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Full Length Research Paper

Floristic composition, life form and leaf spectra of plant communities recorded at Sarsawa hills district Kotli, Azad Kashmir

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The flora of Sarsawa Hills, District Kotli, Azad Kashmir consisted of 40 plant species belonging to 24 families. Of them, 18 families were Dicots; 4 Monocots and 1 Pteridophytes. Gymnosperms were represented by Pinaceae only. Poaceae had 12 species which was followed by Euphorbiaceae (3 spp.). Acanthaceae, Leguminoseae and Urticaceae had 2 species each while remaining families had single species. The biological spectrum showed that hemicryptophytes (27.5%) and megaphanerophytes (25%) were the most abundant, followed by nanophanerophytes (22.5%) and therophytes (17.5%). Geophytes (5%) chemophytes (2.5%)had low occurrence in the investigated area. Leaf spectra investigation revealed thatleptophylls were dominant (40%), followed by nanophylls (22.5%), microphylls (22.5%), and mesophylls (15%). No megaphylls were reported in the investigated area due to severe drought condition.

Key words: Floristic list, Leaf size, Leaf form, Sarsawa hills, Kotli.

INTRODUCTION

Life form of vegetation is to a certain extent, an indicator of the climate and is also useful in comparing geographically, widely distributed plant communities. Furthermore, it is traditionally being used to describe world vegetation types at community level (Raunkiaer, 1934). The life form and leaf size spectra are useful attributes which have been widely used in vegetation description. The life form spectra are indicators of micro and macroclimate (Shimwell, 1971). Similarly leaf size classes have been found to be very useful for plant associations. The leaf size knowledge may help in the understanding of physiological processes of plants and plant communities (Oosting, 1956). Little work has been done on the life form and leaf size spectra. The only references for Azad Jammu and Kashmir are Malik (1986) and Malik *et al*. (2007) who have investigated biological spectrum of vegetation from Kotli, Ganga Chotti and Bedorri Hills Azad Jammu and Kashmir.

The local flora is threatened due to intensive anthropogenic pressure. It is the scientific, moral and ethical duty of the local people to conserve and protect the local flora. Most of the medicinal plants are uprooted for burning purposes and grazed by the livestock. It therefore, seems appropriate to manage the grazing practices. Even fruiting trees are also grazed by animals and used for burning. The local forests are the only refuge for valuable and endangered local flora. Most of the fuel wood and timber wood is also extracted from these forests. Studies are recommended to quantify the data and suggest plans for the conservation of the area.

The present study was undertaken to report the flora of Sarsawa Hills and its ecological characteristics with the aim to construct baseline floristic inventory of the local forests. The findings might be helpful to ecologists, ethnobotanists and conservationists.

MATERIALS AND METHODS

The study area lies between longitudes 73^{O} $6^{/}$ to 74^{O} $7^{/}$ East and latitudes33^{O} $20^{/}$ to 30^{O} $40^{/}$ North in the Kotli District (Topo sheet No 43 G/15). The elevation ranges from 700 – 1150 meters. The climate of the study area is subtropical chirpine type [Malik, 1986].

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Table 1. Floristic list, life form and leaf size of some plants of Sarsawa Hills, District Kotli, Azad Kashmir.

S. No.	Plant Name	Family	Leaf Form	Leaf Size
1	*Adhatodazeylonica*Nees	**Acanthaceae**	NP	Mi
2	*Colebrookiaoppositifolia*Sm	**Acanthaceae**	MP	Me
3	*Carissa opaca*Stapf ex Haines	**Apocynaceae**	NP	Mi
4	*Maytenusroyleanus* Wall ex Lawson	**Celastraceae**	NP	N
5	*Mallotusphillipensis*(Lamk) Muell	**Euphorbiaceae**	MP	Me
6	*Euphorbia indica* Lam	**Euphorbiaceae**	H	N
7	*Euphorbia prostrata* Ait	**Euphorbiaceae**	H	L
8	*Flacourtiaindica* (Bumf) Merriu	**Flacoutiaceae**	MP	Me
9	*Gereniumrotendifolium* Linn.	**Geraniaceae**	Th	Mi
10	*Micromeriabiflora* (Ham) bth	**Labiateae**	Th	L
11	*Otostegialimbata* (Bth) Boiss	**Lamiaceae**	NP	N
12	*Ailanthus altisema*	**Leguminaceae**	MP	Mi
13	*Dalburgiasissoo*Roxb.	**Leguminaceae**	MP	Me
14	*Asparagus gracilus*Royle	**Lilicaceae**	Ch	L
15	*Woodfordia floribunda*Kerz	**Lythraceae**	NP	Mi
16	*Malvestrumcoromandilianum* (L) Garcke	**Malvaceae**	H	Mi
17	*Acacia arabica*Willd	**Mimosaceae**	MP	L
18	*Myrsineafricana* (Lill) Jacq	**Myresinaceae**	NP	N
19	*Oleaferruginea*Royle	**Oleaceae**	MP	N
20	*Pinusroxburghii* Sargent	**Pinaceae**	MP	L
21	*Agritisviridis*Gauon	**Poaceae**	H	L
22	*Aristidaadscensionis* Linn.	**Poaceae**	Th	L
23	*Dichanthiumannulatum* (Forssk) Stapf	**Poaceae**	H	L
24	*Eriophorumcomosom* (Wall ex Roxb) Nees	**Poaceae**	H	L
25	*Heteropogoncontortus* (Linn) P. Beaue	**Poaceae**	H	L
26	*Impretacylindrica* Linn.	**Poaceae**	Th	L
27	*Poaannua* Linn.	**Poaceae**	Th	L
28	*Steriaglauca* (Linn.) P. Beauv	**Poaceae**	Th	L
29	*Steriapalmifolia* (Koen) Stapf	**Poaceae**	Th	L
30	*Saccharamspontaneum* Linn.	**Poaceae**	G	N
31	*Sorghum halepense* (Linn.) Pers.	**Poaceae**	H	L
32	*Themedaanathera* (Nees) Hack	**Poaceae**	H	L
33	*Adiantumincisum*Forssk	**Polypodiaceae**	G	N
34	*Rumuxhastatus* (D. Don)	**Polygonaceae**	H	N
35	*Punicagranatum* Linn.	**Punaceae**	NP	N
36	*Ziziphusnumularia* Miller	**Rhamnaceae**	NP	Mi
37	*Dodonaeaviscosa* (Linn.) Jacq	**Sapindaceae**	NP	Mi
38	*Solanumxanthcarpum*Schrad&Wendle	**Solanaceae**	H	Mi
39	*Ficuscarica* Linn.	**Urticaceae**	MP	Me
40	*Ficuspalmata*Forssk	**Urticaceae**	MP	Me

The geographical setting of the area provides habitat for the growth of a large number of plants. The area has rich diversity of plant resources parts. The winter months extends from November to February. Rain and snow occur in this season. Summer season is short and mild and temperature seldom rises above 40^0C. The monsoon season starts from middle of April and remains till August. The warmer season temperature may reach to 40.8^0C, while in winter (December) temperature may drop to 0^0C. Snowfall also occurs, at higher elevation in cold season (December and January). At lower altitude the snow melts quickly but at higher altitude, it remains till March. Frost also occurs for extended period, which starts from the last week of November to the second week of February. The flora and its ecological characteristics such as life form and leaf spectra were studied. Life form and leaf size spectra indicates climatic and human disturbance of a particular area (Cain and Castro, 1959). Very little work is available on this aspect. The only available references are those of Hussain *et al.* (1985), Badshah *et al.* (1996), Qadir and Tareen (1987), Wali (1966), Tareen and Qadir (1993) and Ayaz *et al.* (1993).

A complete list of the plant communities of the study area was compiled on the basis of plant collection. Life Form and Leaf Spectra were constructed according to Raunkiaer (1934) and Hussain (1989) using the complete list of the plant communities collected from study area. They were identified through available literature Nasir and Ali (1971-1995) and (Ali and Qaisar, 1995-2006).

RESULTS AND DISCUSSIONS

There were 40 plant species belonging to 24 families (Table1). Pinaceae was the only gymnosperms family. Pteridophytes were represented by a single family (Polypodiaceae) and monocot by two families (Liliaceae&Poaceae) while remaining 21 families represented the dicots. The well represented family was Poaceae (12 spp.). Family Euphorbiaceae was represented by 3 species and Family Acanthaceae and Family Urticaceae were 2 species while remaining families were represented by one species each (Table 1).

The biological spectrum (Table 1) showed that hemicryptophytes (27.5%) and megaphanerophytes (25%) were dominant in the study area followed by nanophanerophytes (22.5%),therophytes (17.5%) geophytes (5%) and chemophytes (2.5). Leaf spectra showed that leptophylls were most abundant in the investigated area (40%) followed by nanophylls (22.5%), microphylls (22.5%), and mesophylls (15%). No megaphylls were reported in the investigated area due to severe drought condition.

The dominance of hemicryptophytes (27.5%) indicated that the investigated area was under severe biotic pressure due to deforestation and over grazing. Many plant plant species were decreasing in the area. It would be the moral and ethical duty of the local people to protect the plant resources. Most of the medicinal plants were uprooted for burning purposes and grazed by the livestock. It therefore, seemed appropriate to manage the grazing system. Most of the fuel wood and timber wood was extracted from these forests. Even fruiting trees were also grazed by animals and used for burning. These forests also provide refuge for valuable and endangered animals. Further study is needed to quantify the data and suggest plans for the conservation of the area.

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