NSAP 47th Annual Conference (JOS 2022) CONFERENCE PROCEEDINGS
THEME: SECURING ANIMAL AGRICULTURE AMIDST GLOBAL CHALLENGES

EFFECTS OF FEEDING *DIALUM GUINEENSE* PULP ON FEED INTAKE AND BODY WEIGHT OF ALBINO WISTAR RAT

P.E. Aba*, C.E. Obinatu, S.C. Udem
Department of Veterinary Physiology and Pharmacology, Faculty of Veterinary Medicine, University of Nigeria, Nsukka, Enugu state, Nigeria;
**Corresponding authoremail: Patrick.aba@unn.edu.ng; Phone: 2348062730072*

ABSTRACT
This study investigated the effects of Dialum guineense pulp on feed intake and weight changes in albino wistar rats. Twenty wistar rats assigned to four groups (A-D) consisting of five rats per group were used for this study. Group A rats were fed basal diet (Chikun finisher®) while groups B-D rats received basal diet supplemented with pulverized Dialum guineense pulp at 12.5, 6.25 and 3.125 % inclusion rates respectively for 21 days. Daily feed intake and weekly weight changes were recorded. Results indicated that group C rats consumed more feed and had marginally increased ($p<0.05$) weight when compared with the control and other groups. It was concluded that moderate inclusion of Dialum guineense pulp at 6.25% improved appetite and led to better feed utilization.

Keyword:*Dialum guineense*, Feed intake, Rats, Weight gain

INTRODUCTION

Dialum guineense is called vevet tamarind in English, "Icheku" in Igbo, "Awin" in Yoruba and "Tsamiyar kurn" in Hausa languages (Akinpelu *et al*., 2011). The plant is tropical in origin and it is found in Central and West African countries such as Cameroon, Central African Republic, Chad, Benin, Burkina Fasso, Ivory Coast, Ghana, the Guineas, Liberia, Mali, Senegal, Sierra Leone, and Togo. (Bessong *et al*., 2016). Velvet tamarind grows in dense savannah forests, shadowy canyons and gallery forests (Bessong *et al*., 2016).

Different parts of the tree have been used in folkloric medicine for treatment of different diseases: the bark in cancer, headache, and pains. Idu *et al.,* (2009) reported the usefulness of the bark for oral hygiene and stomach ache among the Esan tribe of Edo state; the leaves are used as a remedy in fever, prenatal pains and oedema; the fruits in diarrhea (Arbonnier 2004). The fruits of the plant are chewed among some women in south-east Nigeria to improve lactation and check genital infection (Nwosu, 2000). The leaves and stem bark are used as folklore remedies for the treatment of infections such as diarrhea, severe cough, bronchitis, wound, stomach ache, malaria fever, jaundice, anti-ulcer and hemorrhoids (Bero *et al.,* 2009). The leaves can also be squeezed and applied on wounds as practiced by Wolof of Senegal (Devendra, 1988).

The pulp of the fruit is edible and sweet, fairly low levels of ascorbic acid and tannin are present. It is a good source of proteins and minerals (Arogba *et al*., 2006). The extracts of leaves and seed coat have been reported to be very rich in vitamin C (Maduaka, 1988). Presence of antioxidant and vitamin C makes it an ideal food additive to boost the body's immunity level. Okegbile and Taiwo (1990) found high content of vitamin C and other micronutrients in wild fruits when compared with nutrition supplied by other fruits such as oranges, avocado pear, pineapple, paw-paw and commercially produced fruits. Themineralcompositionincludes phosphorus,potassium,zinc,calcium,manganese.Itisalsoa potentialsourceofiron,magnesium andcopperandwouldcontribute towardsmeetingtherecommendeddailyallowancesofthese micronutrientsincombatingmalnutritionespeciallyinsub- SaharanAfrica(Nicholas*etal.*,2014).Phytochemical contents of *Dialum guineense* have been reported to include flavonoids, tannins, alkaloids, cardiac glycosides, saponins, terpenoids, resins and steroids (Gideon and Rapheal, 2012). The aim of this study was to investigate the effects of incorporating the pulverized pulp of *D.guineense* on the feed consumption and weight gain in albino wistar rats.

MATERIALS AND METHODS

Experimental site

This study was carried out in the Department of Veterinary Physiology and Pharmacology, Faculty of Veterinary Medicine, University of Nigeria, Nsukka , Enugu state, Nigeria.

Plant materials

The fruits of *Dialum guineense* were purchased from Ogige market in Nsukka town in Enugu State, Nigeria.

Experimental design

Twenty female albino Wistar rats weighing between 150.4g – 193.5g were assigned into four groups (A-D) with each having five rats. They were acclimatized for one week with the environmental temperature of the house varied between 28℃-32℃. The animals were kept in aluminum wire mesh cages, provided with clean water and fed with pulverized Chikun feed® (finisher) *ad libitum* (during the acclimatization period). Rats in groups B-D were administered with the pulverized *D.guineense* pulp included in the basal diet (Chikun finisher) at varying inclusion rates of 12.5%, 6.25% and 3.125% respectively while rats in group A were given normal basal diet without incorporating *D. guineense* pulp. All treatments lasted for 21 days. The average daily feed consumptions were recorded while the weights of the rats were taken on weekly basis throughout the duration of the study.

Table 1. Description of treatment groups.

GROUPS	TREATMENT
GROUP A	Normal control
GROUP B	12.5% inclusion of pulverized *Dialum guineense* pulp
GROUP C	6.25% inclusion of pulverized *Dialum guineense* pulp
GROUP D	3.125% inclusion of pulverized *Dialum guineense* pulp

Preparation of plant extract

After removal of the coats of the fruits and the seeds, the pulp of *Dialum guineense* were sun dried, pulverized and kept in an air tight container till the point of use.

Data analysis

Data obtained from this study were analyzed using One-way Analysis of Variance (ANOVA). Duncans Multiple Range post hoc test were used to separate variant means. P (probability) values less than 0.05 were considered significant. The results were presented as Mean ± Standard Error of the Mean (SEM) in graphs.

RESULTS AND DISCUSSION

The results of weekly weight of rats sub-acutely fed with varying levels of *Dialum guineense* pulp powder incorporated in feed (Figure 1) indicate linear steady increases in weight from day zero to day 21 duration of the study. The rats in group C recorded marginal increase in their weight compared to the rats in other groups following 21 days duration of the study. Significant increase in the mean weight of the rats that received 6.25% inclusion of *D. guineense* pulp indicates optimal feed conversion at this rate. *D. guineense* contain substances such as Vitamin C, proteins and minerals (Arogba *et al*., 2006). Moreover, the ability of the pulp to cure some illnesses as submitted by earlier researchers (Bero *et al.,* 2009) justifies its ability to improve health and increase weight.Figure 2 shows the mean daily feed intake of rats fed with varying levels of *Dialum guineense* pulp powder incorporated in feed. The results showed that rats in group C consumed significantly higher quantity of feed following 21 days duration of the study. The mean daily feed intake was maximum in group C (6.25% inclusion). This only implies that the feed was most palatable at the inclusion rate. Animals tend to eat more when the feed is more palatable and the sweetness of the pulp had earlier been noted by some researchers (Besong *et al.,* 2016).

CONCLUSION

It was concluded that moderate inclusion of *Dialum guineense* pulp at 6.25% improved appetite and led to better feed utilization.

Figure 1

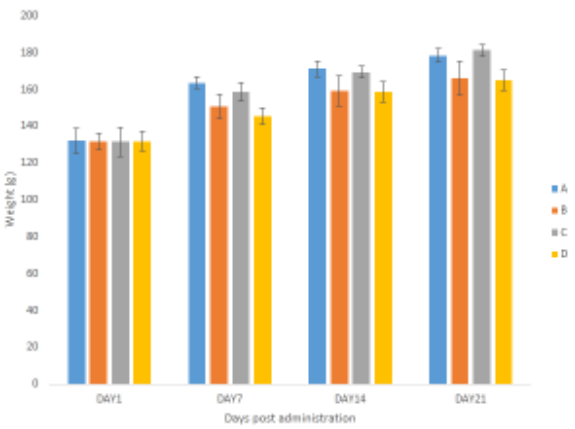

Figure 2

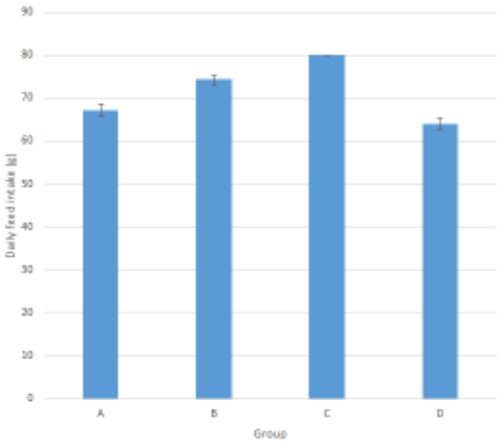

Figure 1: Weekly weight (g) of rats fed with *Dialum guineense* pulp **Figure 2:** Mean daily feed intake (g) of rats fed with *Dialum guineense* pulp

REFERENCES

AkinpeluAD,AwoterebоTO,AgunbiadeOM, AiyegoroAO,OkohIA (2011).Antivibrioand preliminaryphytochemicalcharacteristicsofcrude methanolicextractoftheleavesof*Dialiumguineense*(wild*)*. Journal ofMedicinalPlantResearch5(11):2398-2404.

ArbonnierM(2004).Trees,shrubsandlianasofwestAfrica dryzone.2nded.GMBH:Margarafpublishers

Arogba SS, Ajiboro A, Odukwe IJ (2006) A physiochemical study Nigerian Velvet tamarind. (Dialium guineense) fruit. Journal of Science Food Agriculture. 66: 533-534

Bero J, Ganfen H, Jonville MC, Frederich M, Gbaguidi F, De MP. *et al*. (2009) In-vitro antiplasmodial activity of plants used in traditional medicine to treat malaria. Journal of Ethnopharmacology. 122 (3): 439 - 444.

Besong EE, Balogun ME, Djobissie SFA, Obu DC, Obimma JN (2016) Medicinal and Economic Value of *Dialium guineense.* African Journal of Biomedical Resources. 19: 163- 170.

Devendra E.(1988). Forage supplement, nutritional significance and utilization for drought, meat and milk production in buffaloes. Proceeding of the second world buffalo congress. New Delhi. India: 409-423.

GideonIO,RaphaelA(2012)Phytochemical analysisandinvivoanti-diarrhealpotentialsof*Dialium guineense*(wild)stembarkextract.Journal ofintercultural Ethnopharmacology1(2):105-110.

Idu M., Umweni A.H, Odaro T, Ojelede L (2009). Ethnobotanical plants used for oral health care among the Esan tribe of Edo state, Nigeria. Ethnobotanical Leaf. 13:548-563

Maduaka AUC (1988*)* Determination of the ascorbic acid content of velvet tamarind. Proceedings of 13th annual conference of chemical society of Nigeria. Bauchi, Nigeria.

NicholasCA,Cheikh N,MadyC,MathewG,Mama S,ManuelD(2014)Nutrientcompositionandnutritional potentialofwildfruit*Dialiumguineense*.JournalofFood CompositionandAnalysis 34:186-191.

Nwosu, MO (2000). Plant resources used by traditional woman as herbal cosmetics in south west Nigeria. Arzte fur nature Fahr. 41:111.
Okegbile EO, Taiwo EA (1990) Nutritional potential of velvet tamarind (Dialium guineense wild). Niger, F.A.O. Journal. 8:115-121