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Vegetation Comparison of Sacred, Reserved and Unreserved Sites of Rumli Village at Margalla Hills National Park, Islamabad

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Abstract: This study was part of the ethnobotanical work carried out at Margalla Hills National Park, in order to compare the level of biotic interference among three different sites of the same locality. The community on the sacred site was identified as *Acacia modesta-Carissa opaca-Oxalis camiculata*; on reserved site *Acacia modesta-Carissa opaca-Oplismenus burmanii* while on unreserved site *Phoenix sylvestris-Carissa opaca-Cynodon dactylon* community was found. Comparison of the three sites showed a remarkable difference among them. The number of species found on sacred site were less than reserved and unreserved site which suggest more biotic interference on reserved and unreserved sites than on sacred site. The ratio of wood product found on each site was 6:2:1. The similarity index of the three sites was found to be 10.86%. Small qualitative difference in vegetation among all of the three sites and some other observations suggest that the traditional trend among the people to pay homage to the shrines by not disturbing their vegetation is now decreasing due to urbanisation of the culture.

Key words: Margalla Hills National Park, rumli village, vegetation comparison, sacred, reserved, unreserved sites

Introduction

The research area with in 3 Km. Radius of Rumli village lies on south facing slopes of Margalla Hills National Park at the back side of Quaid-i-Azam University, Islamabad between 33°40' -33°44' N and 72°55'-73°20' E. It spreads in a roughly east-west direction and its altitude varies from 465 m to 1600 m, having rugged topography comprising mainly of steep slopes and gullies where rock structure is basically limestone. Deforestation and grazing have caused soil erosion leaving little but parent rock with shallow residual soil and silty loss. The average maximum temperature is 34.3°C while the average minimum temperature is 3.4°C. Snow is occasional. Rain fall occurs in the monsoon and winter, the average being 1200 mm per year (Khattak and Ahmed, 1990).

The area has been included in the sub-tropical scrub forest by previous workers (Champion *et al*., 1965). Hijazi (1984) reported that *Dodonaea viscose* was the most common shrub of Margalla Hills National Park. Akbar (1988) analysing the vegetation of Quaid-i-Azam University campus established 7 communities. Khattak and Ahmed (1990) compared the vegetation on the north and south facing slopes of Margalla Hills and reported the presence of *Pinus roxburgli-Apluda mutica-Ouercus incana* community on the north facing slopes and *Acacia modesta-Woodfordia fruticosa-Dodonaea viscosa* community on the south facing slopes. According to them, the north facing slopes showed a greater species diversity as compared to the south facing slopes having the similarity index as 46%.

The present study was undertaken to compare the vegetation of sacred (shrines, graveyard), reserved and unreserved sites of the village and to find out the level of biotic interference and protection of the plant resources among the three sites of the same locality. The traditional trend among the inhabitants towards the vegetation of the shrines was also under investigation.

Materials and Methods

The vegetation was systematically measured at all three sites by establishing 12 quardats on all sites having size 10 x 10 meters for trees and shrubs and 2 x 2 m quardarats for herbs at random. Absolute and relative values of density, canopy coverage, frequency and importance values for different species were calculated according to Cox (1967) and Mueller-Dombois and Ellenberg (1974).

$$\text{Importance value (IV)} = \text{RD} + \text{RCC} + \text{RF}$$

Where

$$\text{RD (Relative Density)} = \frac{\text{Total No. of individuals of a species}}{\text{Total No. of individuals of all species}} \times 100$$

$$\text{RCC (Relative Canopy Cover)} = \frac{\text{Total cover of all individuals of a species}}{\text{Total cover of individuals of all}} \times 100$$

$$\text{RF (Relative Frequency)} = \frac{\text{Occurrence points of species in all quardates}}{\text{Total No. of quadrates in a stand}} \times 100$$

The species were stratified into tree, shrub, climbers and herbaceous strata and plant community were established after the leading dominants on the basis of importance values. Similarly index was calculated after Jaccard (1928).

$$\text{Index of Similarity} = \frac{d}{a+b+c+d}$$

Where a = species unique in 1st releve
b = species unique in 2nd releve
c = species unique in 3rd releve
d = species common in both releve

Stems having circumference more than 20 cm at breast height were measured and recorded for comparison among the three sites. The quardat design was as described by Bunce and Shaw (1973).

Results and Discussion

Table 1 shows that the community on the sacred sites was identified as *Acacia modesta-Carissa opaca- Oxalis carniculata.*

Table 1: Importance Value Comparison of three sites

Name of the species	Importance Values (IV)		
	Sacred	Reserved	Unreserved
Trees			
Acacia modesta Wall.	138 .00*	130.00	24.17
Cassia fistula L.	45.14	-	-
Ficus benghalensis L.	12.44	-	-
Flacourtia indica (Burm.f) Merrill	-	-	52.95
Mellotus philippensis (Lam.) Muell.	-	86.97	37.91
Maytenus royleanus (Wall. ex Lawson) Cafond	43.50	33.30	70.59
Olea ferruginea Royle	40.46	-	78.10*
Phoenix sylvestris Roxb.	*20.46*		
Ziziphus jujube Lamk.	/300	/300	/300
Shrubs			
Buxus pipillosa C. K. Schm.	48.00	10.07	
Carissa apaca Stapf ex Halmes	95.69*	100.14*	113.20*
Debregeasia salicifolia (D.Don) Rendle	-	8.28	-
Dodonaea viscose (L.) Jacq.	31.96	13.00	-
Embelia ribes Burm.	-	-	15.49
Ipomea carnea (Martex Choisy) D. Austin	-	-	15A9
Justicia adhatoda L.	88.27	67.96	85.47
Lantana camera L.	18.04	-	17.56
Nerium oleander L.	18.04	-	-
Oreocnide frutescens (Thunb.) Miq.	-	9.73	-
Punica granatum L.	-	-	20.26
Rhamnus pentapomica Parker	-	12.75	-
Sageretie barndrethiana Aitch	-	22.04	-
Solarium erianthum D. Don.	-	11.55	-
Woodfordia fruticosa (L.) S. Kurz	-	22.01	-
Climbers			
Clematis grata Wall		11.94	
Cuscuta reflexa Roxb.		10.53	
	/300	/300	/300
Herbs			
Adiantum incisum Forssk	-	14.54	-
Allium griffithianum Bioss.	-	13.93	
Anagalis arvensis L.	15.78	-	-
Apluda mutica L.	-	17.58	
Argyrolobium roseum (Camb.) Jaub. & Spach	-	-	31.12
Boerhaavie diffuse Auct plur	-	13.92	
Bothriochloa pertusa	-	24.94	45.66
A. Camus	-		
Chrysopogon aucheri (Boiss) Stapf	-	24.96	14.38
Conyza aegyptiaca Ait	10.82	22.88	
Conyza canadensis (L.) Cronquist.	43.23	-	14.36
Cyrrorion dactylon (L.) Pers.	-	-	68.51*
Cynoglossum lanceolatum Forssk.	-	-	7.18
Cyperus nlveus L.	-	25.27	-
Dichanthium annuiatum (Forssk.) Stapf.	-	-	8.11
Didiptera bupleuroides Ness.	-	-	7.18
Euphorbia prostata Ait.	-	-	19.69
Indigolera linifolie (Lt.) Retz.	-	-	22.19
Inula vestida Wall. ex. ❑ C.	-	-	8.26
Lespedeza juncea (LL) Persoon			7.18
Malveastrum coromandelianum (L.) Garcke		23.43	
Micromeria biflora (Buchi-Ham. ex D. Don)	-	20.93	-
OplismenuS burmanii Metz) P. Beauv.	52.94	61.75*	-
Oxalis corndculata L.	80.15*		
Phleum himalaicum Hunds.	-	22.23	-
Poe annua L.	9.97		
Polygala abyssinica R. Br. ex. Presen	-	-	7.18
Primula spp.	-	-	7.18
Saussurea heteromalla (D. Don.) Hand.	15.49		
Soda cordate IBurm.f.) Borris	15.49	22.55	16.52
SoMnum nigrum L.	23.43	-	-
Taraxacurn officinale L.	9.27	-	-
	/300	/300	/300

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Out of 23 species found in this site 6 were arborescent, 6 shrubs and 11 herbaceous species. Ten species were found unique to this site. Grazing and felling were less however the under storey vegetation was a little bit disturbed but not more than the other sites.

The community established on the reserved site was *Acacia modesta-Carissa opaca-Oplismenus burmanii.* Of the total 29 species found in this site 4 were arborescent, 10 shrubs, 2 climbers and 13 herbaceous plants. The dominant *Acacia modesta* was often found in association with *Dodonaea viscose, Carissa apace and Justicia adhatoda. Justicia adhatoda* dominates the under canopy shady places. Grazing and felling were found more than the sacred site.

The community on the unreserved site was found as *Phoenix sylvestris-Carissa opaca-Cynodon dactylon.* Out of 30 species found in this site 6 were arborescent, 8 shrubs and 16 herbaceous plants. Grazing and felling were quite common and more than the other two sites.

One of the study have been made by sampling and analysing the vegetation around the shrine of Khandezi Baba located at a distance of 2.5 km east of Kohat. That area, because of the sanctity of the shrine, remained protected for a long time but has considerably been disturbed in the recent past. It has been concluded that the biotic interference will completely eliminate *Acacia modesta* and its place will be taken by *Capparis decidua* which can form a climax with *Salvadora oleoides* (Chaugthai and Yousaf, 1976).

A comparison of these three sites shows that there is a qualitative and quantitative difference between the vegetation of sacred site and those of reserved and unreserved site. The number of species found on sacred site were fewer but their status was better than reserved and unreserved sites. This small qualitative difference of vegetation may suggest that the traditional trend among the people about the sanctity of sacred places by not disturbing their vegetation is decreasing. *Acacia modesta, Maytenus royleanus, Carissa apace, Justicia adhatoda* and *Side cordate* are found common on all sites. It would be interesting to note that the typical vegetation of scrub forest of Margalla Hills is still existing in all the three sites except *Lantana camera* L. has just started establishing in the area. *Broussonetia papyrifera* Vent. and *Partherium hysterophorous* are the three dominating species spreading rapidly and occupying the foothill areas near the residential areas of Islamabad. Fatima (1999) discovered that *Lantana camera* spreaded widely and depleted *Dodonaea viscose* Vegetation in the catchment area of Rawal Lake, Islamabad. As stated by Shinwari and Khan (1997) a lot of pressure has been found on *Dodonaea viscose, Justicia adhatoda, Carissa apace, Buxus papillose, Acacia modesta* and *Acacia nilotica* as they are being used as fuel wood and this trend is increasing due to expansion of population. Reforetation trend of these native species is absent among local communities. However, the total canopy cover of trees found maximum at sacred site and minimum at unreserved site. Similarly, on sacred site 51 stems were found as having breast height circumference ranges from 20-140 cm, on reserved site 18 stems ranges 20-80 cm while on unreserved site only 8 stems were found of 20-60 cm range. The ratio among number of stems of each site has been found as Sacred: Reserved: Unreserved 6:2:1 (Fig. 1). This gradual reduction in circumference and number suggest that the wood products were found more conserved

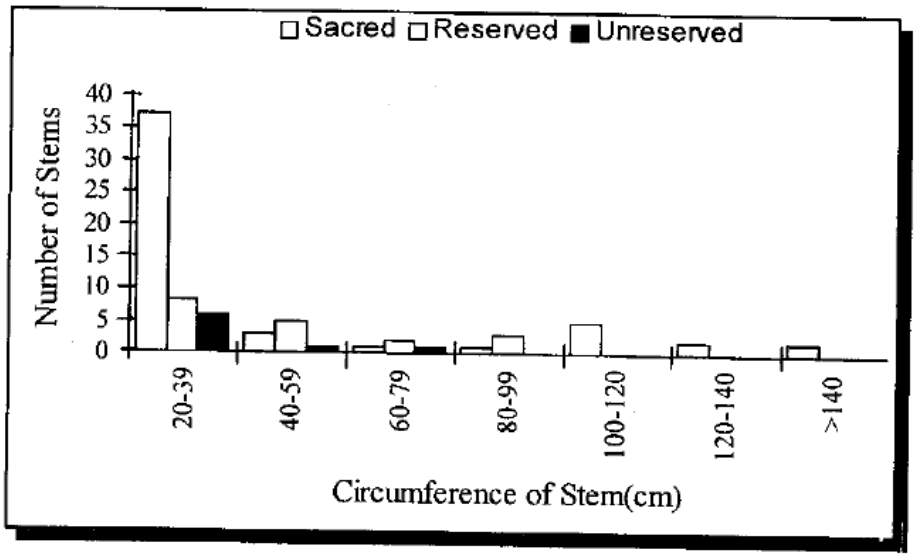

Fig. 1: Comparison of Stem Circumference at Chest height/Site

and less disturbed on sacred site for a long time than those of reserved and unreserved sites due to minimum biotic interference.The variation in the Importance Value of *Acacia modesta* indicate the comparative extraction of this species from these sites in the same locality. People hesitate to use this species from the sacred site in past due to their traditional concepts about such places. While *Cassia fistula* and *Ficus benghalensis* are found absent from the reserved and unreserved sites due to their extensive use and greater demand. Absence of *Flacourtia indica* and *Mallotus philippensis* from the sacred site is occasional.

The number of species unique to sacred, reserved and unreserved sites were 10, 13 and 18, respectively, while those common to all were 5. Thus the index of similarity of the three sites becomes 10.86%. Small qualitative difference in vegetation among all of the three sites and some other observations indicate a decrease in the traditional trend among the people to pay homage to the shrines by not disturbing their vegetation which may be due to urbanisation of the culture.Hence indicating a threat to the conservation of some native species of the area which remained conserved in the past.

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