PRELIMINARY STUDY OF PLANT COMMUNITIES IN SHAIKH BADIN HILLS, D.I. KHAN

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Abstract. *A preliminary study of vegetation was made in Shaikh Badin Hills, lying at 290-1350 m. altitudes. Limestones and sandstones constitute the main rocks. The climate is mainly sub-tropical with mean annual rainfall of about 500 mm mean maximum temperature of about 37°C for June and mean minimum temperature of 0°C for January, with definite but not severe frost period. Three plant communities viz. Rhazya stricta- Salvadora oleoides, Acaia modesta-Olea cuspidata-Dodonaea viscosa and Cymbopogon jwarancusa-Cenchrus ciliaris-Dodonaea viscosa occur.*

Introduction. Shaikh Badin Hills lie in the north-west of Dera Ismail Khan at a distance of 59 km on Bannu Road near Pezu. The hills have an elevation of 290-1350 m. The rocks consist of laminated limestones and sandstones. Limestones are in compact form while sandstones are white, cream-coloured, dark red or purplish brown. Iron ore has also been spotted at the foothill region. There is no meteorological station close-by. From the location of the area and as indicated by the vegetation, the climate is tropical in the lower altitudes and subtropical in the higher. The area receives a mean annual rainfall of approximately 500 mm, mean maximum temperature for June is about 37°C and mean minimum temperature for January about 0°C. Summers are pleasant while winters cold and frosty, with a definite but not severe frost. Although not a common feature, snow-fall is said to have once occurred on the top some 15 years ago. People keep cattle, goats, sheep, donkeys and camels. The vegetation is under heavy pressure for extraction of fuelwood and fodder as well as for grazing. This has resulted in severe soil erosion, denuding some of the area and exposing rocks on the Shahbazkhel side.

Material and methods. Vegetation was studied in December, 1977 taking 40 releves in all the habitat types at Pezu, Paniala and Shaikh Badin proper, with sample plot size of 200 or 100 m^2. The vegetation analaysis was done following the system of Braun-Blanquet (1965), modified by Cetik (1973).

Vegetation. On analysis of vegetation data, the following three plant communities were recognized:

1. Rhazya stricta—Salvadora oleoides community (table 1):

The community is found on sandstones and limestones and sandy calcareous soil at low altitudes (290-440 m). It is characterised by *Rhazya stricta* and *Salvadora oleoides* which are constant dominant species each with 100% frequency. The community is composed of medium number of species, on the whole, with poor coverage. This is due to heavy biotic pressure in the area.

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TABLE 1

Rhazya stricta-Salvadora oleoides community

No. of releve	40	38	35	32	30	Presence	Frequency %	Constancy class
Area (m^2)	200	200	200	200	200			
Aspect	W	E	N	S	SE			
Slope (%)	30	35	25	40	45			
Elevation (m)	290	300	320	400	440			
Mother rock	Sandstone		Sandstone		Limestone			
HCl reaction	+	+	+	+	++			
Coverage (%)	45	40	35	35	30			
Total number of species	21	21	14	13	13			
2nd Storey								
Rhazya stricta	21	21	21	21	21	5	100	V
Salvadora oleoides	12	12	22	22	22	5	100	V
Saccharum bengalense	12	12	12	12	12	5	100	V
Prosopis juliflora	11	11	11	11	11	5	100	V
Capparis aphylla	11	11	.	11	11	4	80	IV
Zizyphus nummularia	12	12	12	.	12	4	80	IV
Calligonum polygonoides	12	+2	.	12	12	4	80	IV
Calotropis procera	+1	+1	.	+1	11	4	80	IV
Fagonia arabica	+1	+1	+2	.	+2	4	80	IV
Withania coagulans	+2	+2	.	+2	+2	4	80	IV
Periploca aphylla	+1	+1	+1	.	.	3	60	I I
3rd Storey								
Pulicaria glaucescens	11	+1	11	.	+1	4	80	IV
Tribulus terrestris	+2	+2	+2	+2	.	4	80	IV
Euphorbia prostrata	+2	+2	+2	+2	.	4	80	IV
Solanum surattense	+1	+2	+1	.	.	3	60	III
Conyza stricta	+1	+1	.	+1	.	3	60	III
Astragalus sp	+1	+1	.	+1	.	3	60	III
Cymbopogon jwarancusa	14	+4	.	.	+4	3	60	III
Bromus japonicus	+1	+1	+1	.	.	3	60	III
Barleria acanthoides	+1	+1	+1	.	.	3	60	III

Species with single frequency: *Diplotaxis griffithii* (40) *Aerua tomentosa* (35) *Salvia moorcroftiana* (32), *Polygonum* sp. (30), *Prosopis cineraria* (38).

TABLE 2

Acacia modesta-Olea cuspidata-Dodonaea viscosa community

No. of releve	29	25	20	15	10	Presence	Frequency (%)	Constancy class
Area (m^2)	200	200	200	200	200			
Aspect	N	S	W	E	SE			
Slope (%)	40	45	45	50	55			
Elevation (m)	1140	1190	1200	1250	1270			
Mother rock	Limestone		Limestone		Limestone			
HCl reaction	+	++	++	++	++			
Coverage (%)	85	80	80	70	70			
Total number of species	25	22	15	15	12			
Ist Storey								
Acacia modesta	22	22	22	22	22	5	100	V
Olea cuspidata	21	21	21	21	21	5	100	V
2nd Storey								
Dodonaea viscosa	24	24	24	24	24	5	100	V
Gymnosporia senegalensis	12	12	12	12	12	5	100	V
Otostegia limbata	11	11	11	11	11	5	00	V
Periploca aphylla	11	11	11	11	11	5	100	V
Grewia tenax	11	+1	11	11	11	5	100	V
Ehretia aspera	11	11	.	11	11	4	80	IV
Sophora mollis	+1	+1	11	.	+1	4	80	IV
Zizyphus nummularia	12	+2	12	12	.	4	80	IV
Capparis spinosa	+2	+2	.	12	.	3	60	III
Withania coagulans	12	+2	12	.	.	3	60	III
Nannorrhops ritchieana	+1	+1	.	11	.	3	60	III
Cocculus laeba	+2	.	.	+2	+2	3	60	III
Asparagus gracilis	+1	+1	+1	.	.	3	60	III
3rd Storey								
Marrubium vulgare	23	12	+3	.	+3	4	80	IV
Salvia moorcroftiana	12	+2	12	+2	.	4	80	IV
Barleria acanthoides	14	14	.	+4	.	3	60	III
Cenchrus ciliaris	+3	+3	13	.	.	3	60	III
Peganuam harmala	11	+1	.	.	.	2	40	II
Solanum nigrum	+1	+1	.	.	.	2	40	II
Euphorbia prostrata	+1	.	.	.	+1	2	40	II
Calotropis procera	++	++	.	.	.	2	40	II

The species with single frequency: *Rumex sp.* (29), *Polygonum* sp. (25), *Fagonia arabica* (20), *Capparis aphylla* (15), *Prosopis juliflora* (29).

TABLE 3

Gymbopogon jwarancusa-Cenchrus ciliaris-Dodonaea vicosa community

No. of releve	8	7	5	4	3	Presence	Frequency (%)	Constancy class
Area (m^2)	100	100	100	100	100			
Aspect	N	S	W	E	SE			
Slope (%)	50	50	45	45	40			
Elevation (m)	950	1000	1050	1100	1120			
Mother rock	Limestone		Limestone		Limestone			
HCl reaction	++	++	++	++	++			
Coverage (%)	90	85	80	80	70			
Total number of species	21	16	17	19	15			
Ist Storey								
Acacia modesta	22	12	12	12	+2	5	100	V
2nd Storey								
Dodonaea viscosa	14	24	24	24	34	5	100	V
Periploca aphylla	12	11	11	11	11	5	100	IV
Otostegia limbata	11	11	+1	+1	.	4	80	IV
Gymnosporia senegalensis	12	12	+2	22	.	4	80	IV
Sophora millis	+2	.	12	12	12	4	80	IV
Asparagus gracilis	+1	.	+1	+1	+1	4	80	IV
Ehretia aspera	+1	11	.	+1	.	3	60	III
3rd Storey								
Cymbopogon jwarancusa	34	24	24	34	34	5	100	V
Cenchrus ciliaris	34	24	24	24	24	5	100	V
Heteropogon contortus	12	12	22	+2	+2	5	100	V
Sporobolus sp	12	12	12	+2	+2	5	100	V
Aristida mutabillis	+2	12	12	12	+2	5	100	V
Poa annua	+2	12	12	12	+2	5	100	V
Bromus japonicus	+1	11	+1	11	.	4	80	IV
Myriactis wallichii	+1	+1	.	+1	.	3	60	III
Crepis sancta	+1	+1	.	+1	.	3	60	III
Cynodon dactylon	+1	.	.	+1	+1	3	60	III
Conyza stricta	+1	.	+1	.	+1	3	60	III
Galium sp	+1	.	+1	.	+1	3	60	III

The species with single frequency: *Chenopodium album* (3), *Stachys parviflora* (8), *Convolvulus arvensis* (4), *Cousinia minuta* (7), *Crotalaria burhia* (5).

2. Acacia modesta—Olea cuspidata-Dodonaea viscosa (table 2):

This community, too, is found on calcareous soils but at higher altitudes (1140-1270m). The constant dominants species are Acacia modesta, *Olea cuspidata* and *Dodonaea viscosa* each with 100% frequency. The number of species is high with generally high coverage. This community forms a better habitat for markhor than the one described above.

3. Cymbopogon jwarancusa-Cenchrus ciliaris-Dodonaea viscosa community (table 3):

This community occurs at medium elevations (950-1120 m) on calcareous soils. The constant dominant species are *Cymbopogon jwarancusa, Cenchrus ciliaris* and *Dodonaea viscosa* each with 100% frequency. The number of species is nearly the same and with as high coverage as in community 2 above. The community includes some good fodder grasses, e.g. *Cenchrus ciliaris* and *Herteropogon contortus*. It provides nearly as good a habitat as the one above.

Discussion and conclusion. Being under heavy biotic influence, the low altitude community is poor both in species number and coverage. Consequently, it is capable of providing neither enough food nor proper shelter for the markhor. In fact, markhor is not likely to descend down into an area so badly disturbed and heavily visited by the livestock.

As to the other communities, they provide a good habitat by virtue of their rich species and better shelter. The situation could further be improved if biotic pressure is reduced in the area.

The vegetation of this low-hill tract is typically tropical thorn type in the lower altitudinel zone and subtropical broad-leaved type in the higher. Further, both the high altitude plant communities contain some floristic elements of the tropical maritime belt. This means that the tract has tropical to subtropical ecosystems occurring within the area.

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