PRELIMINARY INVESTIGATIONS OF *Parkia filicoidea* AND *Tephrosia bracteolata* LEAF MEALS IN THE DIET OF THE GOAT

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ABSTRACT

Eight female, non-pregnant, non-lactating West African dwarf goats were in digestion trials in a preliminary evaluation of 2 legume forages viz *Parkia filicoidea* and *Tephrosia bracteolata* provided as leaf meals. *Tephrosia sp.* was well accepted at 4.14% of body weght and satisfied the requirement for production, resulting in 50g/d gains in weght. *Parkia filicoidea* produced zero weight gain but its crude protein was 56.88% digested so also was ash (88.58%), even better ($P<0.05$) than *Tephrosia bracteolata.* The ash in *Tephrosia sp.* was 62.5% digested. Other nutrients were more than 70% digested. Nutrients were better ($P<0.05$) digested in Tephrosia sp. than *Parkia* sp. *Tephrosia bracteolata* leaf meal is thought good as sole feed for the goat. *Parkia filicoidea* would require some supplementation.

Keywords: Parkia, Tephrosia, Leafmeals, goats.

INTRODUCTION

The search for cheaper alternative feed sources for livestock, the ability of the ruminant species to digest forage, their efficacy to utilize non-protein nitrogen and the nitrogen fixing ability of the leguminous plants call for an assessment of the utilization of forage legumes in the diet of the ruminants. The leguminous plants *Leucaena* sp. and *Gliricidia* sp. have been extensively worked upon and utilized in ruminant diets. However, there exists a variety of the legumes about which very little is known with regard to their feeding potentials.

Parkia filicoidea and *Tephrosia bracteolata* are common leguminous trees in Nigeria. The trees are perennial and are particularly important as they bear green leaves all the year round. The leaves are relished by goats and when accessible on short stems, form part of the browse plants for goats especially in the dry season. Presented are preliminary investigations involving the compositions, intakes and digestibilities of *Parkia filicoidea* and *Tephrosia bracteolata* leaf meals by the goat. The study evaluates the potentials of the forage legumes as dry season feeds for the small ruminant species.

MATERIALS AND METHODS

Eight female non-pregnant, non-lactating West African dwarf goats weighing 6.5 to 8 kg were used. The animals were dewormed and treated against ectoparasites as a routine exercise. They were randomly assigned to 2 groups and alloted each to *Parkia* and *Tephrosia* leaf meals. The goats were group-fed in pens at 5 percent of the total body weights for 14 days. The daily feed allowance was offered in two separate portions on 8.00 hrs and 14. 00 hrs. On 15d, the goats were weighed, transfered to metabolism crates and allowed 7 days to adjust to confinement followed by a 7-day period of the collection of faeces. Faeces voided were weighed, bulked milled, and preserved in air-tight plastic bottles for chemical analyses. The goats were weighed at the end of the collection period.

Fresh leaves of the browse plants were harvested from the plants without regard to the age of the leaves but the leaves are borne by the plants. Leaves of each plant specie were tied in bunches and made to stand on the stubbles under the shade, thereby spreading the leaves for air-drying. The leaves were dried for 14 days after which they were packed in jute bags and gently beaten to detach the leaves from the fine stems.

Samples of the leaf meals and the faeces were analyzed for the chemical components by the AOAC (1975) methods. The dry matter (DM) feed intake values, percentage nutrient

digestibilities and the nutrient compositions were subjected to statistical analyses (Steel and Torrie, 1980) and the means tested (Duncan, 1955).

RESULT AND DISCUSSION

The chemical composition of the legume forages were as presented in Table 1. The legume forages were comparable ($P > 0.05$) in their contents of crude fibre, total ash and energy. Their capacities to retain water in normal dry condition were similar and comparable with a reported value (Onwuka and Akinsoyinu, 1989) on one other lignocellulosic material. *Tephrosia bracteolata* appeared richer ($P < 0.05$) than *Parkia filicoidea* in crude protein and nitrogen-free extracts, while *Parkia filicoidea* was richer in ether extract. However, these forage legumes are low in crude protein when compared with similar reports (Panesa, 1989) on *Leucaena* sp.

A summary of the intakes and digestibilities of the leaf meals are presented in Table 2. *Parkia filicoidea* effected no change in weight of the goat while goats on *Tephrosia bracteolata* obtained a weight of 50g/d, representing 90.3% of a reported value (Akinsoyinu and Adeloye, 1987) on conventional diet. The observation on weight gains with regard to the crude protein (CP) contents of the leaf meals is in line with the (11%CP) recommendations of NRC (1975), and Olubajo and Oyenuga (1974) for sheep and goat respectively, and 16%CP (NRC,1981) for maintenance and production in goat.

The dry matter intakes are indices of the acceptabilities of thes forages to the goat. The intake value of *Parkia filicoidea* was short of the recommended maintenance value (Akinsoyinu, 1974) but compared with the values of (Adegbola, 1988) for goats fed hay with concentrate supplement. *Tephrosia bracteolata* was well accepted (4.14% of body weight), therefore meeting the requirement for production (Olubajo and Oyenuga, 1974). The disparity in DM intakes of the two forages is probably due to the protein intake levels as McDonald *et al* (1982) have indicated the influence of rumen ammonia concentration on the growth of rumen microorganisms, the rate of breakdown of carbohydrate and therefore DM intake. However, sensory factors such as the smell and colour of the leaf meals could also influence DM intake.

The crude fibre in *Parkia filicoidea* was poorly digested (36.96%) while the dry matter (44.62%), ether extract (45.54%), nitrogen-free extract (42.1%) and energy (48.13%) were fairly digested. The ash was very well (88.58%) digested. *Tephrosia bracteolata* compared well ($P > 0.05$) with *Parkia filicoidea* in its fair digestibility of ether extract (47.62%), lower ($P > 0.05$) but well digested total ash (62.65%). *Tephrosia bracteolata* was however better ($P < 0.05$) in the digestibilities of all other nutrients which were very well above 70% digested.

A general observation would make *Tephrosia bracterolata* a better forage legume for the goat as sole feed. However, further investigation (Adeloye *et al*, 1993) tends to indicate that *Parkia filicoidea* in a 1:1 ration with dried cassava peels could produce the same growth rate as obtained with sole *Tephrosia bracteolata* in this study. As a result of this, leaf meals from these two leguminous plants could be useful as feeds for the goats in periods of forage scarcity especially in the dry season.

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Table 1: CHEMICAL COMPOSITION OF THE LEAF MEALS OF *Parkia filicoidea* AND *Tephrosia bracteolata* FED TO W.AFRICAN DWARF GOATS.

	Parkia filicoidea	%compositions	Tephrosia bracteolata
Dry mater (DM on DM basis)	85.64[a]		83.10a
Crude protein	10.94[a]		15.31b
Crude fibre	20.01[a]		18.75a
Ether extract	6.68[b]		1.51[a]
Nitrogen-free extract	58.76[a]		63.02b
Ash	3.61[a]		1.41a
Gross energy (kcal/g)	4.42[a]		4.09[a]

Table 2: SUMMARY OF THE WEIGHT CHANGES, INTAKES AND APPARENT DIGESTIBILITIES OF *Parkia filicoidea* AND *Tephrosia bracteolata*, LEAF MEALS BY THE W.AFRICAN DWARF GOAT.

Liveweight	Parkia filicoidea	Tephrosia bracteolata
Final	6.5±1.6	8.12±1.3
Initial	6.5±1.8	7.87±1.5
Mean	6.5±1.7	8.0±1.3
Gain (g/d)	0	50
Dry matter intake (g/d)	153.2[a]	331.14[b]
(% of body weight)	2.36[a]	4.14[b]
Apparent digestibility (%)		
Dry matter	44.62[a]±1.0	71.96[b]±1.3
Organic matter	32.24[a]±19.2	7.18[b]±12.0
Crude protein	56.88[a]±1.3	75.92[b]±1.0
Crude fibre	36.96[a]±1.3	77.31[b]±1.7
Ether extract	45.54[a]±2.7	47.62[a]±1.0
Nitrogen-free extracts	42.10[a]±4.9	78.10[b]±2.5
Ash	88.58[b]±12.5	62.65[a]±6.7
Energy	48.13[a]±2.93	72.22[b]±2.7