

EFFECT OF *Ficus asperifolia* AQUEOUS EXTRACT ON REPRODUCTIVE PERFORMANCE OF NEWZEALAND WHITE RABBITS RAISED UNDER TROPICAL CONDITION

Ayo-Ajasa, O. Y^{1*}, Abiona, J. A.², Egbeyale, L. T.¹ and Fafiolu, A. O.³

¹Department of Animal Production and Health, Federal University of Agriculture, Abeokuta, Nigeria

²Department of Animal physiology, Federal University of Agriculture, Abeokuta, Nigeria

³Department of Animal Nutrition, University of Agriculture, Abeokuta, Nigeria

*Corresponding author: olapejuyemisi@yahoo.com

ABSTRACT

A 12-weeks study was conducted to evaluate effect of *Ficus asperifolia* aqueous extract on the reproductive performance of Newzealand white rabbits raised under tropical condition. A total of 18 matured rabbit does and 6 bucks (New Zealand White breed) with average weight of 2100.00±89.21g were allotted into three treatment groups in a completely randomized design. Rabbits in treatment 1 (T1; control) received 0 ml of distilled water, while those in T2 and T3 were administered orally, 10ml and 20ml of *Ficus asperifolia* aqueous extract, respectively. Data collected on the reproductive performance of the does were subjected to One Way analysis of variance in a complete randomized design (CRD). Significant differences ($p < 0.05$) among means were separated using Duncan-Multiple Range Test as contained in SAS (2010). Results revealed that rabbit does administered 10ml and 20ml aqueous *Ficus asperifolia* leaves extracts recorded similar and higher (83.33%) breeding efficiency compare to the 50% of rabbit does administered 0ml. Fertility index was significantly ($p < 0.05$) highest in rabbit does administered 20ml (5.17) and lowest control group (3.17). Doe weight at kindling (2567.33g) and weaning (2600.00g) was significantly ($p < 0.05$) higher in the control group than rabbit does administered *Ficus asperifolia* leaves extract. This study therefore concluded that *Ficus asperifolia* leaves extract improved reproductive performance in the does as does administered *Ficus asperifolia* leaves extract significantly ($p < 0.05$) exhibited higher breeding efficiency and fertility index and reduced weight at kindling and weaning than the control.

Key words: Rabbit does, *Ficus asperifolia*, reproductive performance

INTRODUCTION

Reproductive performance is an essential economic trait in the management of breeder stock. (Nwoko and Ibe, 2005) stated that the evaluation of the breeding performance of the doe is an important aspect of the determination of the reproductive status of the female animals. Hence, for great profit to be achieved, special attention must be focused on these traits, so studying factors that directly affect them are so important and must be taken into consideration during breeding of any productive species. Breeding problem is one of the major problems confronting rabbit farming and always increases in the hottest months of the year and this could be as a result of summer heat (Abdel-Samee *et al.*, 2012). Bucks can become sterile in extremely hot weather. The length of time sterility lasts is directly proportional to the length of exposure; this condition affects adult males more than maturing ones (Butswat *et al.*, 2006). When the temperature exceeds 29°C for several consecutive days, male rabbits remain sexually active but may not be fertile for about 60 days. Some medicinal plants and plant products have been used in handling primary medical problems due to their accessibility, availability and affordability in developing countries. In these countries, a variety of plants are claimed to have fertility regulating properties and a few have been tested for such effect (Telefo *et al.*, 2002; Ganguly *et al.*, 2007).

One of these plants is *Ficus asperifolia* of the *Moraceae* family. It is a small or average size tree, terrestrial or epiphyte which can reach 20m in height. According to Adjanohoun *et al.* (1996), *Ficus asperifolia* is abundant in the savannah regions, especially along river banks and marshy areas at an altitude of up to 1100m. Traditional medicine of this same region indicates that the decoction of dry fruits of *Ficus asperifolia* is used to reverse some cases of sterility or infertility whereas the leaves are used as anthelmintic and purgative. Although there is no scientific evidence to support the ethnopharmacological reputation of *Ficus asperifolia* on female reproduction, tribes continue to popularly use it in the management of cases of sterility or infertility in women (Watcho *et al.*, 2009).

Previous work done by Omoniwa and Luka (2012) on the aqueous stem extract of *Ficus asperifolia* revealed that it possesses hypoglycemic and hypolipidemic properties on diabetic rats while Nkamifiya *et al.* (2010) also reported that the leaves of *Ficus asperifolia* has a higher protein, crude fibre and mineral contents than some vegetables. This study evaluated the effect of aqueous extracts of *Ficus asperifolia* leaves on the reproductive performance of New Zealand white rabbit does.

MATERIALS AND METHODS

Experimental Site

The experiment was carried out at the Rabbitry Unit, Teaching and Research Farm Development (TREFAD), College of Animal Science and Livestock Production Farm, Federal University of Agriculture Abeokuta. It lies within the rainforest vegetation zone of South West Nigeria with a mean annual rainfall of 1037mm and a temperature of 43°C and a relative humidity of 82%. It is in the region of 70m above sea level, 7°S 5°N longitude 3°W 11.2°E. (Google earth, 2019).

Experimental Animals and Management

A total of 18 matured rabbit does and 6 bucks (New Zealand White breed) with average weight of 2100g were purchased from a reputable farm in Abeokuta, Ogun State. On the arrival of the rabbits, they were given feed and water containing anti-stress (Maxiyield). The rabbits were allowed to acclimatize with the environment for one week (7 days) before the commencement of the experiment. The hutches and equipment that were used were thoroughly washed and disinfected with morigard before stocking the rabbits. The rabbits were kept in hutches equipped with concrete pots of feeders and drinkers. They were supplied with clean water in concrete drinkers and fed on commercial diet (Table 1) in concrete feeders and were also given *Tridax procumbens* twice a week. The droppings were swept off every day, and the rabbit were observed for any sign of illness.

The does were distributed into three treatments, of six does per treatment. Each treatment was further subdivided into six replicates consisting of one does per replicate. Treatment 1 was orally administered 0ml aqueous *Ficus asperifolia* leaves extract and served as control, Treatment 2 and Treatment 3 were administered the prepared aqueous *Ficus asperifolia* leaves extract orally with 10ml and 20ml daily respectively for 3 weeks consecutively. After three weeks of *Ficus asperifolia* leaf extracts administration, does were hand mated twice to ensure conception and palpated at the 14th day of the gestation for pregnancy test. Kindling boxes were introduced on the 28th day of gestation into the hutches to stimulate nest building, safe delivery and kids protection. The experiment lasted for 12 weeks.

Table 1: Nutrient Composition of the Commercial Feed (As Declared)

Parameter	Value
Crude Protein (%)	16.00
Fats and Oil (%)	5.00
Crude Fibre (%)	7.00
Calcium (%)	1.60
Available Phosphorus (%)	0.45
Lysine (%)	0.75
Methionine (%)	0.36
Salt (%)	0.30
Metabolizable Energy (kcal/kg)	2450

Preparation of Test Ingredient

The fresh leaves of *Ficus asperifolia* were harvested within the environment of Federal University of Agriculture, Abeokuta. The leaves were sorted to remove contaminants, dead matter, sand particles and were air dried for 10 days in the absence of sunlight to retain its nutrients. The air-dried leaves were finely powdered using electric blender. The powdered leaf meal obtained was stored until further use. 200g of the leaf meal was measured into conical flasks and extracted with 1000ml distilled water for 24 hours. The mixture was filtered into 500ml conical flasks with Whatman paper no. 1. The

solution was filtered, decanted and filtered three times using sieve to achieve aqueous leaves extract of *Ficus asperifolia*.

Data Collection

Data were collected on breeding efficiency (percentage of kindled does), litter size at birth (number of kids per doe at birth), litter size at weaning (number of kids per doe at weaning), average birth weight (weight of kids of a doe at birth divided by the total number of the kids), pre weaning loss (number of kids that kiddied before weaning), gestation length (difference between conception date and kindling date) and fertility index (breeding efficiency multiplied by litter size at birth divided by 100).

Statistical Analysis

Data obtained were subjected to One way analysis of variance in a complete randomized design (CRD). Significant differences ($p < 0.05$) among means were separated using Duncan-Multiple Range Test as contained in SAS (2010).

RESULTS

Reproductive performance of rabbit does administered *Ficus asperifolia* leaves extract results presented in Table 5 show significant ($p < 0.05$) effect only for breeding efficiency, fertility index, doe weight at kindling and weaning. Doe administered *Ficus asperifolia* leaves extract significantly ($p < 0.05$) exhibited higher breeding efficiency and fertility index and reduced weight at kindling and weaning than the control. Rabbit does administered 10ml and 20ml aqueous *Ficus asperifolia* leaves extracts recorded similar and higher (83.33%) breeding efficiency compare to the 50% of rabbit does administered 0ml. Fertility index was significantly ($p < 0.05$) highest in rabbit does administered 20ml (5.17) and lowest control group (3.17). Doe weight at kindling (2567.33g) and weaning (2600.00g) was significantly ($p < 0.05$) higher in the control group than rabbit does administered *Ficus asperifolia* leaves extract.

Table 2: Reproductive performance of rabbit does administered *Ficus asperifolia* leaves extract

Parameters	Levels of <i>Ficus asperifolia</i> leaves extract			
	0ml	10ml	20ml	SEM
Gestation length	31.33	31.40	31.20	0.24
Breeding efficiency	50.00 ^b	83.33 ^a	83.33 ^a	4.05
Live birth weight	296.67	270.00	244.60	15.66
Average birth weight	48.99	48.85	40.43	2.43
Litter size at birth	6.33	5.60	6.20	0.41
Litter size at weaning	4.00	5.20	4.00	0.54
Pre-weaning loss	2.33	0.40	2.00	0.60
Litter weight at weaning	1588.33	2330.00	1650.00	248.29
Fertility index	3.17 ^b	4.67 ^{ab}	5.17 ^a	0.37
Still birth	0.00	0.00	0.20	0.08
Weight of kid	298.89	434.29	359.94	42.52
Litter weight	1286.67	2060.00	1405.40	254.50
Weaning rate	70.24	91.00	69.29	8.74
Doe weight at kindling	2567.33 ^a	2222.00 ^b	2384.40 ^{ab}	58.82
Doe weight at weaning	2600.00 ^a	2104.80 ^b	2350.00 ^{ab}	68.36

*Means on the same row having different superscripts are significantly different ($P < 0.05$).

DISCUSSION

Significantly higher breeding efficiency exhibited by doe administered *Ficus asperifolia* leaves extract suggests that *Ficus asperifolia* leaves extract provided enough nutrients for maintenance and reproduction of the rabbits. This result is better and higher than the 16.67% breeding efficiency obtained from rabbits fed diet containing 7.5% Neem leaf meal reported by Ayo-Ajasa *et al.* (2018) and also disagrees with the 67 to 100% conception rate reported by Abdelli- Larbi. (2014) in New Zealand White breed of rabbits and the study of Odeyinka *et al.* (2008) who fed Moringa leaf in place of *Centrosema pubescens*. Also the high fertility index reported in this study shows that *Ficus asperifolia* leaves extract prevented aspermic ejaculation from the bucks involved in the fertilization

process and hence did not impair fertility (Szendro *et al.*, 1984). Breeding efficiency and fertility index can be employed as traits to determine the future breeding programmes and lifetime productivity in rabbit production.

CONCLUSION

The study concluded that *Ficus asperifolia* leaves extract improved reproductive performance in the does as does administered *Ficus asperifolia* leaves extract significantly ($p < 0.05$) exhibited higher breeding efficiency and fertility index and reduced weight at kindling and weaning than the control.

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