BIBLIOGRAPHY

DAWATON, JUDY D. APRIL 2012. Efficacy of Horse Chestnut Seed Decoction As Dewormer To Native Chicken. Benguet State University La Trinidad, Benguet.

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ABSTRACT

The study was conduted to determine the efficacy of horse chestnut seed seed decoction as dewormer to native chicken. Specifically, it aimed to determine the species of parasites infesting the native chicken.

Fecal analysis using the floatation method was used to determine the number of eggs per gram of each species present in the experimental birds. Results of the fecal analysis revealed that there are four species of parasites infested to the experimental birds as follows:

1. Ascaridia galli species
2. Capillaria species
3. Heterakis gallinae species
4. Strongyloides avuim species

Horse chestnut decoction was administered as dewormer to the experimental birds was based on the body liveweight. The treatments tested were:

T_0 – control (no dewormer)

T_1 – 1ml horse chestnut decoction dewormer/kg body liveweight

T_2 – commercial dewormer

Results of the study show that the horse chestnut dewormer could effectively eradicated the *Capillaria spp* and *Heterakis gallinea spp.* seven days after deworming. The commercial dewormer was only able to decrease the number of egg per gram of *Capillaria spp*. At three days after deworming, the egg per gram was reduced to 70% then to 60% at seven days after deworming and *Heterakis gallinea spp* was eradicated at three days after the administration of the dewormer although, 50% eggs were again seen seven days after deworming. This may imply that a follow-up should be done at this stage to prevent recurrence of the worms.

INTRODUCTION

Aesculus hippocastanum is a large deciduous tree, commonly known as Horse chestnut. It is widely cultivated throughout the temperate world. The nuts, especially those that are young and fresh, are slightly poisonous, containing alkaloid saponins and glucosides.

Horse chestnut contains triterpenoid saponins (notably aescin), coumarins (notably aesculin) and flavonoids. There are also tannins, flavones, purines, starch, sugar, albumin and fatty oil. The bark contains coumarins, glycoside, resin and pigment. Aescin, the main active constituent, has anti-inflammatory properties.

Many rural folks engage in raising native chickens. Aside from the meat which these chickens provide for the family, they are a good source of additional income. These native chickens are raised in the backyard by farmers the traditional way without considering the effect of this on hygiene and sanitation. Native chickens are not given disease immunization and often times are attacked by pests and diseases.

Native chickens are well known for their adaptability to local agro-climatic conditions, hardiness, ability to utilize farm-by-products and resistance to diseases. Moreover, they require minimal care, management and inputs. Meat and eggs of native chickens are preferred by many Filipinos over the same products from commercial poultry because of their taste, leanness, pigmentation and suitability to Filipino special dishes. Moreover, native chicken meat and eggs are priced higher than those coming from commercial poultry.

Traditionally, native chicken raised in backyard just graze in the hill side on sunny days and driving them home at sunset to be watered and given supplemental feed. On the

other hand, small scale raisers do not have any program of deworming these birds due to unawareness of the parasite infection to the birds.

Parasite is one of the most destructive pests in native chickens. Parasite cause loss in body weight, poor feed conversion and decrease of body resistance against bacterial and viral infection.

This study was undertaken to find out the effect of powdered horse chestnut seed decoction as dewormer for native chickens. With this homemade dewormer, poultry raisers in the rural communities could be able to control parasite infection in native chickens and will help produce healthy native chickens for family consumption and income.

This study conducted to determine the efficacy of decocted horse chestnut seed as a dewormer to native chicken.

Specifically, it aimed to:

1. determine the parasite egg count before the administration of powdered horse chest nut seeds as dewormer;
2. determine the specie of parasites that could be killed by decocted horse chestnut seed; and
3. compare the efficacy of powdered horse chest nut seeds with the commercial dewormer.

The study was conducted at the BSU Poultry Experimental Station, LaTrinidad, Benguet. The experiment used a total of 24 native chickens, which was subjected to 7 days deworming.

REVIEW OF LITERATURE

A study by Baens (1941) indicated good prospects for the production in the Philippines for tannin extract from locally grown betel nut. The highest tannin content occurs when the kernel is just reaching maturity and the outside husk is still green. This tannin is said to compare favorably with other tannin of local extraction and with those of foreign in origin such as chest nut, henlock, and mycobaloon for light weather tannage, the quality, excellent.

Botero *et.al.,* (1987) revealed that tapeworms of cestodes are flattened, ribbon-shaped, usually segmented worms. Tapeworms are characterized by complete absence of the digestive tract and obtain their nourishment from the host animal. The control of intestinal parasites is largely a matter of sanitation and deworming program using "anthelmintic", a general term to treat worm infestation. Cecal worm infection can be treated with phemothezene.

According to Dagoon (1990), he suggested that anthelmintic deworming agent can be added to drinking water or feeds for long term administration. Specific drugs or anthelminthics are required for each specific type of external parasite, although most preparations will eliminate adult worms.

Faulty nutrition is a pre-disposing factor in a certain disease. The best tonic is a well balance diet. Proper hygiene and sanitation measures will check parasite infestation.

Dagoon (1989) revealed further that parasites produce injuries on the host by taking away material well-being from the host which usually results to the disturbance of the regular process on growth and development.

Characteristics of common roundworms of chicken (Gapus, 1973). The most common roundworms of poultry are large roundworms, small roundworms, cecal worms and gapeworms. The large roundworms of chickens, Ascaridia galli, are very common. It is found in the small intestines where it grows up to about five inches in length. Young birds particularly are very susceptible to this infection causing them to loose appetite, become stunted, emaciated and weak and eventually die. Nervous symptom like jerking the head has been observed especially when some parasites die in the gut. Mature birds with this parasite have low egg production. In unusual cases, the worms may even cause blocking and rapture of the intestines.

The small roundworms, Capillaria spp. are hair-like in appearance and they are found in the crop, gizzard, and small intestines. Considerable damage is caused to the host when they are present in large numbers.

The cecal worms Heterakis gallinarum are small grayish and small, and slender helminthes that invade the ceca. They cause inflammation of the cecal mucosa resulting in the birds stiffness and progressive emaciation. They also transmit a protozoan disease known as blackhead. This disease has caused enormous losses in fowls including turkey.

Satryn *et.al.,* (1976) stated that pathogenic organisms must be able to gain access to the body tissue before it can raise to disease. For this, it can overcome the natural barriers at the chief portals of entry. Microorganisms gain entry into the body such as alimentary canal, respiratory tract, skin conjuncture, uro-genital tract, umbilicus placenta and mammary gland. Thus, the causes for infection are many despite the natural barriers, more so when the vitality of the animal is reduced under stress conditions. The farmers' aim

should be keep the stock vigorous and healthy by proper feeding management so that the animals may resist disease well.

Eimeria tenella is highly pathogenic. This acute infection occurs most commonly in young chicks. Heavy infections are characterized by the presence of blood in the dropping and by high morbidity and mortality. At post mortem in the acute phase, the caecums are distended by blood following erosion of the mucosa. Large second generation schizonts and free merozoites can be detected in smears from the caecum mucosa. Caecal cores are composed of necrotic debris, gametocytes and oocytes may be found during the recovery period of the host. Acute deaths without the presence of oocytes may occur KaufMann (1996).

Botanical Description

Aesculus hippocastanum (Figure 1), is the horse chestnut most frequently used in herbal medicine. It is a member of the Hippocastanaceae family. Horse chestnuts are in an entirely different botanical family from the well-known sweet chestnut tree, *Castanea vesca*. Horse chestnuts exist in nature as both a tree and a shrub, and are found in all temperate regions of Europe, Asia, and North America. The name *Aesculus* is actually a misnomer, coming originally from the word *esca*, meaning food. It was applied by ancient peoples to a certain species of oak; somehow the name was transferred over the years to the horse chestnut. The name *hippocastanum* is thought to refer to the horse chestnut's ability to heal horses and cattle of respiratory illnesses. Another possibility may be that it is named for the small horseshoe-like markings that are present on the branches of the horse chestnut tree.

Horse chestnut trees grow in nearly any soil but seem to prefer a sandy loam. They grow very rapidly into tall straight trees that can reach heights of over 100 ft (approximately 30 m) tall, with widely spreading branches. The bark is grayish-green or grayish-brown in color, and the tree limbs are thick and have corky, elongated, wart-like eruptions that appear from a distance like ribbing. The interior of horse chestnut bark is pinkish-brown, with fine lines running its length. It is odorless and its taste is very bitter and astringent.

The characteristic horseshoe markings found on the branches are actually the scars from where leaves previously grew. Horse chestnut wood is seldom if ever used for lumber due to its soft and spongy character. Large leaf and flower buds are clearly visible even during winter months but are encased in a scaly, resinous protective covering that prevents damage from frost or damp. This thick sticky coating melts with the beginning of warm weather in spring, and flowers and leaves appear with remarkable rapidity, usually within three to four weeks.

Figure 1. Horse chestnut tree

The leaves are dark green, rough in texture, and large, with minutely serrated edges. Horse chestnut leaves can be nearly 1 ft (0.3 m) in length. They somewhat resemble a hand with five to nine leaf sections emerging from a palm-like base to form the finger-like projections. European horse chestnuts produce clusters of white flowers with a pale scarlet tinge at the throat or yellow mottling. American horse chestnut flowers can be white, pale pink, or yellow, depending upon the species. All types of horse chestnut trees, with their graceful wide limbs and showy flowers, are grown for their ornamental beauty.

The fruit of the horse chestnut is a dark brown smooth-surfaced nut approximately 2 in (5 cm) in diameter. It has a polished appearance except for the rounded dull tan-colored scar on the side that was attached to the seed vessel. Horse chestnuts are encased in a light green spine-covered coating that divides into three parts and drops away prior to the nut dropping from the tree. Horse chestnut nuts contain mostly carbohydrates which are generally indigestible until boiled. They also contain saponins, tannin, flavones, two glycosides, aesculin and fraxin, some crude protein, a fatty oil, ash and water schonbeck (2005).

Chemical Composition of Horse Chestnut

The seeds and bark contain a mixture of triterpene saponins known as aescin (escin), composed of acylated glycosides of protoeasigenin and barringtogenol-C, hippoaesculin and others;' quinones, including plastoquinone 8; flavones, including 3,5dihydroxy-3',4',7-trimethoxyAavone, myricetin 3',4',7-trimethyl ether; sterols, including stigmasterol, cr-spinasterol, and p-sitosterol; linolenic, palmitic, and stearic acids; and others. The glycoside aesculin (esculin) (7-hydroxycoumarin 6-P-glucoside) is considered the most toxic component of the seed Wiley (1996).

MATERIALS AND METHOD

Materials

The materials used in this study are as follows: powdered horse chestnut seed (Figure 2), cages, 24 native chickens, Ziploc bags, ice box, weighing scale, electric compound microscope, glass slide, cover slip, record book, vials and Mc master counting chamber.

Methodology

Experimental design and treatment. Following the Completely Randomized Design (CRD), the 24 native chickens were divided into three treatments. Each treatment was replicated four times with two birds per replication making a total of eight birds per treatment.

The different treatments were as follows:

T_0- no application (control)

T_1- 1ml horse chestnut decoction dewormer/kg animal body live weight

T_2- commercial dewormer

Procurement of experimental birds. The experimental birds (Figure 3) were taken from Pinukpuk Kalinga. Twenty-four native chickens regardless of sex were used in the study for the administration of powdered horse chestnut seed decoction as dewormer. The feces of the experimental birds were collected and placed in vials and examined at the College of Veterinary Medicine, Benguet State University for analysis prior to the conduct of the study to make sure that the birds have parasites.

Figure 2. The dried seed and pulvurized horse chestnut seed

Preparation and administration of the horse chest nut seed. The horse chestnut seeds were collected, dried and pulverized. Two hundred grams of powdered horse chestnut were mixed with 200ml of water and boiled until the liquid becomes 100ml (Figure 4).

Weighing of experimental animals. Before the study proper, actual weights of the experimental animals were taken as basis in determining the appropriate amount of the dewormer to be administered per head.

Deworming. The experimental animals were given dewormer based on their body weights. The dewormer solution was given using syringe or improvised deworming materials (Figure 5). The dosage used was based on the recommendation of Cagayan Valley Processing Plant of 1.28 ml/ kg body weight.

Figure 3. The experimental birds

Collection of the fecal samples. There were three fecal collection periods for fecal analysis. The first fecal collection was done before the administration of the decocted horse chestnut seed or deworming. The succeeding fecal collection was done 3 days and 7 days after deworming. At least 10 grams of fresh fecal samples were colleceted.

Fecal analysis. Fecal analysis was performed at the BSU College of Veterinary Medicine, LaTrinidad, Benguet.

The procedures were as follows:

Four grams of feces of the experimental animals was suspended in 20cc. of water. The suspension was mixed thoroughly with 36cc. of sugar solution and passed through a sieve (Figure 6). The mixture was further mixed in vortex mixer for 3.5 minutes. While stirring, 3-5cc was pipetted off and allowed to flow into the chambers of Mc Master Slide then left to stand for 15-20 minutes. The sample was examined under the microscope (LPO) and eggs were counted (Figure 7).

Fecal analysis was performed before deworming and at three and seven days after the administration of the dewormer.

Data Gathered

The data gathered are as follows:

1. Species of parasites present in the feces of experimental animals based on egg morphology. This was obtained through fecal analysis of the animal prior to the administration of the dewormer.
2. Egg per gram of feces. This was taken by multiplying the reality of egg frequency count from the microscope multiplying by 200.
3. Number of egg per gram of feces. This was taken before deworming and at three and seven days after the administration of the dewormer.

Figure 4. Pulverized horse chestnut in casserole

Figure 5. Deworming the experimental birds

Figure 6. Preparation of the sample for analysis

Figure 7. Focusing the sample in the electronic microscope

RESULTS AND DISCUSSION

General Observations

The chicken during the process of drenching the decoction of horse chestnut seed did not exhibit salivation, and also did not vomit after swallowing the liquid mixture inspite of the severe bitter taste of horse chestnut. However, the drenching was done in such as way that the solution was poured directly in the esophagus to minimize the mixture having direct contact with the tongue of the animal. The decoction smelled very odorous. No mortality of the test animals was observed.

Species of Parasites and Egg Count from the Experimental Birds before Treatment.

Before the administration of the horse chestnut seed dewormer, the feces of the experimental birds were subjected for analysis using the flotation method. There were four species present as follows:

1. Ascaridia galli species (Figure 8)
2. Capillaria species (Figure 9)
3. Heterakis gallinae species (Figure 10)
4. Strongyloides avium specie

Result of Fecal Analysis for Ascaridia spp. before and after Deworming

Ascaridia galli spp was found only in the control. Before deworming, the average number of egg per gram was 350.00. Three days after deworming, the mean was 50.00 and at seven days after deworming the number of egg per gram of the species was

Figure 8. Ascaridia galli spp. egg

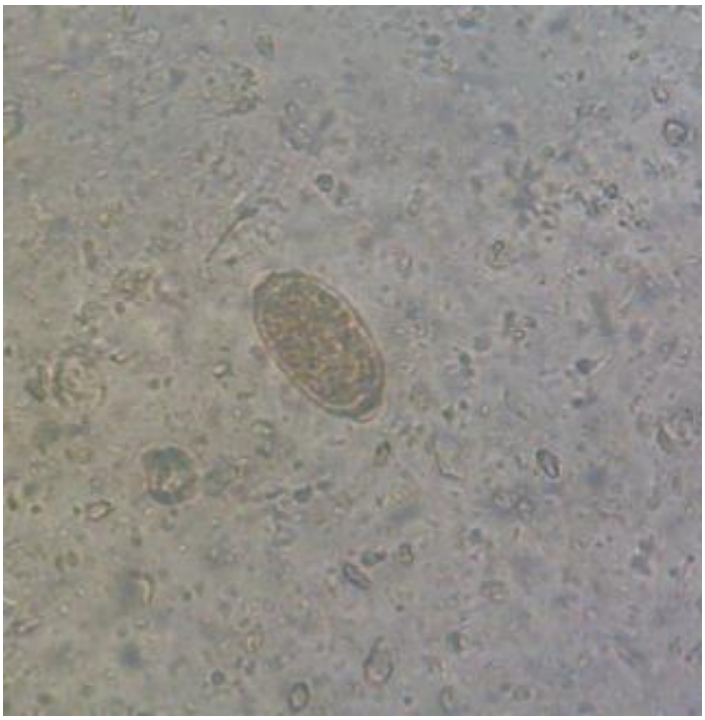

Figure 9. Capillaria spp. egg

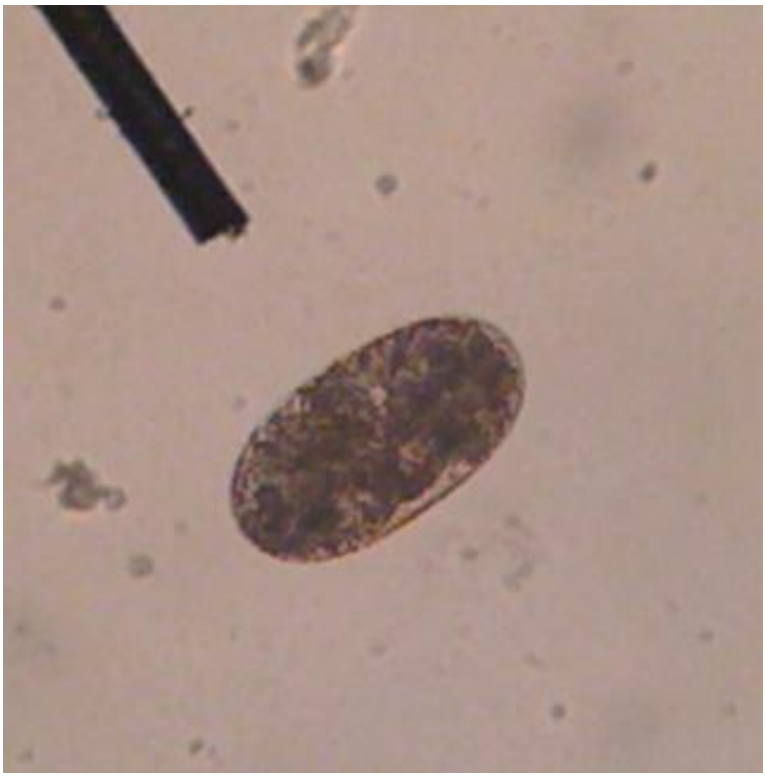

Figure 10. Heterakis gallinae spp. egg

increased with a mean of 500.00. The experimental birds assigned in the horse chestnut and commercial dewormer treatments were not infested with the *Ascaridia galli spp*.

Result of Fecal Analysis
for Capillaria spp. before
and after Deworming

Table 1 reflects the mean of egg per gram of *Capillaria spp.* before and after deworming. The experimental birds in all treatments were infested with the *Cappillaria spp*. At three days after deworming there was 63.64% reduction of the egg per gram with the use of horse chestnut dewormer. Seven days after deworming, the eggs were totally eradicated. It means that the horse chest nut dewormer was very effective as reflected by 100% reduction of eggs. On the other hand, the commercial dewormer was only able to decrease the number of egg per gram. At three days after deworming, the egg per gram was

reduced to 70% then to 60% at seven days after deworming. There was increase in the eggs per gram of the birds assigned in the control.

Table 1. Capillaria ssp. egg count before and after treatment

TREATMENT	BEFORE DEWORMING	AFTER DEWORMING	
		3 DAYS	7 DAYS
no dewormer (control)	450.00	77.78%	100%
horse chestnut dewormer	550.00	63.64%	0
commercial dewormer	1000.00	70%	60%

Result of Fecal Analysis for Heterakis spp. before and after Deworming

Table 2 reflects the mean eggs per gram of *Heterakis gallinea spp* before and after deworming. As reflected in the Table, the *Heterakis gallinea spp* infested all the treatments. The horse chestnut dewormers effected a 50% reduction in the number of eggs three days after deworming and total zero count seven days after. This means that horse chest nut dewormer was also effective in eradicating the *Heterakis gallinea spp.* The commercial dewormer was able to eradicate the *Heterakis spp*. three days after the administration of the dewormer although, 50% eggs were again seen seven days after deworming. This may imply that a follow-up deworming should be done at this stage to prevent recurrence of the worms.

Table 2. Heterakis gallinea ssp. Egg count before and after treatment

TREATMENT	BEFORE DEWORMING	AFTER DEWORMING	
		3 DAYS	7 DAYS
no dewormer (control)	650.00	107.69%	123.07%
horse chestnut dewormer	200.00	50%	0
commercial dewormer	200.00	0	50%

Result of Fecal Analysis
for Strongyloides avium ssp. before
and after Deworming

The experimental birds assigned in the control and those given horse chestnut dewormer were not infested with *Strongyloides avium spp.* The eggs were seen only on the group assigned to the commercial dewormer. The commercial dewormer reduced the egg count by 33.33% after three days. and at seven days after deworming the eggs were eradicated. It means that the commercial dewormer was effective in eradicating the *Strongyloides avium spp.*

SUMMARY, CONCLUSION AND RECOMMENDATION

Summary

The study was conducted to determine the efficacy of horse chestnut seed decoction as dewormer to native chicken. Specifically, it aimed to determine the species of parasites infesting the native chicken.

Fecal analysis using the floatation method was used to determine the number of eggs per gram of each species present in the experimental birds.

Results of the fecal analysis reveal that there are four species of parasites infested to the experimental birds as follows:

1. Ascaridia galli species
2. Capillaria species
3. Heterakis gallinae species
4. Strongyloides avuim species

Horse chestnut decoction was administered as dewormer to the experimental birds was based on the body liveweight following the recommended dosage of 1.28 ml/kg body weight. The treatments were:

T_0 – control (no dewormer)

T_1 – 1ml horse chestnut decoction dewormer/kg body liveweight

T_2 – commercial dewormer

Results of the study showed that the horse chestnut dewormer could effectively eradicate the *Capillaria spp* and *Heterakis gallinea spp.* in a period of seven days from deworming. The commercial dewormer could also eradicate the *Capillaria spp* in the same

period. However, for *Heterakis gallinea spp*, further administration should be done to effect total eradication.

Conclusion

From the findings of the study, it is concluded that horse chestnut seed decoction at the dosage of 1ml per kilogram body weight is effective in expelling intestinal parasites particularly *Capillaria species* and *Heterakis gallinae spp.*

Recommendation

Based on the results of the study, horse chestnut seed decoction could be a very effective alternative to commercial dewormer for chicken. It is a safe and effective dewormer at 1ml per kilogram live weight of chicken.

It is however recommended that another study may be conducted placing the powdered horse chestnut in a capsule or making it in a pellet form for easy administration or that the dewormer be used in other species.

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