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The Dominant Pasture Species Utilized by Tiang (*Damliascus korrigum)* in Sudd area (South Sudan)

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Abstract

The study was undertaken during dry season, (January- April) and wet season, (May – Sept.) 2009, at the Sudd regions Mobior Gol in Jonglei South Sudan in three Locations (Mara, Duk Padiet and Jeli). The Study was conducted to determine the feeding habits of tiang *(Damaliscus korrigum*) from the plant material in its habitats, and to investigate the feeding by examination of faecal pellets. Thirty one plant species were collected and identified; there was strong correlation between Iocations and seasons regarding the frequency of categories. The Iocaion Mara showed the highest frequency 30 out of 77 followed by Duk Padiet 26, and Jeli 21, respectively. With percentage of 39% in Mara, 33.8% in Duk Padiet, and 27,3% in Jeli. Sixty slides of plant fragment of dry season was prepared then examined. The result identified epidermis characteristics of plant fragment clearly and gave excellent view of epidermis cell pattern, Forty slides of plant fragment of wet season were preserved and examined, the result identified unclear views of epidermis characteristics because of high constituents of herbs, mean difference of forbs in wet season were as 48.50 #9.56. Mean difference for forbs in dry season were as 33.45 ±7.92, as well mean difference for grass in wet season were as 8.73 ± 7.7 1,mean difference of grass in dry season were as 11.77 ± 5.43.

Key words: Faecal Pellets, forbs, herbs, Grasse.

Introduction

Sudan has a rich biodiversity, and this is reflected in the number of mammalian orders out of 13 mammalian orders in Africa. 12 occur in Sudan (northern and southern) U.N.E.P, (2007). Southern Sudan contains a range of ecological zones providing habitat for the country globally total important biodiversity (Itto, 2000). The sudd wetland is one of biggest swamps in Africa, neighboring the smaller wet – land of the Bahr –el Ghazal and marches, the sudd was declared a ramsar site, the designation for wetlands of global significance the dominant vegetation that covers about three quarters of the swamp (Sutcliffe, 2005). The word sudd is derived from an Arabic word meaning a blockage of river channel which obstructs navigation. Ecologically the sudd wet land is composed of various ecosystems grading from open water and submerged vegetation seasonally inundated woodland – rain fed and river fed grassland and finally flood plain scrub land. Pastoralists use the sudd and the surrounding

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areas extensively , live stock and rain fed agriculture are the dominant means of support for the largely rural population , for which the seasonal flooded grassland along the sudd provide valuable grazing lands (Baecher, 2000) The Tiang Damaliscus korrigrum is one of four species included into the genus Damaliscus (Kingdon, 1997) its habitat extends from Senegal in the west of Africa , east ward to Sudan and Ethiopia. (Audubon Society field guard to Africa Wildlife 1995) The Sudd area in Sudan is a migratory route and breeding site for the tiang during the dry season (Sutcliffe, 2005). Pastoralists use the sudd and the surrounding area extensively. Life stock and rain fed agriculture are the dominant means of support for the largely rural population for which the seasonal flooded grasslands along the sudd provide valuable grazing lands (Baecher. 2000). The tiang varies in weight from 91 to 136kg and height at shoulder 1-3m. Female are similar to male but with shorter and less rigged horns, they live in open habitats and open savannah woodland and short grass on floodplains (child, 1972), they are highly gregarious and live in herd of 15-30 herd (Hashim and Nimir, 1977). Vegetation cover of the area can be generally classified into five categories which occur depending on the elevation of the area above river level, Swamp River, Flooded grassland Toich. Rain flooded grassland woodlands Grassland woodland – cultivated area. The density of the grassland here is changing depending on the dry season, being tall grass in the rainy season and short and dry in the dry season (Sutcliffe 1974). The objective of the study was to determine feeding habits of tiang, to investigate into feeding habits by examined to faecal pellet analysis.

Materials and Methods

The study was undertaken at sudd region in locality Mobior Gol which is the migratory route and breeding site for tiang in dry season, the area begins from Kon marak payam, Jeli payam, and Mara payam then ending with Jongeli canal north word of the area. The Sudd marshes are vast seasonally flooded wetlands along the White Nile, the area has a mean precipitation of 800 to 900mm per year falling mainly in a pronounced rainy season between May to October. The precipitation is relatively uniform over the area, declining slightly from south to north, But varying greatly between different years (Mefit – babtie 1983), the area geology in general is characterized by an eight to ten meter thick highly impervious clay layer. The thickness and imperviousness of the clay ground water interaction can be legible. Samples of natural forage and faecal material were collected. Asquare quadrate (50cm ×50cm) and a tape (100m) were used for frequency measurements randomly in selected sites in wet and dry seasons 2009. The measurements were taken according to Abdel Hamid (1983), samples of faecal material were labled according to location and season, faecal analysis by micro histological technique was conducted according to Sparks and Malechek, (1968). The data was analyzed using T- test for seasons and correlation for the plant species (Gomez and Gomez, 1984).

Results

Dominant plants of sudd region which were collected during the dry and wet seasons appeared in Tables (1-6), thirty one plant species were recorded, frequency of plant were 12 sp. in Mara Payam, 10 sp, in Dukpadiet Payam and, 8 sp in Jeli Payam. Total plant species were 77. With a mean percentage of 39, 0%in Mara, 33, 8% in Duk padiet, and 27, 3% in Jeli, The T- test revealed significant differences between plants in different locations for the two seasons ($P\leq 0, 05$) with mean difference of 2.06494. The mean difference for the three plant types in the two seasons was 1.48649 which is significant ($p\leq 0.05$) the most frequency plant sp was with mean difference

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of 6.53425 which is highly significant (p≤0,050). Correlation revealed significant differences between plant types in seasons and location (p≤ 0.05) compared to sedge, and grass. As well correlation of sedge in season and location were highly significance (p≤0.05) compared to herbs and grass, correlation of grass in season & location were highly significance (p≤0.05) compared to herbs which were and sedge. Sixty slides of plant fragment of dry season were preserved then examined by phase contrast microscope for histological analysis to identify plant fragment in the diet of tiang , as well forty slides of faecal pellet of wet season were preserved, then examined by phase contrast microscope, the determination of the faecal species by histomicroscopical analysis of the faecal material revealed significant differences between season , mean difference (T- test) 1.40000 which is highly significant (p≤0.05) .According to different species it was shown by faecal analysis there is highly significant difference The phase contrast microscopy, showed the fibers, grasses and herbs it was evident that there were no representation of the sedges in micro histological analysis.

Table 1a: Palatable grasses species documented in three locations in sudd Area During (dry and wet) season

Location 1 Jeli pay am	*Location 2 Mara pay am*	*Location 3 Duk, Padiet pa yam*
Setaria verticllata	*Setaria verticllata*	*Setaria verticllata*
Setaria sluice	*Setaria sluice*	*Setaria sphcalate*
Setaria Sphcalate	*Setaria sphcalate*	*Setaria sphcalate*
Rottboellia exaltata	*Rottboellia exaltata*	*Rottboellia exaltata*
Agrostics stolonifaria	*Oryzal long staminate*	*Oryzal long staminate*
Typha latifolia	*Agrostics stolonifaria*	*Typha latifolia*
Pennicetum zizaniodes	*Typha latifolia*	*Agrostics stolonifaria*
Oryza longistamiata	*pennicetum clandestinum*	

Table 1b: Palatable forbs species documented in three locations in sudd Area During (dry and wet) season

Location 1 Jeli pay am	*Location 2 Mara pay am*	*Location 3 Duk, Padiet pa yam*
Ipomoea hepatica	*Ipomoea*	*Ipomoea hepatica*
Ipomoea carica	*Ipomoea carica*	*Ipomoea carica*
Ipomoea cardiosepala	*Ipomoea cardiosepala*	*Ipomoea*
Callitriche truncate	*Playgoum salicifolium*	*Hydro Sp*
Playgoum salicifolium	*Hydro Sp*	*Vossia cuspidate*
Hydro cotyle SP	*Vossia cuspidate*	*Tagetes minutia*
Epilobium hirsutum	*Veronica Sp*	*Veronica Sp*
Bracharia stigmaticsata	*Conyza sp*	*Crotalaria barkae*
Tagetes minutia	*Bracharia stigmaticsata*	*Callitriche truncate*
Vossia cuspidate	*Callitriche truncate*	*Rhynchosia hirta*
Crotalaria barkae	*Commel Benghazi*	*Ludwig stolonifaria*
Veronica Sp	*Rhynchosia hirta*	
Commabenghazi		
Conyza sp		
Ludwig stolonifaria		

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Table 2: Palatable Sedge species documented in three locations in sudd Area during (dry and wet) season

Location 1 Jeli pay am	*Location 2 Mara pay am*	*Location 3 Duk, Padiet pa yam*
Cyperus flavescens	*Cyperus flavescens*	*Cyperus dives*
Eichornia crassipes	*Eichornia crassipes*	*C. Rigidoffolius*
Salvinina molesta	*Salvinina molesta*	*C. papyrus*
C. papyrus	*C. marginatus*	*Eichornia crassipes*
C. marginatus	*C. Rigidoffolius*	*Salvinina molesta*
C. rigidoffolius	*C. Papyrus*	
Cyperus dives		

Table 3: Palatable grass species documented in three locations in sudd Area during (dry and wet) season

Location 1 Jeli pay am	*Location 2 Mara pay am*	*Location 3 Duk, Padiet pa yam*
Setaria verticllata	*Setaria verticllata*	*- Setaria verticllata*
Setaria gluace	*Setaria sluic*	*- Setaria sphcalate*
Setaria Sphcalate	*Setaria sphcalate*	*- Rottboellia exaltata*
Rottboellia exaltata		*- Agrostics stolonifaria*
Agrostics stolonifaria		

Table 4: Palatable forbs species documented in three locations in sudd Area during (dry and wet) season

Location 1 Jeli pay am	*Location 2 Mara pay am*	*Location 3 Duk, Padiet pa yam*
Playgum salici folium	*Ipomoea carica*	*Playgum salici folium1*
Hydro Sp	*Crotalaria barkae*	*Tagetes minutia*
Epilobium hirsutum	*Epilobium hirsutum*	*Crotalaria barkae*
Bracharia stigmaticsata	*Bracharia stigmaticsata*	*Commabenghazi*
Crotalaria barkae	*Commabenghazi*	*Bracharia stigmaticsata*
Rhynchosia hirta	*Veronica Sp*	*Rhynchosia hirta*
Epilobium hirsutum	*Conyza sp*	*Hydrocotyle SP*
Commabenghazi	*Ludwig stolonifaria*	*Ipomoea hepatica*
Ipomoea carica		

Table 5: Palatable sedge species documented in three locations in sudd Area during (dry and wet) season

Location 1 Jeli pay am	*Location 2 Mara pay am*	*Location 3 Duk, Padiet pa yam*
Cyperus flavescens	*C. rigidoffolius1*	*Cyperus dives1*
Salvinina molesta	*C. marginatus*	*C. marginatus*
C. rigidoffolius	*C. papyrus*	*C. rigidoffolius*
Cyperus dives	*Cyperus flavescens*	*Cyperus flavescens*
C. papyrus	*C. marginatus*	
	Eichornia crassipes	
	Salvinina molesta	

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Discussion

The scientific study of wildlife feed and feeding habits is of comparatively recent origin. Field observation of what animal feeds upon, where and when, have been recorded and reported through the centuries and evolved into our present – day Knowledge of feed habits, with its associated a specific field and laboratory methods. The results showed that herbs were the most abundant plant species in tiang faecal material. This denotes herbs are the most abundant plant types especially in the dry season, or that herbs are the most favored feed item for tiang, Herbs belong to perennial vegetation which should be more palatable to the tiang compared to the grasses as they are more nutricious and succulent. Grasses are annuals that become dry in the dry season, and shed their seeds. Also it might be said that herbs are more abundant in the study area, sedge on other side, did not appear in tiang faecal material and they should be excluded as feed item for the tiang. It might draw our attention that tiang is selective grazer. The result agreed with the studies done by (Howell et al 1988) who said *Cyperus papyrus* is dominant at riverine fringe and in the wettest swamps and covers about 3.900km2 within the sudd. Cyperus papyrus forms a fringe along the Baher el Jabal that is up to 30km broad in the south declining to 50 m in the north and disappearing completely in the east. Associated species are few but those that are climber and tend to be most common at channel margins where there is lighter. *Oryza longistaminata* is perennial and provides high quality grazing for much of the year , although in dry years the re- growth after burning is sparse . *Echinochloa pyramidal is* on the other hand produces some re – growth in the dry season and thus provide important years pastures. The percentage of locations which was occupied by plants was as 39.0% Mara, 33.8% in Duk padiet, and 27.3% in Jeli. Also it might be said that forbs are more abundant in the study area. Mean difference of forbs were higher 6.5342 compared to grasses which were 4.3478 and sedges were 3..wet season slides which were prepared identified unclear view of epidermal cell patterns this was because of high constituence of forbs content . Mean difference of forbs in wet season was 48.50±9.56 and 33.45±7.92 in dry season forbs were highly significant compared to grasses. Mean difference of grass in wet season were 8.73±71and 11.77±5.43 in dry season. The result of epidermis characteristics of dry season identified that plant fragments in faecal material gave clear views of epidermal cell patterns, this result agreed with (Todd and Hansen 1973) who said that the relative number of plant fragment remains the same even passed through the digestive tract of an animal.

Conclusion

The dominant pasture species utilized by tiang in sudd area was forbs. Tiang is a selective grazer animal found in sud area. Grazer's animals share the wildlife in the range. Laboratory works of investigation into feed and feeding habits of tiang identified that samples of dry season gave a clear view of epidermis cell patterns compared to wet season sample.

Recommendations

The sudd is an important wet land for wildlife and livestock that may need sustainable management to the resources in the Area.

Vegetation cover of the area should be identified and classified to enable researchers conduct research proposals in the future.

Conservation to the habitats of antelope and large mammals during dry and wet seasons in the feeding sites should be organized by wildlife administration in the region.

Evaluation and monitoring of plant species in the area should be organized seasonally then compared with other plants species in

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different locations. Seasonally perennial plant species and annual species should be identified in the area. Feeding habits of wild ungulates must be studied, to identify various species of plant utilized in the area.

Laboratory works of investigation into food and feeding habits, need great support by providing modern equipment and developed techniques to enable researchers carry out relevant studies

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نباتات المرعى المستخدمة بواسطة التيتل في منطقة السدود بجنوب السودان

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المستخلص:

أجريت الدراسة في موسمي الجفاف (يناير – ابريل) ، والخريف (مايو– سبتمبر 2009م) في منطقة السدود (مبيورقول) بولاية جونقلى بجنوب السودان وذلك في ثلاث مواقع مختلفة : مارا ، دوك فاديت وجالى . الغرض من الدراسة هو التعرف على العادات الغذائية لظبى التيتل فى المواد النباتية الموجودة فى بيئته والتعرف على أنواع النباتات التى يتغذى عليها وذلك بتحليل روث التيتل ثم جمع 31 نوعاً من النباتات ومن ثم التعرف عليها . كان تردد مجموعات النبات فى المواقع الثلاث كالآتي : 12 ، 10 ، 9 في مارا دوك فاديت وجالى على التوالي ، بأعلى نسبة مئوية فى مارا(39%) ، تبعتها دوك فاديت (33.8%) ثم جالى (27.3%) . وثم فحص 60شريحة لنباتات فصل الجفاف بواسطة مجهر phase – contrast للتعرف على الالياف . أظهرت النتائج خصائص الالياف النباتية بوضوح . وتم حفظ أربعين عينة من نباتات فصل الامطار ثم تم فحصها بنفس طريقة نباتات فصل الجفاف . أعطت النتائج صور غير واضحة لخصائص الالياف وذلك لاحتوائها على نسبة عالية من الاعشاب. متوسط التباين للاعشاب فى موسم الامطار كان 48.50 ±9.56 وكان متوسط التباين للاعشاب فى موسم الجفاف 33.45 ±7.93 . بينما كان متوسط التباين للحشائش فى موسم الامطار 8.73 ±0.77 وكان متوسط التباين فى موسم الجفاف للحشائش 11.77 ±5.43

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