IDENTIFICATION OF UNCULTIVATED PASTURE SPECIES AND ITS AVAILABILITY IN THE SEMI-ARID ZONE OF ALIERO LOCAL GOVERNMENT AREA OF KEBBI STATE, NIGERIA

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ABSTRACT

A total of nine (9) visits on weekly basis were done during the rainy season to investigate the abundance of uncultivated pasture species in the semi-arid zone of Aliero LGA of Kebbi State. Every week, pasture samples contained in about 3 to 5 sacks of various sizes were purchased from three hawkers at different locations within the town. Personal interview with the hawkers revealed that the pasture species encountered were collected at both cultivated and fallow areas. The encountered pasture species from each sack were sorted into various individual species on weekly basis to determine the frequency of each species. The encountered pasture species comprises of; *Digiteria alata*, *Andropogon gayanus*, *Commelina banghalensis*, *Bororia radiate*, *Cenchrus biflorus*, *Pennisetum pedicellatum*, *Setaria sphacellata* and *Indigofora hirsute*. The pasture species varies in their frequencies with the highest dominant species from *Digiteria alata* and *Bororia radiate* having 21.43% each while the least frequent species are *Setaria sphacellata* and *Cenchrus biflorus* having 2.38% each. These pasture species are the dominant in the study area during the rainy season. The study area constitutes grasses, legumes and forbs species which are of good pasture materials that could support ruminant production. Also the area comprises of decreaser and increaser pasture species which serves as feed to the animals and support the hawkers for their livelihood during the rainy season.

Key words: pasture, dominant, rainy season, semi-arid

INTRODUCTION

Areas dominated by grasses, forbs and herbaceous plants are known as grassland. They are very special plants that sustain their growth regardless of weather condition and animal pressure. Grassland can therefore support a high population of grazing animal. Grasslands constitute about 26% of total land area and 80%of agriculturally productive land globally (Akinwumi, 2017).

Most of the grasslands are located in tropical developing countries where they are particularly important to the livelihoods of hundred millions of rural dwellers (Akinwumi, 2017). In addition, grasslands provide valuable roles including rain water catchment, biodiversity conservations, cultural and recreational needs and potentially a carbon sink to alleviate greenhouse gas emission (Akinola, 1981).

Presently, the most frequently cultivated forage grass species in Nigeria are *Andropogon gayanus* (Northern Gamba), *Digitaria smutsii* (Wooly finger grass), *Sorghum almum*, (Columbus grass) *Penisettum pedicelatum* (Kyasuwa), *Setaria anceps* (Sataria) etc. However, the use of highly productive improved pasture species has increased the productivity of livestock in Nigeria (Agishi, 1971; de Leeuw, 1978; Agishi, 1983). Research into both indigenous and exotic forage species has been going on in Nigeria, particularly in the savanna zones since 1950s. The criteria used for the evaluation of pasture species were based on ease of establishment, high dry matter yield, nutritive value, persistence, good seeds yield and their suitability for conservation as hay or silage (Foster and Mundy, 1961; Haggar *et al*., 1977; de leeuw, 1974; Muhammad and Abubakar, 2004).

Pasture species collection and hawking has become a means of livelihood among the youth for decades in the study area as it serves as a means of income from the sales of collected forages to interested individual during the rainy season (May-October) of every year when there is high abundant production of these uncultivated forages. The facts that information on the abundant of

uncultivated herbaceous pasture species for sale in Aliero local Government Area during the rainy season is missing, it is therefore necessary to investigate the frequency and distribution of grasses, legumes and forbs species collected by the hawkers in order to have documentation of the common species in the study area.

MATERIALS AND METHOD

Study Area

The research was conducted during 2018 rainy season at Aliero LGA between the months of June to August. Aliero is a town located in the southeast of Kebbi State, the north-western part of Nigeria. The town lies between the latitude $12^0$19"06"N and longitude 4^0 3^0 10"5. It has a short wet season lasting from May to October. The people of the town embark mostly on onion and pepper production, although mixed farming is also common among the farmers along with cattle, sheep and goats reared, they also produce other crops like maize, groundnut, millet and tree crop like mango, cashew (KARDA,2012).

Samples Collection, Sorting and Weighing

A total of nine (9) visits on weekly basis were done for the purchase of the pasture samples contained in about 3 to 5 sacks of various sizes from three hawkers at different locations within the town. Personal interview with the hawkers revealed that the pasture species encountered were collected at both cultivated and fallow areas. On weekly basis, the pasture purchased from each sacks was sorted and frequency of each specie was determined. Each of the pasture specie encountered were identified by their local names with the aid of local farmers in the study area and their scientific names were identified from Roger and Mallam (2007)

Data Analysis

Data generated from the species frequencies were analyzed using descriptive statistics of percentages and frequencies.

RESULTS AND DISCUSSION

Table 1 presents the various species encountered at different locations in the study area. A total of eight (8) pasture species were encountered comprising of six (6) grass species namely; *Pennisetum pedicellatum, Cenchrus biflorus, Digiteria alata, Andropogon gayanus, Setaria sphacellata* and *Bororia radiate*; one forbs and leguminous species namely; *Commelina banghalensis* and *Indigofora hirsute* respectively. These species were perennial type as most author (de Ridder and Breman, 1993) reported that in the Sudan and Sahel rangelands, the vegetation consist mainly the annual plants. Presently, the most frequently cultivated forage grass species in Nigeria are northern gamba (*Andropogon gayanus*), wooly finger grass (*Digiteria smutssi*), Sorghum almum (*Columbus grass*), kyasuwa (*Pennicetum pedicellatum*), setaria (*Setaria anceps*) (Agishi, 1971; de Leeuw and Agishi, 1978; Agishi, 1983). However the encountered species in the study area were uncultivated types.

Table 1: Common Pasture Species found in Aleiro Local Government Area during 2018 Rainy Season

Botanical names	Family names	Common names	Local names (Hausa)
Pennisetum pedicellatum	Poacea	Hairy fountain grass	*Kyasuwa*
Andropogon gayanus	Poacea	Gamba grass	*Gamba*
Digitaria alata	Poacea	Crab grass	*Harkiya*
Cenchrus biflorus	Poacea	Bursal grass	*Karangiwa*
Commelina banghalensis	Commelinisea	Banghal day flower	*Bulasa*
Indigofora hirsute	Legumenisea	Hairy indigo	*Gadagi*
Bororia radiate	Poacea	Ant wheat	*Alkamar turuwa*
Setaria sphacellata	Poacea	Blue stem grass	*Tubin jaki*

Source: Field survey, 2018

Percentages and frequencies of pasture species encountered in the study area during the nine (9) weeks of collection in the rainy season were presented in Table 2. The highest occurred species are *Digiteria alata* and *Bororia radiate* with 21.43% each. The species; *Commelina banghalensis* has

19.05%, *Pennisetum pedicellatum* and *Andropogon gayanus* were having 14.29% each, while *Indigofora hirsute* has 4.76% and the least occurred species are *Cenchrus biflorus* and *Setaria sphacellata* having 2.38% each. These species were annual type as most authors (de Ridder and Breman, 1993) reported that in the Sudan and Sahel rangelands, the vegetation consisted mainly of annual plants. The increaser species such as *P. pedicellatum*m, *C. banghalensis* and *B. radiate* dominate the study area. This is in agreement with the findings of Allan and Maclood (1991) who reported that the frequency of defoliation due to overgrazing results in compositional changes of plant species. These increaser species were reported to be rejected by livestock during the rainy season grazing (Malami *et al*., 1998), however consumed by livestock when they are dried during the dry season (Buxton, 1996) in the absence of any other feeds (Kriemer and Steinbaca 1998), among the decreasers herbage species *I. hirsute* and *S.sphacellata* had lower frequencies and percentages in the study area.

Table 2: Percentages and Frequencies of Pasture Species in Aliero Local Government Area during 2018 Rainy Season

	Pasture species								
	P.p	C.b	C.b*	A.g	I.h	D.a	B.r	S.s	
Weeks									Total
1	1	1	1	1	1	1	1	1	8
2	1	0	1	1	0	1	1	0	5
3	0	0	1	0	1	1	1	0	4
4	1	0	1	1	0	1	1	0	5
5	0	0	1	0	0	1	1	0	3
6	0	0	1	1	0	1	1	0	4
7	1	0	1	1	0	1	1	0	5
8	1	0	1	1	0	1	1	0	5
9	1	0	0	0	0	1	1	0	3
Total	6	1	8	6	2	9	9	1	42
(%)	14.29	2.38	19.05	14.29	4.76	21.43	21.43	2.38	Total

Source field survey, 2018

Keys:P.p=*Pennisetum pedicillatum*; C.b=*Cenchrus biflorus*; C.b*=*Commelina banghalensis*; A.g=*Andropogon gayanus;* I.h=*Indigofora hirsute;* D.a=*Digiteria alata;* B.r= *Bororia radiate*; S.s=*setaria sphacellata*

CONCLUSION

The study area constitutes grasses, legumes and forbs specie which are of good pasture materials that could support ruminant production. The encountered pasture species varies in their frequencies which comprises of; *Digiteria alata*, *Andropogon gayanus*, *Commelina banghalensis*, *Bororia radiate*, *Cenchrus biflorus*, *Pennisetum pedicellatum*, *Setaria sphacellata* and *Indigofora hirsute*. These pasture species are the dominant in the study area during the rainy season. Also the area comprises of decreaser and increaser pasture species which serves as feed to the animals and support the hawkers for their livelihood during the rainy season. Management such as fertilization, irrigation, conservation practices and proper storage are necessary to sustain the all year round production of these pasture species.

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