

**NSAP****47th Annual Conference
(JOS 2022)****CONFERENCE
PROCEEDINGS**THEME
**SECURING ANIMAL
AGRICULTURE AMIDST
GLOBAL CHALLENGES****COMPARATIVE EFFICACY OF AMPROLIUM AND AQUEOUS EXTRACT OF *PROSOPIS AFRICANA* LEAVES IN THE TREATMENT OF COCCIDIAL OOCYSTS INFECTED WEST AFRICAN DWARF GOATS****Mohammed, B., M. M. Adua., S. E. Alu., D. Gambo., S. I. Musa and R. A. Ofukwu.**

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Corresponding author: Tel. +2348068268511. E-mail: bawamuhammad63@gmail.com**Abstract**

This study aimed at evaluating the comparative efficacy of amprolium and crude extracts of *Prosopis africana* (Iron tree) leaves in the treatment of coccidial oocysts infected West African dwarf goats. The study was conducted at the Livestock Teaching and Research Farm of the Faculty of Agriculture, Shabu-Lafia Campus, Nasarawa State University Keffi. The efficacy of aqueous extract and amprolium were tested using a total of 16 West African dwarf goats (WAD) of both sexes. The goats were randomly divided into four (4) groups comprising of four (4) goats each for aqueous extract and amprolium treatments. coccidial Oocyst count reduction per gram of faeces was determined. Data collected was subjected to one way analysis of variance (ANOVA) procedure and T-test statistics in SPSS software version 22. The result obtained from this study revealed the presence of flavonoids, Saponins and tannins in all the extracts but absence of alkaloids in fresh and dried aqueous extracts except methanolic extract and also absence of Glycosides in all the extracts. Maximum percent oocyst count reduction of 87.62% and 96.51% on day six (2) and day two (4) post treatments (PT) were recorded in goats treated with 200mg/kg and 100mg/kg b.w. of the fresh leaves aqueous extract and amprolium respectively.

Keywords: *Prosopis africana*, coccidial oocysts, Goats, amprolium and aqueous extracts**INTRODUCTION**

Parasites such as coccidial species (*E. aloigi*, *E. caprina*) affect animals thereby causing great economic losses. They probably cause more morbidity and greater economic and social deprivation among young goats than any single group of parasites (Suleiman *et al.*, 2005). The prevalence of coccidial diseases among young goats in Nigeria is very high, especially during the wet season when infection rate could be as high as 100% in most places (Fajimi *et al.*, 2002b). Such high infection rates prevent the animals from attaining optimum productivity, especially under the intensive husbandry system (Fakae, 1990). Coccidiosis in young goats continues to be the sources of high morbidity and mortality, therefore causes great economics losses. However, synthetic anticoccidial drugs have been used for several years which result to the resistance of these parasites to the drugs because of the frequent used (Faizal, *et al.* 1999; Faizal and Rajapakse, 2001; Waller, 2004). The emergence of resistant strains of pathogenic coccidial has sustained the desire to search for additional therapeutic agents that might allow more effective control of coccidial parasites (Hammond *et al.*, 1997).

Prosopis africana (Iron Tree) is a savannah tree which is characterized by its dark rouge bark, pale trooping foliage with small pointed leaflets and sausage shaped fruits. Known by local names *Kaki-gbagi* (Eggon), *kiriya* (Hausa), *Ayan* (Yoruba), *Okpei or Ubal* (Igbo). It is a medium size tree of up to 40-60 ft height and often branching very low down. It is a tree with a very hard wood (Burkart, 1976).

MATERIALS AND METHODS

Study area: The study was conducted at Livestock Teaching and Research Farm of the Faculty of Agriculture, Shabu-Lafia Campus, Nasarawa State University Keffi. The Study area falls within Guinea Savannah, particularly on sandy-clay soil of Nigeria. It lies between latitude 8.5583653°N and longitude 8.5513946°E. It has a climate typical of the tropical zone because of its location. It has a temperature of mostly between 27°C (81.25°F) to 31°C. Broken clouds: wind 2.11 m/s, humidity 77%, cloudiness 78, pressure 1015.0 hpa in September.

Plant collection and authentication: The leaves of *prosopis Africana* (Iron tree) were collected within Lafia Metropolis. The leaves were dusted and washed to remove dirt. The samples were taken to the



herbarium of the Federal College of Forestry Jos, Plateau State where it was identified, authenticated and voucher number was given FHJ 304.

Processing and extraction procedure of the leaves: The processing and extraction procedure of the plant leaves were carried out at the Faculty of Agriculture Research laboratory, Nasarawa State University Keffi. Fresh leaves samples were pounded, mixed with distilled water, squeeze and sieved to obtain Fresh Leaves Aqueous Extract (FLAE). The extracts were stored at 4°C and continued using it until the end of the experiments.

Phytochemical screening of the leave extract: Qualitative phytochemical analyses of the FLAE were carried out according to established standard methods (Harborne, 1984). The aqueous extract was subjected to qualitative phytochemical screening for: Saponins, Alkaloids, Tannins, Flavonoids and Glycosides.

Experimental procedure: Total of 16 West Africa Dwarf (WAD) goats of both sexes were used for the experiment. The goats were randomly divided into four (4) groups comprising four (4) goats each. The goats were infected with mixed species of coccidial oocyst which was tested and confirmed their presence, and all goats were monitored for clinical signs of coccidiosis before treatment commenced. They received two different dosages of the extract. Treatment 1 (T₁) were infected and left untreated to serve negative control, Treatment 2 (T₂) were infected and treated with Aprotium at 100mg/kg body weight to serves as positive control, Treatments 3 and 4 were infected and treated with FLAE at two different dosages (150mg and 200mg/kg b.w.) respectively. All treatments lasted for five (5) days period. Clinical signs due to side effect of the leaves extract were observed. Faecal oocyst count reduction (FOCR) was monitored for eight days using Mac Master Technique by counting the number of oocyst present in the faecal sample of each goat, starting from day 0 pre-treatment and at day 2, 4, 6 and 8 post-treatment (PT).

Data collection

Oocyst count: Fresh faecal sample of each goat was collected directly from the goats rectum into labeled sterile universal bottles and taken immediately to the laboratory to evaluate the presence of coccidial oocyst before and after the administration of the leaves extract, using Mac Master Techniques. The goats were weighed before and after the treatment.

Statistical analysis: Data collected from this study were subjected to one way analysis of variance (ANOVA) and T-Test using SPSS statistical package version 22. Where significant differences exist, means were separated using Duncan Multiple Range Test (DMRT) of the same package, at the confident level of 5% level of significance.

Result and Discussion

Results

Phytochemical screening of fresh leaves aqueous extract: The phytochemical screening of the leaves extracts is presented in Table 1. The result revealed the presence of tannins, saponins, flavonoids in the extract but absence of alkaloid and glycosides in fresh aqueous extract.

Table 1: Phytochemical screening of iron tree (*Prosopis Africana*) leaves extract

SAMPLE CODE	TANINS	SAPONINS	FLAVONOIDS	ALKALOIDS	GLYCOSIDES
Aq-FLE	+	+	+	-	-

Key: + = Present, - = Absent, Aq= Aqueous, FLE = fresh leave extract.

Effect of iron tree (*Prosopis africana*) fresh leaves aqueous extracts on oocyst count per gram of faeces (efficacy study).
 The effects of *Prosopis africana* fresh leaves aqueous extracts on oocyst count per gram of faeces in West African dwarf (WAD) goats infected with natural mixed species of coccidial oocyst using two different dosages is presented in Table 2. The result showed that the extracts had no significant ($P>0.05$) effects across all the treatments except at days four (4) and six (6) PT. T-test (table 3) showed no significant ($P>0.05$) effects across all the treatments except at treatment 1.

Table 2: Effects of *Prosopis africana* fresh leaves aqueous extracts on oocyst per gram (OPG) of faeces in WAD goats infected with natural mixed species of coccidial oocyst (at different dosages).

Treatment	Pre treatment(Day 0)	PT (Day 2)	PT (Day 4)	PT (Day 6)	PT (Day 8)
Control(-ve)	22050±17932.86 (0%)	43500.00±34038.17	22937.50±9469.37 ^b	32350.00±12390.47 ^b	45537.50±29774.58
Positive(+ve)	1075.00±791.23 (0%)	350.00±144.34 (67.44%)	37.50±37.50 ^a (96.51%)	262.50±184.14 ^a (75.58%)	100.00±100.00 (90.70%)
Amprolium 100mg	5500.00±3692.11 (0%)	13562.50±12104.28	887.50±584.66 ^a (83.86%)	4900.00±4700.71 ^a (10.90%)	1775.00±1575.53 (67.73%)
FALE (150mg)	10100.00±9438.55 (0%)	1250.00±952.85 (87.62%)	1312.50±820.4 ^a (87.00%)	3163.75±1762.31 ^a (68.68%)	1762.50±1175.33 (82.55%)
FALE (200mg)	NS	NS	*	*	NS
LOS	NS	NS	*	*	NS

Key: -ve= Negative, +ve= Positive, FALE= fresh aqueous leaves extract, LOS= Level of significant and NS= Not significant. Values in the same column with different letters superscripts are significantly different.

Table 3: Effects of *Prosopis africana* fresh leaves aqueous extracts on oocyst per gram (OPG) of faeces of WAD goats infected with natural mixed species of coccidial oocyst (at different dosages) using T-test statistics, Second phase.

Treatments	Oocyst Counts Pre T.	Oocyst Counts PT	% Reduction	Sig values	LOS
1	22050.00±17932.86	36081.25±16977.96	-63.63	0.01	*
2	5500.00±3692.11	5281.25±2940.65	3.98	0.13	NS
3	10100.00±9438.55	1872.19±863.07	81.46	0.11	NS
4	1075.00±791.23	187.50±79.88	82.56	0.91	NS
All T.	9681.25±5032.41	10855.55±5408.12	-12.13	0.00	*

Key: Pre T = Pre treatment, PT= Post treatment, Sig= Significant, LOS= Level of significant - = sign of the oocyst load, % = Percentage, T = Treatments.



Discussions: This study revealed the anticoccidial activities of the fresh aqueous leaves extract of two different dosages of *Prosopis africana*. The result showed that there was significant ($P \leq 0.05$) effect of *Prosopis africana* leaves on the oocyst count as demonstrated in the treated group that received dose of 200mg/kg body weight (B.W.). The observed result was fairly comparable with Amprolium at the dose of 100mg/kg B.W. which was similarly reported by Constable *et al.* (2012). The reduction in oocyst count per gram of faeces observed in treated groups could be attributed to the presence of some phytoconstituents in the leaf extracts (Jackson *et al.*, 2015). Saponins was reported to restrain parasites membrane and cholesterol level, thereby altering the integrity of the parasite membrane which results to loss of homeostasis and eventual death of the organism (Wang *et al.*, 2010). The leaves of *Prosopis glandulosa* have been reported to have efficacy against parasites (Rahman *et al.*, 2011). The observed increase in the oocyst load in some days contrary to the expected decrease after treatment could be attributed to the mode of action of the various phytoconstituents present in the leaf extracts.

CONCLUSION AND RECOMMENDATIONS: Based on the results obtained in this study, FLAE had fairly anticoccidial efficacy when compared with amprolium. Therefore, the leaves extracts could be used as a natural anticoccidiosis. These will reduce the effects of chemicals residues in animal products, such as meat and milk when synthetic drug is used. Since the plants can be found almost everywhere in our locality and easy to process.

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