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Issues Associated With the Existence of *Ficus Microcarpa* in Compound Farms and Bushes at Nnobi, Southeastern Nigeria

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Abstract
Historically in southeastern Nigeria, smallholder farmers plant trees in compound farms for more than one purpose. *Ficus microcarpa*, a popular fodder plant was studied to elucidate the issues associated with its existence in compound farms at Nnobi in Anambra state, Southeastern Nigeria. Primary data generated from the survey of 45 small-ruminant farmers at the location were used to determine the origin, reasons for planting, agronomic characteristics, and the dynamics of its use as a fodder plant by the farmers. The proximate composition of its leaf meal was also determined. Majority of the trees (97.78%) were planted by either the grandparents (44.44%) or parents (28.89%) of the farmers, thus, 75.56% of the trees have existed for 31 – 51 years and above. The trees were planted exclusively for ruminant browsing (100.00%) and other purposes such as shed (64.44%) and medicine (24.44%) among others. The tree is propagated vegetatively (93.33%), and does not require much agronomic care. About 1 to 2 stands (68.89%) were found per household. They produced fodder mostly during the rainy season (86.66%), and were harvested as the occasion demanded. All the farmers fed the fodder to small ruminants, while 31.11% fed it to large ruminants. The fodder yielded mean crude protein content of 12.56±1.01%, ether extract (2.13±0.49%), crude fiber (26.30±3.19%) and total ash (13.85±0.98%) among other proximate contents. Further studies on the socioeconomic and phytochemical characteristics of *F. microcarpa* are needed in order to elucidate its other beneficial attributes that make it a browse plant of promise in Nigeria.

Keywords: Browse, Ficus microcarpa, ruminants, compound bushes, small-holder farmers

Introduction

In southeastern Nigeria, indigenous trees provide multiple benefits such as nutritious fodder, food, fiber, shade, soil improvement, timber, fuel wood and live fences across all agro-ecological zones of Africa (Okoli *et al*., 2014). Such fodder trees constitute abundant biomass in farmlands, bush fallows and forests in the humid tropical environment of southeastern Nigeria, where they are commonly utilized as browses in the wild by small-holder livestock farmers for feeding small ruminants (Okoli *et al*., 2002). Historically at Nnobi in Idemili South LGA of Anambra state in Southeastern part of Nigeria, small ruminant farmer's plant *Ficus microcarpa,* and other indigenous fodder trees in compound farms and family backyards (Okafor and Fernandez, 1987). There is however scanty published information on the values of *Ficus microcarpa* as an important economic tree in the study area.

The objective of this study is to determine the socio-cultural a *Ficus microcarpa*, a fodder plant found at Nnobi, Southeastern Nigeria was studied to determine the reasons for its existence in compound farms at the location.

Materials and Methods

The study was carried out at Nnobi community in Idemili South Local Government Area (LGA), in Anambra State, southeastern Nigeria during the early rainy season month months 2015. Anambra state is one of the south-eastern states situated between latitude 06°00'N and 06°05'N and longitude 06°57'E and 06°95'E; altitude of 213meters above sea level within the south-eastern agricultural zone of Nigeria. Nnobi community was purposively selected for the study because of the traditional practice of planting and feeding *Ficus microcarpa*to animals in the community and also due to the active participation of the indigenes in small ruminant rearing (Chah *et al*., 2013). Primary data generated with the aid of structured questionnaires distributed to 45 small-ruminant farmers across the three villages at the study location were used to determine the origin, reasons for planting, agronomic characteristics, and the dynamics of its use as a fodder plant by the farmers.Selection of farmers was based on the presence of small ruminants and *F. microcarpa* together in a household and willingness of the livestock keeper to participate in the study.

Fresh foliage from three stands of *Ficus microcarpa* at each study villages were obtained and air-dried by spreading them under shed every day for about 6 - 8 days, while retaining the greenish coloration.They were thereafter ground with hammer mill through a 1mm screen to produce their respective leaf meals.The proximate composition of its leaf meal was determined according to the methods of AOAC (2010).

Data generated from the study was subjected to descriptive statistics such a means, standard deviations and coefficient of variation.

Results and Discussions

Table 1 showed that majority of the trees (97.78%) were planted by either the grandparents (44.44%) or parents (28.89%) of the farmers, thus, 75.56% of the trees have existed for 31 – 51 years and above, indicating that the practice of planting this tree in the compounds and compound bushes is entrenched in the livestock farming culture of the people. These results point to a rare case of deliberate effort by man in southern Nigeria to plant a tree within compound bushes solely for the feeding of animals. *R. heudelotii* has also been identified as another plant that has been domesticated in the study area for this same purpose (Okoli *et al*., 2001 and 2014b). However, the actual origin of the plant could not be ascertainedsince the farmers could not specify whether it is an exotic plant or indigenous to the study area.

Table 1: Factors associated with the existence of *Ficus microcarpa*trees at Nnobi

Parameters	Awuda (n=15) Frequency (%)	Ebenesi (n=15) Frequency (%)	Ngo (n=15) Frequency (%)	Overall (n=45) Mean Frequency (%)
(a) Origin of tree				
Planted by man	14 (93.33)	15 (100.00)	15 (100.00)	44 (97.78)
Grew by itself	1 (6.67)	0 (0.00)	0 (0.00)	1 (2.22)
(b) The planter of the tree				
Farmer/grazier	5 (33.33)	4 (26.67)	3 (20.00)	12 (26.67)
His parents	5 (33.33)	3 (20.00)	5 (33.33)	13 (28.89)
His grandparents	5 (33.33)	8 (53.33)	7 (46.67)	20 (44.44)
(c) Estimated age of the plant				
10-20yrs	2 (13.33)	2 (13.33)	3 (20.00)	7 (15.55)
21-30yrs	1 (6.67)	1(6.67)	2 (13.33)	4 (8.89)
31-40yrs	3 (20.00)	2 (13.33)	4 (26.67)	9 (20.00)
41-50yrs	6 (40.00)	6 (40.00)	4 (26.67)	16 (35.56)
51yrs-above	3 (20.00)	4 (26.67)	2 (13.33)	9 (20.00)
(d) Reasons for planting/uses				
Browse	15 (100.00)	15 (100.00)	15 (100.00)	45 (100.00)
Shed	11 (73.33)	8 (53.33)	10 (66.67)	29 (64.44)
Medicinal purpose	5 (33.33)	3 (20.00)	3 (20.00)	11 (24.44)
Others	2 (13.33)	4 (26.67)	3 (20.00)	9 (20.00)

The trees were planted exclusively for ruminant browsing (100.00%) and other purposes such as shed (64.44%) and medicine (24.44%) among others, in support of the report of Le Houerou (1980b) that indigenous trees provide multiple benefits such as nutritious fodder, food, fibre, shed, soil improvement, timber, fuel wood and live fences across all agro-ecological zones of Africa.

Table 2 showed that the tree is propagated vegetatively (93.33%), and does not require much agronomic carethus highlighting the amenability of the plant to plantation application since much lesser labour will be needed to care for it at any given time of the year.

Table 2: Agronomic characteristics of *Ficus microcarpa*atNnobi

Parameters	Awuda (n=15) Frequency (%)	Ebenesi (n=15) Frequency (%)	Ngo (n=15) Frequency (%)	Overall (n=45) Mean Frequency (%)
(a) Agronomic care requirements				
Yes	0 (0.00)	1 (6.67)	0 (0.00)	1 (2.22)
No	15 (100.00)	14 (93.33)	15 (100.00)	44 (97.78)
(b) Method of propagation				
Vegetative	13 (86.67)	14 (93.33)	15 (100.00)	42 (93.33)
Seed	2 (13.33)	1 (6.67)	0 (0.00)	3 (6.67)
(c) No. of stands per household				
1-2	11 (73.33)	10 (66.67)	10 (66.67)	31 (68.89)
3-4	3 (20.00)	5 (33.33)	4 (26.67)	12 (26.67)
5-Above	1 (6.67)	0 (0.00)	1 (6.67)	2 (4.44)
(d) Season of high productivity				

Dry Season	2 (13.33)	1 (6.67)	0 (0.00)	3 (6.67)
Rainy Season	12 (80.00)	13 (86.67)	14 (93.33)	39 (86.66)
All year round	1 (6.67)	1 (6.67)	1 (6.67)	3 (6.67)

About 1 to 2 stands (68.89%) were found per household, where they produced fodder mostly during the rainy season (86.66%), and were harvested as the occasion demanded. However the respondents hinted that in recent times, some of the trees have been cut down to make way for infrastructural developments. This particular development is important since it points to the fact that this important tree may be at risk at the study location. All the farmers fed the fodder to small ruminants, while 31.11% fed it to large ruminants. However, there is currently no reported study on the appropriate harvesting frequency for the plant or the effects of different frequencies of harvesting on the nutrient value of the plant leaves fed to livestock.

Table 3 showed that the leaf meals from the tree yielded mean crude protein content of 12.56±1.01%, ether extract (2.13±0.49%), crude fiber (26.30±3.19%) and total ash (13.85±0.98%) among other proximate contents. Ahamefule *et al*. (2006a) specifically reported a higher CP content of heavily browsed species plants of Southeastern Nigeria used in ruminant feeding (14.70 - 20.65% with a mean value of 17.92±2.46), moderately browsed plants (13.66 - 24.85% with a mean value of 18.35±4.04) and occasionally browsed plants (13.65 - 25.55% witha mean value of 18.62±4.34), indicating higher values than the result of the present study. Okoli *et al*. (2014b) also suggested that candidates browse plants for domestication in the study area should have endogenous use ranking of 2 - 5 uses and leaf CP of 14.88 - 32.27% for them to be adopted by farmers.

The NFE recorded in the leaf meal is similar to the 30.82% reported by Okoli *et al*. (2001) for *Ficus spp.* of Southeastern Nigeria but lower even at its upper range than the 46.27% reported for *R. heudelotii* in the same study area by Okoli *et al*. (2003b). Again, the mean ME value of the study plant at 2238.41±288.51 was quite high for a leaf meal and compares favourably with the value obtained for grains by-products (Uchegbu *et al*., 2011).

Table 3: Proximate and Metabolizable Energy Compositions of *Ficus microcarpa* from different locations at Nnobi, Idemili South L.G.A, Anambra State

Parameters	Sample A	Sample E	Sample N	Mean±SD	SEM	CV
Dry Matter (DM) (%)	92.60 ^{ab}	94.60 ^{a}	89.10 ^{b}	92.10±2.78	1.61	0.03
Moisture Content (MC) (%)	7.40 ^{ab}	5.40 ^{b}	10.90 ^{a}	7.90±2.78	1.61	0.35
Crude Protein (CP) (%)	11.58 ^{b}	13.59 ^{a}	12.50 ^{ab}	12.56±1.01	0.58	0.80
Ether Extract (EE) (%)	2.30 ^{ab}	2.52 ^{a}	1.58 ^{b}	2.13±0.49	0.28	0.23
Crude Fibre (CF) (%)	24.42 ^{b}	24.49 ^{ab}	29.98 ^{a}	26.30±3.19	1.84	0.12
Total Ash (TA) (%)	14.12 ^{ab}	12.75 ^{b}	14.67 ^{a}	13.85±0.98	0.57	0.07
Nitrogen free extract (NFE) (%)	40.18 ^{ab}	41.25 ^{a}	30.37 ^{b}	37.27±6.00	3.46	0.16
Metabolizable Energy (ME) (Kcal/Kg)	2333.16 ^{ab}	2467.63 ^{a}	1914.44 ^{b}	2238.41±288.51	166.57	0.13

^{ab} within the same rows show that means are significantly different (P<0.05). Sample A=Awuda; Sample E=Ebenesi; Sample N=Ngo; SD=Standard deviation; SEM=Standard error of mean; CV=Coefficient of variation

Conclusion

It was therefore concluded that *Ficus microcarpa* is an enduring economic tree in the compound bushes of Nnobi, used chiefly for feeding small ruminants, while other minor uses were provision of sheds and use in animal healthcare. Leaf meals from the plant were relatively rich in crude protein, nitrogen free extract, metabolizable energy and digestible fibres. Further studies are however needed onits socioeconomic and phytochemical characteristics in order to elucidate its other beneficial attributes that make it a browse plant of promise in Nigeria.

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