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## EFFECT OF *Syzygium aromaticum* (L) EXTRACT ON THE REPRODUCTIVE FUNCTIONS OF WEST AFRICAN DWARF BUCKS

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### ABSTRACT

*Syzygium aromaticum* (L) is an important spice used as aphrodisiacs in some African countries and can increase libido, potency and sexual pleasure. The present study is aim at investigating the effect of graded level of clove on the reproductive functions of West African Dwarf Bucks. 5g of the extract was dissolved in 250ml of normal saline to obtain appropriate concentration suitable to achieve 0.5ml dose by volume of extract administered subcutaneously o the bucks. The results recordedfor follicle-stimulating hormone (FSH) accounted for  $1.26\pm 0.08$ miu/ml,  $0.13\pm 0.08$ miu/ml and  $0.80\pm 0.08$ miu/ml for group A, D and E respectively and were significantly different ( $P<0.05$ ) within groups while group C and B accounted for  $0.11\pm 0.08$  and  $4.33\pm 0.08$ miu/ml. Luteinizing hormone (LH) recorded  $3.66\pm 0.14$  and  $1.16\pm 0.14$ miu/ml in group A and E with significant difference within group. Group B, C and D were not significantly different with  $2.16\pm 0.14$ miu/ml,  $2.31\pm 0.14$ miu/ml and  $2.62\pm 0.14$ miu/ml respectively. Testosterone count recorded  $6.10\pm 0.14$ ng/ml in group E and  $8.15\pm 0.14$ ng/ml in group B and were not significantly different from each other ( $P>0.05$ ). While group A, D and E were significantly different within groups. FSH values increases as the level of *Syzygium aromaticum* extract administered increases, while LH values reduced as the level of clove extract administered increases. Testosterone count decreased as the level of clove extract administered increases. *Syzygium aromaticum* extract increases libido in WAD bucks and also helps to enhance reproductive performance. It is noted that low level of the extract increases steroidal hormone such as testosterone, this had no negative effect on the hormonal parameters of the WAD bucks.

**Keywords:** Effect, Extract, Reproductive functions, *Syzygium aromaticum*, WAD Bucks,



## INTRODUCTION

*Syzygium aromaticum* (Clove) is a small evergreen tree of Myrtle family and for its unopened flower bud, an important spice, the buds are reddish brown in colour and have a strong aromatic flavor (Orwa *et al.* 2009). Various substances of animal and plant origin have been used in folk medicine of different cultures as aphrodisiacs; some of which have been identified pharmacologically to exert their effects on the hypothalamic-pituitary-testicular axis (Fouche *et al.*, 2015). *Syzygium aromaticum* is an aphrodisiac agent and is used to cure sexual disorders in male (Buch *et al.*, 1998) research has shown that *syzygium aromaticum* oil was spermicidal on ejaculated human sperm (Mishra and Singh 2008). Clove has been used in China for the treatment of diarrhea, liver and gastrointestinal track ailments and a stimulant for nerves (Zhang *et al.*, 2005). Lengthy exposures to clove extracts can cause mortality and sub-acute morbidity (Javahery *et al.*, 2012). In Ajuurvedic and Unani medicines, the *Syzygium aromaticum* is well-known for its aphrodisiac property and is used to treat male sexual disorders (Tajuddin *et al* 2003, Jain and Defilipps 2004). Tajuddin *et al* (2004) reported that *Syzygium aromaticum* produce a sustained increase in the mounting frequency of normal male rats and mice.

However, results of clove extracts will not necessarily be the same as studies using the raw plant (Banerjees *et al.* 2006). West African Dwarf Goat is much more than any other ruminant in Nigeria; it is the most common breed in the southern region of Nigeria (Bourn *et al.* 2004). The main objective of this study is to determine the effect of *Syzygium aromaticum* (Clove) extract on the Reproductive functions of West African Dwarf bucks.

## MATERIALS AND METHODS

The experiment was conducted at the Animal production pavilion, Faculty of Agriculture, University of Ilorin, Nigeria. *Syzygium aromaticum* buds were bought within Ilorin metropolis and ground into powder using mortar and pestle. The extraction process was carried out using modified Swain method (Swain, 1999) using 96% ethanol at 75 – 80°C in a soxhlet apparatus for 4 hours. The liquid was filtered using 125mm whatman filter paper and the filtrate concentration under reduced pressure in vacuum desiccators and was dried to a constant weight at 45<sup>0</sup>C in a hot air oven. Subsequently, 5g of the extract was dissolved in 250ml of normal saline to obtain



appropriate concentration suitable to achieve 0.5ml dose by volume of extract which was administered to the Bucks. Fifteen (15) West African Dwarf Bucks of between 1 to 2 permanent incisors were purchased within Ilorin metropolis. These bucks were quarantine for a period of 14 days; during this period the bucks were given oxyletic, vitamin and ivomec injection to relieve them from stress, external and internal parasites. Bucks were vaccinated against *pestes des petite ruminatum* (PPR) using Tissue Culture Rinderpest Vaccine (TCRV) before the commencement of the experiment.

Animals were housed in pen with slatted floor; pen was swept, washed and disinfected with germicide to get rid of germs. Wooden troughs and plastic bowls were provided for feeding and drinking respectively. Feed was formulated to meet the nutrient requirement of the bucks. The bucks were fed 300g of concentration feed per day throughout the experimental period. *Panicum maximum* and water were provided *ad libitum*.

The experiment follows a completely randomized design. Animals were randomized into 5 groups of 3 animals per treatment. Animals in group A (control) were given 0.1ml/kg normal saline; Animals in group B (standard) were given 0.1mg/kg standard drug (sildenafil – citrate drug) while animals in group C, D and E were injected 0.1mg/kg, 0.2ml/kg, and 0.3ml/kg body weight of clove extract subcutaneously for a period of 4 days. Blood samples were collected from each animal at the end of the experiment. The samples were collected via jugular vein of the animal using needle and syringe into EDTA and lithium heparin bottle to prevent it from clotting. Blood samples to be used for hormonal analysis were centrifuged at 2000 R.P.M for 10 minutes to obtain serum which was later kept in a plain bottle. The samples were taken to the laboratory for appropriate analyses.

### **Data Analysis**

The data were analyzed using analysis of variance (ANOVA) procedure following a completely randomized design and the level of significance were determined using the Duncan's multiple range test (Duncan, 1955).



## RESULTS AND DISCUSSIONS

The results of the effects of clove extract on reproductive parameters of WAD bucks are shown in table 1. Testosterone count ranged from  $6.10 \pm 0.14$  –  $8.15 \pm 0.14$  ng/ml in group A – E. Group D, B and C were not significantly different from each other ( $P > 0.05$ ) while group A, D and E were significantly different from each other ( $P < 0.05$ ). Follicle stimulating hormone (FSH) ranged from  $0.11 \pm 0.08$  –  $4.33 \pm 0.08$  miu/ml. Group C and D were not significantly different ( $P > 0.05$ ) while group A, B and E were significantly different ( $P < 0.05$ ) from each other. Luteinizing Hormone (LH) ranged from  $1.16 \pm 0.14$  –  $3.66 \pm 0.14$  miu/ml. Group B, C and D were not significantly different ( $P > 0.05$ ) while groups A and E were significantly different ( $P < 0.05$ ) from each other. Prolactin ranged from  $0.20 \pm 0.04$  –  $0.86 \pm 0.04$  ng/ml. Group B and E were not significantly different ( $P > 0.05$ ) from each other. While group A, C and D were significantly different ( $P < 0.05$ ) from each other.

Table 1: Effects of *Syzygium aromaticum* (Clove) Extract on Reproductive parameters of West African Dwarf Bucks

Parameters	A	B	C	D	E	± SEM
	0.1ml	0.1ml	0.1ml	0.2ml	0.3ml	
	Sa	Sc	Sa	Sa	Sa	
			Extract	Extract	Extract	
Testosterone (ng/ml)	7.21 <sup>b</sup>	8.15 <sup>a</sup>	8.15 <sup>a</sup>	6.61 <sup>c</sup>	6.10 <sup>d</sup>	0.14
FSH (miu/ml)	1.26 <sup>b</sup>	4.33 <sup>a</sup>	0.11 <sup>d</sup>	0.13 <sup>d</sup>	0.80 <sup>c</sup>	0.08
LH (miu/ml)	3.66 <sup>a</sup>	2.16 <sup>b</sup>	2.31 <sup>b</sup>	2.62 <sup>b</sup>	1.16 <sup>c</sup>	0.14
PRL (ng/ml)	0.56 <sup>b</sup>	0.20 <sup>d</sup>	0.36 <sup>c</sup>	0.86 <sup>a</sup>	0.21 <sup>d</sup>	0.04



The results obtained from bucks receiving *Syzygium aromaticum* (clove) extract were similar to the results reported by Tambuwal, *et al* (2002) for red Sokoto goat and the reports of Mishra and Singh (2008) for the assessment of clove extract with respect to testicular function in mice. This study shows that *Syzygium aromaticum* stimulates the production of iron in the blood of bucks and has no negative effect on the health status of the animal. *Syzygium aromaticum* enhances sexual performance of bucks which is essential for the development of male sexual characteristic and sperm production. Testosterone level increases at smaller dosages and decreases as the level of clove extract administered increases. This indicates that *Syzygium aromaticum* increases sexual performance at a lower dosage and reduces it at a higher dose and indicates that the production of testosterone by leydig cells could be inhibited with increase in the level of the extract. FSH value increases as the level of *Syzygium aromaticum* extract administered increases as seen in table 1 for group C - E. This indicates that *Syzygium aromaticum* extract stimulate the development of primary spermatocytes in bucks. LH values reduced as the level of clove administered increases. Prolactin decreases as the level of the extract increases. This shows that the extract could be used in prolonging the duration of mating as a reduction in the level of prolactin has been reported to increase the duration of mating (Thakur and Paramanik, 2009).

### CONCLUSION

It is clear from this study that low level of the extract increases steroidal hormone including testosterone. *Syzygium aromaticum* extract increases libido in WAD bucks and also helps to enhance reproductive performance.

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