Research Article

Nutritional Analysis of Some Rangeland Species for Camel Browsing at Thatta District of Pakistan

Asad Ali Khaskheli[1*], Gulfam Ali Mughal[1], Gul Bahar Khaskheli[2], Allah Jurio Khaskheli[3], Arshad Ali Khaskheli[4], Abdul Samad Magsi[5], Ghulam Shabir Barham[2], Arab Khan Lund[5] and Maqbool Ahmed Jamali[4]

[1]Department of Animal Nutrition, Sindh Agriculture University, Tando Jam, Pakistan; [2]Department of Animal Products Technology, Sindh Agriculture University, Tando Jam, Pakistan; [3]Department of Biotechnology, Sindh Agriculture University, Tando Jam, Pakistan; [4]Sindh Agriculture University, Tando Jam, Pakistan; [5]Shaheed Benazir Bhutto University of Veterinary and Animal Sciences, Sakrand, Pakistan.

Abstract | Study was conducted at the Department of Animal Nutrition, Sindh Agriculture University, Tando Jam during the year 2018. Investigation was themed to monitor and assess major nutrients in different camel browse vegetations over Thatta district. Results of current study indicated highest moisture content in Trifolium alexandrinum and lowest in Tamarix gallica. Zea mays contained considerably high organic matter. Capparis deciduas followed by Salvadora oleiodes and Ziziphus nummularia possessed significantly high concentration of crude protein. Further the Prosopis juliflora against Zea mays, in Acacia nilotica versus Alhagi maurorum, in Tamarix orientalis versus Trifolium alexandrinum, Tamarix gallica versus Cordia sinensis (Linn.) crude protein content existed statistically non-significant, but each of above set varied significantly to one another. Trifolium alexandrinum and Zea mays though had statistically similar concentration of ether extract were found prominently higher compared to all other vegetations. Alhagi maurorum was significantly rich in nitrogen free extract. Zea mays held significantly top, while Alhagi maurorum possessed significantly bottom percent of crude fiber. Acacia nilotica and Alhagi maurorum though were statistically similar to each other but found prominently rich in total carbohydrate content. It could be concluded that the thatta district possessed significant influence on most of the nutrients, whereby negative effect on the moisture content and positive on the dry matter was noted. Overall, no considerable influence on nitrogen free extract and total carbohydrate contents but on crude fiber concentration prominent influence appeared.

Received | May 26, 2019; **Accepted** | June 24, 2019; **Published** | August 11, 2019
***Correspondence** | Asad Ali Khaskheli, Department of Animal Nutrition, Sindh Agriculture University, Tando Jam, Pakistan; **Email:** khaskhelias@gmail.com
Citation | Khaskheli, A.A., G.A. Mughal, G.B. Khaskheli, A.J. Khaskheli, A.A. Khaskheli, A.S. Magsi, G.S. Barham, A.K. Lund and M.A. Jamali. 2019. Nutritional analysis of some rangeland species for camel browsing at Thatta district of Pakistan. *Pakistan Journal of Agricultural Research,* 32(3): 498-506.
DOI | http://dx.doi.org/10.17582/journal.pjar/2019/32.3.498.506
Keywords | Coastal zone, Perinnial species, Rangeland, Nutrient, Sub-tropical

Introduction

Livestock animals including camels represent an important component of the agricultural sector in Pakistan especially in Sindh. Indeed, crop and livestock activities are, to a great extent, interdependent upon each other for their functioning within the farm sector. As camel is a multipurpose animal, it may be used for travelling, carrying goods, drawing out water from well, ploughing the field for crop sowing, producing milk, meat and hair (Ahmed et al., 2010). Just because of their vital role, the population of camels has become steadily more important in the livestock economy of Sindh during the last two livestock census compared to other provinces. But the misfortune is that the Sindh has a larger percentage of small and medium camel herds while majority of herders are poor. They normally feed natural browse vegetations to their camel as this practice is non-costly. Keeping in view the role played by camels in pastoral livelihoods, their dietary requirements must not be ignored (Ali et al., 2011). It is well studied that the nutritional need of camels strongly correlated with their production and performance. Camels by preference are browsers of a broad spectrum of forage plants including trees, shrubs and hard-thorny, bitter and halophytic (salty) plants that naturally grow. Therefore, they must be provided easy access these vegetations (Dokata, 2014).

Thatta is one of the southern and border districts of Pakistan. This district lying between23°43' to 25°26' north latitude and 67°05' to 68°45'east longitude and bounded by District Jamshoro in North, Karachi in North West, Hyderabad and Tando Muhammad Khan in North East, Badin in East, Arabian Sea in the South and Rann of Kutch in South East (Iqbal et al., 2001). Thatta spreads over a vast area of 17,355 square kilometers and is the second largest district of the Sindh province following District Tharparkar. It covers 12.3% area of the province and 2.18% of Pakistan. In terms of use, the lands in this district can be divided into five major categories viz lands not available or fit for agriculture, those under arable agriculture, forests, rough grazing lands and areas under human settlements (Anonymous, 2016).

Being a sub-tropical region, Thatta has been categorized as good source of rangeland species which are normally used for camel browsing. Unfortunately, rangelands of Thatta are degrading and facing many problems including short growth period, over grazing, droughts, and marginal availability of perennial species (Ali et al., 2001). The herbaceous vegetations of these rangelands are although vast natural resources but they are not managed by scientific approaches and only 10-15% of their actual potential is being documented. The rangelands of Thatta district show a great diversity of species composition, structure, productivity and ultimately their capacity to support camels as well as other livestock animals. Therefore, sustainable use of these rangelands is essential (Majeed et al., 2002). Fodder trees and shrubs represent an enormous potential source of protein in the tropics but unfortunately these feed resources have been ignored mainly because of inadequate knowledge on various aspects of their nutritive potential and use (Manzoor et al., 2013). It has been estimated that the most of animal protein deficiency in developing world mainly occurs due to lack of forages. Fodder trees and shrubs have always played vital role in camel feeding. During the dry and crop-fallow season, farmers traditionally feed indigenous fodder species to meet nutritional requirements of the grazing animals (Nasrullah et al., 2003). So far, very little work has been done on the identification, prioritization and characterization of indigenous fodder and soil improving trees and shrubs in Thatta district. Current study was therefore planned in order to monitor and assess the major nutrients among commonly available camel browse vegetations at Thatta district of Pakistan.

Materials and Methods

Location of study

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

Experimental procedure

Present study was conducted during the year 2018 whereby investigation was subjected into two parts. In the first part, comprehensive survey was performed at different villages of Thatta 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 Thatta were analyzed. A total of 12 different camel browse vegetations were samples. 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 Tando Jam. Sample were dried under Hot air (65°C) and stored till analysis. For the examination of dry matter and inorganic/mineral (ash) matter contents, fresh samples were processed. Furthermore, the data on major nutritional variables like moisture, dry matter, total organic matter, ether extract, crude fiber was gathered by (AOAC, 2000). Crude protein

Links Researchers

was analyzed by Kjeldhal method while nitrogen free extract and total carbohydrate was determined by difference method.

Results and Discussion

Camel browse vegetations such as Trifolium alexandrinum, Suaeda fruticosa, Cordia sinensis (Linn.), Tamarix orientalis, Zea mays, Salvadora oleiodes, Alhagi maurorum, Acacia nilotica, Capparis deciduas, Ziziphus nummularia, Prosopis juliflora, Tamarix gallica sampled from Thatta district were analyzed for major nutrients including moisture, dry matter, total organic matter and inorganic matter, crude protein, ether extract, total carbohydrate, nitrogen free extract and crude fiber contents, and results are presented in respective section.

Moisture and dry matter content

Table 1 indicates highest moisture content in Trifolium alexandrinum (85.55%) and lowest in Tamarix gallica (47.95%), while in Suaeda fruticosa (80.95%), Cordia sinensis (Linn.) (76.95%), Tamarix orientalis (71.52%), Zea mays (71.05%), Salvadora oleiodes (70.15%), Alhagi maurorum (64.07%), Acacia nilotica (58.95%), Capparis deciduas (58.90%), Ziziphus nummularia (55.95%) and Prosopis juliflora (51.10%) it was recorded at intermediate level. Table 4.8 further shows that among all the above vegetations moisture content varied statistically significant ($p<0.05$) excepting Acacia nilotica and Capparis deciduas though held no prominent differences between each another. Regarding dry matter content (Table 1) results appeared vice versa with moisture content where Tamarix gallica (52.05%) had prominently maximum dry matter content and Trifolium alexandrinum minimum (14.45%). In case of Prosopis juliflora (48.90%), Ziziphus nummularia (44.05%), Capparis deciduas (41.10%), Acacia nilotica (41.05%), Alhagi maurorum (35.93%), Salvadora oleiodes (29.85%), Zea mays (28.95%), Tamarix orientalis (28.48%), Cordia sinensis (Linn.) (23.05%) and Suaeda fruticosa (19.05%), the dry matter content recorded at moderate level, where differences in their concentration varied significantly ($p<0.05$) excepting Capparis deciduas and Acacia nilotica though existed non-significant variation with one another. Result regarding the Ziziphus nummularia, dry matter content in current investigation appeared in agreement with different studies (Farooq et al., 2018; Chandra and Mali, 2014; Khanum et al., 2007). Moreover, percent of dry matter in Capparis deciduas recorded in the present study found dissimilar with the reported results of Gull et al. (2015) who reported somewhat higher dry matter in Capparis deciduas. Nevertheless, findings of dry matter in Salvadora oleiodes found comparble with the study of Samreen et al. (2016) 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. (2007) 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., 2001; Towhidi and Zhandi et al., 2007; Ashraf et al., 2013; Ullah et al., 2013; Abdullah et al., 2017; Farooq et al., 2018) and found quit different, while in Prosopis juliflora, Salvadora oleiodes and Trifolium alexandrinum it was in accordance with different reported studies (Murray et al., 2000; Mabrouk et al., 2008; El-Amier and Abdullah, 2015; Samreen et al., 2016).

Total organic matter

Results regarding the organic matter content are depicted in Table 1. It was noted that organic matter content varied plant to plant. However, in Zea mays (94.70%) it was recorded considerably high compared to that of examined in Prosopis juliflora (93.05%), Alhagi maurorum (92.95%), Capparis deciduas (92.75%), Acacia nilotica (92.65%), Ziziphus nummularia (89.75%), Tamarix gallica (82.75%), Trifolium alexandrinum (82.70%), Tamarix orientalis (80.75%), Suaeda fruticosa (73.80%), Cordia sinensis (Linn.) (67.50%) and Salvadora oleiodes (67.40%). It was further observed that organic matter content in Alhagi maurorum versus Prosopis juliflora and Capparis deciduas, and Acacia nilotica versus Capparis deciduas appeared statistically similar ($P>0.05$), while it existed considerably ($P<0.05$) different in Prosopis juliflora versus Capparis deciduas and Acacia nilotica, and Alhagi maurorum versus Acacia nilotica. It was also noted that difference in organic matter content between Tamarix gallica and Trifolium alexandrinum, and between Cordia sinensis (Linn.) and Salvadora oleiodes revealed no statistical ($P>0.05$) variation. The level of organic matters recorded in the present study for Ziziphus nummularia, Capparis deciduas, Prosopis juliflora, Salvadora oleiodes and Trifolium alexandrinum found relatively in accordance with that of reported in different studies (Mohsen et al., 2011; Ullah et al., 2013; Chandra and

Table 1: *Assessment of moisture and dry matter content in camel browse vegetations sampled from Thatta District.*

Camel browse vegetations	Moisture (%)	Dry matter		
		Total (%)	Organic matter (% over dry matter)	Inorganic matter (% over dry matter)
Acacia nilotica	58.95[h]	41.05[d]	92.65[d]	7.35[f]
Trifolium alexandrinum	85.55[a]	14.45[k]	82.70[f]	17.30[d]
Ziziphus nummularia	55.95[i]	44.05[c]	89.75[e]	10.25[e]
Prosopis juliflora	51.10[j]	48.9[b]	93.05[b]	6.95[h]
Cordia sinensis (Linn.)	76.95[c]	23.05[i]	67.50[i]	32.50[a]
Alhagi maurorum	64.07[g]	35.93[e]	92.95[bc]	7.05[gh]
Salvadora oleiodes	70.15[f]	29.85[f]	67.40[i]	32.60[a]
Capparis deciduas	58.9[h]	41.1[d]	92.75[cd]	7.25[fg]
Suaeda fruticosa	80.95[b]	19.05[j]	73.80[h]	26.20[b]
Tamarix orientalis	71.52[d]	28.48[h]	80.75[g]	19.25[c]
Tamarix gallica	47.95[k]	52.05[a]	82.75[f]	17.25[d]
Zea mays	71.05[e]	28.95[g]	94.70[a]	5.30[i]
LSD (0.05)	0.2166	0.2166	0.2311	0.2311
SE±	0.0994	0.0994	0.1061	0.1061

LSD (0.05): 0.5804; SE± 0.2664.

Mali, 2014; El-Amier and Abdullah, 2015; Heuzé et al., 2015; Heuzé et al., 2016; Rasool et al., 2017; Farooq et al., 2018; Kathirvel et al., 2011). 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 authors (Murray et al., 2001; Towhidi and Zhandi, 2007; Ashraf et al., 2013; Chandra and Mali, 2014; Bwai et al., 2015; Samreen et al., 2016).

Total inorganic matter

Table 1 indicates significantly (P<0.05) high concentration of inorganic/mineral matters in Salvadora oleiodes (32.60%) and Cordia sinensis (Linn.) (32.5%) compared to that of in Suaeda fruticosa (26.2%), Tamarix orientalis (19.25%), Trifolium alexandrinum (17.3%), Tamarix gallica (17.25%), Ziziphus nummularia (10.25%), Acacia nilotica (7.35%), Capparis deciduas (7.25%), Alhagi maurorum (7.05%), Prosopis juliflora (6.95%) and Zea mays (5.3%). However, within Salvadora oleiodes (32.6%) and Cordia sinensis (Linn.) (32.5%) no significant (p>0.05) difference occurred. Inorganic/mineral matters in Suaeda fruticosa, Tamarix orientalis, Ziziphus nummularia and Zea mays varied significantly (P<0.05) from one another. Moreover, differences in inorganic/mineral matters of Trifolium alexandrinum versus Tamarix gallica, Acacia nilotica versus Capparis deciduas existed non-significant (p>0.05). Furthermore, inorganic/mineral matter content in Capparis deciduas did not significantly vary from Acacia nilotica, and Alhagi maurorum versus Prosopis juliflora. 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., 2000; Abdulrazak et al., 2001; Ullah et al., 2013; Samreen et al., 2016; Abdullah et al., 2017). While findings regarding inorganic matter in Cordia sinensis (Linn.), Prosopis juliflora, Capparis deciduas, Trifolium alexandrinum and Ziziphus nummularia in the current study found in line with that of reported by different authors (Towhidi, 2009; Mohsen et al., 2011; Chandra and Mali et al., 2014; Mabrouk et al., 2008; Rasool et al., 2014; El-Amier and Abdullah, 2015; Abdullah et al., 2017; Chandra and Mali, 2016; Farooq et al., 2018).

Crude protein content

Crude protein contents of various camel browse vegetations sampled from the Thatta district were assessed, and results are depicted in the Figure 1. Capparis deciduas (22.50%) followed by Salvadora oleiodes (19.65%) and Ziziphus nummularia (17.60%) possessed significantly high concentration of crude protein contents compared to Prosopis juliflora (13.72%), Zea mays (13.17%), Acacia nilotica (10.97%), Alhagi maurorum (10.87%), Suaeda fruticosa (8.62%) Tamarix orientalis (6.84%), Trifolium alexandrinum (6.68%), Tamarix gallica (4.54%) and Cordia sinensis (Linn.) (4.44%). Further, the percent of crude protein content in Prosopis juliflora against Zea mays, Acacia nilotica versus Alhagi maurorum, Tamarix orientalis versus Trifolium alexandrinum and Tamarix gallica versus Cordia sinensis (Linn.) existed statistically non-significant ($p>0.05$), but each of above set varied significantly ($p<0.05$) from one another. Crude protein content in Capparis deciduas recorded in the present study found statistically similar to that of reported by Gull et al. (2015), while Abdullah et al. (2017) 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 2009) and Samreen et al. (2016) but their concentration seems to be somewhat close to reported findings of Abdullah et al. (2017).

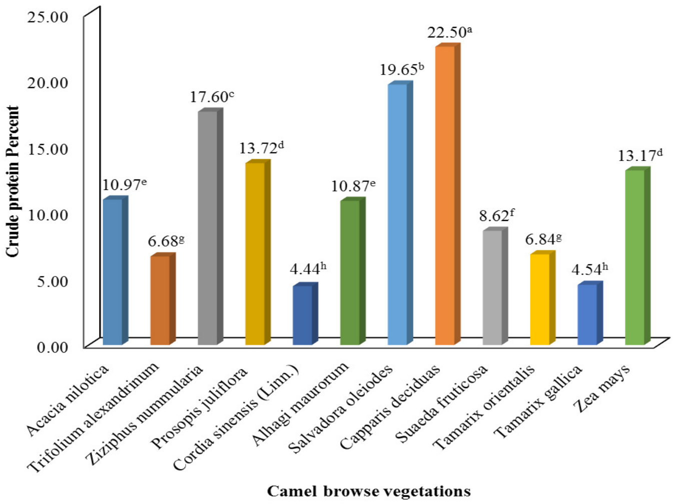

Figure 1: *Assessment of crude protein in camel browse vegetations sampled from Thatta District.*

The level of crude protein contents in Ziziphus nummularia, Acacia nilotica and Cordia sinensis (Linn.) in present findings existed in agreement with that of reported results of different authors (Farooq et al., 2018; Chandra and Mali, 2014). Further, the level of crude protein content in Prosopis juliflora, Cordia sinensis (Linn.) and Ziziphus nummularia are very much different compared to that of reported in different studies (Mabrouk et al., 2008; Ullah et al., 2013; Rasool et al., 2017).

Ether extract content

Results of ether extract content of different camel browse vegetations sampled from Thatta district are presented in the Figure 2. It was observed that Trifolium alexandrinum (5.10%) and Zea mays (5.10%) though had statistically similar ($p>0.05$) concentration of ether extract content and found prominently ($p<0.05$) high compared to that of all other camel browse vegetations like Alhagi maurorum (3.60%), Acacia nilotica (3.10%), Cordia sinensis (Linn.) (2.60%), Prosopis juliflora (2.55%), Tamarix orientalis (2.40%), Capparis deciduas (2.10%), Ziziphus nummularia (2.05%), Tamarix gallica (1.65%), Suaeda fruticosa (1.25%), and Salvadora oleiodes (0.60%).

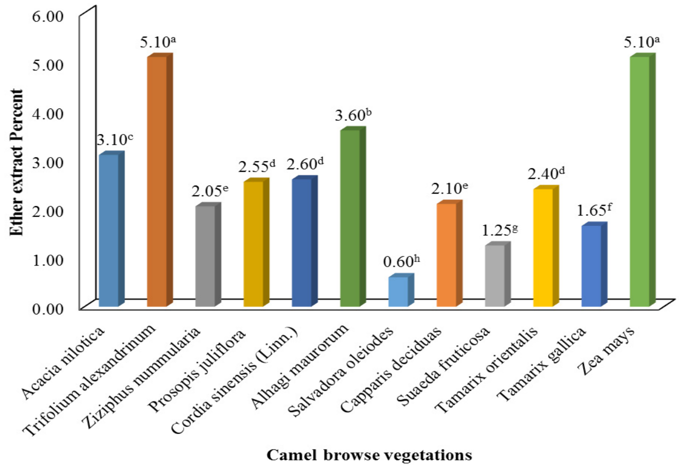

Figure 2: *Assessment of ether extract in camel browse vegetations sampled from Thatta District.*

Further results showed that percent of ether extract in Alhagi maurorum (3.60%), Acacia nilotica (3.10%), Tamarix gallica (1.65%), Suaeda fruticosa (1.25%) and Salvadora oleiodes (0.60%) significantly ($p<0.05$) varied plant to plant. Figure 2 also reveals non-significant ($p>0.05$) variation between Cordia sinensis (Linn.), Prosopis juliflora and Tamarix orientalis and between Capparis deciduas and Ziziphus nummularia. The concentration of ether extract content in Cordia sinensis (Linn.), Prosopis juliflora , Acacia nilotica, Capparis deciduas and Ziziphus nummularia observed in the current study were in line with that of reported in different studies (Abdulrazak et al., 2001; Shawn et al., 2001; Towhidi and Zhandi, 2007; Mabrouk et al., 2008; Mohsen et al., 2011; Ashraf et al., 2013; Chandra and Mali, 2014; El-Amier and Abdullah, 2015; Abdullah et al., 2017; Farooq et al., 2018), while percent of ether extract in Alhagi maurorum, Salvadora oleiodes recorded in current study found somewhat different from reported studies (Ullah et al., 2013; Samreen et al., 2016; Rasool et al., 2017).

Carbohydrate content

Different camel browse vegetations were assessed for nitrogen free extract, crude fiber and total carbohydrate content and results are shown in the

Table 2. Nitrogen free extract in Alhagi maurorum (58.63%) recorded significantly rich ($P<0.05$) followed by Tamarix gallica (55.37%), while in Salvadora oleiodes (23.36%) it was significantly low ($P<0.05$). Moreover, concentration of nitrogen free extract between Acacia nilotica (54.23%) and Prosopis juliflora (54.14%), between Cordia sinensis (Linn.) (37.62%) and Suaeda fruticosa (37.39%), between Zea mays (46.99%) and Ziziphus nummularia (46.95%) although existed statistically non-significant ($p>0.05$) but each set varied significantly ($P<0.05$) in nitrogen free extract from one another. Comparable variation occurred in nitrogen free extract of Salvadora oleiodes, Capparis deciduas, Tamarix orientalis and Trifolium alexandrinum against Alhagi maurorum, Tamarix gallica, Acacia nilotica, Prosopis juliflora, Zea mays, Ziziphus nummularia, Cordia sinensis (Linn.) and Suaeda fruticosa. Compared to present study, the findings of nitrogen free extract contents in Acacia nilotica and Ziziphus nummularia found dissimilar with that of reported studies (Towhidi and Zhandi, 2007; Abdullah et al., 2017; Farooq et al., 2018). However, Nitrogen free extract of Salvadora oleiodes existed in agreement with that of reported studies of different authors (Mohsen et al. (2011); Chandra and Mali, 2014; Abdullah et al., 2017). It could be argued that environment of localities had significant impact on the percent of nitrogen free extract contents of different vegetations under present investigation.

Crude fiber content of camel browse vegetations are presented in the Table 2. Results reveals that the Zea mays (46.99%) held significantly top, while Alhagi maurorum (58.63%) possessed significantly bottom percent of crude fiber compared to Capparis deciduas (26.65%), Suaeda fruticosa (26.55%), Tamarix orientalis (25.95%), Acacia nilotica (24.35%), Salvadora oleiodes (23.80%), Ziziphus nummularia (23.15%), Cordia sinensis (Linn.) (22.85%), Prosopis juliflora (22.65%), Trifolium alexandrinum (21.95%) and Tamarix gallica (21.20%). No considerable difference in crude fiber was observed between Capparis deciduas and Suaeda fruticosa. Concentration of crude fiber in Ziziphus nummularia and Prosopis juliflora recorded significantly different to each other but found statistically similar to that of observed in Cordia sinensis (Linn.).

Results regarding total carbohydrate content mentioned in Table 2 reveals that Acacia nilotica (78.58%) and Alhagi maurorum (78.48%) though were statistically similar to each other, found prominently ($p<0.05$) rich in total carbohydrate content, while Salvadora oleiodes (47.16%) contained considerably poor ($P<0.05$) compared to Prosopis juliflora (76.79%), Tamarix gallica (76.57%), Zea mays (76.44%), Tamarix orientalis (71.51%), Trifolium alexandrinum (70.92%), Ziziphus nummularia (70.10%), Capparis deciduas (68.15%), Suaeda fruticosa (63.94%) and Cordia sinensis (Linn.) (60.47%). No prominent differences were recorded among total carbohydrate content of Prosopis juliflora, Tamarix gallica, Zea mays, and between Tamarix orientalis and Trifolium alexandrinum, but compared with other camel browse vegetations they possessed significant ($p<0.05$) variation. For instance, Mabrouk et al. (2008) reported quite relevant results regarding the total carbohydrate level in Prosopis juliflora, while Rifat et al. (2018) reported little bit different concentration of carbohydrate content in Salvadora oleiodes 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 and seeds were used, while in reported study of Rifat et al. (2018) only seeds were focused.

Table 2: *Assessment of carbohydrate content in camel browse vegetations from Thatta District.*

Camel browse vegetations	Carbohydrate		
	Nitrogen free extract (%)	Crude fiber (%)	Total (%)
Acacia nilotica	54.23[c]	24.35[d]	78.58[a]
Trifolium alexandrinum	48.97[d]	21.95[h]	70.92[c]
Ziziphus nummularia	46.95[e]	23.15[f]	70.10[d]
Prosopis juliflora	54.14[c]	22.65[g]	76.79[b]
Cordia sinensis (Linn.)	37.62[h]	22.85[fg]	60.47[g]
Alhagi maurorum	58.63[a]	19.85[j]	78.48[a]
Salvadora oleiodes	23.36[i]	23.80[e]	47.16[h]
Capparis deciduas	41.50[g]	26.65[b]	68.15[e]
Suaeda fruticosa	37.39[h]	26.55[b]	63.94[f]
Tamarix orientalis	45.56[f]	25.95[c]	71.51[c]
Tamarix gallica	55.37[b]	21.20[i]	76.57[b]
Zea mays	46.99[e]	29.45[a]	76.44[b]
LSD (0.05)	0.9292	0.3502	0.807
SE±	0.4265	0.1607	0.3704

LSD (0.05): 0.2950; SE± 0.1354.

Conclusions and Recommendations

Study concludes that the prominent impact of location was noted on most of the nutrients of different vegetations. For instance, negative effect on the moisture content and positive on the dry matter was noted. No considerable influence of location appeared on nitrogen free extract and total carbohydrate contents but on crude fiber concentration prominent influence appeared.

Authors Contribution

Asad Ali Khaskheli: Wrote abstract, methodology, results and discussion.
Gulfam Ali Mughal: Conceived the idea.
Gul Bahar Khaskheli: Data entry in SPSS and analysis.
Allah Jurio Khaskheli: Overall management of the article.
Arshad Ali Khaskheli: Data collection and write-up of conclusion.
Abdul Samad Magsi: Provided technical Input at every step.
Ghulam Shabir Barham: Helped in write-up of introduction.
Arab Khan Lund: Did SPSS analysis and also supported in overall formatting of manuscript.
Maqbool Ahmed Jamali: Helped in References.

References

Abdullah, M., M. Rafay, N. Sial, F. Rasheed, M.F. Nawaz, W. Nouman, I. Ahmad, T. Ruby and S. Khalil. 2017. Determination of forage productivity, carrying capacity and palatability of browse vegetation in arid rangelands of Cholistan desert (Pakistan). Appl. Ecol. Environ. Res. 15(4): 623-637. https://doi.org/10.15666/aeer/1504_623637

Abdulrazak, S.A., E.A. Orden, T. Ichinohe and T. Fujihara. 2001. Chemical composition, phenolic concentration and in vitro gas production characteristics of selected Acacia fruits and leaves. Asian Aust. J. Anim. Sci. 13(7): 935-940. https://doi.org/10.5713/ajas.2000.934

Ahmad, S., M. Yaqoob, N. Hashmi, M. Zaman and M. Tariq. 2009. Economic importance of camel: Unique alternative under crisis. Pak. Vet. J. 30(4): 191-197.

Ahmad, S., M. Yaqoob, N. Hashmi, M. Zaman and M. Tariq. 2010. Economic importance of camel: Unique alternative under crisis. Pak. Vet. J. 30(4): 191–197.

Ali, H.A.M., A. B. O. Ismail, M. Fatur, F. A. Ahmed, and M. E. E. Ahmed. 2011. Nutritional Evaluation and Palatability of Major Range Forbs from South Darfur, Sudan. Open J. Anim. Sci. 6(1): 42.

Amin, A.S., K.A. Abdoun and A.M. Abdelatif. 2011. Observations on the seasonal browsing and grazing behaviour of camels (Camelus dromedarius) in southern Darfur-Sudan. Res. Opin. Anim Vet. Sci. 1(4): 213-216.

Anonymous. 2016. Economic survey. Govt. of Pakistan. Ministry of Finance, Islamabad.

Ashraf, M.A., M. Karamat, A. Wajid, A.K. Qureshi and M. Gharibreza. 2013. Chemical constituents of Haloxylon salicornicum plant from Cholistan desert, Bahawalpur, Pakistan. J. Food Agric. Environ. 11(3-4): 1176-1182.

A.O.A.C. 2000. Official methods of analysis. Association of Official Analytical Chemists International. Maryland, USA.

Bwai, M.D., D. Uzama, S. Abubakar, O.O. Olajide, P.P. Ikokoh and J. Magu. 2015. Proximate, elemental, phytochemical and anti-fungal analysis of Acacia nilotica fruit. Pharm. Biol. Eval. 2(3): 52-59.

Chandra, J. and M.C. Mali. 2014. Nutritional evaluation of top five fodder tree leaves of mimosaceae family of arid region of Rajasthan. Int. J. Inn. Res. Rev. 2(1): 14-16.

Chiofalo, B., V.L. Presti, A.D. Agata, R. Rao, G. Ceravolo and F. Gresta. 2018. Qualitative profile of degummed guar (Cyamopsis tetragonoloba L.) seeds grown in a Mediterranean area for use as animal feed. J. Anim. Phys. Anim. Nutr. 102(1): 260-267. https://doi.org/10.1111/jpn.12687

Dokata, M.D. 2014. Factors influencing camel milk production in central division of Isiolo District: A case of three camel milk women self-help groups in Isiolo County, Kenya, MA dissertation. Kenya: Univ. Nairobi.

Economic survey of Pakistan., 2015-2016. Economic advisor's wing, finance division, GoP. Islamabad, Pakistan.

El-Amier, Y.A and T.J. Abdullah. 2015. Evaluation of nutritional value for four kinds of wild plants in Northern sector of Nile Delta, Egypt. Open J. Appl. Sci. 5(7): 393-402. https://doi.org/10.4236/ojapps.2015.57039

Farooq, M.U., R.U.K. Marwat, I.A. Qamar, S. Ahmad, A. Razaq and U.A. Tiwana. 2018. Seasonal variation in nutritional characteristics of forage species in Rakh Choti Dalana in District Dera Ghazi Khan "Pakistan. Basic Res. J. Agri. Sci. Rev. 6(3):21-26.

Gull, T., Z. Mahmood, F. Anwar, B. Sultana, W. Nouman, S.A. Shahid and M.Z. Iqbal. 2015. Variation of proximate composition and minerals within different parts of Capparis decidua (Forssk.) Edgew. as a function of harvesting seasons. Pak. J. Bot. 47(5): 1743-1748.

Heuzé, V., H. Thiollet, G. Tran, P. Hassoun, D. Bastianelli and F. Lebas. 2016. Gum arabic tree (Acacia senegal). Feedipedia, a programme by INRA, CIRAD, AFZ and FAO. http://www.feedipedia.org/node/342. Retrived on July 4, 2018, 17:00.

Iqbal, A and B. B. Khan. 2001. Feeding behavior of camel. Pak. J. Agri. Sci. 38: 58-63.

Kathirvel, P. and P. Kumudha. 2011. Chemical composition of prosopis juliflora (SW.) DC (mosquito bean). Int. J. Appl. Biol. Pharmaceut. Technol. 2(4): 5-14.

Khanum, S.A., T. Yaqoob, S. Sadaf, M. Hussain, M.A. Jabbar, H.N. Hussain, R. Kausar and S. Rehman. 2007. Nutritional evaluation of various feedstuffs for livestock production using in vitro gas method. Pak. Vet. J. 27 (3): 129-133.

Majeed, A., M. Azam and D.A. Mumtaz. 2002. Drought and water management strategies in Pakistan. Proceedings of SAARC workshop on drought and water management strategies. Pak. Council Res. Water Res. Islamabad, Pak.

Mabrouk, H., E. Hilmi, and M. Abdullah. 2008. Nutritional value of Prosopis juliflora pods in feeding nile tilapia (Oreochromis niloticus) fries. Arab Gulf J. Scientific Res. 26(1-2): 49-62.

Malik, N.S. and K. Nath. 1970. Chemical composition and nutritive value of green pala (Ziziphus nummularia) leaves. Ind. J. Anim. Sci. 40: 41-45.

Manzoor, M., J. Sultan, M. Nisa and M. Bilal. 2013. Nutritive evaluation and in-situ digestibility of irrigated grass. J. Anim. plant Sci. 23(5): 1223-1227.

Mohsen, M.K., G.S. El-Santiel, H.M.A. Gaafar, H.M. El-Gendy and E.A. El-Beltagi. 2011. Nutritional evaluation of berseem. 2. Effect of nitrogen fertilizer on berseem fed as silage to goats. Arch. Zootech. 14(3): 21-31.

Murray, S.S., M.J. Schoeninger, H.T. Bunn, T.R. Pickering and J.A. Marlett. 2000. Nutritional composition of some wild plant foods and honey used by Hadza foragers of Tanzania. J. Food Comp. Anal. 14(1): 3-13. https://doi.org/10.1006/jfca.2000.0960

Nasrullah, M.N., R. Akashi and O. Kawamura. 2003. Nutritive evaluation of forage plants grown in South Sulawesi, Indonesia. Asian Aust J. Anim. Sci. 16(5): 693-701. https://doi.org/10.5713/ajas.2003.693

Rasool, F., Z. H. Khan, M. Ishaque, Z. Hussain, K. M. Khalid, M. S. Saleem, M. Farooq, and M. Bashair. 2014. Assessment of nutritional status in selected indigenous and exotic rangeland grasses. World Appl. Sci. J. 21(5): 795-801.

Rasool, F., M.Ishaque, S. Yaqoob and A. Tanveer. 2017. Chemical composition and ethnobotanical uses of Acacia jacquemontii Benth. in the Thal desert in Pakistan. Bois et Forêts des Tropiques. 331: 1-10.

Rathore, M. 2009. Nutrient content of important fruit trees from arid zone of Rajasthan. J. Hort. For. 1(7): 103-108.

Rifat, U.K.M., M.U. Farooq, I.A. Qamar, S. Ahmad, A. Razaq and U.A. Tiwana. 2018. Seasonal variation in nutritional characteristics of forage species in rakh choti dalana in District Dera Ghazi Khan Pakistan. Basic Res. J. Agric. Sci. Rev. 6(3): 21-26.

Samreen, U., M. Ibrar, L. Badshah and B. Ullah. 2016. Nutritional and elemental analysis of some selected fodder plants of Darazinda FRDI Khan, Pak. Adv. Plant. Agric. Res. 4(1): 00127.

Schawn, H.J. 2001. The biology of the camel. The One-humped camel in eastern Africa, Weikersheim, Verlag Josef Margraf: 10-29.

Towhidi, A. and M. Zhandi. 2007. Chemical composition, in vitro digestibility and palatability of nine plant species for dromedary camels in the province of Semnan, Iran. Egypt. J. Biol. 9(1): 47-52. https://doi.org/10.1017/S1752756200021360

Towhidi, A. 2009. Nutritive value of some herbages for dromedary camel in Iran. Pak. J. Biol. Sci. 10(1):167-170.

Ullah, Z., M.K. Baloch, J.A. Khader, I.B. Baloch, R. Ullah, M.N. AbdEIslam and S. Noor. 2013. Proximate and nutrient analysis of selected medicinal plants of Tank and South Waziristan area of Pakistan. Afr. J. Pharm. Pharmacol. 7(5): 179-184. https://doi.org/10.5897/AJPP12.766