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ORAL ADMINISTRATION OF ALOE VERA, BEETROOT AND THEIR COMBINATION ON COCCIDIA OOCYST IN BROILER CHICKENS

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ABSTRACT

Coccidiosis is one of the deleterious and the most common diseases in the poultry industry with detrimental impacts on growth performance and farmers income. This study was conducted to investigate the effect of aloe vera, beet root and their combinations on coccidia oocyst in Broiler chickens. A total of 120-day old chicks were used for the experiment. The experimental animal consisted of four treatments and three replicates, treatment 1 is the control group without the test ingredient, treatment 2 contained administration of Aloe vera extract at 30mLs/litre of water, while T3 contained the combination of Aloe vera and beetroot at 15mLs each, T4 contained the administration of beet root at 30mLs/litre; the administration lasted for a period of 6weeks. The test ingredients were administered prophylactically as the birds were not infected with coccidia oocyst or given anti-cocci vaccine prior to the administration; moreover, antibiotics were not given on arrival during the two weeks of brooding period. Examination of coccidia oocyst from the faecal samples was carried out according to McMaster procedure and was examined microscopically. Data obtained were subjected to one way analysis of variance and significant mean separated. 100 g of oocyst egg count per gramme was recorded for the control group and 200 g for treatment 4 that contained beet root. However, treatments 3 and 4 were free of coccidia oocyst. The study concluded that administration of Aloe vera (Aloe barbadensis Miller) at 15 and 30 mLs into a litre of water can serve as prophylactic treatment in Broiler chickens.

Keywords: Coccidia, oocyst, beet root, aloe vera, Broiler

INTRODUCTION

The growing and increasing knowledge on the wholesomeness of what to consume has led to herbal research or supplements that can improve productivity especially in a country with vast herbal materials which has much therapeutic potential even in humans. Herbs and natural products are cheaper with great potential for enhancement of health status of poultry birds (Hashemi and Davoodi, 2011). A well-known herb that has received particular attention from researchers is Aloe vera (*Aloe barbadensis*Miller), known as one of the oldest herbs with a history that dates back to traditional medicine several years ago (Kumar *et al.,* 2017). Medicinal plants are the richest material of drugs in the ancients (Hashemi and Davoodi, 2011). Moreover,the potential of other medicinal plants had been investigated, Red beet (*Beta vulgaris* L.) is an example of such plant. Beet root is cultivated throughout the world for its roots, a small herbaceous plant which are used as a food and as a source of natural dye (Tayo *et al*., 2020) is therefore imperative that materials such as Aloe vera and beetroot be examined for their potential against coccidiosis in Broiler chickens, hence the need for this study.

MATERIALS AND METHODS

The Experiment was conducted at the poultry unit of the Directorate of University Farm, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria. The area is located on Latitude 7^{o} 10 N and Longitude 3^{o} 2 E. It receives a mean precipitation of 1037mm per annum an average temperature of 34.7°C and an average annual relative humidity of 82%. (Google Earth, 2021).

Phytochemical properties of Aloe vera

The preliminary phytochemical analysis of aqueous extract of Aloe vera recorded protein, carbohydrates, phenols, tannin, steroids, terpenoids and glycosides. Total Phenol Content (30.53 mg/g), Total Flavonoid Content (14.29 mg /g) and Tannin Content (73.26 mg /g) of methanolic extract (73.26) of Aloe vera were respectively and that of ethanolic extract were (54.95), respectively (Bista *et al.,*2020)

Phytochemical compounds of beetroot phytochemical properties of beetroots are ascorbic acid, carotenoids, phenolic acids and flavonoids (6-8) and Betalains (9-10). Flavonoids is one of a highly bioactive pigment in Beetroot, likewise Betalains that contained antioxidant and anti-inflammatory ingredients (Nguyen *et al.,* 2018)

Source and preparation of test ingredient (Aloe vera and Beetroot):

The Aloe vera was collected from around residential houses in the University environment while beetroot was purchased from reputable fruit store. The Aloe vera and beetroot were prepared according to the method of Cowan (1999). Briefly, 100 g of fresh leaves of Aloe vera and 100 g of beetroot were blended with 500 mL of water respectively. This was done with the aid of an electric blender until fine particles of the Aloe vera and beetroot were achieved, after which the extract was sieved out.

*Experimental birds and management:*A total number of 120-day old chicks were used for the experiment. Prior to their arrival, the pens were cleaned and disinfected. Feeders, drinkers, vitamins and lightning materials were also made available. The birds were brooded for two weeks prior to the experiment. At two weeks of age, the birds were divided into four treatments and three replicates after balancing for live-weight.

Experimental Treatments and Diet: The experimental treatment contained, Ordinary water for Treatment 1, 30 mL of aqueous extract of Aloe vera per litre of water for treatment 2, 15 mL of aqueous extract of Aloe vera juice + 15 mL of aqueous extract of beetroot per litter of water for treatment 3 and 30 mL of aqueous extract of Beetroot per litre of water for treatment 4. Commercial Broiler starter and finisher diets were used. Birds were vaccinated but not medicated throughout the period of the experiment, the birds were not inoculated with coccidia oocyst. However, the treatment was administered prophylactically for a period of six weeks after the brooding period likewise antibiotics were not given on arrival during the brooding period.

Collection of faecal sample: Faeces were collected directly from the rectum into universal bottles and labelled for parasitology faecal examination and the eggs were counted through modified McMaster method according to manual of veterinary parasitology techniques.

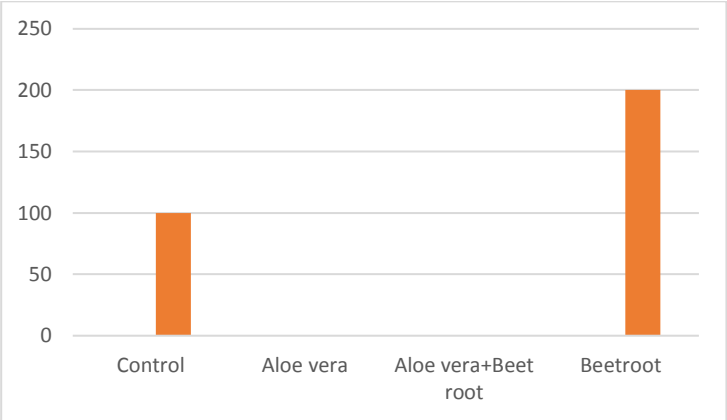
Examination of Coccidia oocyst was carried out according to McMaster procedure where 3 g of faecal sample was mixed with 42 mL of H_2O into 120 mL of glass stoppered bottle. The filtrate was mixed and transferred to a centrifuge tube. Saturated salt solution (Nacl) was added and the tube were inverted for proper suspension of the sediment which were later filled into McMaster chamber and examined under the microscope.

Statistical Analysis: Data collected were subjected to a oneway analysis of variance in a completely randomized design using the Statistical Analyst Software (SAS, 2000) package. Significantly ($P<0.05$) different means among variables were separated using New Duncan's Multiple Range Test as contained in the same package.

RESULTS AND DISCUSSION

The collection of feacal samples at weeks 5 and 8 recorded a significant value for oocyst count for Treatment 1 that contain ordinary water (control) with a total of 100 oocysts per gramme likewise treatment 4 that contained 30 mL of aqueous beetroot with 200 oocysts per gramme. However, treatment 2 that contains Aloe vera recorded no oocyst, likewise the treatment 3 that contained the combinations of Aloe vera and beetroot at 15mLs into a litre of water. The results from treatment 2 indicated that, administration of aloe vera at 30 mLs into a litre of water can prevent coccidiosis in Broiler chickens. However, treatment 4 that contained beetroot recorded highest count of *eimeria* oocyst in their faeces. This study is in agreement with the report of Mwale *et al*. (2006) who reported that increase in *Aloe vera* and aloe spicata content significantly decreases coccidia oocyst count. Yim *et al*. (2011) also reported that broilers that received *Aloe vera* powder (0.1%, 0.3%, and 0.5%) had smaller faecal oocyst shedding count compared to infected group fed with the standard diet. In addition, Akhtar *et al*., (2012) found in their studies that faecal oocyst shedding in broilers orally administered with ethanol and

aqueous extracts of *Aloe vera* pulp at 300 mg/kg body weight/day for three consecutive days was significantly lower.



Effect of aqueous extract of aloe vera, beetroot and their combination on coccidia oocyst in faecal sample of Broiler chickens

From this figure it can be deduced that beetroot did not have an anticoccidial properties. Likewise, the absence of the oocyst in the treatment three that contained the combination of aloe vera and beetroot was because of the aloe vera and never a synergistic effect of the combination of the two ingredients.

CONCLUSION AND RECOMMENDATIONS

An excellent way to control coccidiosis is to use anticoccidial drugs. However, high treatment costs and heightened resistance against these drugs have shifted attentions toward herbs for controlling the disease. It can be concluded that Aloe vera extract at both 15mLs and 30mLs into a litre of water can be used prophylactically for coccidiosis in Broiler chickens.

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