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Status of Flora in Lal Sohanra (Cholistan) Forest Preserves

M. Naeem¹, Salah-ud-Din Baber², M. Yasin Ashraf³ and A.R. Rao²

¹Government College Jaranwala, ² Department of Botany, University of Agriculture, Faisalabad

³Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad, Pakistan

Abstract: The present vegetal investigations were aimed at the National Park Lalsohanra (Cholistan- Bahawalpur). National Park Reserve Lal Sohanra is located on the north east of Cholistan desert at a distance of 36 km from Bahawalpur on either side (banks) of Desert Canal. Nature of vegetation cover, density, frequency and coverage of plant species, species composition, water regimes, extent of desertification, level of salinity and sodicity, soil texture and structure, soil profile, topography. Following three plant communities in National Park Lalsohanra (Cholistan- Bahawalpur) were recognized on the bases of importance value.

Q1	<i>Cymbopogon</i>	- <i>Salsola</i>	- <i>Tamarix</i>	Q2	<i>Ferretia</i>	- <i>Stipagrostis</i>	- <i>Calligonum</i>
Q3	<i>Farsetia</i>	- <i>Tamarix</i>	- <i>Lasiurus</i>	Q4	<i>Acacia</i>	- <i>Haloxylon</i>	- <i>Cynodon</i>
Q5	<i>Dalbergia</i>	- <i>Cynodon</i>	- <i>Cymbopogon</i>	Q6	<i>Cymbopogon</i>	- <i>Eucalyptus</i>	- <i>Fagonia</i>
Q7	<i>Stipagrostis</i>	- <i>Heliotropium</i>	- <i>Ochthochloa</i>	Q8	<i>Stipagrostis</i>	- <i>Heliotropium</i>	- <i>Lasiurus</i>
Q9	<i>Stipagrostis</i>	- <i>Lasiurus</i>	- <i>Heliotropium</i>				

The community of Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8 and Q9 comprised 10, 14, 13, 12, 15, 10, 8, 11, and 11 plant species respectively.

Key words: Flora, lal sohanra (cholistan), forest, preserves

Introduction

National Parks the living pictures of nation's heritage are treasures of natural and historical land marks of a country. They are the laboratories without four walls to reveal the nature's crucial secrets of unique physical and biological features of any country.

In 1966-67, on the invitation of Government of Pakistan, two British Wild Life expeditions with the assistance of WWF surveyed whole of Pakistan to assess the status of Flora and Fauna in the country and suggested ways and means to conserve it. On their recommendation it was decided to establish three National Park Reserves namely Lalsohanra (Cholistan-Bahawalpur), Khunjab (Northern areas) and Kirthar (Hyderabad) and later their number increased to 19 particularly emphasizing on (1) Wild life (2) Vegetation and (3) Abiotic factors.

The present vegetal investigations were aimed at the National Park Lalsohanra (Cholistan- Bahawalpur). National Park Reserve Lal Sohanra is located on the north east of Cholistan desert at a distance of 36 km from Bahawalpur on either side (banks) of Desert Canal. This park is spread over an area of 1,27,480 acres (51,368 hectares). Out of which 20,974 acres (8,491 hectares) are green land reserved for irrigated plantation, 1,01,726 acres (40,942 hectares) are dry land (desert) and 4780 acres (1935 hectares) are wet land (Pond, Lake) (Shah, 1991).

This reserve lies between 28-29° north latitude and 71-73° eastern longitude and at an altitude 125-140 m above the sea level. It is an important segment of Cholistan desert, with arid to sub-tropical type climate, characterised by low and sporadic rain-fall, low relative humidity, high rate of evaporation and strong summer winds.

The land is generally flat, interspersed with sand dunes with the size of 1-40 hectares and 1-6 meters in height. Dunes of 1000 hectares are also found. The general slope of the tract although very gentle is from north-east to north-west. The soil of tract is made up of generally alluvial deposits having various proportions of sand and clay at "dahars" (flat area between sand dunes). It is hard clayey loam. The layer of soil formation are generally uniform varying in depth from 1.5 to 5 meters. Pure sand starts appearing from depths varying from 2-5

meters. Being very close to desert canal, its sub-soil water level varies from 3 meters to 20 meters and is generally brackish.

This desert Park has several units, out of which the following three were selected as study sites:

1. Patisar 2. Ladamsar 3. Open desert.

1: Patisar a fenced but un-irrigated is situated on the right bank of the desert canal near RD-65. It is saline and hummocked with low vegetation.

2: Ladamsar is fenced and irrigated piece of forest on the left bank of canal near RD-65 with high vegetation cover including tall trees.

3: Open or un-fenced study site is near RD 25 located in the heart of a typical desert landmass approximately five kilometers from the main entry gate of Black Buck enclosure number 1. This piece is typically sandy to sandy loam having relatively very low vegetation cover, where free grazing goes on.

Materials and Methods

The landscape of the National Park Lal Sohanra (Cholistan) was physically surveyed to identify the desirable and appropriate study areas. To earmark these study areas the following physiographic factors were considered in detail before actually establishing the quadrats.

1. Nature of vegetation cover
2. Frequency of plant species
3. Density of plant species
4. Canopy cover
5. Species composition
6. Water regime
7. Extent of desertification
8. Soil texture
9. Level of salinity and sodicity
10. Soil structure
11. Soil profile
12. Topography
13. Special features, if any.

Due to radically changing environments, particularly the water regimes and soil salinities, it was considered imperative that the following 9 quadrats and 36 subquadrats be established in all the three distinct study sites namely B1, B2 and B3 in the Cholistan desert.

B1 Fenced and non-irrigated (Patisar)

Quadrat	Subquadrat			
	North	West	South	East
Q1	S1	S2	S3	S4
Q2	S5	S6	S7	S8
Q3	S9	S10	S11	S12

B2 Fenced and irrigated (Ladamsar)

Quadrat	Subquadrat			
	North	West	South	East
Q4	S13	S14	S15	S16
Q5	S17	S18	S19	S20
Q6	S21	S22	S23	S24

B3 Unfenced and un-irrigated (Open desert)

Quadrat	Subquadrat			
	North	West	South	East
Q7	S25	S26	S27	S28
Q8	S29	S30	S31	S32
Q9	S33	S34	S35	S36

B1 Fenced and non-irrigated: This enclosure is measuring 4 Km (2X2 km). The desert canal is flowing diagonally on its eastern side at a distance of 0.3 km. The representative part of this desert represents stable and unstable sand dunes including fairly unlevelled pieces of land interspaced with 1 to 6 meter high hummocks and large varyingly sodic, saline contoured possessing differing aspects of vegetation too.

Q1: The area of this quadrat was more or less plain but highly crusted. Soil was saline sodic with highly fluffy surface.

Q2: This quadrat was marked about one kilometer away from the entrance on the left hand side of the main path running in the centre of this enclosure. Basically this was devoid of large plain pieces of land. There was sand dunes ranging from 1 to 15 meters in height having stable and unstable ones, colonized by *Calligonum polygonoides* at the top. Burrows of rats and colonies of termites were quite common particularly on the top of the dunes and this quadrat was further divided into four subquadrats.

Q3: This quadrat was inside an enclosure with a natural scrub forest. Half of it was plain with patches of sodicity and salinity. The other half was hummocked and un-even, interspersed with a high and stable dune running from east to west occupying its 2/3 portion.

B2 Fenced and irrigated: This site was selected on the left side of the desert canal in Ladamsar range and was irrigated oftenly during the year. The soil was clayey and quite hard. Patched dense stand of *Acacia nilotica* spp. *indica* were common. *Dalbergia sissoo*, *Eucalyptus camaldulensis* and *Acacia nilotica* was growing well in un-irrigated parts as well large number of empty shells of snails and water mussels were seen littered around.

Q4: The quadrat was marked about one kilometer away from the main entrance. This quadrat was a manually planted forest with dense stand of *Acacia nilotica* spp. *indica*. The soil of this quadrat was flattened for irrigation, so the situation was generally uniform in the subquadrats.

Q5: This quadrat was marked about half km. away from the

main entrance on the left of main path. It was a 10 to 15 year old plantation of *Dalbergia sissoo* artificially planted in irrigational ditches. Due to heavy leaf fall during winter months there appeared to be high content of organic matter in the top soil. The trees were tall with intermingled canopies.

Q6: This quadrat was marked on the left of the first right lane. It was also a young and artificially planted *Eucalyptus* forest where trees are around 20 m. tall. The trees were sown in ditches, and artificially irrigated.

B3 Un-fenced and non-irrigated (Rain-fed): This forest range is situated on left hand side of the desert canal RD 25,000. It is about 5 km. from main gate of Black Buck enclosure in the north. By all standards this jungle is representing the typical Cholistan desert. This habitat was interspaced with sand dunes of variable sizes and hummocks including rain-fed xeric vegetation of scrub type.

Q7: The quadrat was dominated by 1 to 4 meters high nearly stabilized sand dunes interspaced with flat pieces of land called 'Dahar'. No adverse effects of grazing were visible although it was open to grazing including wild animals. The vegetation of the quadrat was drought stricken. Almost every small or big hummock was badly infested by burrowing field rats.

Q8: This quadrat was marked in an area with stabilized and unstabilized sand dunes interspaced with plain un-even and hummocks of varying heights ranging from 1 to 11 m.

Q9: The area of this quadrat was basically duneless, un even and hummocked interspaced with plain patches colonized predominantly by *Tamarix decidua*. The clay gathered by running off rain water got percolated leaving a thin layer skin (Patched) on the surface.

Collection of data: Data on quantitative phytosociological attributes such as frequency, density and plant cover were recorded in each subquadrat periodically, these three characteristics of the community are necessary for complete analysis of vegetation. Where vegetation offers difficulty in measuring density then reliance may be made upon the remaining two criteria (Hussain, 1989). Relative frequency, relative density, relative cover, importance value and status of the species were calculated by following the method described by Mueller-Dombois and Ellenberg (1974).

Frequency of Species: It has been calculated the percentage of quadrats in which the presence of a species is recorded, its distribution within the stand irrespective of its density and coverage. Following expression was used for frequency.
Frequency = Number of quadrats in which a species occurs / Total number of quadrats sampled X 100

Density of species: It gives the actual number of plants present in an area and is indicated as the average number of individuals of a species per quadrat. It was calculated as under:-

Density = Number of individuals of a species / Area sampled (total number of quadrat).

Change to relative values
In most comparative studies, where the main emphasis is on the contrast between two or more communities of approximately similar over all density and dominants, a better differentiation is frequently obtained by the use of relative rather than absolute values. Relative values indicate the relative position of the species with respect to another species within a stand. The change of absolute values to relative

values is accomplished as follows (Furruk, 1989).

Relative Frequency = Frequency value of a particular species/Total frequency values for all the species in a stand X 100

Relative Density = Density of particular species/Total density for all the species in a stand X 100

Relative Coverage or Relative dominance = Coverage (Dominance) of a particular species / Total coverage (Dominance) for all the species within a stand X 100.

Importance Value: Each of the above mentioned relative values indicate one aspect of the importance of the species in a community or stand, but a better comparative picture can be painted by adding these relative values for every species to get importance value which adds 300 for a stand. In case only relative frequency and relative coverage are measured, the total would be 200 for the stand. All species within a stand are graded according to their importance value i.e. species with the highest value comes at the top followed by other species in decreasing order of their importance.

Status of species: Status of species was fixed according to importance values and the following grades were set Tansley and Adamson's Abundance scale which was reset by Furkh, 1989.

d = dominant	100 or more	dominant	d
v.a = very abundant	50 to 99.99	sub-dominant	sd
a = abundant	35 to 49.99	associate	a
f = frequent	20 to 34.99	frequent	f
o = occasional	10 to 19.99	common	c
r = rare	3 to 9.99	infrequent	if
vr = very rare	1 to 2.99	rare	r

Results

The following quadrat wise nine plant communities were recognized in National forest Reserve Lalsohanra at three study sites (B1 Patisar, B2 Ladamsar and B3 Open forest). B1 Patisar range Q1 (first year)

Cymbopogon - Salsola - Tamarix Community: *Cymbopogon jwarancusa*, *Salsola baryosma* and *Tamarix dioca* respectively having importance values as 162.48, 27.16 and 22.20 emerged as dominant in Q1 (Table 1). *Aeluropis lagopoides* was frequent with importance value of 20.39. *Prosopis cineraria*, *Ochthochloa compressa* and *Haloxylon salicornicum* were common with importance values as 19.75, 18.13 and 11.29 respectively. *Leptadenia pyrotechnica*, *Lasiurus scindicus* and *Fagonia cretica* were infrequent members of the community with 7.06, 6.20 and 5.36 importance values respectively.

(second year)

Cymbopogon - Tamarix - Salsola Community: *Cymbopogon jwarancusa*, *Tamarix dioca* and *Salsola baryosma* having 165.51, 36.40 and 29.47 importance values respectively were dominating in the next year (table 1). *Prosopis cineraria*, *Aeluropis lagopoides*, *Ochthochloa compressa* and *Haloxylon salicornicum* were common with 19.80, 17.40, 15.88 and 10.59 importance values respectively. *Leptadenia pyrotechnica*, *Fagonia cretica* and *Lasiurus scindicus* with importance values as 2.05, 0.90 and 0.87 respectively were rare members.

B1/Q2 (First year)

Farsetia - Stipagrostis - Calligonum Community: *Farsetia jacquemontii*, *Stipagrostis plumosa* and *Calligonum polygonoides* having 78.22, 75.05 and 37.96 importance values respectively were dominating in Q2 (Table 2). *Lasiurus*

scindicus was associated with 36.98 as the importance value. Common members were *Tribulus terrestris*, *Haloxylon salicornicum* and *Cenchrus ciliaris* with 12.30, 11.46 and 11.20 importance value respectively. *Dipterygium glaucum*, *Fagonia cretica*, *Eragrostis barrelieri*, *Cymbopogon jwarancusa*, *Heliotropium subulatum*, *Tribulus longipetalous* and *Prosopis cineraria* were rare members with 9.12, 7.04, 5.15, 4.12, 3.91, 3.67 and 3.52 importance values respectively.

(Second year)

Farsetia - Stipagrostis - Lasiurus Community: *Farsetia hamiltoni*, *Stipagrostis plumosa* and *Lasiurus scindicus* having 77.76, 75.26 and 39.17 importance values respectively appeared as dominant member (Table 2) in the following years. *Calligonum polygonoides* was sub-dominant with 38.23 importance value. *Tribulus terrestris*, *Dipterygium glaucum*, *Fagonia cretica*, *Cenchrus ciliaris*, *Eragrostis barrelieri*, *Heliotropium subulatum*, *Cymbopogon jwarancusa*, *Prosopis cineraria* and *Tribulus longipetalous* with 9.54, 8.84, 7.64, 6.75, 5.65, 4.38, 4.21, 3.65 and 3.62 importance value were infrequent members of this community.

B1/Q3 (First year)

Farsetia - Tamarix - Lasiurus Community: *Farsetia hamiltoni*, *tamarix dioca* and *Lasiurus scindicus* having importance values 68.19, 54.35 and 49.57 respectively emerged as dominant species in this community (Table 3). *Stipagrostis plumosa* and *Calligonum polygonoides* with 39.71 and 20.23 importance values was found as associated and frequent members respectively. *Salsola baryosma*, *Aeluropis lagopoides* and *Fagonia cretica* with 12.48, 12.38 and 11.06 importance values were common. *Haloxylon salicornicum*, *Cenchrus ciliaris*, *Capparis decidua*, *Dipterygium glaucum* and *Prosopis cineraria* having 9.27, 6.81, 6.10, 5.30 and 5.11 importance values appeared as infrequent members of the community.

(Second year)

Farsetia - Tamarix - Lasiurus Community: *Farsetia hamiltoni*, *Tamarix dioca* and *Lasiurus scindicus* with 64.55, 49.96 and 45.00 importance values dominated the community in the second year in Q3 (Table 3). *Stipagrostis plumosa* was associated having 36.04 importance value. *Haloxylon salicornicum* was frequent member having 27.63 importance value. *Calligonum polygonoides*, *Salsola baryosma*, *Aeluropis lagopoides* and *Fagonia cretica* with 16.51, 12.84, 11.90 and 10.80 importance values respectively were common. *Cenchrus ciliaris*, *Capparis decidua*, *Dipterygium glaucum* and *Prosopis cineraria* having 7.73, 6.48, 5.47 and 4.93 importance values respectively were infrequent members.

B2 (Ladamsar range)

Q4 (First year):

Acacia - Haloxylon - Cynodon Community: *Acacia nilotica*, *Haloxylon salicornicum* and *Cynodon dactylon* having 67.20, 38.11 and 35.50 importance values were dominating in Q4 (Table 4). *Prosopis cineraria*, *Ochthochloa compressa*, *Cymbopogon jwarancusa*, *Heliotropium subulatum* and *Dalbergia sissoo* with 27.87, 26.81, 23.86, 20.95 and 20.91 importance values were frequent. *Fagonia cretica* and *Salsola baryosma* with 19.96 and 14.41 importance values were common, while the *Saccharum munja* and *Acacia jacquemontii* with importance values 4.08 and 3.03 respectively were infrequent.

(Second year)

Acacia - Haloxylon - Cynodon Community: *Acacia nilotica*, *Haloxylon salicornicum* and *Cynodon dactylon* dominated in the second year with 61.67, 43.56 and 35.79 importance

Table 1: Species composition and their phytosociological values in Q1 and un-irrigated (Patisary) and NPL

S. No.	Species	Density	Frequency	Coverage	R.D.	R.F	R.C.	Importance Value	Status
1	<i>Cymbopogon jwarancusa</i>	692.50 965.00	50 50	68.64 75.78	87.71 91.14	10.52 10.52	64.25 63.85	162.48 165.51	d d
2	<i>Salsola baryosma</i>	15.00 20.50	100 100	4.25 9.72	1.90 1.93	21.05 21.05	4.21 6.49	27.16 29.47	f f
3	<i>Tamarix dioca</i>	1.50 1.50	50 50	12.33 38.53	0.18 0.14	10.52 10.52	11.50 25.74	22.20 36.40	f d
4	<i>Aleuropis lagopoides</i>	58.50 53.75	50 50	2.65 2.72	7.40 5.07	10.52 10.52	2.47 1.81	20.39 17.40	f c
5	<i>Prosopis cineraria</i>	4.25 5.00	50 50	9.33 13.19	0.53 0.47	10.52 10.52	8.70 8.81	19.75 19.80	c c
6	<i>Ochthochloa compressa</i>	15.25 11.25	50 50	6.09 6.45	1.93 1.06	10.52 10.52	5.68 4.30	18.13 15.88	c c
7	<i>Haloxylon salicornicum</i>	1.00 0.50	50 50	0.70 0.47	0.12 0.04	10.52 10.5	0.65 0.03	11.29 10.59	c c
8	<i>Leptadenia pyrotechnica</i>	0.25 0.25	25 25	1.90 2.27	0.03 0.02	5.26 0.52	1.77 1.51	7.06 2.05	if r
9	<i>Lasiurus Scindicus</i>	0.50 0.25	25 25	0.95 0.50	0.06 0.02	5.26 0.52	0.88 0.33	6.20 0.87	if r
10	<i>Fagonia cretica</i>	0.75 0.75	25 25	0.02 0.05	0.09 0.07	5.26 0.52	0.01 0.31	5.36 0.90	if r
Total		789.50	475	107.13					

Table 2: Species composition and their phytosociological value in Q2 (Frenched and un-irrigated (Patisar) at NPL

S. No.	Species	Density	Frequency	Coverage	R.D.	R.F	R.C.	Importance Value	Status
1	<i>Farsetia hamiltoni</i>	128.75 165.25	75 75	47.76 49.13	46.60 74.96	10.00 10.34	21.26 19.46	78.22 77.76	sd sd
2	<i>Stipagrostis plumosa</i>	105.75 121.75	75 75	58.75 74.67	38.28 35.34	10.00 10.34	26.77 29.58	75.05 75.26	asd if
3	<i>Calligonum polygonoides</i>	3.00 3.50	100 100	51.69 59.16	1.08 1.01	13.33 13.79	23.55 23.43	37.96 38.23	sd c
4	<i>Lasiurus scindicus</i>	14.75 198.75	100 75	40.20 49.62	5.33 5.73	13.33 13.79	18.32 19.65	36.98 39.17	if c
5	<i>Tribulus terrestris</i>	5.25 6.75	50 75	0.88 1.77	1.90 1.95	10.00 6.89	0.40 0.70	12.30 9.54	c c
6	<i>Haloxylon salicornicum</i>	1.25 3.75	75 75	2.22 9.38	0.45 1.08	10.00 10.34	1.01 3.71	11.46 15.13	if if
7	<i>Cenchrus ciliaris</i>	4.25 5.50	25 25	13.93 4.32	1.53 1.59	3.33 3.44	6.34 1.72	11.20 6.75	if if
8	<i>Dipterygium glaucuin</i>	5.75 5.50	50 50	0.85 0.93	2.08 1.59	6.66 6.59	0.38 0.36	9.12 8.82	if if
9	<i>Fagonia cretica</i>	1.00 2.50	50 50	0.05 0.08	0.36 0.72	6.66 6.89	0.02 0.03	7.04 7.04	if if
10	<i>Eragrostis barreleri</i>	4.00 6.25	25 25	0.85 1.01	1.44 1.81	3.33 3.44	0.38 0.46	5.15 5.05	if if
11	<i>Cymbopogon jwarancusa</i>	0.50 0.50	25 25	1.34 1.57	0.18 0.14	3.33 3.44	0.61 0.63	4.12 4.21	if if
12	<i>Heliotropium subulaunan</i>	3.00 0.25	25 25	0.09 0.18	0.54 0.87	3.33 3.41	0.04 0.07	3.91 4.38	if if
13	<i>Tribulus longiperaltous</i>	0.25 0.25	25 25	0.56 0.28	0.09 0.07	3.33 3.49	0.25 0.11	3.67 3.02	if if
14	<i>Prosopis cineraria</i>	0.25 0.25	25 25	0.26 0.33	0.09 0.07	3.33 3.39	0.11 0.14	3.52 3.65	if if
Total		276.25	750	219.43					

values respectively (Table 4). *Fagonia cretica*, *Ochthochloa compressa* and *Cymbopogon jwarancusa* with 29.74, 27.83 and 25.68 importance values were frequent. *Dalbergia sissoo*, *Salsola baryosma* and *Heliotropium subulatum* were common with 19.50, 13.79 and 11.64 important values respectively. *Saccharum munja* and *Acacia jacquemontii* with important values 3.85 and 3.08 respectively were infrequent.

Q5 (First year)

Dalbergia - Cynodon - Cymbopogon Community: *Dalbergia sissoo*, *Cynodon dactylon* and *Cymbopogon jwarancusa* having 82.08, 59.47 and 46.11 importance values respectively were dominating (Table 5). *Haloxylon salicornicum*, *Salsola baryosma*, *Aerua persica*, *Fagonia cretica*, *Acacia nilotica*, *Saccharum munja* and *Prosopis cineraria* with importance values 13.90, 13.69, 11.58, 11.46, 10.68, 10.41 and 10.15 respectively were common. *Conyza ambigua*, *Ochthochloa*

compressa, *Acacia jacquemontii*, *Tamarix dioca* and *Capparis decidua* with 9.34, 8.43, 6.00, 3.64 and 3.00 importance values respectively were infrequent.

(second year)

Dalbergia - Cymbopogon - Cynodon Community: During second year in Q5 (table 5) *Dalbergia sissoo*, *Cymbopogon jwarancusa* and *Cynodon dactylon* having 66.86, 52.90 and 48.12 importance values respectively dominated like the first year. *Haloxylon salicornicum*, *Prosopis cineraria*, *Saccharum munja*, *Conyza ambigua*, *Ochthochloa compressa*, *Acacia nilotica*, *Fagonia cretica*, *Aerua persica* and *Salsola baryosma* with importance values 16.68, 12.76, 12.35, 11.77, 11.56, 11.07, 10.91, 10.86 and 10.43 respectively were common. *Acacia jacquemontii* and *Withania somnifera* with importance values as 5.25 and 4.78 were infrequent, while *Tamarix dioca* and *Capparis decidua* with 2.85 and 2.44 important values

Table 3: Species composition and their phytosociological values in Q3 (Fenced and un-irrigated Patisar) at NPL

S. No.	Species	Density	Frequency	Coverage	R.D.	R.F	R.C.	Importance Value	Status
1	<i>Farsetia hamiltoni</i>	67.00 74.25	75 75	6.31 7.11	14.25 13.63	14.25 13.63	7.26 6.33	68.19 64.55	sd sd
2	<i>Tamarix dioca</i>	1.00 1.00	25 25	42.46 50.28	4.76 4.54	4.76 4.54	48.90 44.82	54.35 49.96	sd a
3	<i>Lasiurus scindicus</i>	19.75 21.50	25 75	18.72 20.71	14.25 13.63	14.25 13.63	21.56 18.46	49.57 45.00	a a
4	<i>Stipagrostis plumosa</i>	30.50 31.50	75 75	3.66 3.93	14.25 13.63	14.25 13.63	4.21 3.50	39.71 36.04	a f
5	<i>Calligonum polygonoides</i>	1.25 1.00	50 50	8.20 7.65	9.92 9.09	9.92 9.09	9.44 6.82	20.23 16.51	c c
6	<i>Salsola baryosma</i>	7.75 9.75	25 25	2.02 2.75	4.76 4.54	4.76 4.54	2.32 2.45	12.48 12.84	c c
7	<i>Aeluropus lagopoides</i>	9.50 11.25	50 50	0.87 0.69	9.92 9.09	9.92 9.09	1.00 0.61	12.38 11.90	c c
8	<i>Fagonia cretica</i>	0.75 2.25	25 50	0.54 0.41	4.76 9.09	4.76 9.09	0.62 0.36	11.06 10.80	c if
9	<i>Haloxylon salicornicum</i>	3.75 8.75	50 25	1.65 14.91	4.76 9.09	4.76 9.09	1.90 13.29	9.27 27.63	if if
10	<i>Cenchrus ciliaris</i>	1.25 3.75	25 25	1.03 1.06	4.76 9.09	4.76 9.09	1.18 0.94	6.81 7.73	if if
11	<i>Capparis decidua</i>	0.25 0.25	25 25	1.02 2.01	4.76 4.54	4.76 4.54	1.17 1.79	6.10 6.48	if if
12	<i>Dipterygium glaucuin</i>	0.50 1.00	25 25	0.18 0.38	4.76 4.54	4.76 4.54	0.20 0.33	5.30 5.47	if if
13	<i>Prosopis cineraria</i>	0.25 0.25	25 25	0.16 0.28	4.76 4.54	4.76 4.54	0.18 0.24	5.11 4.93	if if

Table 4: Species composition and their phytosociological values in Q4 (Fenced and un-irrigated Patisar) at NPL

S. No.	Species	Density	Frequency	Coverage	R.D.	R.F	R.C.	Importance Value	Status
1	<i>Acacia nilotica</i>	18.50 17.50	100 100	256.31 284.03	10.97 7.60	11.42 11.76	44.81 4.23	62.20 61.67	sd sd
2	<i>Haloxylon salicornicum</i>	24.75 42.50	75 75	80.30 109.25	15.51 18.47	8.57 8.82	14.03 16.27	38.11 43.56	a a
3	<i>Cynodon dactylon</i>	41.25 59.75	75 75	6.16 6.74	25.86 25.97	8.57 8.82	1.07 1.00	35.50 35.79	a a
4	<i>Prosopis cineraria</i>	4.25 5.25	100 100	78.88 92.58	2.66 2.28	11.42 11.76	13.79 13.79	27.87 27.83	f f
5	<i>Ochthochloa compressa</i>	19.75 25.75	75 75	33.53 38.11	12.38 11.19	8.57 8.82	5.86 5.67	26.81 25.68	f f
6	<i>Cymbopogon jwardncusa</i>	16.25 20.25	75 75	29.26 40.93	0.18 8.80	8.57 8.82	5.11 6.09	23.86 23.71	f f
7	<i>Heliotropium subulam</i>	17.25 11.25	75 50	8.99 5.88	10.81 4.89	8.57 5.88	1.57 0.87	20.95 11.64	f c
8	<i>Dalbergia cretica</i>	2.25 3.25	75 75	62.57 62.25	1.41 1.41	8.57 8.82	10.93 9.27	20.91 19.50	f c
9	<i>Fagonia cretica</i>	7.75 34.75	100 100	3.92 10.34	4.86 15.10	11.42 11.76	0.86 2.88	16.96 29.74	c f
10	<i>Salsola baryosma</i>	6.75 8.25	75 75	9.26 9.37	4.23 3.58	8.57 8.82	1.61 1.39	14.41 13.79	c c
11	<i>Saccharum munja</i>	1.25 1.25	25 25	2.63 2.50	0.78 0.54	2.85 2.94	0.45 0.37	4.08 3.85	if if
12	<i>Acacia jacquemontii</i>	0.25 0.25	25 25	0.18 0.27	0.15 0.10	2.85 2.94	0.03 0.04	3.03 3.08	if if
Total		159.25 230.00	875 850	571.99 671.25					

respectively were rare members of this community.

Q6 (First year)

Cymbopogon - Eucalyptus - Fagonia Community: *Cymbopogon jwarancusa*, *Eucalyptus camaldulensis* and *Fagonia cretica* having 95.08, 85.69 and 34.38 importance values were dominating in Q6 (Table 6). *Tamarix dioca* was frequent with 27.69 importance value. *Prosopis cineraria* and *Saccharum munja* having 19.41 and 13.06 importance values emerged as common. *Dalbergia sissoo*, *Saccharum spontaneum* and *Acacia nilotica* were infrequent with 9.59, 8.33 and 6.63 important values.

(Second year)

Cymbopogon - Eucalyptus - Fagonia Community: During the

second year this community was almost the same but with differing importance values. *Cymbopogon jwarancusa*, *Eucalyptus camaldulensis* and *Fagonia cretica* having 86.74, 73.99 and 38.77 importance values respectively were dominating. *Tamarix dioca* was frequent with its importance values as 25.75 *Prosopis cineraria*, *Conyza ambigua*, *Dalbergia sissoo* and *Saccharum munja* were common with 18.38, 17.43, 12.64 and 12.40 importance values respectively. *Saccharum spontaneum* and *Acacia nilotica* were infrequent with 7.35 and 6.19 importance values.

B3 (Open forest)

Q7 (first year)

Stipagrostis - Heliotropium - Ochthochloa Community: *Stipagrostis plumosa*, *Heliotropium strigosum* and *Ochthochloa*

Table 5: Species composition and their phytosociological values in Q5 (Fenced and un-irrigated Patisar) at NPL

S. No.	Species	Density	Frequency	Coverage	R.D.	R.F.	R.C.	Importance Value	Status
1	<i>Dalbergia sisso</i>	16.75	100	187.29	6.51	10.00	65.57	82.08	sd
		16.75	100	215.52	4.47	8.00	54.39	66.86	sd
2	<i>Cynodon dactylon</i>	130.75	75	3.30	50.82	7.50	1.15	59.47	sd
		153.75	75	4.04	41.10	6.00	1.02	48.12	a
3	<i>Cymbopogon jwarancusa</i>	68.50	100	27.11	26.62	10.00	9.49	46.11	a
		129.50	100	40.75	34.62	8.00	10.28	52.90	sd
4	<i>Haloxylon salicornicum</i>	4.50	75	13.32	1.74	8.00	4.66	13.90	c
		12.25	75	29.36	3.27	7.50	7.41	16.68	c
5	<i>Salsola baryosma</i>	7.75	75	8.85	3.01	6.00	3.00	13.60	c
		8.50	75	8.59	2.27	7.50	2.16	10.43	c
6	<i>Aerua persica</i>	4.25	50	14.10	1.65	5.00	4.93	11.58	c
		6.25	50	20.57	1.67	4.00	5.19	10.86	c
7	<i>Fagonia cretica</i>	5.50	75	5.23	2.13	7.50	1.83	11.46	c
		11.00	75	7.81	2.97	6.00	1.97	10.91	c
8	<i>Acacia nilotica</i>	2.00	75	6.91	0.77	7.50	2.41	10.68	c
		2.25	100	9.82	0.80	8.00	2.47	11.07	c
9	<i>Saccharum munja</i>	3.75	75	4.19	1.45	7.50	1.46	10.41	c
		4.50	100	12.50	1.20	8.00	3.15	12.35	c
10	<i>Prosopis cineraria</i>	2.00	75	5.37	0.77	7.50	1.88	10.15	c
		2.00	75	24.70	0.53	6.00	6.23	12.76	c
11	<i>Conyza ambigua</i>	4.00	75	0.83	1.55	7.50	0.29	9.34	if
		11.00	100	3.32	2.94	8.00	0.83	11.77	c
12	<i>Ochthochloa compressa</i>	6.25	50	2.90	2.42	5.00	1.01	8.43	if
		14.00	75	7.25	3.74	6.00	1.82	11.56	c
13	<i>Acacia jacquemontii</i>	2.00	75	6.91	0.29	5.00	0.71	6.00	if
		1.00	50	3.95	0.26	4.00	0.99	5.25	if
14	<i>Tamarix dioca</i>	0.25	25	3.01	0.09	2.50	1.05	3.64	if
		0.25	25	3.14	0.09	2.00	0.79	2.44	r
15	<i>Capparis decidua</i>	0.25	25	1.18	0.09	2.50	0.41	3.00	if
		0.25	25	1.54	0.09	2.00	0.38	2.44	r
Total		257.25	100	285.63					

Table 6: Species composition and their phytosocial values in Q6 (Fenced and un-irrigated patisar) at NPL

S. No	Species	Density	Frequency	Coverage	R.D.	R.F.	R.C.	Importance value	Status
1	<i>Cymbopogon jwarancusa</i>	97.75	100	39.26	72.94	14.81	7.33	95.08	sd
		115.00	100	72.23	62.50	12.90	11.34	86.74	sd
2	<i>Eucalyptus caamaldulensis</i>	14.00	100	323.51	10.44	14.81	60.44	85.09	sd
		14.00	100	340.64	7.60	12.90	53.49	73.99	sd
3	<i>Fagonia cretica</i>	14.75	100	45.89	11.00	14.81	8.75	34.38	f
		30.00	100	62.24	16.30	12.90	9.77	38.97	a
4	<i>Tamarix dioca</i>	1.75	100	62.02	1.30	14.81	11.58	27.69	a
		2.50	100	73.29	1.35	12.90	11.50	25.75	f
5	<i>Prosopis cineraria</i>	1.50	75	38.50	1.11	11.11	7.19	19.41	c
		2.75	75	46.04	1.49	9.67	7.22	18.38	c
6	<i>Saccharum munja</i>	1.50	75	40.50	1.11	11.11	0.84	13.06	c
		2.75	75	70.92	1.49	9.67	1.24	12.40	c
7	<i>Dalbergia sissoo</i>	1.75	50	4.79	1.30	7.40	0.89	9.50	if
		2.50	75	10.33	1.35	9.67	1.62	12.64	c
8	<i>Saccharum spontaneum</i>	0.75	50	2.04	0.55	7.40	0.38	8.33	c
		0.75	50	3.24	0.40	7.45	0.50	7.35	c
9	<i>Acacia nilotica</i>	0.25	25	14.72	0.18	3.70	2.75	6.63	c
		0.25	25	18.10	0.13	3.22	2.48	6.19	if
10	<i>Conyza ambigua</i>	-	-	-	-	-	-	-	-
		13.50	75	2.79	7.33	9.67	0.43	17.43	c
Total		134.00	675	535.23					
		184.00	775	636.82					

compressa having 133.54, 48.95 and 29.51 importance values were dominating in Q7 (Table 7). *Haloxylon salicornicum* and *Lasiurus scindicus* with 27.43 and 22.58 importance values were frequent. *Farsetia hamiltoni*, *Calligonum polygonoides* and *Cymbopogon jwarancusa* were common with 16.13, 11.28 and 10.55 importance values.

(Second year)

Stipagrostis - Lasiurus - Ochthochloa Community: In Q7 (Table 7) in the following year, *Stipagrostis plumosa*, *Lasiurus scindicus* and *Ochthochloa compressa* having 154.55, 30.21 and 29.45 importance values respectively were dominating. *Haloxylon salicornicum* with 26.03 importance value was frequent. *Heliotropium strigosum*, *Farsetia hamiltoni*,

Cymbopogon jwarancusa and *Calligonum polygonoides* were common members with 19.48, 18.03, 11.39 and 10.8 importance values.

Q8 (First year)

Stipagrostis - Heliotropium - Lasiurus Community: *Stipagrostis plumosa*, *Heliotropium strigosum* and *Lasiurus scindicus* having 103.17, 48.85 and 29.81 dominated in Q8 (Table 8). *Cymbopogon jwarancusa*, *Calligonum polygonoides* and *Acacia nilotica* with 27.68, 26.62 and 27.07 importance values were emerged frequent. *Farsetia hamiltoni* and *Haloxylon salicornicum* with 18.20 and 10.49 importance values were common. *Salsola baryosma*, *Cenchrus ciliaris* and *Leptadenia pyrotechnica* with 5.39, 5.04 and 4.61 importance values

Table 7: Species composition and their phytosocial values in Q7 (Fenced and un-irrigated open desert) at NPL

S. No	Species	Density	Frequency	Coverage	R.D.	R.F.	R.C.	Importance value	Status
1	<i>Stipagrosis plumosa</i>	235.50	100	144.37	60.81	17.40	55.33	133.54	d
		293.00	100	191.41	69.67	17.39	67.49	154.55	d
2	<i>Heliotropium strigosum</i>	46.00	100	51.35	11.87	17.40	19.68	48.95	a
		5.50	75	14.60	1.30	13.04	5.14	19.48	c
3	<i>Ochthochloa compressa</i>	53.00	50	18.62	13.68	8.70	7.13	29.51	f
		55.75	50	21.23	13.25	8.69	7.51	29.45	f
4	<i>Haloxylon salicornicum</i>	8.25	100	20.63	2.13	17.40	7.90	27.43	f
		7.50	100	19.46	1.78	17.39	6.86	26.03	f
5	<i>Lasiurus scindicus</i>	14.25	75	15.30	3.67	13.05	5.86	55.58	f
		17.25	100	24.75	4.16	17.39	8.66	30.21	f
6	<i>Farsetia hamiltoni</i>	24.75	50	2.72	6.39	8.70	1.04	16.13	c
		34.50	50	3.26	8.20	8.69	1.14	18.03	c
7	<i>Calligonum polygonoides</i>	1.00	50	6.10	0.25	8.70	2.33	11.28	c
		1.00	50	5.36	0.23	8.69	1.88	10.80	c
8	<i>Cymbopogon jwarancusa</i>	4.50	50	1.81	1.16	8.70	0.69	10.55	c
		6.00	50	3.62	1.42	8.69	1.29	11.39	c
Total		387.25	575	260.90					
		420.50	575	283.60					

Table 8: Species composition and their phytosocial values in Q8 (Fenced and un-irrigated open desert) at NPL

S.No	Species	Density	Frequency	Coverage	R.D.	R.F.	R.C.	Importance value	Status
1	<i>Stipagrosis plumosa</i>	260.25	100	77.00	48.98	17.40	36.79	103.17	d
		244.75	100	69.09	67.10	16.00	13.60	96.70	sd
2	<i>Heliotropium strigosum</i>	91.00	50	8.81	35.95	8.70	4.20	48.85	a
		78.00	50	4.38	21.38	8.00	1.72	31.10	f
3	<i>Lasiurus scindicus</i>	19.50	75	27.11	3.67	13.09	13.09	29.81	f
		19.50	75	21.88	5.34	12.00	8.61	25.95	f
4	<i>Cymbopogon jwarancusa</i>	13.50	50	34.42	2.54	8.70	16.44	27.88	a
		15.50	50	64.01	4.24	8.00	25.19	37.43	f
5	<i>Calligonum polygonoides</i>	3.00	100	18.12	0.56	17.40	8.66	26.62	f
		1.25	100	9.80	0.34	16.00	13.85	20.19	f
6	<i>Acacia nilotica</i>	1.00	50	23.42	0.18	8.70	11.19	20.07	f
		1.00	75	60.09	0.27	12.00	13.00	25.87	f
7	<i>Farsetia hamiltoni</i>	39.50	25	13.45	7.43	4.35	6.42	18.20	c
		0.25	50	20.00	0.06	4.00	7.87	11.93	c
8	<i>Haloxylon salicornicum</i>	1.00	75	3.39	0.18	8.70	1.61	10.49	c
		2.00	25	21.19	0.54	12.00	8.33	20.87	c
9	<i>Salsola baryosma</i>	0.50	25	2.01	0.09	4.35	0.96	5.39	if
		2.00	25	9.05	0.54	4.00	3.56	8.10	if
10	<i>Vernhetud vilistid</i>	1.00	25	1.08	0.18	4.35	0.51	5.04	if
		0.25	25	0.07	0.06	4.00	0.02	4.08	if
11	<i>Leptadenia pyrotechnica</i>	1.00	25	0.18	0.18	4.35	0.08	4.61	if
		0.25	25	20.00	0.06	4.00	0.02	4.08	if
Total		531.25	575	209.29					
		364.75	625	254.09					

Table 9: Species composition and their phytosociological values in Q9 (Fenced and un-irrigated Patisar) at NPL

S. No.	Species	Density	Frequency	Coverage	R.D.	R.F.	R.C.	Importance Value	Status
1	<i>Stipagrosis plumosa</i>	251.50	100	110.93	63.51	17.40	48.77	129.68	d
		241.75	100	113.90	68.56	16.66	47.00	132.22	d
2	<i>Lasiurus scindicus</i>	19.00	75	45.15	4.80	13.05	19.85	37.70	a
		28.75	100	51.73	8.17	16.16	21.34	46.17	a
3	<i>Heliotropium strigosum</i>	57.50	75	7.18	14.52	13.05	3.15	30.72	f
		7.75	50	1.02	2.20	8.33	0.42	10.95	c
4	<i>Calligonum polygonoides</i>	4.50	100	23.63	1.13	17.40	10.38	28.91	c
		2.00	75	24.57	0.56	12.50	10.13	23.19	f
5	<i>Farsetia hamiltoni</i>	51.75	25	21.66	13.06	4.35	9.52	26.93	f
		60.75	25	33.00	17.28	4.16	13.61	35.05	d
6	<i>Haloxylon salicornicum</i>	5.25	75	16.03	1.32	13.06	7.04	21.41	d
		3.00	100	15.10	0.85	16.66	6.23	23.73	f
7	<i>Cenchrus ciliaris</i>	2.00	50	0.60	0.50	8.70	0.26	9.46	if
		0.25	25	0.02	0.07	4.16	0.01	4.24	if
8	<i>Cymbopogon jwarancusa</i>	3.00	25	2.08	0.75	4.35	0.91	6.01	if
		3.50	50	2.59	0.99	8.33	1.06	10.38	c
9	<i>Ochthochloa compressa</i>	1.25	25	0.16	0.31	4.35	0.07	4.73	c
		2.25	25	0.13	0.64	4.16	0.05	4.85	if
10	<i>Fagonia cretica</i>	0.25	25	0.03	0.06	4.35	0.01	4.42	if
		0.25	25	0.07	0.07	4.16	0.02	4.25	if
11	<i>Leptadenia pyrotechnica</i>								
		12.5	75	0.19	0.35	4.16	0.07	4.58	if
Total		396.00	575	227.45					
		351.50	600	242.32					

were infrequent.

(Second year)

Stipagrostis - Cymbopogon - Heliotropium Community: During the second year *Stipagrostis plumosa*, *Cymbopogon jwarancusa* and *Heliotropium strigosum* having 96.70, 37.43 and 31.10 were dominating in Q8 (Table 8). *Lasiurus scindicus*, *Acacia nilotica*, *Haloxylon salicornicum* and *Calligonum polygonoides* were frequent with 25.95, 25.87, 20.87 and 20.19 importance values. *Farsetia hamiltoni* was common with 11.93 importance value. *Salsola baryosma*, *Cenchrus ciliaris* and *Leptadenia pyrotechnica* were infrequent with 8.10, 4.08 and 4.08 important values.

Q9 (First year)

Stipagrostis - Lasiurus - Heliotropium Community: *Stipagrostis plumosa*, *Lasiurus scindicus* and *Heliotropium strigosum* having 129.68, 37.70 and 30.72 importance values dominated in Q9 (Table 9). *Calligonum polygonoides*, *Farsetia hamiltoni* and *Haloxylon salicornicum* were frequent with 28.91, 26.93 and 21.41 importance values. *Cenchrus ciliaris*, *Cymbopogon jwarancusa*, *Ochthochloa compressa* and *Fagonia cretica* with 9.46, 6.01, 4.73 and 4.42 importance value were infrequent.

(Second year)

Stipagrostis - Lasiurus - Farsetia Community: Next year *Stipagrostis plumosa*, *Lasiurus scindicus* and *Farsetia hamiltoni* dominated with the values as 132.22, 46.17 and 35.05 respectively (Table 9). *Haloxylon salicornicum* and *Calligonum polygonoides* appeared as frequent with 23.74 and 23.19 importance values, while *Heliotropium strigosum* and *Cymbopogon jwarancusa* were common with 10.95 and 10.38 importance values. *Ochthochloa compressa*, *Leptadenia pyrotechnica*, *Fagonia cretica* and *Cenchrus ciliaris* were infrequent with 4.85, 4.85, 4.25 and 4.24 importance values respectively.

Discussion

Lal Sohanra Natural Park is a very special and radically varying ecozone. It differs in soil structure, texture, water regimes, severity of temperature, amount of annual precipitation and fertility of soil. It is, basically, a sandy loam soil highly malaised with high levels of salinity, therefore presents a typical deserted landscape (Arshad *et al.* 1995a).

Quadrat 1 fenced and unirrigated located in Patisar Range comprised of 10 species, where species colonizing were generally xeric and salt resistant bushes such as *Salsola baryosma*, *Haloxylon salicornicum*, *Leptadenia pyrotechnica*, and *Fagonia cretica*. The most dominant *Cymbopogon jwarancusa* increased its density as well as importance values during the second year where density and importance value of *Tamarix dioca*, *Fagonia cretica*, *Haloxylon salicornicum* did not show a big change; typically the species composition remained the same over both the years and no new colonizer were noted. *Salsola baryosma* is being used for the preparation of 'Saji' (Jhomb *et al.* 1985).

Q2 fenced and unirrigated in Patisar Range was slightly a richer habitat represented by 14 species. *Farsetia hamiltoni*, *Stipagrostis plumosa*, *Lasiurus scindicus* improved their densities and importance values much better than the other species. There was no change in the number and composition of species, similarly there were no fresh colonizers.

Q3 situated in fenced and unirrigated piece of Patisar Range

represented by 13 species was led by *Farsetia hamiltoni*. However this is very important to know that during the second year virtually there was no meaningful change among the gradients scored. The only important change was that it had *Tamarix dioca* and *Capparis decidua* as the perennial trees of the desert (Anonymous 1972).

Q4 pertaining to and artificially irrigated habitat in the Ladamsar Range presented an altogether different scenario. Artificially planted tall trees like *Acacia nilotica* and *Dalbergia sissoo* masked the character of the desert due to the availability of irrigation water. Although the number of species remained 12, but their phytosociological values were radically different from other quadrats. This may be important to note that some of the grasses endemic to the desert were showing their comeback; similarly perennial trees and bushes like *Tamarix dioca*, *Capparis decidua*, *Prosopis cineraria* and *Saccharum munja* etc were seen growing.

Q5 the fenced and irrigated Ladamsar Range was not radically different from the previous quadrat but the status and composition of species. Increased moisture regime was major factor to change the density and importance values of the grasses as well as other perennial species. Trees of the desert like *Acacia jacquemontii*, *Tamarix dioca* and *Capparis decidua* were showing a comeback in addition to *Acacia nilotica*. Being an artificial plantation of *Dalbergia sissoo* grasses like *Cynodon dactylon*, *Cymbopogon jwarancusa* increase their densities as well as their importance value due to the shade, organic matter and the moisture content.

Q6 in the fenced and irrigated Ladamsar Range was basically a *Eucalyptus camaldulensis* planted artificial forest having the highest coverage and the second best importance value. This is notable that grasses except the *Cymbopogon jwarancusa* were not seen in this habitat except the rare appearance of *Saccharum spontaneum*, however, it was gratifying to note that tree species like *Tamarix dioca*, *Prosopis cineraria*, *Dalbergia sissoo* and *Acacia nilotica* were seen growing there in this habitat in low densities. This was a very characteristic feature that because of the allelomorphic affects *Eucalyptus camaldulensis* did not allow the desert grasses to grow.

Q7 unfenced and unirrigated piece of open desert was one of the poorest habitat with regard to the composition of species.

It was having predominantly the salt bushes like *Stipagrostis plumosa*, *Haloxylon salicornicum*, *Calligonum polygonoides* and *Farsetia hamiltoni*. Two species of grass namely *Lasiurus scindicus* and *Cymbopogon jwarancusa* were available but at low densities as reported by Chawdhary (1985) in Rajasthan.

Q8 and Q9 unfenced and unirrigated open desert habitat were almost the same with regard to their species composition and phytosociological values excepting that the Q8 had *Acacia nilotica* whereas Q9 showed *Ochthochloa compressa* instead.

This is important to note that *Heliotropium strigosum* in both the habitat was reduced in its density because of the artificial exploitation for its medicinal values related with liver diseases. Fencing and artificial irrigation have their combined impact on the desert landscape. The enclosures with irrigation water changed the picture of the desert in such a way that it no longer looks like a desert. The vegetation cover did improve inside the fence (Arshad and Rao, 1994a), however, the speed of recovery was slow. Introduction of forest trees like *Acacia*, *Dalbergia* and *Eucalyptus* definitely improve the environment of the desert (Narayana, 1988). These species change the composition and growth pattern of the floor species because of their allelopathic affects. *Acacia*, *Prosopis* and *Zizyphus*

were far better for stabilization of sand dunes. (Tomer, 1988). Relatively young fenced area of Patisar Range failed to show matching qualities of the fenced and irrigated habitat, but on the contrary when compared with unfenced open desert it has much better composition of the species and their phytosociological values as also reported by Tareen (1991), while working in the hills of Quetta. This is highly interesting to know that non of the habitat in the Lalsohanra National Park neither lost any species nor had any new colonizer, whereas it was a common feature among some of the habitat of National forest Park Chinji by Sharve (1951a), while working in Sonarce desert (Mexico) reported similar views. This is an important finding that by and large the habitat characteristics and the endemic plant species remain stable in Lalsohanra National Park, however, this does not hold good in National Park Chinji (Naeem *et al.*, 2000)

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