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Nutritional Variation among Irrigated Species of Camel Browse Vegetations

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Abstract

Study was carried out at the department of Animal Nutrition, Sindh Agriculture University, Tandoiam during the year 2018. Investigation was themed to monitor and assess major nutrients in different camel browse vegetations at Tando Allahyar. Results indicated *Haloxylon salicornicum* significantly rich and Prosopis cineraria comparatively poor in moisture content however dry matter appeared vice versa. Total organic and inorganic matter in *Acacia nilotica*, *Ziziphus nummularia*, *Acacia jacquemontii*, *Prosopis juliflora*, *Prosopis cineraria*, *Alhagi maurorum*, *Capparis deciduas*, and Zea mays found significantly different (p<0.05) from *Trifolium alexandrinum*, *Salvadora oleiodes*, *Suaeda fruticosa*, *Haloxylon salicornicum* and *Tamarix passerinoides*. *Suaeda fruticosa* had significantly maximum crude protein concentration. Zea mays had significantly high, *Suaeda fruticosa* comparatively low extract level. Nitrogen free extract among *Acacia nilotica*, *Prosopis juliflora* and *Prosopis cineraria* existed considerably high. Crude fiber was found significantly higher in Zea mays. *Prosopis juliflora* and *Acacia nilotica* acquired prominent concentration of total carbohydrate. Inorganic matter in *Haloxylon salicornicum*, *Tamarix passerinoides*, *Salvadora oleiodes*, *Suaeda fruticosa* and *Trifolium alexandrinum* didn't significantly vary compared to each other, while with other vegetations it significantly varied. Zea mays, *Acacia nilotica*, *Capparis deciduas*, *Ziziphus nummularia, Prosopis cineraria, Alhagi maurorum, Acacia jacquemontii* and *Prosopis juliflora* appeared significantly different compared to *Haloxylon salicornicum* , *Tamarix passerinoides*, *Salvadora oleiodes*, *Suaeda fruticos* and *Trifolium alexandrinum* against ash content. Study concludes that *Trifolium alexandrinum* noted to be high moistured vegetation, *Acacia jacquemontii* rich in organic matter and *Salvadora oleiodes* in total inorganic matter. *Capparis deciduas*, and *Suaeda fruticosa* both pertained considerable crude protein contents. Zea mays and *Salvadora oleiodes* possessed high ether extract.

Introduction

Tando Allahyar is a very rich agricultural city of Pakistan. Sugarcane, wheat, onion and cotton are commonly cultivated as cash crops in this region. This district was previously a taluka of district Hyderabad, while from 5th May 2005 this taluka was separated and regarded as a separate district (Anonymous [1]). Tando Allahyar district lies in 680 34' 23" to 680 57' 35" east longitudes and 250 12' 24" to 250 45' 17" north latitudes. The climate of district Tando Allahyar is temperate and pleasant. It is neither hot in summer nor cold in winter. The hottest months of summer are June and July, while the coldest months of winter are December and January (Manzoor [2]). Hot winds blow from May to August from south to north, while cold winds blow from north to south in November, December and January.

Due to the favorable climatic conditions and plenty supply of irrigation water, multiple types of crops are cultivated in the district, especially cotton, wheat, sugarcane, and all types of fruits and vegetables are available for most of the time (Iqbal et al. [3]). Additionally, various species of cow, sheep, goat and camels are also found which are normally used for the production of milk, meat, wool and hair. Regarding camels it has been reported that majority of the camel herders keep their camels in open air system and take their camels for grazing from morning till evening. Camels generally prefer to browse the natural vegetations which are rarely found in the district, as most of lands are commercially used for cash crops where browsing of camels is not allowed and that results camels particularly suffer from shortage of high quality feed among all livestock animals (Sarwar et al., [4]).

It is also well documented that nutrients composition of dietary forages have prominent influence on the health status and production of camels and in this regards various studies have been conducted in the different parts of the world. As Towhidi, [5] reported nutritive value of some vegetations for dromedary camels in Iran such as *Alhagi persarum*, *Artemisia seiberi*, *Atriplex letiformis*, *Hammada salicornica*, *Haloxylon ammodendron*, *Saueda fruticosa*, *Salsola tomentosa*, *Salsola yazdiana*, *Seidlitzia rosmarinus*, *Tamarix kotschyi* and *Tamarix aphylla*. Ibrahim et al., [6] reported nutritional composition of some forage species consumed by one-humped camels (camelus dromedarius) in the sub-humid region of Nigeria known as Zaria whereby nutritional composition of

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leaves from eight different forage species like *Dalbergia sisso*, *Ziziphus mauritania*, *Khaya senegalensis*, *Lephatadenia hastala*, *Ziziphus var-spinachristi*, *Acacia hoskii* and *Dichrostachys cineria* was assessed in term of dry matter, crude protein, crude fiber, ether extract, neutral detergent fiber, Acid detergent fiber and Nitrogen free extract. Ahmed, [7] reported the order of usefulness of plants as *Salsola arbuscula*, *Seidlitzia rosmarinus*, *Suaeda fruticosa*, *Alhagi camelorum*, *Haloxylon ammodendron*, *Halostachys spp*., *Tamarix tetragyna*, *Tamarix stricta* and *Hammada salicornica*. Rathore, [8] reported nutritive compositions of different rangelands at Southern Darfur, Sudan. Although worldwide various compositional studies have been conducted on camel browse vegetations but unfortunately such kinds of studies have rarely been invested in the Pakistan, especially in the Sindh Province. Particularly focusing the Tando Allahyar district of Sindh Province such type of studies has never been carried out yet. Current study was therefore planned in order to study the commonly available camel browse vegetations in Tando Allahyar district for assessing their major nutrient components.

Materials and Methods

Location of study: The major part of study was conducted at the Laboratory of Animal Nutrition, Faculty of Animal Husbandry and Veterinary Science, Sindh Agriculture University, Tandojam. Further, five different villages of Tando Allahyar district of Sindh province were included to monitor and collect the samples of commonly available camel browse vegetations.

Experimental procedure: Current investigation was carried out during the year 2018 whereby study was subjected into two parts. In the first part, comprehensive survey was performed at different villages of Tando Allahyar district of Sindh province in order to gather the data regarding availability of different camel browse vegetations. While in the second part of study major nutrients among camel browse vegetations grown in district Tando Allahyar were analyzed. A total of 13 different camel browse vegetations were sampled. To have replicated data composite sampling was performed from all five villages. All the samples were brought to the Laboratory of Animal Nutrition, Sindh Agriculture University Tandojam. Sample were dried under air circulation oven (65°C) and stored till analysis. For the examination of dry matter and inorganic/mineral (ash) matter contents, fresh samples were processed.

Moisture content was analyzed using evaporation method (AOAC, [9] whereby sample of each camel browse vegetation (2g) was measured in pre-weighed empty dried aluminum dish and kept in hot air oven at 105±1°C for 24hrs. It was then desiccated, weighed and re-dried in the hot air oven for further 30 min. Dry matter of sample was determined using same method as for moisture. Total organic matter was computed by difference method. Percent of inorganic matter was subtracted from hundred to calculate the percent of total organic matter. Ether extract content was determined through Soxhlet method (AOAC) [9]. Ground sample (2g) in thimble was extracted with diethyl ether (200ml) into pre-weighed clean and dry fat beaker for six hrs. Crude protein content was analyzed by Kjeldhal method. Sample (1g) was measured in Kjeldhal flask to which copper sulfate (0.2g) and sodium sulfate (2g) as catalyst were added. Further, sulfuric acid (25ml) as an oxidizing agent was delivered and digested in Micro-Kjeldhal digester till solution became transparent. It was transferred into volumetric flask (250ml), and made up to mark with distilled water. Diluted sample (5ml) was distilled with 40% sodium hydroxide (5ml) using Micro-Kjeldhal distillation unit, where steam was distilled over 2 percent boric acid (5ml) containing an indicator. The ammonia trapped in boric acid was titrated with 0.01N HCl, and the volume of HCl used was recorded. Percent of nitrogen content was computed using formula. Crude fiber was determined using VanSoest method (AOAC) [9]. Ether extracted sample (2g) was boiled in pre-heated H2SO4 having normality 0.2N (200ml) for about 30min. Contents of beaker were filtered through buchner funnel and rinsed with 50ml boiling water. Residues were transferred back into the beaker and boiled with NaOH having normality 0.3N (200ml) for 30min. Contents were filtered as above and washed with 25ml of boiling H_2SO_4 (0.2N) and with 50ml H_2O. The residues were dried at 65°C for 24hrs and weighed. The residues were transferred into a pre-weighed crucible and ashed for 4hrs. Crucible containing sample was desiccated and weighed using analytical weight balance. The recorded observations were fixed in the following formula to compute the crude fiber percent. Nitrogen free extract was analyzed by difference method whereby sum of ether extract; crude protein; crude fiber and ash content was subtracted from Hundred. Percent of nitrogen free extract and crude fiber was summed together to calculate the total carbohydrate content. Inorganic matter was examined using Gravimetric method whereby sample (2g) in pre-weighed crucible was ignited in muffle furnace (600°C) for 6hrs, desiccated for one hour and then weighed. The ash percent was calculated by using formula.

Statistical analysis: A computerized statistical package i.e. Student Edition of Statistix (SXW), Version 8.1 (Copyright 2005, Analytical Software, USA) was applied to assess the data. Statistical procedure of completely randomized analysis of variance (ANOVA) under linear models was used to observe the significant variations between vegetations, and in case of the significant differences found among the means, the least significant difference (LSD) test was applied (Gomez and Gomez, 1984).

Results and Discussion

Moisture and dry matter content: Results regarding the moisture content, dry matter, organic matter and inorganic/mineral matter contents are presented in Table 1. *Haloxylon salicornicum* (82.40%) held significantly high ($p<0.05$) moisture content, whereas *Prosopis cineraria*(44.95%) shows comparatively low. Results further revealed that *Trifolium alexandrinum* (78.05%) *versus* Zea mays (77.90%) and *Prosopis juliflora* (67.75%) *versus Ziziphus nummularia* (67.55%) had no comparable ($p<0.05$) variation in moisture contents, however, both of these set of plants varied in moisture contents to each other as well as other plants. Regarding total dry matter content results found *vice versa* with moisture content, where Prosopis cineraria pertained maximum and *Haloxylon salicornicum* minimum concentration of dry matter (55.05 and 17.60% respectively). The percent of dry matter content in Acacia nilotica (48.90%), *Acacia jacquemontii* (46.05%), *Capparis deciduas* (36.45%), *Tamarix passerinoides* (35.95%) and Alhagi maurorum (35.45%) contrast to *Salvadora oleiodes* (28.65%), *Suaeda fruticosa* (18.10%) and *Haloxylon salicornicum* (17.60%) recorded at moderate level with significant variation to each other. Moreover, *Ziziphus nummularia* (32.45%) compared to *Prosopis juliflora* (32.25%), and Zea mays (22.10%) *versus Trifolium alexandrinum* (21.95%) indicated no substantial differences but compared to other camel browse vegetations both set found statistically different (p<0.05). Result regarding the *Ziziphus nummularia*, dry matter content in current investigation appeared in agreement with different studies (Farooq et al., Chandra and Mali, [10]; Khanum et al., [11]). Moreover, percent of dry matter in *Capparis deciduas* recorded in the present study found dissimilar with the reported results of Gull et al., [12] who reported ~ 1.7 fold higher dry matter in *Capparis deciduas*. Nevertheless, findings of dry matter in *Salvadora oleiodes* found comparable with the study of Samreen et al., [13] who reported 61.6% dry matter in *Salvadora oleiodes* at Darazinda FRDI Khan, Pakistan. Percent of dry matter content of Acacia nilotica did not match with that of reported by Khanum et al. [11] i.e 60.4 ± 1.9%. Moisture content of *Acacia nilotica*, *Ziziphus nummularia*, *Capparis deciduas* in the current study did not appear in line with that of reported studies of different authors (Abdulrazak et al., [14]; Towhidi and Zhandi et al., [15]; Ashraf et al., [16]; Ullah et al., [17]; Abdullah et al., [18]; Farooq et al., [19]) and found quit different, while in Prosopis juliflora, Salvadora oleiodes, and Zea mays it was in accordance with different reported studies (Murray et al., [20]; Mabrouk et al.,; El-Amier and Abdullah, [21]; Samreen et al., [22]).

Results further revealed that the concentration of both organic and inorganic matter in *Acacia nilotica*, *Ziziphus nummularia*, *Acacia jacquemontii*, *Prosopis juliflora*, *Prosopis cineraria*, *Alhagi maurorum*, *Capparis deciduas*, and Zea mays did not vary to each other (p<0.05), but significantly different (p<0.05) from that of observed in *Trifolium alexandrinum*, *Salvadora oleiodes*, *Suaeda fruticosa*, *Haloxylon salicornicum* and *Tamarix passerinoides* though also did not differ from each other. Nevertheless, former set of plants found significantly high in organic matter contents compared to latter set of plants, while for Inorganic/mineral matter trend appeared opposite, where latter set was significantly abundant (p<0.05) from that of former set of plants (Table 1). The level of organic matters recorded in the present study for *Acacia jacquemontii*, *Capparis deciduas*, *Prosopis juliflora*, *Prosopis cineraria* and *Ziziphus nummularia* found relatively in accordance with that of reported in different studies (Mohsen et al., [23]; Ullah et al., [17]; Chandra and Mali, [10]; El-Amier and Abdullah, [21]; Heuzé et al., [24]; Heuzé et al., [24]; Rasool et al., [25]; Farooq et al., [19]; Kathirvel et al., [26]). Nevertheless, slight variation occurred among them. This minor difference may be concerned with the environmental changes or variety distinction. However, the level of organic matter in *Acacia nilotica* and *Salvadora oleiodes* in current study totally disagreed with that of stated by different authers (Murray et al., [20]; Towhidi and Zhandi, 2007 [15]; Ashraf et al., 2013 [16]; Chandra and Mali [10]; Bwai et al., 2015 [27]; Samreen et al., [22]). Present results of inorganic/mineral matter in *Salvadora oleiodes* and *Acacia nilotica* did not appear in accordance with that of reported in different studies (Murray et al., [20]; Abdulrazak et al., [14]; Ullah et al., [17]; Samreen et al., [22]; Abdullah et al., [18]). While findings regarding inorganic matter in *Prosopis cineraria*, *Prosopis juliflora*, *Capparis deciduas*, *Acacia jacquemontii* and *Ziziphus nummularia* in the current study found in line with that of reported by different authors (Towhidi, [5]; Mohsen et al., [23]; Chandra and Mali et al., [9]; Mabrouk, Rasool et al., [25]; El-Amier and Abdullah, [21]; Abdullah et al., Chandra and Mali, [9]; Farooq et al., [19]).

Crude protein content: Results regarding the assessment of crude protein content in different camel browse vegetations are shown in the Figure1 which indicates that the *Suaeda fruticosa* (33.81%) had significantly maximum concentration of crude protein following *Trifolium alexandrinum* (25.13%) and *Haloxylon salicornicum* (24.13%) amongst all other camel browse vegetations. *Salvadora oleiodes* (20.05%), *Ziziphus nummularia* (17.80%) and *Prosopis cineraria* (13.27%) also differed significantly to each other. Moreover, crude protein in *Tamarix passerinoides* (16.36%) *versus Acacia jacquemontii* (15.95%) did not show any significant variation while difference in crude protein of *Tamarix passerinoides versus* Zea mays existed statistically significant (p<0.05). Results further indicate that difference in crude protein content of *Prosopis juliflora* (12.12%) *versus Acacia nilotica* (12.07%) and *Capparis deciduas* (22.79%) *versus* Alhagi maurorum (21.94%) appeared statistically non significant (p<0.05), but these sets of plants found significantly different from each other in crude protein content. Crude protein content in *Capparis deciduas* recorded in the present study found statistically similar to that of reported by Gull et al., [12], while Abdullah et al., [18] did not support it, their findings looks quite dissimilar from the present results. The level of crude protein content in *Salvadora oleiodes* appeared dissimilar with that of observed by Towhidi [5] and Samreen et al., [22] but their concentration seems to be somewhat close to reported findings of Abdullah et al., [16]. The level of crude protein contents in *Ziziphus nummularia*, Acacia nilotica and *Prosopis cineraria* in present findings existed in agreement with that of reported results of different authors (Farooq et al., 2018 [19]; Chandra and Mali, [10]). Further, the level of crude protein content in *Prosopis juliflora*, *Prosopis cineraria* and *Acacia jacquemontii* are very much different compared to that of reported in different studies (Mabrouk et al.,; Ullah et al., [17]; Rasool et al., [25]).

Ether extract content: Ether extract content of different camel browse vegetations is presented in the Figure 2. Results showed that Zea mays (6.40%) had significantly high and *Suaeda fruticosa* (1.15%) comparatively low, while *Salvadora oleiodes* (1.60%) and *Ziziphus nummularia* (3.05%) prominently different percent of ether extract contents compared to *Trifolium alexandrinum* (3.45%), *Prosopis juliflora* (3.55%), *Acacia jacquemontii* (2.75%), *Tamarix passerinoides* (2.60%), *Capparis deciduas* (2.55%), *Prosopis cineraria* (2.45%), Alhagi maurorum (2.45%), *Haloxylon salicornicum* (2.05%) and *Acacia nilotica* (2.00%). Results further reveals that difference in ether extract contents of *Trifolium alexandrinum versus Prosopis*

Table 1: Nutritional Assessment of moisture and dry matter content in irrigated species of camel browse vegetations sampled from Tando Allahyar district.

Camel browse vegetations	Moisture (%)	Dry matter		
		Total	Organic matter	Inorganic matter
		(%)	(% over dry matter)	(% over dry matter)
Acacia nilotica	51.10^{j}	48.90^{b}	88.85^{a}	11.15^{b}
Trifolium alexandrinum	78.05^{c}	21.95^{i}	81.85^{b}	18.15^{a}
Ziziphus nummularia	67.55^{e}	32.45^{g}	89.15^{a}	10.85^{b}
Acacia jacquemontii	53.95^{i}	46.05^{c}	90.15^{a}	9.85^{b}
Prosopis juliflora	67.75^{e}	32.25^{g}	92.35^{a}	7.65^{b}
Prosopis cineraria	44.95^{k}	55.05^{a}	89.85^{a}	10.15^{b}
Alhagi maurorum	64.55^{f}	35.45^{f}	90.05^{a}	9.95^{b}
Salvadora oleiodes	71.35^{d}	28.65^{h}	79.80^{b}	20.20^{a}
Capparis deciduas	63.55^{h}	36.45^{d}	88.90^{a}	11.10^{b}
Suaeda fruticosa	81.90^{b}	18.10^{j}	80.70^{b}	19.30^{a}
Haloxylon salicornicum	82.4^{a}	17.60^{k}	77.05^{b}	22.95^{a}
Tamarix passerinoides	64.05^{g}	35.95^{e}	79.30^{b}	20.70^{a}
Zea mays	77.9^{c}	22.10^{i}	88.70^{a}	11.30^{b}
LSD (0.05)	0.2966	0.2966	6.2751	6.2751
SE±	0.1373	0.1373	2.9046	2.9046

juliflora, *Acacia nilotica versus Haloxylon salicornicum* , *Acacia jacquemontii versus Capparis deciduas, Tamarix passerinoides* and *Capparis deciduas, Prosopis cineraria versus Alhagi maurorum*, *Capparis deciduas* and *Tamarix passerinoides* existed non-significant (p<0.05) but each set found statistically different from one another (p<0.05). The concentration of ether extract content in *Prosopis juliflora*, *Acacia nilotica*, *Capparis deciduas*, *Prosopis cineraria* and *Ziziphus nummularia* observed in the current study were in line with that of reported in different studies (Abdulrazak et al., [12]; Shawn et al.,; Towhidi and Zhandi, [15]; Mabrouk et al., Mohsen et al., Ashraf et al., [16] Chandra and Mali, 2014 [10]; El-Amier and Abdullah, [21]; Abdullah et al., [18] Farooq et al., [19]), while percent of ether extract in Alhagi maurorum , *Salvadora oleiodes*, *Acacia jacquemontii* recorded in current study found somewhat different from reported studies (Ullah et al., [17]; Samreen et al., [22]; Rasool et al., [25]).

Carbohydrate content: Table 2 represents the nitrogen free extract, crude fiber and total carbohydrate percent in different camel browse vegetations at Tando Allahyar. It was observed that percent of nitrogen free extract among *Acacia nilotica* (55.14%), *Prosopis juliflora* (54.89%) and *Prosopis cineraria* (54.24%) existed relatively similar (p<0.05), and found considerably (p<0.05) high from that of recorded in Alhagi maurorum (46.52%), *Ziziphus nummularia* (45.35%), *Acacia jacquemontii* (45.20%), *Tamarix passerinoides* (40.30%), Zea mays (38.00%), Capparis deciduas (37.76%), *Salvadora oleiodes* (35.40%), *Trifolium alexandrinum* (31.42%), *Haloxylon salicornicum* (25.77%) and *Suaeda fruticosa* (19.95%). In *Tamarix passerinoides* no significant (p<0.05) dissimilarity in nitrogen free extract was noted against *Ziziphus nummularia*, *Acacia jacquemontii*, Zea mays, *Capparis deciduas* and *Salvadora oleiodes* (35.40%), while compared to other vegetations differences existed statistically significant (p<0.05). Likewise, *Trifolium alexandrinum* held no significant (p<0.05) variation in nitrogen free extract content compared to *Salvadora oleiodes* and *Haloxylon salicornicum*. However, compared to other camel browse vegetations *Salvadora oleiodes* and *Trifolium alexandrinum* pertained considerable (p<0.05) dissimilarity. Nitrogen free extract percent in *Haloxylon salicornicum* did not vary from that of recorded in *Suaeda fruticosa* and *Trifolium alexandrinum*, while percent in these plants significantly (p<0.05) varied from all camel browse vegetations. In contrast to current study, the findings of nitrogen free extract contents in *Acacia nilotica* and

Ziziphus nummularia found dissimilar with that of reported studies (Towhidi and Zhandi, [14]; Abdullah et al., [17]; Farooq et al., 2018 [18]). However, Nitrogen free extract of *Prosopis cineraria* existed in agreement with that of reported studies of different authors (Mohsen et al. [22]; Chandra and Mali, [9]; Abdullah et al., [17]). It could be argued that environment of localities had significant impact on the percent of nitrogen free extract and total carbohydrate contents of different vegetations under present investigation. Results regarding crude fiber content of camel browse vegetations are shown in the Table 2. It indicates that the Zea mays (29.15%) had significantly ($p<0.05$) rich concentration of crude fiber followed by *Acacia jacquemontii* (26.25%), while Alhagi maurorum (19.15%) possessed comparatively poor percent of crude fiber compared to all camel browse vegetations examined under present study. Further, *Capparis deciduas* (25.80%) *versus Suaeda fruticosa* (25.80%), *Ziziphus nummularia* (22.95%) and *Salvadora oleiodes* (22.75%), and *Trifolium alexandrinum* (21.85%) *versus Prosopis juliflora* (21.80%) did not show considerable variation in crude fiber contents, but contrast to other vegetations they all possessed comparable concentration. Similarly, the concentration of crude fiber in *Tamarix passerinoides* (20.05%) against *Prosopis cineraria* (19.90%) and *Acacia nilotica* (19.65%) *versus Prosopis cineraria* (19.90%) showed no prominent *Prosopis julifloraation* to each other (Table 2).

Table 2: Nutritional assessment of carbohydrate content in irrigated species of camel browse vegetation's sampled from Tando Allahyar district.

Camel browse vegetations	Carbohydrate		
	Nitrogen free extract	Crude fiber	Total
	(%)	(%)	(%)
Acacia nilotica	55.14^{a}	19.65^{h}	74.79^{a}
Trifolium alexandrinum	31.42^{ef}	21.85^{f}	53.27^{gh}
Ziziphus nummularia	45.35^{bc}	22.95^{e}	68.30$^{b\text{-}d}$
Acacia jacquemontii	45.20^{bc}	26.25^{b}	71.45$^{a\text{-}c}$
Prosopis juliflora	54.89^{a}	21.80^{f}	76.69^{a}
Prosopis cineraria	54.24^{a}	19.90^{gh}	74.14^{ab}
Alhagi maurorum	46.52^{b}	19.15^{i}	65.67$^{c\text{-}e}$
Salvadora oleiodes	35.40^{de}	22.75^{e}	58.15^{fg}
Capparis deciduas	37.76^{d}	25.80^{c}	63.56$^{d\text{-}f}$
Suaeda fruticosa	19.95^{g}	25.80^{c}	45.75^{i}
Haloxylon salicornicum	25.77^{fg}	25.10^{d}	50.87^{hi}
Tamarix passerinoides	40.30^{cd}	20.05^{g}	60.35^{ef}
Zea mays	38.00^{d}	29.15^{a}	67.15^{cd}
LSD (0.05)	6.0799	0.3494	6.2064
SE±	2.8143	0.1617	2.8728

Further, results showed that the *Prosopis juliflora* (76.69%) and Acacia nilotica (74.79%) acquired prominently high ($p<0.05$) concentration of total carbohydrate content compared to that of *Ziziphus nummularia* (68.30%), Zea mays (67.15%), Alhagi maurorum (65.67%), *Capparis deciduas* (63.56%), *Tamarix passerinoides* (60.35%), *Salvadora oleiodes* (58.15%), *Trifolium alexandrinum* (53.27%), *Haloxylon salicornicum* (50.87%) and *Suaeda fruticosa* (45.75%). Zea mays (67.15%) pertained no prominent dissimilarity with *Acacia jacquemontii* (71.45%), *Ziziphus nummularia* (68.30%), Alhagi maurorum (65.67%) and *Capparis deciduas* (63.56%), while compared to other vegetations examined in the present study, the difference in total carbohydrate contents occurred comparable ($p<0.05$). Alhagi maurorum (65.67%) held no considerable variation contrast to *Acacia jacquemontii*, *Ziziphus nummularia*, Zea mays, *Capparis deciduas* and *Tamarix passerinoides* but it possessed prominent ($P<0.05$) variation compared to other remaining vegetations. Total carbohydrate concentration in *Capparis deciduas* (63.56%) existed non-significant with *Ziziphus nummularia*, Zea mays, *Alhagi maurorum*, *Tamarix passerinoides* and *Salvadora oleiodes*, but in comparison with that of in other camel browse vegetations, differences recorded significant ($p<0.05$). *Tamarix passerinoides* was not prominently vary in total carbohydrate content from that of *Alhagi maurorum*, *Capparis deciduas* and *Salvadora oleiodes* but from other camel browse vegetations it appeared significantly different ($p<0.05$). Total carbohydrate content in *Salvadora oleiodes* was not considerably different from that of in *Capparis deciduas*, *Tamarix passerinoides* and *Trifolium alexandrinum*, while from other vegetations it was prominently different. *Haloxylon salicornicum* possessed no considerable variation in carbohydrate contents with that of *Trifolium alexandrinum* and *Suaeda fruticosa* but held prominent difference contrast to Salvadora oleiodes. However, compared to other camel browse vegetations *Trifolium alexandrinum* (53.27%), *Haloxylon salicornicum* (50.87%) and *Suaeda fruticosa* (45.75%) possessed significant ($P<0.05$) distinction. For instance, Mabrouk et al. reported quite relevant results regarding the total carbohydrate level in *Prosopis juliflora*, while Rifat et al. [18] reported little bit different concentration of carbohydrate content in *Prosopis cineraria* compared to current study. This difference among the results might be related with the variety, environmental distinction and soil composition. Differences in the results could also be related with the sample part of plant as in current study homogenous sample of leaves, seeds, pods were used, while in reported study of Rifat et al. [19] only pods were focused.

Conclusion

Present study concludes that the *Trifolium alexandrinum*, *Suaeda fruticosa*, *Haloxylon salicornicum* , Zea mays, *Salvadora oleiodes* noted to be high moistured vegetations, *Acacia jacquemontii* appeared considerably rich in organic matter contents while *Salvadora oleiodes* in total inorganic/mineral matter. *Capparis deciduas* and *Suaeda fruticosa* both pertained considerable concentration of crude protein contents. Zea mays and *Salvadora oleiodes* possessed high ether extract whereas Zea mays revealed remarkably maximum percentage of crude fiber.

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