VEGETATION AROUND THE SHRINE OF GHALIB GUL BABA IN KHWARRA-NILAB VALLEY, NWFP, PAKISTAN

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Abstract

The vegetation is scrub type and is dominated by *Dodonaea viscosa* which seems reproducing well. The rare arborescent species are *Acacia modesta, Maytenus royleanus, Reptonia buxifolia, Olea ferruginea* and *Sageretia thea* var. *brandrethiana*; but none of them is perpetual. The area is much disturbed biotically and *A. modesta* seems to be the prime target of fuel-hunters.

Introduction

The shrines of the saints, in a Muslim society, have always remained the sanctuaries of native vegetation. By and large, either because of sheer fear or respect the surroundings have esacped denudation. Such a situation was noticed around the shrine of Ghalib Gul Baba, a great saint of 15th century, and an effort is being made here to bring this vegetation on record.

The research area is located about 10 km west of Nizampur town, district Nowshera in the northern extreme of the Khwarra-Nilab valley bordered by the south-facing slopes of the Cherat range and lies at 71° 55′ east longitude and 33° 47′ north latitude. In the north there stands the mighty Cherat ridge, the elevation of the highest point on which is 1385 m, with its steep south-facing slopes; the western side is bound by Karamzai Khwar, a seasonal stream carrying the water of run off from the nearby hillocks; the Karamzai Khwar also covers the southern side and runs into Uch Khwar down in the east, further in the south, there flows Musa Darra Khwar which also empties into Uch Khwar in the east; in the east there lies the flat, eastwardly tilted land traversed by a number of small and large seasonal streams locally called Khwars.

In the south of the research area there stands the shrine of Ghalib Gul Baba on a slightly raised mound.

Physiographically the research area is the part of the Khattak hills (Dichter & Popkin, 1967). The Khattak hills rise rapidly from the southern edge of the Peshawar Basin and are east-west trending. These desolate hills comprise two main ranges, i.e. the Cherat and the Nilab Dhasha. The Khattak hills throw off an array of low-lying hills which in the north extend almost to the banks of the Kabul River. The Cherat range is separated from the Nilab Dhasha by the Khwarra-Nilab valley. The research area comprises two types of land forms; firstly a vast, almost levelled and south-east sloping outwash plains over which flows, in rainy season only, the water from the south-east-southwest trending low-lying hilly spurs which are placed almost at right angle to the Cherat ridge. The average elevation of the outwash plains is about 500 m. The soil is gravelly. The low-lying hilly spurs are many and run parallel to one another enclosing in narrow valleys between them; the average elevation of the spurs is about 762 m.

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Climatically the area lies in semiarid region with no distinct seasonal precipitational maximum. The temperature in the coldest month, i. e. January, ranges between 0^{o} C and 10^{o} C; whereas in hottest month, i. e. June, it remains above 30^{o} C (Dichter & Popkin, 1967). Most of the precipitation occurs in winter and severe drought conditions prevail in June and July (Khattak, 1980).

No phytosociological work of any significance has yet been done in the area. Salim and Shahid (1973) conducted a preliminary survey of the vegetation of the Cherat ridge but they remained confined to the foot of the south-facing slopes of the ridge from where the Khwarra-Nilab valley starts and gathered information on the frequency of the species alone. Khattak (1980)studied the phytosociology of the Cherat ridge but did not cover the Khwarra-Nilab valley.

Materials and Methods

The vegetation was sampled by one square meter quadrats laid systematically in the outwash plains and also on the east–and west-facing slopes of the hilly spurs. Four spots were randomly selected from each of the two types of sites. The data on the community attributes was collected and the absolute and the relative values of density, canopy-coverage and the frequency and the importance values for different species were calculated according to Cox (1967). The canopy-coverage was estimated according to Daubenmire (1959).

The nomenclature followed for plants in this work is that of Stewart (1972), Siddiqi (1977) and Qaiser and Nazimuddin (1981). The sampling was done in May, 1984.

Results and Discussion

The vegetation of the old graveyards and also around the shrines is generally believed to represent the natural vegetation of the area (Stewart, 1958; and Champion *et al.*, 1965). But owing to heavy grazing and substantial cutting in the area under study, the climax type has been degraded to scrub and the presumed tree stratum has either completely been eliminated or represented only by an occasional survivor. The heavy grazing has consequently pushed the unpalatable species into dominance. The vegetation on three types of sites represents the ultimate stage of degradation by excessive cutting and grazing. All other species except the hardy, self-perpetuating and unpalatable *Dodonaea viscosa* have been destroyed and it has resulted in a *Dodonaea* scrub type of vegetation which merges upwards with the temperate forests and downwards with the tropical thorn forests. The temperature restricted *D. viscosa* to lower altitudes only. It is a very common plant of the sub-Himalayan tracts and can flourish on denuded soils where little else can survive (Stewart, 1958 & 1972). *D. viscosa* has always remained an important component of the scrub vegetation of low hilly areas and covers extensive tracts in the drier regions (Abdulla, 1973; and Brandis, 1911).

The vegetation of outwash plains:

It is a vast flat, dry and gravelly land, sloping gently towards southeast, over which flows the water of run off from the south-facing slopes of mighty Cherat ridge in rainy season only. There were noticed many open and bare small areas scattered all over. *Dodonaea viscosa* is the

leading dominant with a comparatively higher importance value with all other associates of the community namely *Acacia modesta*, *Rhazya stricta* and *Cyperus rotundus* lingering far behind the dominant one (Table 1). The frequency of the dominant species is lowest of the three types of sites sampled but a relatively higher value for coverage is chiefly because of the larger specimens of the dominant plant inhabiting the area. *D. viscosa* was noticed perpetuating well under its own shade and also there occurred large accumulation of organic matter under it. *A. modesta* was very scarce but the presence of many large size stumps scattered all over indicated that this species had remained the prime target of fuel-hunter's axe. *D. viscosa R. stricta* and *A. modesta* were found in many places growing gregariously suggesting as if they possess non-overlapping niches.

Table 1. Attributes of the outwash plain's vegetation

(CC, canopy-coverage; RCC, relative canopy-coverage; D, density; RD, relative density; F, frequency; RF, relative frequency; and IV, importance value)

Species	CC	RCC	D	RD	F	RF	IV
Dodonaea viscosa	20.90	87.0	50.18	93.6	0.75	83.3	263.9
Cyperus rotundus	0.68	2.8	2.54	4.7	0.04	4.4	11.9
Acacia modesta	0.34	1.4	0.18	0.3	0.02	2.2	3.9
Rhazya stricta	2.10	8.7	0.72	1.3	0.09	10.0	20.0

Table 2. Attributes of the hilly spur's vegetation – west-facing slopes

Species	CC	RCC	D	RD	F	RF	IV
Dodonaea viscosa	19.24	91.7	41.09	97.4	0.87	89.7	278.8
Adhatoda vasica	1.70	8.1	0.96	2.3	0.09	9.3	19.7
Acacia modesta	0.03	0.1	0.12	0.3	0.01	1.0	1.4

Table 3. Attributes of the hilly spur's vegetation – east-facing slopes

Species	CC	RCC	D	RD	F	RF	IV
Dodonaea viscosa	32.19	98.6	64.36	99.6	0.98	98.0	296.2
Rhazya stricta	0.22	0.7	0.12	0.2	0.01	1.0	1.9
Maytenus royleanus	0.22	0.7	0.12	0.2	0.01	1.0	1.9

Some other species which were so rare that they could not be hit by the quadrats were: *Maytenus royleanus, Olea ferruginea* and *Withania somnifera*. According to Salim and Shahid (1973) *A. modesta* was the sole representative of the arboreal vegetation; but at present it has rarely been noticed because of being eliminated by extensive cutting and in its stead other tree species have made their appearance.

Spur's vegetation:

Both the east – and the west-facing slopes of the hilly spurs were dominated by *D. viscosa* (Tables 2 & 3). The importance value of the dominant species, on both the slopes, was found to be higher that of outwash plains.

On west-facing slopes, the density of *D. viscosa* was found to be lowest of all sites but the plants were relatively older and larger and more evenly spaced and consequently there occurred almost no bare areas (Table 2). *Adhatoda vasica* and *A. modesta*, the other associates of west-facing plant communities contributed very little to the bulk of vegetation.

Some other plants which were very scarce and escaped sampling were : *Reptonia buxifolia, O. ferruginea, Grewia tenax, Sageretia thea* var. *brandrethiana* and *Berberis lycium*; these species were represented by relatively older specimens. *O. ferruginea* and *R. buxifolia* were found growing gregariously without causing any noticeable harm to one another.

The importance value of *D. viscosa* on the east-facing slopes was highest of the three sites and had almost reached the maximum which was largely because of higher values for all the three attributes of the community contributed by a large number of relatively younger and evenly spaced individuals (Table 3). The slopes were covered allover by very young seedlings of *D. viscosa* hinting at the remarkable quality of this species to perpetuate under the harsh conditions of temperature and soil moisture. However, many seedlings showed the signs of wilting. The vegetation on these slopes was very thick and no bare areas of any size were found. *M. royleanus* and *R. stricta* were the community associates imparting almost no significant colour to the vegetation. *M. royleanus* was badly deformed and stunted because of heavy grazing and browsing. There were only one or two plants of *A. modesta* growing on the slopes.

Unlike the undisturbed or little disturbed vegetation found around the shrines of some Muslim saints in this region (Chaghtai & Yusuf, 1976; Chaghtai *et al.*, 1978; and Chaghtai *et al;* 1983), the vegetation around the shrine of Ghalib Gul Baba was found to be greatly disturbed because of cuttng, grazing and browsing which hampered the process of succession leading to a climax vegetation. The dominance of *D. viscosa* is chiefly attributed to its unpalatability and also its escape from the axe of the fuel-hunters in the presence of some other fuel-forming species. *D. viscosa* is eaten by goats only in the absence of any other palatable species (Parker, 1956). The pressure of grazing and browsing is borne by *M. royleanus, R. buxifolia* and *A. modesta. D. viscosa* ordinarily, is much appreciated as firewood because it does not need splitting (Stewart, 1958; Abdulla, 1973; and Parker, 1956). It was observed with great surprise that the local population had spared *D. viscosa* and extracted the fuel exclusively from *A. modesta. A. modesta* has almost completely been eliminated by cutting and it is anticipated that in near future *D. viscosa* would become the next target of fuel-hunter's axe. All the arborescent species except *D. viscosa* had not been perpetuating well and this factor

coupled with grazing, browsing and cutting will eliminate them completely leaving *D. viscosa* to reign the area alone. *D. viscosa* is highly susceptible to fire (Parker, 1956); and the possibility of a limited fire devastating the area cannot altogether be dismissed. If it happened, it would relieve the pressure of the dominant species and would further provide an opportunity to other tree species to stage a come back.

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