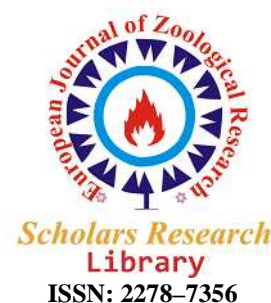




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European Journal of Zoological Research, 2012, 1 (3):77-79  
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### Effect of aqueous extract of *Datura stramonium* on spermatogenesis of West African Dwarf bucks.

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#### ABSTRACT

This study examines the effect of aqueous extracts of *Datura stramonium* seeds on the spermiogramic parameters of West African Dwarf bucks. Plant extracts were tested for their effect on the seminal characteristics at five dose levels: 0 (physiological saline solution), 0.02, 0.04, 0.06, and 0.08ml/kgBW/ animal/day subcutaneously for 10 consecutive days, using Completely randomized block design (CRBD) and the spermiogramic studies of the semen were carried out. The results of the present study showed marked variations in the spermiogramic parameters of WAD bucks, as manifested by increased ( $p < 0.05$ ) mass activity, mass motility, sperm concentration and improved semen output but reduced ( $p < 0.05$ ) semen volume and total sperm cell. Semen pH in all the animals were similar ( $p > 0.05$ ). The scrotal circumference in the treated bucks were statistically differed ( $p < 0.05$ ) from the control in the period of the study. The extract produced a remarkable effect on the spermiogramic parameters ( $p < 0.05$ ) and this may be as a result of the active principles present in the extract used. The results showed that the bucks can tolerate the aqueous extracts when administered. Based on the finding of the present study, aqueous extract of *D. stramonium* seeds contains active ingredient of pharmacological significance that if properly screened using additional solvents, pharmacologically active drugs could be obtained. The significant activity exhibited by the extract on the animals, have provided scientific justification for the ethno medicinal uses of the plant in India.

**Keywords:** androgenic activity, *Datura stramonium*, ethanolic extracts, spermiogramic parameters, active principles

#### INTRODUCTION

The use of young male goats as sire has advantages in genetic improvement, especially in dairy goats [9]. Using a young male goat the biological potential will be better exploited too, then it is possible to prepare more semen doses by each sire [4], then it is important to induce the most production of semen with good quantity and quality from animal using less expensive preparations. Some hormones like melatonin and GnRH can stimulate the Central Nervous System and the pituitary gland in order to secrete gonadotrophins and testosterone. Some plants are known to contain some active biologic constituents secondary metabolites such as tannin, saponin, saponin, glycosides, alkaloid and other related drug compounds which have been reported to stimulate or inhibit sperm motility, although some did so only at high concentration [7]. However, cases of acute neurological dysfunction in relation to plants

have been reported [2]. *Datura stramonium* “Thorn apple” is a toxic plant which greatly affects animals. The critical intoxication evidences nervous and gastroenteric symptoms together with a serious hepatic insufficiency. The study was carried out to find out the effects of the ethanolic crude extract of *Datura stramonium* seed on spermatogenesis in WAD bucks.

### MATERIALS AND METHODS

The study was carried out at the Animal Production Pavilion, Faculty of Agriculture, University of Ilorin, Nigeria. Extract was prepared from 250g of the seed soaked in 1 litre of distilled water without agitation for 48 hours, after which the content was sieved with 2.00mm woven wire sieves, filtered with 125mm Whatman® 42. The residue discarded and the extracts retained served as the treatment medium. Twenty West African Dwarf bucks were randomly divided into 5 treatment groups were used in this study. The bucks were administered doses of extract at 0, 0.02, 0.04, 0.06 and 0.08ml/kgBW/animal/day subcutaneously for 10 consecutive days. The scrotal circumference was measured using [5]. Semen was obtained with Electro-ejaculator and semen analysis was determined [1]. Data were analyzed by ANOVA using the Completely Randomized Block Design with the COSTAT program and means tested [3].

### RESULTS AND DISCUSSION

Semen characteristics of WAD bucks treated with different levels of crude extract are shown in Table I. The results of the present study showed marked variations in the levels of crude extract and the spermiogramic parameters of WAD bucks. The scrotal circumference in the treated bucks were statistically differed ( $p < 0.05$ ) from the control, although wrinkling was observed in the period of the study. Semen volume was lower in the treated bucks and similar ( $p > 0.05$ ) with the control, this could be traceable to the discharge of semen exhibited by the treated bucks. The results showed that the bucks exposed to treatments had higher mass activity and progressively sperm motility and differed ( $p < 0.05$ ) from the control.

**Table I: Semen characteristics of WAD bucks treated with different levels of ethanolic extract of *Datura stramonium* Linn**

Parameters	0	0.02	0.04	0.06	0.08	S.E
Semen colour	white	creamy	creamy	creamy	creamy	
Mass activity	1.23d	2.12c	2.43bc	2.56ab	2.76a	0.076
Semen volume (ml)	0.67a	0.23b	0.21b	0.22b	0.19b	0.043
Sperm motility (%)	63.32c	74.34b	77.87ab	81.45a	83.42a	3.015
Sperm concentration ( $\times 10^9$ )	1.13c	1.43b	1.61a	1.65a	1.68a	0.037
Total sperm cell ( $\times 10^9$ )	0.76a	0.33b	0.34b	0.36b	0.32b	0.024
Semen pH	7.2	7.3	7.2	7.4	7.3	0.018
Change in scrotal Circumference	1.34b	1.87a	1.85a	1.82a	1.79a	0.116

*a, b, c, d means same row bearing different superscripts differ ( $p < 0.05$ ).*

The values of these parameters followed similar trend and increased progressively with increasing levels of crude extract. There were differences in sperm concentration among the treatment groups and there were significant difference ( $p < 0.05$ ) in the sperm number per ejaculate in the treated bucks in this study. Consequent on the treatment with crude extract, the enhancement of scrotal circumference, mass activity, mass motility, sperm concentration and sperm number per ejaculate is supported by several studies [1] [6] [8] which have shown close association of these parameters with sperm production. The study indicated that the extract affected sperm production in WAD bucks and the dose was enough to initiate feedback on the hypothalamus. The results showed that bucks treated with crude extract exhibited more sexual activity as evidenced by interest in mating through mounting, erection and discharge of semen and this could probably be an effective technique for enhancing spermatogenesis in WAD bucks and administration of the crude extract daily for ten days was effective to improve semen quality in WAD bucks.

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