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RESPOSE OF RABBIT'S TESTOSTERONE AND ESTROGEN STATUS TO GRADED LEVELS OF WHITE MANGROVE PLANT (*Laguncularia racemosa*)

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ABSTRACT
The Study investigated the response of *L. racemosa* on the status of estrogen and Testosterone of adult rabbits. Forty eight (48) adult rabbits of 50:50 ratio of bulks and does, were randomly assigned to four dietary treatment groups designated (A, B, C, D) in a Randomized Complete Block Design (RCBD). Each group comprises 12 rabbits with 3 replicates of four rabbits each (2 bucks and 2 does). The first group A (Control) were fed diet free of the additive plant (*L. racemosa*) while the other three groups were fed growers mash mixed with the additive plant at graded levels of 70gm/kg, 80gm/kg and 90gm/kg for treatments B, C and D respectively. The results of the estrogen indicates a progressive significant increase of estrogen ($P<0.05$) according to the increased graded levels of the *L. racemosa* as follows; A (90mg/ml) 94.2 mg/ml, C (100mg/ml) and D (105mg/ml) respectively. Also, there was significant increase ($P<0.05$) on the status of testosterone of the test rabbits according to the increasing levels of the additive plant. The values are as following; 2.8mg/ml, 14mg/ml, 15.3mg/ml and 17mg/ml for treatments A, B, C and D respectively. It was therefore concluded that, *L. racemosa* have a beneficial response on Estrogen and Testosterone levels of an adult rabbits, a clinical ethno veterinary data for rabbit reproductive physiologist.

KEY WORDS: Responds, Estrogen, Testosterone, *L. racemosa*, rabbits, Tropics.

INTRODUCTION

Rabbit eat vegetable in proportion to its abundance (Forys and Humphrey 1994). The have been seen foraging on a variety of grasses shrub and tree species. The most abundant species in the rabbit diets includes *Sporobolus virginicus, Rhizophora mangle* and *Laguncularia rasemosa* (white mangrove) (Forys and Humphery 1994). In folk medicine, *Laguncularia rasemosa,* have healing properties which are attributed to Rhizophora trees. Rot, leaf and stem extracts. The inhibitory properties affects the growth of various human pathogenic organisms. Among these are bacteria fungi and virus (Hermandez and Perez, 1978). The influence of mangroves on reproductive health and their performance enhancement attributes has been reported by Lesile *(* 2003) to be due to the following phytochemicals; Alkaloids, Liginus. flavonoids, lipids, benzenoids, steroids, alkanes, tannin and saponins. On the aerial parts, some crystalline lignins including phyllantive and phypopyllanthine revealed wonderful overall increased reproductive performance in human and animals (Lesile, 2003). The use of phytochemical extracts to improve the reproductive function and overall performance of animals (rabbits and man) had long been report (Yakubu, *et al* 2003; Ratnasorija and Dharmasiri 2000). *Laguncularia racemosa* (white mangrove) abundance and its seemingly forgotten potentials as nutritional and economic plants prompted the trial of this foliage to investigate its influence on the reproductive physiology of Rabbits. Itigowa *et al* (2001), Lesile *(*2003) asserted that Avicennaespecially *Lagucularia racemosa* are used in traditional medicine that might serve asa lead for the development of novel drugs. Therefore the objectives of this work is to investigate the graded levels of *L. racemosa* on some the gonadal hormones (estrogen and Testosterone) of adult rabbits of both sexes

MATERIALS AND METHODS

Animals, housing and management

Forty eight (48) Adult New-Zealand white and Chinchilla breeds of rabbits weighing between 2.0-2.35kg. This comprised 50:50 ratio of bucks and does, procured from agricultural development project (ADP) Abuja, were used in an experiment that lasted for 84 days. The experimental rabbits were housed in the rabbitary section of the Teaching and Research farm of the Rivers State University of Science and Technology, Port Harcourt. They were preconditioned for two weeks in a three tier conventional hutches built of wire mesh and iron frames with each hutches having nine compartments. During this time, they were de-wormed using Ivermectin, and prophylactic theraphy of Oxyteliacycline, soluble powder (Tetracin) and multivitamin powder (coryl. Sp.). They were fed with top feeds (growers mash).They were all subjected to the same pre-experimental management conditions of cleaning, disinfection and adlib feeding and watering.

Processing method of the mangrove plants

Whole fresh leaves of *L. racemosa* from Eagle Island Port Harcourt Rivers State of Nigeria, were oven dried at 780C for 2hrs according to Wekhe and Oboh (2007). Thereafter,

were grounded to powder using grinding machine for easy application (Wekhe and Njoku 2002).

Experimental Design and Procedure

48 adult rabbits of 50:50 ratio of both sexes were randomly assigned to four dietary groups (A,B,C and D) in a Randomized Complete Block Design(RCBD). Twelve rabbits were allotted to each group and further replicated three times with four rabbits each (2 of each sex – 2 bucks and 2 does). The first group A (control) were fed diets free of the additive plant (*L. racemosa)* while the other three groups (B,C and D) were fed growers mash mixed with the additive at graded proportions as follows; Treatment B – 70mg/kg growers mash Treatment C – 80m/kg of growers mash Treatment – 90gm/kg of growers mash And these were properly mixed and label for proper identification. The model for RCBD employed are stated as follows

$Xij = \mu + li + Ej + Eij$

Where Xij = Observed data

μ = population mean

Ti = treatment effect

Ej = block effect

Eij = error term.

Estrogen and testosterone hormones lecels were determined by Enzyme immunoassay method, according to Ismail *et al*. (1986) using commercially available test kits BioCheck, Inc, 323 Vintage Park Dr foster City CA 94404.

RESULTS

TABLE 1: The effects of graded levels *Langucularia racemosa* on gonadal Hormones (Testosterone and Estrogen) of rabbits.

Hormones	A (Control)	B (70gm)	C (80g)	D (90g)	SEM
Estrogen mg/ml	90.00^{c}	94.20^{b}	100.00^{a}	105.00^{a}	0.20
Testosterone mg/ml	12.80d	14.00c	15.30b	17.00a	0.30

Means with different superscripts within the same horizontal column differs significantly($P<0.05$)

Estrogen:- Significant difference ($P<0.05$) were observed in the estrogen levels between the treatment groups. The control recorded mean estrogen value of 90.00 (pg/ml), the values increased with increasing concentration of the additive *Laguncularia racemosa* and ranged from 94.20, 100.00 to 105.00 + 0.20 for treatment B,C and D female respectively.

Testosterone: the mean level of testosterone in control rabbits was 12.80+0.30. and this increased with increasing concentration of the fed *Laguncularia racemosa* and ranged from 14.00, 15.30 to 17.00 + 0.30 mg/ml for treatment B,C and D of the males respectively.

The mean testosterone values were significantly different ($P<0.05$) between the treatment groups.

In. Treatment D with additive level of 90m/kg of the plant had superior value of 17.00+0.30 mg/ml testosterone than experimental group C, with mean value of 15.30+0.30 mg/ml testosterone. Treatment groups B and A (control), recorded the least values of 14.00 and 12.80+0.30mg/ml respectively

DISCUSSION

Estrogen

Estrogen is a steroidal hormone that supports the maturation of the oocytes and stimulates the growth of uterine lining. The increased value of female sex hormone (oestrogen) obtained in this study is consistent with the finding of Lesile (2003) who attributed the influence of mangrove plants on reproductive health and performance enhancement to their phytochemicals (steroids, alkaloids and saponins). The rises in estrogen status of all the treated groups suggest a stimulation of ovarian activity. This collaborates the findings of Yakubu *et al* (2003) who reported the use of *L. rasmosa* to improve the reproductive function and the overall performance of animals and man. The significant increase in serum estrogen concentration in all the treated groups suggests that *Laguncularia racemosa* leaves might have increased the blood serum estrogen concentrations and thus may be responsible for its reported aphrodisiac effects in traditional medical practice (Bandaranayke, 2002), and may have been influenced by the photochemical components (steroids, alkaloids, saponin, flavonoid and benzonoids), which was reported to promote overall reproductive performance of humans and animals (Leisil 2003).

Testosterone

This is the most important androgen that promotes the production of the functional sperm cell, maintains the secretary glands of the male reproductive trait, stimulates growth and determines secondary male sexual characteristics such as distribution of facial hair and body fat. Testosterone the main circulating androgen of testicular origin is vital in maintaining libido, body fat, maintaining muscle mass, bone density and the regulation of blood sugar. The results obtained in this study showed that mean levels of testosterone in rabbits increased significantly ($P<0.05$) with increasing inclusion of the *Laguncularia racemosa*. This findings, agrees with the work of Bandaranayke, (2002) who reported that some mangrove plants and extracts are used by some herbalist to enhance reproduction in male and this was related to the presence of phytochemical in the test additive (Leisil 2003). Studies have implicated the saponin component of forest plants to enhance aphrodisiac properties and increases androgen (Bandaranayke, 1996). Bandaranayke, (1996) revealed that mangrove leaves are rich sources of tannins, saponins, alkaloids, flavonoids and as antimicrobial agents. The properties of mangrove leaves could have indirectly influenced the testosterone production. Increase in testosterone in the blood circulation improves protein synthesis, muscles development and the resultant increased in weight gain (Gauthmen *et al.*, 2002). The presence of saponin in those plant may be responsible in stimulating increase in the body endogenous testosterone levels by raising the level of Luteinizing hormone. This LH released normally by pituitary gland helps to maintain testosterone levels; as LH increases, the testosterone increases also. Yakubu *et al*

(2003): Amin *et al.* (1996) all reported the use of phytochemical substances to improve the reproductive function and the overall performance of livestock.

CONCLUSION

Mangrove plant have earlier established to influence reproductive health of both man and animals due to its numerous phytochemic,al containt like alkaloids, lignin's, flavonoids,lipids, benzenoids, steroids, alkenes, Tannin and saponin (Lesile, 2003).Ethno veterinary importance especially in the area of the reproductive health of rabbits. The findings indicated that *L. rac emosa* has a positive influence on gonadal hormones (oestrogen and testosterone), the key factor in reproductive physiology of rabbits.

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