaf extract with commercial purgative in the treatment of gastro-intestinal parasites.

MATERIALS AND METHODS

The Complete Randomized Design (CRD) was used in this study having five (5) treatments replicated three (3) times. Descriptive analysis was used to interpret the result of the two studies.

Collection of fecal materials for fecalysis was done prior to the start of the study to determine positive birds of gastro-intestinal parasites. Positive birds were again subjected for fecalysis a week prior to the start of the study as basis for evaluation on the effect of purgatives given. Then the succeeding collections were done every week after the administration of purgatives. Only fresh or newly voided droppings were collected, placed separately in a clean ice plastic bag and labeled for identification. These samples were submitted immediately for fecal analysis at Regional Animal Disease Diagnostic Laboratory (RADDL) Tebag, Sta. Barbara, Pangasinan.

Fecal examination was done using the Mc Master Method. Two grams of each fecal sample was placed in strainer then 30 cc of water with saturated salt solution was poured slowly to the sample, while pouring the solution a stirring gun was used to stir the fecal sample. A container was placed below the strainer to collect the solution. The collected solution was the one used for examination. A sieved pipette was used to get a sample from the collected solution, placed it in the slides and examined under an electric compound microscope for the presence of parasite's egg. The number of eggs counted, multiplied by 200 represents the egg per gram. All the laboratory results were recorded for analysis and interpretation.

Preparation of Ampalaya Leaf Extract

Only the matured ampalaya leaves were gathered and washed with running tap water, then drained for ten minutes. The leaves were put inside the mortar and pound with pestle. After pounding, leaves were put in a clean cheese cloth and squeezed manually to remove the juice. The extract was placed in a clean, sterile

container to avoid contamination. Finally, labeled and stored inside the refrigerator to prolong its shelf life.

Preparation of Ampalaya Leaf Extract Tablet

Ampalaya leaves were gathered from the area, washed with running tap water then drained for ten minutes. The leaves were put inside the mortar then pound with pestle to facilitate the removal of its juice. After pounding the leaves, it was placed in a clean cheese cloth and squeezed manually to remove the juice. The extract was measured using a measuring cup before it was put in a cleaned dry plate. The binder (corn starch) was also weighed before pouring to the extract, the ratio of extract and the binder (corn starch) is 1:1. The binder (corn starch) and the extract were mixed thoroughly with the used of spoon. Little by little the mixture was mold manually into tablet. The mold tablet will be placed in an oven to dry for five minutes. The dried ampalaya leaf extract tablets were placed in a clean, sterile container, to avoid contamination. Then, labeled and stored in a cool place to prolong its shelf life.

Administration of Ampalaya Purgative Ampalaya Leaf Extract

The prepared ampalaya leaf extract as purgative was given orally to experimental native chicken assigned in treatment 2, 5 and 8. Each chicken was given two ml of ampalaya leaf extract per administration with the use of a disposable syringe. Administration was done every Saturday before feeding the experimental chicken.

Ampalaya Leaf Extract Tablet

The prepared ampalaya leaf tablet was given orally to the experimental native chicken assigned in treatment 3, 6 and 9. Each of the chicken was given one tablet of ampalaya leaf extract tablet per administration. The administration of ampalaya leaf extract tablet was done once a week, every Saturday morning before feeding the experimental chicken.

Administration of Commercial Purgative Piperazine dihydrochloride

The commercial purgative (piperazine dihydrochloride) was purchased from the agricultural supply. This is one of the common purgative used by the poultry raisers in deworming their chicken. It is in powdered form with the dose of 0.20 gms per kilogram body weight, and was repeated after two weeks of administration. The amount of commercial

purgative was diluted first in water before it was administered orally to the chicken with the used of disposable syringe. The ratio of commercial purgative and water is 0.16 mg: 1 ml.

Mebendasole, Niclosamide and Levamisole

For the mebendasole, niclosamide and levamisole, the dosage was, one tablet given once within in the entire duration of the study as prescribed by the manufacturer.

Scale

The given scale was used to interpret the presence of Egg Parasites in the Feces from week 0 to week 4: (-) = No Infection; (+) = 100 -700 Light Infection; (++) = 800 – 1100 Moderate Infection; (+++) = 1200 – above Heavy Infection

RESULTS AND DISCUSSION

Study 1. Ampalaya leaf extract vs. Piperazine dihydrochloride against gastro-intestinal parasites of native chicken.

Table 1-1 – Presence of Egg Parasites of *Ascaridia galli* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	++	+	+	++
T ₁ –Comm'l	++	+++	+	-
T ₂ – Wild	++	+	+	-
T ₃ – Native	+	+	-	-
T ₄ – Bonito	-	-	-	-

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract and piperazine hydrochloride as purgative. The result shows that all varieties of ampalaya leaf extract and commercial purgative (piperazine dihydrochloride) used in the study, indicates positive result in the treatment and control of *Ascaridia galli*.

Table 1-2 – Presence of Egg Parasites of *Capillaria columbae* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	+	+	+	+++
T ₁ –Comm'l	+	+	-	-
T ₂ – Wild	+	+	++	+++
T ₃ – Native	+	+	+	+
T ₄ – Bonito	++	+++	+++	+++

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract and piperazine hydrochloride. The result reveals that all varieties of ampalaya leaf extract used as purgative indicates negative result in the treatment and control of *Capillaria columbae*, whereas the commercial purgative (piperazine dihydrochloride) indicates positive result in the treatment and control of *Capillaria columbae*.

Table1- 3 – Presence of Egg Parasites of *Syngamus trachea* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	-	-	-	-
T ₁ –Comm'l	-	+	-	+
T ₂ – Wild	-	+	-	-
T ₃ – Native	-	-	-	-
T ₄ – Bonito	+	-	+	-

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract and piperazine dihydrochloride. The result reveals that all varieties of ampalaya leaf extract used as purgative indicates positive result in the treatment and control of *Syngamus trachea*, whereas the commercial purgative (piperazine dihydrochloride) indicates negative result in the treatment and control of *Syngamus trachea*.

Table1- 4 – Presence of Egg Parasites of *Railletina sp.* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	+	+	+	+
T ₁ –Comm'l	-	+	+	+
T ₂ – Wild	+	+	+	-
T ₃ – Native	-	-	-	+++
T ₄ – Bonito	-	-	-	+

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract and piperazine dihydrochloride. The result reveals that only the wild variety of ampalaya leaf extract as purgative indicates positive result in the treatment and control of *Reilletina sp.*, the rest were all negative, same result was noted with the used of commercial purgative (piperazine dihydrochloride).

Table 1-5 – Presence of Egg Parasites of *Heterakis gallinarum* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	-	-	-	-
T ₁ –Comm'l	+	-	-	-
T ₂ – Wild	-	-	-	-
T ₃ – Native	+	-	-	-
T ₄ – Bonito	+	+	+	+

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract and piperazine dihydrochloride as purgatives. The result reveals positive results in all varieties of ampalaya leaf extract except the bonito variety wherein a negative result was noted. The commercial purgative (piperazine dihydrochloride) reveals positive in the treatment and control of *Heterakis gallinarum*.

Table 1-6 Presence of Adult Parasites During Necropsy Examination

Treatment	<i>Ascaridia galli</i>	<i>Capillaria columbae</i>	<i>Syngamus trachea</i>	<i>Railletina spp.</i>	<i>Heterakis gallinarum</i>
To – Control	5	0	0	2	0
T1 – Comm'l	0	0	0	1	0
T ₂ - Wild	0	0	0	0	0
T ₃ – Native	0	0	0	1	0
T ₄ – Bonito	0	0	0	1	0

Based on the result of post mortem examination conducted, after three consecutive weeks of purgatives administration, shows that all sample chicken found positive of *Reillettina spp.*, except T₂ wild ampalaya leaf extract which gave positive result in treating and controlling gastrointestinal parasites present in each sample bird. Results confirmed that ampalaya leaf extract is effective in treating and controlling gastrointestinal parasites of poultry.

Study2. Ampalaya leaf extract tablet vs. Mebendasole, niclosamide and levamisole against gastro-intestinal parasites of native chicken

Table 2-1 – Presence of Egg Parasites of *Ascaridia galli* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	++	+	+	++
T ₁ –Comm'l	+	-	-	-
T ₂ – Wild	+	-	+	+
T ₃ – Native	++	-	+++	+
T ₄ – Bonito	+	-	-	+

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract tablet and levamisole and others as purgatives. The result reveals negative results in all varieties of ampalaya leaf extract tablet whereas the commercial purgative (mebendasole, niclosamide and levamisole) gave positive result in the treatment and control of *Ascaridia galli*.

Table 2-2 – Presence of Egg Parasites of *Capillaria columbae* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	+	+	+	+++
T ₁ –Comm'l	+++	+	-	-
T ₂ – Wild	+	+	+	+
T ₃ – Native	+	+	+	++
T ₄ – Bonito	+	+++	+	+

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract tablet and commercial purgative (mebendasole, niclosamide and levamisole). The result reveals that all varieties of ampalaya leaf extract tablet as purgative indicates negative result in the treatment and control of *Capillaria columbae*, whereas the commercial purgative (mebendasole, niclosamide and levamisole) shows positive result in the treatment and control of *Capillaria columbae*.

Table 2-3 – Presence of Egg Parasites of *Syngamus trachea* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ –Control	-	-	-	-
T ₁ –omm'l	-	-	-	-
T ₂ – Wild	+	-	-	-
T ₃ – Native	-	-	-	-
T ₄ – Bonito	-	+	-	-

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract tablet and commercial purgative (mebendasole, niclosamide and levamisole). The result reveals that all varieties of ampalaya leaf extract tablet used as purgative indicates positive result in the treatment and control of *Syngamus trachea*, same effect was also noted with commercial purgative.

Table 2- 4 – Presence of Egg Parasites of *Railletina sp.* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ – Control	+	+	+	+
T ₁ – Comm'l	-	+	-	-
T ₂ – Wild	-	-	-	-
T ₃ – Native	-	-	+	-
T ₄ – Bonito	-	-	++	+

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract tablet and commercial purgative (mebendasole, niclosamide and levamisole). The result reveals that all varieties of ampalaya leaf extract tablet as purgative indicates positive result in the treatment and control of *Reilletina sp.*, except the bonito variety wherein a negative result was noted, whereas the used of commercial purgative (levamisole and others) a positive effect was noted.

Table 2-5 – Presence of Egg Parasites of *Heterakis gallinarum* in the Feces from week 0 to week 4

Treatment	0 Week	1 Week	2 Week	3 Week
T ₀ – Control	-	-	-	-
T ₁ – Comm'l	-	-	-	-
T ₂ – Wild	-	-	-	-
T ₃ – Native	-	-	-	-
T ₄ – Bonito	-	-	-	-

Note: Egg per gram (e.p.g.)

This table reveals the result of fecalysis of all the experimental native chicken after the administration of different varieties of ampalaya leaf extract tablet and commercial purgatives (mebendasole, niclosamide and levamisole). The result reveals positive in all varieties of ampalaya leaf extract tablet, same positive result was noted with commercial purgative (mebendasole, niclosamide and levamisole) in the treatment and control of *Heterakis gallinarum*.

Table 2-6. Presence of Adult Parasites During Necropsy Examination

Treatment	<i>Ascari- dia galli</i>	<i>Capil- laria colum -bae</i>	<i>Synga- mus trachea</i>	<i>Rail- letina spp.</i>	<i>Hete- rakis galli- narum</i>
To – Control	5	0	0	0	2
T1 – Comm'l	0	0	0	0	0
T ₂ - Wild	1	0	0	0	0
T ₃ – Native	2	0	0	0	0
T ₄ – Bonito	2	0	0	0	6

Table shows on the result of post mortem examination conducted, after three consecutive weeks of purgatives administration, shows that all sample chicken found positive of *Ascaridia galli*, and also *Reilletina spp.* for T4 bonito ampalaya leaf extract tablet. Only the commercial purgative (mebendasole, niclosamide and levamisole) which shows positive results in the treatment and control of gastrointestinal parasites of chicken

Based on the result of the study, ampalaya leaf extract shows comparable effect to positive control (Piperazine dihydrochloride) in treating and controlling gastro-intestinal parasites of native chicken. Commercial purgative (mebendasole, niclosamide and levamisole) is more effective than the ampalaya extract because it is multi-ingredients.

CONCLUSION AND RECOMMENDATION

Based on the result of the study, the researcher concludes that efficacy of ampalaya leaf extract as purgative is comparable to the effect of commercial purgative with single active ingredient (Piperazine dihydrochloride), commercial purgative with triple active ingredients (mebendasole, niclosamide and levamisole) excelled over the ampalaya extract because of its multi-ingredients.

In view of the above findings of the study, it is recommended the use of ampalya leaf extract in treating and controlling gastro-intestinal parasites of chicken.

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