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Range vegetation analysis of Kherimurat Scrub Forest, Pakistan

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Abstract

Vegetation analysis is an important tool for field foresters as well as field ecologists and has many uses in range management and comparative studies. Quantitative vegetation assessment of Kherimurat Scrub Forest, Pakistan was an attempt to highlight the vegetation structure and composition during the spring and summer season. In total eight blocks two distinct range sites (Relatively Flat and Gentle Slope) were selected for the collection of data and line transect method was used after a reconnaissance survey. Total 42 species were recorded from entire scrub forest in two seasons (spring and summer), comprising of 17 grasses, 6 shrubs, 11 herbs and 8 trees. Vegetation parameters like density cover percentage, composition and frequency, importance value and tree volume was conducted during two consecutive seasons in scrub forest. For two seasons Overall, average herbaceous cover was 18.10 %. During summer season highest grass cover (19.75 %) was recorded as compared to the spring season (16.45%). Average vegetation cover provided by trees and shrubs component was 27.38% and density of 1718 trees/shrubs ha^{-1}. The average diameter and height of trees in Kherimurat range was 10.83 cm and 3.01m respectively with 1.39cft average volume.

Keywords: Herbaceous Cover; Vegetation Parameters; Composition and Frequency

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1. Introduction

Rangelands are those areas of the world having little with irregular precipitation and topography, high temperatures, poor drainage and are unsuitable for cultivation, mostly are the source of fodder for domestic and range animals also are the source of wood products, water and wildlife (Miller, 1997). The increasing human population particularly in last few decades demand development in various spheres of life which has put enormous and often far reaching pressure on natural ecosystem. The expansion of large urban area, constructing of roads, dams and encroachment of agriculture into forest areas are examples of direct onslaughts on nature resources which have steadily depleted natural resources. The plant populations have lost their species abundance at high rate due to illegal felling (Johnson et al., 1993) and exerting more pressure on rangeland for grazing of animals (Peet et al., 1983).

Pakistan has five significant mountain systems, i.e. Western Himalayas, Karakoram, Hindukush, Suleiman and Khirthar range. Biodiversity in Pakistan is rich covering of dissimilar climatic zones with a variety of plant species. About 6000 plant species which have medical or commercial significance are found in Pakistan (Steward et al., 1972). Various works described vegetation of different parts in northern area like Ahmed and Qadir (1976), Ahmed (1976) and Ahmed (1988). In Balochistan Province (Rafi, 1965) presented similar studies and Hussain (1984) described vegetation of Karachi. Chaudhri (1960) described vegetation of Kaghan valley. Ayub National Park and Wah Garden vegetation was described by Hussain (1969). A lot of researchers studied different vegetation on the basis of different ecological zones of Pakistan. In Pakistan mostly workers have studied the vegetation of Himalayan forests in dissimilar climatic regions. Like (Durrani and Hussain, 2005) presented comprehensive work on ecology and vegetation types for lesser Himalayan Pakistan followed by Ahmed et al. (2006) and Siddiqui et al. (2009) in Hindu kush. To determine the most effective parameters liable in the dispersal of vegetation types in rangelands of the Cholistan desert combining with soil characteristics were conducted by Arshad et al. (2008).

Apart from these efforts on aforesaid studies by individuals in different areas of Pakistan, little attention is paid to describe the vegetation of area under Pothwar Plateau in Pakistan. However this area was described as sub-tropical broad leaved evergreen forest by Hussain and Ilahi (1991). Ecological Assessment of Production Potential for Rangeland Vegetation in Southern Attock was conducted by Ahmed et al. (2006). Vegetation study of compartment No. 66 Pabbi Rasul Reserved Forest Rangeland Sub-Division Kharian was conducted by Ullah et al. (2007). Forage production on Mari reserve forest of Pothwar tract was calculated by Chaudhry et al. (2010). A phytosociological study of sub-tropical sub-humid Nurpur rangelands and Dhrabi watershed district Chakwal was conducted by Hussain et al. (2009) and Sana-ul-Haq et al. (2011), respectively. Pothwar Plateau comprises of Rawalpindi, Chakwal, Attock and Jehlum districts of Punjab covering an area of more than one million hectare. It contributes significantly to agricultural and livestock production of Pakistan because of rain fed tract (Supple, 1985). In Pothwar region very few studies have been conducted to highlight the vegetation structure and composition.

This study in Kherimurat Scrub Forest was an attempt to calculate the seasonal variation in vegetation parameters and to document area for future management.

2. Material and methods

2.1. Description of study area

The present study was conducted during the spring and summer season at Kherimurat scrub Forest. Geographically it is situated 33° North at latitude and 72° East at longitude. Climatically the study area falls in subtropical sub humid regions of Pothwar. The forest is also known as Kahu Phulai Forest. It extends over an area of 12,253 acres consisting of longitudinal mountainous stretch of land. The area is 29 km long and 2-4 km wide. The height of the area varies from 596-946 meters from the sea level. The annual rainfall is about 750 to 875 mm. In this tract summer (monsoon) receives more than 70% of precipitation while shortage of livestock forages occurs during spring and winter season (Qamar and Arshad, 2002).

2.2. Selection of site and vegetation analysis

Two distinct range sites were selected for the collection of data after a reconnaissance survey and study of site maps. These sites (slope and flat areas) represented the whole stand of Kherimurat Scrub Forest like valleys, sloping areas, nullahs/channel beds, etc. The whole Kherimurat range has been divided into 18 blocks. However eight blocks numbering 1, 3, 4, 7, 10, 14, 15, 18 were selected for the present study because rest of the 10 blocks are no more under the control of Barani Livestock Production Research Institute (BLPRI), Kherimurat.

2.3. Collection of data

For all eight blocks two range sites were selected in every block i.e. relatively flat and gentle to moderate slope area. In each range site two sample plots of 1 ha area was earmarked randomly and transect of 100 m length was laid in the center of each sample plot and then 10 quadrats (Kent and Coker, 1992) of size 1x1 meter for grasses and herbs were studied for various vegetation parameters on the alternate sides of the transect at every 10 meter interval of the length of the transect. For trees/shrubs 10x10 m plot at every 30th meter of each line transect was taken for the desired parameters. Trees/shrubs of each plot were marked with waterproof paint to identify them for collection of data for next season. Similar operation was repeated for every block. The vegetation was sampled during spring and summer season (Moonsoon). Hence the data for two seasons was collected.

2.4. Measuring vegetation cover and composition

Transect method was used for measurement of vegetation cover, composition, frequency, relative cover, relative frequency and relative density using equations given by Shaukat et al. (1976) and Kim and Keith (1983).

$$\text{Percent cover} = \frac{\text{Sum of intercepts by a species on all the transects}}{\text{Total length of all the transects}} \times 100$$

$$\text{Percent composition} = \frac{\text{Sum of intercepts by a species on all the transects}}{\text{Sum of intercepts by different species on all the transects}} \times 100$$

2.5. Measuring density

It relates with the number of plants rooted with in each quadrat, the sum of the individual per species was calculated for the total area sampled by the quadrat method.

$$\text{Density} = \frac{\text{Number of individual of species in all quadrats}}{\text{Total area sampled}} \times 100$$

2.6. Measuring frequency

It relates to percentage of total quadrats that contain at least one rooted individual of species.

$$\text{Frequency (\%)} = \frac{\text{Number of quadrates in which a species occurred}}{\text{Total number of quadrates sampled}} \times 100$$

2.7. Measuring relative density

It shows the ratio of total individual of a species to the total individual of all species.

$$\text{Relative density} = \frac{\text{Total individual of a species}}{\text{Total individual of all species}} \times 100$$

2.8. Relative frequency

It shows the ratio of frequency of a species to the total frequency value of all species.

$$\text{Relative frequency} = \frac{\text{Frequency of a species}}{\text{Total frequency value of all species}} \times 100$$

2.9. Measuring relative cover

It shows the ratio between total intercept lengths of a species to the Total intercepts length of all species.

$$\text{Relative cover} = \frac{\text{Total intercept length of a specie}}{\text{Total intercepts length of all species}} \times 100$$

2.10. Measuring importance value

It was determined from the formula given by (Barbour et al., 1980).

Importance value = (Relative cover + Relative frequency + Relative density)

On the basis of importance value sampled vegetation was delineated into different plant communities. The community within each stand was named as the species having highest importance value irrespective of its habitat. When two or more species approach each other's in order of importance value then the communities share the names of these dominants. The name of the species with highest importance value will appear first followed by other dominant species.

2.11. Measuring tree growth parameters

Besides collecting data on cover, density and frequency parameters of trees; tree height and tree diameter was measured from trees occurring inside the 10x10 m quadrats. Tree height was measured by using the measuring rods while the diameter was measured by using the diameter tapes at breast height. Tree volume of different species was calculated by using the following formula:

$$\text{Volume} = \frac{3.14\, d^2}{4} \times \text{length}$$

3. Results and discussions

3.1. Vegetation type

Total 42 species were recorded from entire scrub forest in two seasons (spring and summer), comprising of 17 grasses, 6 shrubs, 11 herbs and 8 trees. In spring season total 32 plant species were present comprising of 12 grasses, 5 shrubs, 7 herbs and 8 trees while in summer season(monsoon) even greater number of plants were prominent making a total of species comprising of 17 grasses, 6 shrubs, 10 herbs and 9 trees. Detail of species is given in table 1.

3.2. Measurement of vegetation cover

Average ground cover (herbaceous) for two seasons Spring and summer was measured using transect method, In each range site (relatively flat and gentle slope) two sample plots of 1 ha area was earmarked randomly and transect of 100 m length was laid in the center of each sample plot and then 10 quadrats (Kent and Coker, 1992) of size 1x1 meter for grasses and herbs were studied on the alternate sides of the transect at every 10 meter interval of the length of the transect.

Table1. List of natural vegetation found in Kherimurat Scrub Forest

S.NO.	Botanical name	Local name	Life form
1	Hetropogon contortus	Sariala	Grass
2	Cymbopogon distance	Sufaid	Grass
3	Cynodon dactylon	Khabbal	Grass
4	Desmostachya bipinnata	Dab grass	Grass
5	Cymbopogon jawarancusa	Ithavi	Grass
6	Dactyloctenium aegyptium	Madhana	Grass
7	Cenchrus ciliaris	Dhaman	Grass
8	Eulaliopsis binnata	Babbur	Grass
9	Saccharum bengalensis	Saroot	Grass
10	Saccharum grifithii	Kai	Grass
11	Digitaria bicornus	Pharyun	Grass
12	Cyperus rotundus	Deela	Grass
13	Echinochloa colonum	Swank	Grass
14	Sorghum halepense	Baru	Grass
15	Unidentified	Dhamiya	Grass
16	Bothriochloa pertusa	Palwan	Grass
17	Themeda anathera	Loondar	Grass
18	Zizyphus nummularia	Melah/Jangli ber	Shrub
19	Dodonea viscosa	Snatha	Shrub
20	Calotropis procera	Ak	Shrub
21	Lycium edgeworthii	Kanderi	Shrub
22	Grewia villosa/ opitva	Dhaman	Shrub
23	Adhatoda vasica	Bhaikar	Shrub
24	Cannabis sativa	Bhang	Herb
25	Trianthema portulacastrum	It sit	Herb
26	Tribulus terrestris	Bakhara	Herb
27	Unidentified	Loondari booti	Herb
28	Unidentified	Sawa lana	Herb
29	Unidentified	Chitta lana	Herb
30	Mentha royleeana	Jangali podena	Herb
31	Solanum surattense	Kandiari	Herb
32	Unidentified	Khor sumbi	Herb
33	Unidentified	Gilao	Herb
34	Dalbergia sissoo	Shisham	Tree
35	Olea ferruginea	Kaho	Tree
36	Acacia modesta	Phulai	Tree
37	Acacia nilotica	Kikar	Tree
38	Ficus religiosa	Peepal	Tree
39	Boehenia variegata	Kachnar	Tree
40	Prosopis juliflora	Mesquite	Tree
41	Prunus serotina	Kukair/cherry	Tree

Average ground cover (herbaceous) for both the season spring and summer was 18.10%. When the below ground cover of two seasons was compared, higher cover percentage was recorded in summer season (19.75 %) as compared to the spring season (16.45%). High cover in summer season was because the sampling was done in August where the effect of monsoon rain was considered. There was comparatively low vegetation cover present in the flat area 16.91% while 19.29% in gentle slope sites. We suggest it may be because of more grazing pressure on the flat areas, because Barani livestock production research institute is huge livestock farm in Pakistan and this range supports millions of livestocks. Less cover percentage in the flat areas within the compartments indicates grazing pressure in the flat areas because animals requires less energy to graze in the flat areas while in slopes the good cover shows lesser grazing pressure and better management comparatively to the flat site. Grazing animals prefer to graze on flat sites because it's difficult to maintain their energy balance during walking on slopes. The blocks near the administrative building showed highest percent cover because of better management by the forest department. The main contributor grass species were *Cymbopogon distance*, *Hetropogon contortus* and *Cynodon dactylon*.

Woody vegetation cover was determined for each tree encountered in 100 m^2 (10x10 m) plot taken at 30th m of each line transect by measuring diameter of tree crown. Average vegetation cover provided by trees and shrubs component was 27.38%. When the above ground cover of two seasons was compared, higher cover percentage was recorded in summer season (28.21%) as compared to the spring season (26.55%). High above ground cover percentage was because of the monsoon rains in summer season and also the proper management of the BLPRI administration. Low woody vegetation cover was observed in relatively flat areas; 26.11% as compared to relatively slope area; 28.66%. BLPRI is surrounded by small towns with no supply of gas looping of branches is common to meet the fuel requirement despite of strict protection by the management. The main contributor trees/shrubs species in cover %age were *Olea ferruginea, Acacia modesta and Dodonea viscose.* Table 2 shows the comparison of average herbaceous and above ground cover for relatively flat and gentle slope sites across all eight compartments with two distinct range sites in spring and summer season.

3.3. Measurement of vegetation density

Using transect of 100 m length with 10 quadrats the average vegetation density (Herbaceous) for the both season was 32 plants m^{-2}. When the herbaceous density for the two seasons was compared, result showed a little difference in number of plants per unit area. In the spring season herbaceous density was 31 plants m^{-2} while in summer it was 33 plants m^{-2}. The main contributor grass species in density were *Hetropogon contortus, Cynodon dactylon and Cymbopogon distance.* Slightly low grasses density was recorded in the relatively flat site (30 m^{-2}) as compared to gentle slope (34 m^{-2}). Overall there was not much different in density per unit area in both seasons. Because the different blocks of BLPRI are used for grazing purpose according to the conditions of the range. But those blocks which were present on higher elevation and far location showed better density in both the seasons. Woody vegetation density was determined for each tree encountered in 100 m^2 (10x10 m) after the interval of 30th m of each line.

Table 2. Site wise Herbaceous and Tress/Shrubs cover percentage for spring and summer season in all Blocks of Kherimurat Scrub Forest

Blocks	Spring						Summer					
	Flat Area		Slope Area		Sitewise Mean		Flat Area		Slope Area		Sitewise Mean	
	Grasses	Trees	Grasses	Trees	Grasses	Trees	Grasses	Trees	Grasses	Trees	Grasses	Trees
1	15.48	22.53	21.82	29.15	**18.65**	**25.84**	20.22	*24.29*	24.80	33.53	**22.51**	**28.91**
3	11.92	27.21	13.55	25.17	**12.74**	**26.19**	17.37	30.83	17.14	26.71	**17.26**	**28.77**
4	12.83	28.88	13.82	27.85	**13.33**	**28.37**	18.69	32.11	17.69	31.79	**18.19**	**31.95**
7	14.54	26.65	14.16	28.92	**14.35**	**27.79**	15.09	27.30	22.41	30.43	**18.75**	**28.87**
10	14.42	35.13	20.14	33.63	**17.28**	**34.38**	15.20	36.20	22.52	31.58	**18.86**	**33.89**
14	23.33	25.95	23.39	29.66	**23.36**	**27.81**	28.88	26.70	24.65	28.70	**26.77**	**27.70**
15	23.20	26.64	24.29	34.81	**23.75**	**30.73**	20.44	31.62	28.08	35.51	**24.26**	**33.57**
18	8.05	7.66	8.26	15.03	**8.16**	**11.35**	10.94	7.98	11.93	16.03	**11.44**	**12.01**
Mean	**15.47**	**25.08**	**17.43**	**28.03**	**16.45**	**26.55**	**18.35**	**27.13**	**21.15**	**29.29**	**19.75**	**28.21**
Season wise Herbaceous			**Flat= 16.91%**		**G Slope= 19.29%**		Mean= 18.10%					
Season wise Tree/Shrubs			**Flat= 26.11%**		**G Slope= 28.66%**		Mean= 27.38%					

Average vegetation density for both the season in two distinct range sites in terms of trees and shrubs component in BLPRI Kherimurat range was 1718 trees/shrubs ha^{-1}. When the average woody vegetation density (trees/shrubs) of two different seasons was compared then it was observed more trees/shrubs density (1745 trees/shrubs ha^{-1}) was found in summer season and lesser in spring season (1691 trees/shrubs ha^{-1}). There was certain increase in density of *Adhatoda vasica* in summer season because of fresh sprouting after the monsoon rains. Low woody vegetation density was recorded in the relatively flat site (1652 trees/shrubs ha^{-1}) as compared to gentle slope (1785 trees/shrubs ha^{-1}). Table 3 shows the comparison of average herbaceous and trees/shrubs density for relatively flat and gentle slope sites across all eight compartments with two distinct range sites in spring and summer season. Similar results were conducted by Sana-ul-Haq et

al. (2011). Because of more grazing pressure and deforestation on flat sites indicated by less cover and density. Mostly difference in the distinct range sites was because of the human interference. Though for attainment of our primary study objective; seasonal variation in the study area has provided data and on the basis of these facts and figures the forest department can manage these Rangelands according to their potential by introducing improved grazing management systems.

Table 3. Site wise herbaceous density/m^2 and trees/season in all blocks of Kherimurat scrub forest

Blocks	Spring						Summer					
	Flat Area		Slope Area		Mean		Flat Area		Slope Area		Mean	
	Grasses	Trees	Grasses	Trees	Grasses	Trees	Grasses	Trees	Grasses	Trees	Grasses	Trees
1	45	1833	43	2233	**44**	**2033**	45	1733	50	2500	**48**	**2117**
3	21	1600	27	1633	**24**	**1617**	27	1866	29	1633	**28**	**1750**
4	*21*	2033	*38*	1866	**30**	**1950**	28	2166	39	1866	**34**	**2016**
7	18	1700	40	1933	**29**	**1817**	18	1733	44	1800	**31**	**1767**
10	19	1733	25	1566	**22**	**1650**	18	1933	34	1633	**26**	**1783**
14	45	1933	38	1833	**42**	**1883**	49	1966	42	1900	**46**	**1933**
15	46	1766	23	2100	**35**	**1933**	39	1733	31	2166	**35**	**1950**
18	18	333	22	966	**20**	**650**	12	366	26	933	**19**	**650**
Mean	**29**	**1616**	**32**	**1766**	**31**	**1691**	**30**	**1687**	**37**	**1804**	**33**	**1745**
Season wise Herbaceous			**Flat= 30**		**G Slope= 34**		Mean= 32					
Season wise Tree/Shrubs			**Flat= 1652**		**G Slope= 1785**		Mean= 1718					

3.4. Measurement of vegetation composition and frequency percentage

Main contributing species among trees was *Olea ferruginea* (kahu) which was found in all eight blocks. Highest contribution in species composition was presented by *Olea ferruginea* (kahu) with composition of 75.95% and frequency of 62.54% followed by *Acacia modesta* (Phulai) with composition of 21.17% and frequency of

55.25% (Fig 1). More species diversity was found in those compartments which were situated in upper zone with a total 14 species of trees/shrubs while *Acacia nilotica* (Kikar) and *Prosopis juliflora* (Mesquite) were found in all compartments situated on the lower zones of BLPRI, Kherimurat. *Dodonea viscosa* (Snatha) and *Adhatoda vasica* (Bhaikar) was found almost in each compartment and each site accompanied with *Olea ferruginea* (kahu).

Similar study was conducted by (Zewdu and Oustalet, 2007) to characterize vegetation composition as well as to estimate biomass production in eastern Ethiopia. The palatable grasses, trees and shrubs decreased due to overgrazing, human exploitation resulting rangeland degradation. In grassy component *Heteropogon contortus* (Sariala grass) was the main contributor with composition percentage of 26.30 and frequency of 54.375% followed by *Cymbopogon distance* with composition percentage of 22.48 and frequency of 68.39% (Figure 1).

3.5. Importance value

Different plant communities of sampled vegetation are divided on the basis of importance values and species having highest importance value is named irrespective of its habit. From grasses and herbs the vegetation was dominated by *Cynodon dactylon* with maximum importance value 47.23 (Table 4) followed by *Cymbopogon distance* 34.41 and *Heteropogon contortus 33.59.* From trees and shrubs point of view the vegetation was dominated by *Olea ferruginea* associated with *Acacia modesta*, *Lycium edgeworthii* and *Adhatoda vasica* with importance value 83.66, 40.63, 36.88 and 32.95 respectively. Table 4 shows Importance value index of the main species of Kherimurat Scrub Forest.

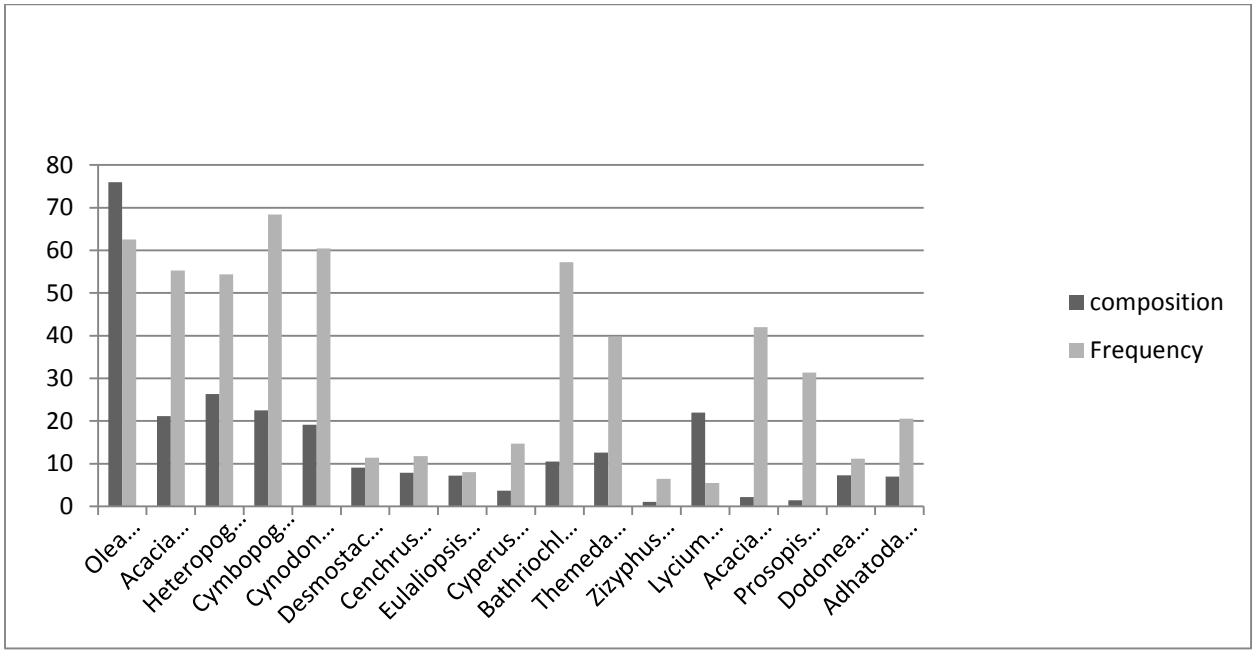

Figure 1. Composition and Frequency percentage

3.6. Tree growth parameters

Besides measuring the aforesaid parameters, tree growth was compared between the relatively flat and gentle slope for assessing the volume of the trees in the BLPRI Kherimurat scrub forest for better understanding and future management.

Table 4. Relative densities (RD), Relative frequency (RF) and Relative cover (RC) of main species

S. No.	Spp. name	RD	RF	RC	IV
1	Hetropogan contortus	12.04	7.23	14.31	33.59
2	Cymbopogon distance	13.65	8.59	12.18	34.41
3	Cynodon dactylon	26.07	8.63	12.53	47.23
4	Desmostachya bipinnata	2.52	1.57	5.51	9.6
5	Cenchrus ciliaris	3.76	1.82	4.61	10.19
6	Eulaliopsis binnata	2.02	1.25	5.65	8.91
7	Cyperus rotundus	2.83	2.07	2.94	7.84
8	Bathriochloa pertusa	8.93	6.88	6.19	22
9	Themeda anathera	3.88	4.75	4.66	13.3
10	Zizyphus nummularia	1.29	1.93	1.47	4.7
11	Dodonea viscosa	19.11	6.65	7.13	32.88
12	Lycium edgeworthii	10.98	9.69	16.2	36.88
13	Adhatoda vasica	19.74	6.07	7.13	32.95
14	Trianthema portulacastrum	3.35	2.91	3	9.26
15	Olea ferruginea	30.61	11.92	41.12	83.66
16	Acacia modesta	11.33	11.63	17.68	40.63
17	Acacia nilotica	1.05	1.11	1.42	3.58
18	Boehenia variegata	0.73	1.66	1.28	3.67
19	Prosopis juliflora	0.91	0.84	1.04	2.79
20	Prunus serotina	1.89	2.79	3.38	8.06

3.6.1. Tree height and diameter

The average tree height in BLPRI Kherimurat range was 3.01 m. Trees of more height (3.06 m) in gentle slope areas were found while trees in flat areas were shorter with average height of 2.97 m. It was measured at 1.37 meter above ground level in centimeters (cm) by using diameter tape. The average diameter of trees in BLPRI Kherimurat range was 10.83 cm. Trees present on flat areas had highest diameter of 11.24 cm while in gentle

slope areas the average diameter was 10.42 cm. The difference in distinct range sites was because of looping of branches by local people to meet the requirement of fuel and also the browsing by camels and goats.

3.6.2. Volume

Volume of trees was calculated by the following formula:

$$\text{Volume} = \frac{3.14\ d^2}{4} \times \text{length}$$

The total trees which were sampled in BLPRI Kherimurat range during spring and summer season were 132.

Total volume of these 132 trees = 183.48 cubic feet

Average volume of one tree = 1.39cft

4. Conclusions

Biodiversity is very important element for effective grazed Ecosystem. In productive rangelands Greases, Trees and shrubs are very crucial fragments (Sanderson et al., 2002). Community recognition heavily depends on the basis of variation in floristic and ecological characteristics, portion of these communities are visible in three seasons; winter, spring and summer as vegetation (Smitheman and Perry, 1990). For the efficient management of livestock grazing it's better to have understanding of seasonal variation in rangelands, though to encounter the study objective seasonal changes in various vegetation parameters in Kherimurat Scrub Forest, Pakistan, results obtained on the various vegetation parameter studied in this part of Pothwar tract like frequency, density, coverage, relative frequency, relative density, relative coverage and importance values respectively from two range sites (Relatively Flat and Gentle Slope) and our results are supported with the work of some former researchers like (Austin and Heyligers, 1989) who described vegetation communities of dissimilar areas of the world and the study of sub-tropical sub-humid Nurpur rangelands and Dhrabi watershed district Chakwal, Pakistan by (Hussain et al., 2009).

The results in the present research were also supported by the findings of (Sana-ul-Haq et al., 2011). Lan degradation either by animals as grazing or by humans as illegal felling of trees or shrubs creating hurdle against Range management. Based on the findings of the study, we recommend rangeland reseeding with controlled grazing for better management practice to improve forage production. For soil conservation and forest management its necessary to promote ethics that conservation and improvement of natural vegetation is critical. Illegal cutting of natural vegetation by the local communities should be stopped and alternate source of fuel should be provided. Education should be given to natives about the grazing system and importance of natural resources.

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