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EFFECT OF PRE-COPULATORY TREATMENT WITH AQUEOUS LEAF EXTRACT OF *Spondias mombin* ON GESTATIONAL CHARACSTERISTICS OF RABBITS

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ABSTRACT

Fifteen plurigravida rabbits weighing between 2.0 and 2.6 kg were used for the study of gestational characteristics after pre-copulatory oral administration of aqueous leaf extract of *Spondias mombin*. The fifteen does were divided into three groups of five does per group. Four untreated reproductively proven bucks kept separately in different cages were used for copulation. Dosages administered were 400mg/kg and 800mg/kg for groups A and B respectively while distilled water was served to control group C. Mating, pregnancy diagnosis using ultrasound and determination of birth parameters were conducted subsequently at the end of extract treatment.

Average litter size,birth weight and gestation length observed in all dosage groups had statistically similar values ($p \geq 0.05$).However, it is worth noting the relatively higher values of average litter size in 800mg/kg dosage group and control (5.60±0.40) compared to 400mg/kg group (5.40±0.75) and the highest birth weight value recorded for 800mg/kg (46.63±3.55) compared to 400mg\kg group (45.30±3.22) and control (42.38±3.74). It was concluded that pre-copulatory administration of aqueous leaf extract of *Spondias mombin* at dosages as high as 800mg/kg to rabbit does not have deleterious effect on its prolificacy and does have pro-fertility tendencies.

Keywords: Aqueous, extract, gestation, leaf, *Spondia*,

INTRODUCTION

The use of local plants as health remedies (ethno-veterinary medicine) for livestock is often the only option available to rural and peri-urban populations, particularly in the Third World (McCorkle, 1995). Livestock owners continue to utilize ethno-veterinary medicine because of its efficacy, low cost, availability and ease of administration (Uchendu and Isek, 2008).*Spondias mombin* is one plant used locally in Nigeria, the western part of Africa, for various reasons ranging from the treatment of eye inflammation, diarrhea, venereal diseases and helminthosis (Ayoka*et al.,* 2008, Ademola*et al.,* 2005). The plant isa species of flowering plant belonging to the family *Anacardiaceae*. It is native to the tropical Americas, including the West Indies but has been naturalized in parts of, India, Sri Lanka, Indonesia and Africa including Nigeria. The fruit is called by different names in the three major languages in Nigeria; ***Iyeye*** in the Yoruba language (Oyelade*et al.,* 2005), ***ngulungwu*** in Igbolanguage and***isada*** in Hausa language (Adepoju and Oyewole, 2008).

In Eastern Nigeria, fresh leaves of *Spondias mombin* is widely used by the natives to aid delivery and to expel the placenta in small ruminants (sheep and goats), especially during difficult parturition (Uchendu and Isek, 2008). In humans, it helps in labour induction, pain relief and control of hemorrhage during and after childbirth in addition to bringing on the flow of breast milk, and usage as vaginal wash to prevent or treat uterine or vaginal infections after childbirth (Taylor, 2006). It is also used as an abortifacient (Offiah and Anyanwu, 1989). Toxicity studies with mice and rats have been performed on *Spondias mombin* in several published studies (Taylor, 2006). The leaves were reported non-toxic in animals when administered up to 5 g per kg of an animal's weight orally (Taylor, 2006). Among its various chemical constituents is the saponin, which is known to have an oxytocitic property, a property believed to be responsible for the plant's abortifacient tendency (Yeonju Lee *et al.,* 2012). *Spondias mombin* has also been shown to produce changes in sex steroid hormone concentration in gravid rabbit which can alter gestation and ultimately lead to abortion (Oloye*et al.,* 2013a).This project sought to study andexplore the potentials of*Spondiasmombin*on increase in litter size and birth weight which are the fulcrums on which livestock productivity is stabilised.

MATERIALS AND METHODS

Plant Collection and Preparation of Aqueous extract

Spondias mombin leaves were collected and authenticated at the National Centre for Genetic Resources and Biotechnology (NACGRAB), Moor Plantation, Ibadan. Leaves were collected and dried under a shade then pulverized. The resulting leaf powder was soaked in distilled water for three days. Solution was filtered and filtrate was distilled at a controlled temperature using a distillation apparatus. The resulting pasty extract was kept in a hood for further solidifying.

Experimental protocol

Fifteen Plurigravida does and 4 mature proven bucks were used for the study. The does weighed between 2.0 and 2.6kg. The animals were housed in wooden hutches in the experimental animal house of College of Veterinary Medicine Abeokuta. They were fed with commercial standard ration and grass. Water was given *ad libitum* throughout the period of the study.

The rabbits were assigned randomly to two treatment groups (A and B) and control group (C) with each group having five animals. Does in group A were administered 400mg/kg aqueous extract while group B does were given 800mg/kg aqueous extract. Group C animals were administered distilled water. All groups were orally treated with 1ml of the dosages once daily for seven days before copulation.

Each group of 5 experimental does was transferred to a male cage for copulation 12 hours after extract was last administered. Mating was monitored and assisted. A successful mating was established by signs of recoil of the male and a fall backwards or sideways and emission of a snorting sound (Noakes*et al.,* 2001). Count down of gestation began 10 hours after a successful mating since they ovulate 10 hours after mating. Pregnancies were diagnosed using abdominal palpation and ultrasonography (Harkness *et al*., 2013). Gestation length, live birth weight and litter size of animals in all groups were measured.

Statistical analysis was done using descriptive statistics. Means were compared using one–way Analysis of Variance. $p \leq 0.05$ was considered significant. Graph pad 5.0 version was utilized.

RESULT

All the birth parameters evaluated (average litter size, average gestation lengths) had statistically similar values ($p \geq 0.05$). However, it is of note that average litter sizes (Fig 1) of 800mg/kg dosage group and control (5.60±0.40) were marginally higher compared to 400mg/kg group (5.40±0.75) (Table 1). Likewise average birth weight in 800mg/kg dosage group (46.63±3.55) was marginally greater when compared to 400mg/kg group (45.30±3.22) and control (42.38±3.74) (Table 1). Average gestation lengths in all dosage groups were practically the same (30.20±0.37, 30.80±0.37, 30.60±0.40 days respectively in dosage groups 400mg/kg, 800mg/kg and control).

Table 1: Gestation length, Litter size and Live birth weight in does treated with 400 and 800mg/kg leaf aqueous extract of *Spondias mombin*

	Group A (400mg/kg)	GroupB(800mg/kg)	Group C (Control)
Gestation Length (days)	30.20±0.37	30.80±0.37	30.60±0.40
Litter Size	5.40±0.75	5.60±0.40	5.60±0.40
Live Birth Weight (g)	45.30±3.22	46.63±3.55	42.38±3.74

Mean ± Standard error of the mean (SEM)

Figure 1: Showing litter of a doe treated with 800mg/kg of extract

DISCUSSION

Litter sizes of 5.60±0.4 in 800mg/kg group and control group and 5.40±0.75 in 400mg/kg group fell within the range (4-10 kits) considered as standard (ILAR, DELS, 2011). Average live birth weight reported in this work fell within the range (30-80g) reported by ILAR, DELS (2011). The high litter size in 800mg/kg group lent credence to Oloye*et al*(2013b) submission that treatment of does with 800mg/kg of ethanol extract of *Spondias mombin* seemed to favourfolliculogenesis going by themultiplesof follicles observed in the treated rabbits.These follicles potentially were available for ovulation hence more follicles meant more possible kids after successful fertilization. Higher average live birth weight (46.6g) observed in rabbits treated with 800mg/kg *Spondias mombin* compared with control group (42.38g) even with their similar litter size suggest a pro-fertility property of the leaf extract of the plant. This corroborates the findings of Oloye*et al.,* (2012) who submitted that ethanolic extract of *Spondias mombin* at 800mg/kg fed orally before copulation had no anti-fertility effect on female wistar ratsrather it favoured live birth weight and potentiates gestation parameters.

CONCLUSION

Pre-copulatory administration of aqueous leaf extract of *Spondias mombin* at dosages as high as 800mg/kg to rabbit does has profertility tendencies. Trials with dosages higher than 800mg/kg is recommended for possible increase in litter size.

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