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Floristic Composition and Ecological Characteristics of Shahbaz Garhi, District Mardan, Pakistan

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Abstract- The study was designed to explore the floristic composition and biological characteristics of the area. A record of plant species of Shahbaz Garhi, Mardan was organized during 2009 – 2010. A record of plant species was organized on the source of field trips conducted in winter, summer and monsoon and identified with available literature. The plants were classified into different life form and leaf size classes after standard methods. The flora consisted of 132 plant species belonging to 104 genera and 47 families. Asteraceae and Poaceae are the dominant families. The biological spectrum explains that therophytes (63 spp., 47.73%) were the dominant followed by chamaephytes (24 spp., 18.18%), magaphanerophytes (15 spp., 11.36%), hemicryptophytes (13 spp., 9.85%), nanophanerophytes (12 spp., 9.09%), geophytes (4 spp., 3.03%) and parasite (1 spp., 0.76%). Leaf size classes of plants consisted of microphylls (62 spp., 46.97%), mesophylls (28 spp., 21.21%), nanophylls (18 spp., 13.64%), leptophylls (15 spp., 11.36%) and megaphylls (9 spp., 6.82%). Analysis of the study reveals the phytoclimate to be of therophytic type. The domination of therophytes indicates that the investigated area is under deep biotic stress.

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I. Introduction

Taxonomists are naturally interested to record flora of different geographical areas. Since very long time many attempts have been through by different workers in searching away Flora of our dear native soil, Pakistan. The effort of both Pakistani and Foreign Taxonomists is basic approach. Different workers have worked in different parts of Pakistan still when it was part of United India. The area under discussion is typically unfamiliar and very a small number of reports are originated. Khan (2004) has effort on the flora of Tehsil Banda Daud Shah Karak, Khan (2007) has work on ethnobotany of Tehsil Karak. The floristic composition of Dureji (Khirthar range) was reported by Parveen et al., (2008). They recorded 74 species belonging to 62 genera and 34 families. Qureshi, (2008) identified 120 plant species belonging to 84 genera and 39 families of Chotiari Wetland Complex, Nawab Shah, Sindh, Pakistan. Hussain, et al., (2009) reported 62 species including 15 monocots and 01 pteridophyte of 24 families from Azakhel Botanical Garden, University of Peshawar. Muhammad, et al., (2009) reported 67 weed species out of which 2 belonging to monocot families, and 27 to dicot families from wheat, maize and potato crop fields of Tehsil Gojra, District Toba Tek Singh, Punjab. Qureshi and Bhatti (2010) recorded 93 plant species belonging to 67 genera and 30 families of Pai forest, Nawab Shah, Sindh, Pakistan. Khan et al., (2011a & b), designed the ethnobotany of halophyte of Tehsil Karak and dara Adam Khel. Khan et al., (2011c) reported 161 plant species in the Tehsil Takht-e-Nasratti, District Karak where 25 monocotyledonous and 136 dicotyledonous species belonging to 52 families. Biological spectrum of vegetation is the index of the phytoclimate of the site, deduction of which is based on diverse life-forms composing the flora of the site. The life-form in its turn is the ultimate manifestation of the sum of all the adaptations undergone by a plant to the climate in which it resides. Raunkiaer (1934) proposed the term "Biological Spectrum" to express both the life-form distribution in a flora and the phytoclimate under which the prevailing life-forms evolved. Life-form study is thus an important part of vegetation description, ranking next to floristic composition. Leaf size classes have been set up to be very positive for plant links. The leaf size knowledge may help out in the accepting of physiological processes of plants and plant communities (Oosting, 1956). Life form and leaf size spectra indicates climatic and creature fracas of a particular area (Cain & Castro, 1959). The life form and leaf size spectra are significant physiognomic feature that comprise generally in vegetation studies. The life form spectra are supposed to be the signal of micro and macroclimate (Shimwell, 1971). Disturbances can have an unfathomable outcome on life forms, phenology and distribution of plant populations. Disturbances caused by man and animals such as fire, scraping and profound grazing frequently reappear within the life period of a plant and may comprise significant constituent of its life cycle (Agrawal 1989). Literature dealing with the life form and leaf size spectra shows that very little work has been made in Pakistan i.e. Abbas et al., (2010), Qureshi & Ahmad (2010) and

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Khan et al., (2011a,b, 2012, 2013). The biological spectrum is thus useful as an index of the health status of a forest. When worked out at periodic intervals, biological spectrum may set the guidelines for eco-restoration and optimization of a community. y. In view of this, the present work was under taken in the forested areas of Shahbaz Garhi, Mardan.

a) Location of the study area and physiography

The district lies from 34°12'0"N 72°2'24"E. The elevation of the valley is 1000 to 2056m above sea level. The total area of the district is 1632 kilometers. Mardan district may broadly be divided into two parts, North-Eastern hilly area and south western plain (Figure 1). Shahbaz Garhi is situated on the junction of three ancient routes i.e. Kabul to Pushkalavati, Swat through Buner and Taxila through Hund on the bank of Indus River. The town was once a thriving Buddhisy city surrounded by monasteries and stupas. The Emperor Babar in his book Tuzk-e-Babri has given reference of this monastery. It has also been stated that this village has named with the name of a famous religious person. In the ancient books the name of this village is Varsha pura. In 7th century, a Chinese pilgrim Mr.Haven Sang visited this monastery and recorded this polosha in his book. In local language it is called Shahbaz Garha. This is the place to take a break or rest when you are tired. It has beautiful mountains, green trees, open fields and a small river in the centre of the village. In old times all these facilities made it attractive for the army and travelers to dig in their tents here, stay for few days and organize their further strategy. The historic Stones of Ashoka (Figure 2) and other sites like Mekha Sanda are worth visiting. The most attractive building of the new era is the high school, this has given a new look to the ancient stones of Ashoka. The local people had put their efforts and resources in building the school. Many sites have been discovered in Mardan and it looks as Mardan was the heart of Gandhara civilization. One of the Buddhist monasteries is of Mekha Sanda, which is located 17 km from Mardan in the North Eastern side in the Hills of Shahbaz Garha (Figure 3, 4). This site was surveyed and excavated by a team of Japanese archaeologists between 1959 and 1965. During courses of excavations a good number Gandhara art sculptures, main stupa, votive stupas, monastery, chapels and Monks' chambers were found. This site became a place for research and a tourist spot. The name is derived from Pushto language. Mekha means a female buffalo and Sanda means a male buffalo. The arrangement of the stones is in such a way that it looks like buffaloes. Unfortunately some treasure hunters illegally dug out the site in search of antiques and it has been spoiled. It is the utmost responsibility of the government to provide guards, restore this site and protect it from further destruction. So far there is no sign of it happening. (Khan et al., 2011d).

Fig. 1 : Map of District Mardan showing research area

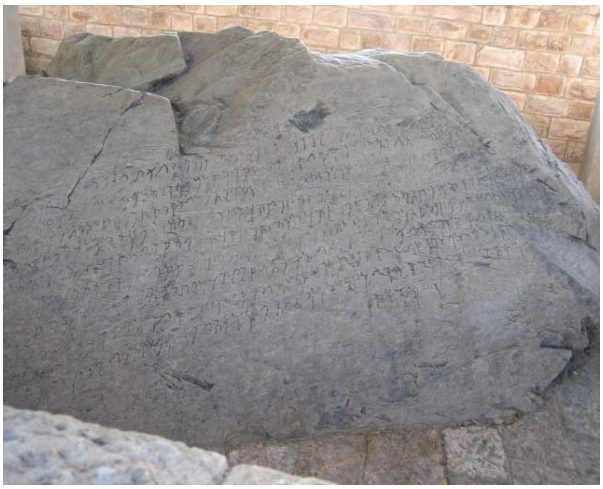

Fig. 2 : Historic Stones of Ashoka in research site

Fig. 3 : View of Research area

Fig. 4 : View of Research area

II. Materials and Methods

The study area was thoroughly surveyed during the year 2009 - 2010 from time to time to learn the botanical and biological situation with students of biology, Federal government collage Mardan. It presents a prospect to compose plant compilation and field interpretation throughout the flowering and fruiting of maximum quantity of species. Plant specimens collected from the area were dried and preserved (Figure 5). They were identified from first to last available literature Nasir & Ali (1970-1994) and Ali & Qaisar (1971-2006). The plants were classified into different life form and leaf size classes as follows after Raunkiaer (1934), Muller and Ellenberg (1974) and Hussain (1989). These plant specimens were submitted to the Herbarium, Department of Botany, Federal Government College Mardan, Pakistan.

Fig. 5 : Collection of plant species in research area

III. Result

Field survey and collection of plants were completed 2009 -2010. The current result reveled that 132 plant species belonging to 47 families and 104 genera were initiate in the area (Figure 6). Along with these presented 16 trees, 10 shrubs, 106 herb species (Figure 7). Asteraceae and Poaceae were the dominant with 15 species then Amaranthaceae, Solanaceae both by 7 species, Cucurbitaceae, Euphorbiaceae, Laminaceae and Moraceae by means of 6 species. Polygonaceae had 5 species. Chenopodiaceae and Zygophyllaceae had 4 species each. Brassicaceae, Cyperaceae and Malvaceae had 3 species each one. Apiaceae, Boraginaceae, Caesalpinaceae, Liliaceae, Myrtaceae, Nyctaginaceae, Papaveraceae,

Papilionaceae, Rosaceae and Verbenaceae each and every one had 2 species. Adiantaceae, Asclepiadaceae, Cactaceae, Canabinaceae, Caryophyllaceae, Commelinaceae, Convolvulaceae, Crassulaceae, Cuscutaceae, Fabaceae, Fumariaceae, Meliaceae, Mimosaceae, Oxalidaceae, Portulacaceae, Punicaceae, Rhamnaceae, Rubiaceae, Rutaceae, Sapindaceae, Scrophulariaceae, Simaroubaceae and Tamaricaceae had 1 specie each one (Table 1).

The biological spectrum explains that therophytes (63 spp., 47.73%), chamaephytes (24 spp., 18.18%), megaphanerophytes (15 spp., 11.36%), hemicryptophytes (13 spp., 9.85%), nanophanerophytes (12 spp., 9.09%), cryptophytes (Geophytes) (04 spp., 3.03%), parasite (1 spp, 0.76%) had originated in the investigated area (Table. 3). Leaf spectra of plants consisted of microphylls (62 spp. 46.97%), mesophylls (28 spp. 21.21%), nanophylls (18 spp. 13.64%) leptophylls (15 spp. 11.36%) and megaphylls (9 spp. 6.82%) (Table 2; Figures 8, 9).

Table 1 : Floristic list of Shahbaz Garhi, District Mardan

SN	Family	Species	Habit	Life Form	Leaf size classes
1	Adiantaceae	*Adiantm capillus veneris* L	H	Hem	Na
2	Amaranthaceae	*Achyranthus aspera* L	H	TH	Mes
		Aerva javanica(Burm.f.) Shult	H	CH	Mic
		Alternanthera sessil(L.) R.Br. ex DC	H	CH	Mic
		Amaranthus spinosus L	H	CH	Mg
		Amaranthus torreyi Benth. Exs.Watson	H	NP	Mic
		Amaranthus viridis L	H	TH	Mic
		Digera muricata (L.)	H	CH	Mic
3	Apiaceae	*Coriandrum sativum* L.	H	TH	Lep
		Eryngium bourgatii L	H	NP	Mg
4	Asclepiadaceae	*Calotropis procera* (Wight.) Ali	S	CH	Mes
5	Asteraceae	*Carthamus oxycantha* M. Bieb.	H	TH	Mic
		Carthamus tinctirius L	H	CH	Mes
		Centaurea calcitrapa L.	H	TH	Mes
		Conyza aegyptiaca (L.) Aiton	H	CH	Mes
		Echinops carnigerus DC.	H	CH	Mes
		Launea procumbens Roxb.	H	TH	Mes
		Onopordum acanthium L.	H	CH	Na
		Parthenium hysterophorus L	H	TH	Mes
		Silybum marianum (L.) Gaertn.	H	TH	Mes
		Sonchus arvensis L.	H	TH	Mes
		Sonchus asper (L.) Hill	H	TH	Mic
		Sonchus auriculata L	H	TH	Mic
		Sylibum marianum (L) Graertn	H	CH	Mic
		Taraxacum officinale Weber.	H	TH	Mic
		Xanthium strumarium L.	H	CH	Mes
6	Boraginaceae	*Heliotropium europaeum* L.	H	TH	Na
		Heliotropium strigosum Willd	H	TH	Lep
7	Brassicaceae	*Capsella bursa-pestoris* Medic.	H	TH	Mic
		Descurainia sophia (L.) Webb.	H	TH	Na
		Eruca sativa Mill	H	TH	Mic

8	Cactaceae	*Opuntia littoralis* (Engelm.)	S	NP	Lep
9	Caesalpinaceae	*Cassia fistula* L.	T	MP	Mes
		Cassia occidentalis L.	H	TH	Mes
10	Canabinaceae	*Cannabis sativa* L.	H	TH	Mic
11	Caryophyllaceae	*Stellaria media* (L.) Cry	H	TH	Na
12	Chenopodiaceae	*Chenopdium ambrosiodes* L	H	TH	Mic
		Chenopodium album L.	H	TH	Mic
		Chenopodium murale L.	H	TH	Lep
		Spinacea oleracea L.	H	TH	Mic
13	Commelinaceae	*Commelina communis* L.	H	TH	Mic
14	Convolvulaceae	*Convolvulus arvensis* L.	H	TH	Mic
15	Crassulaceae	*Sedum acre* L	H	TH	Mic
16	Cucurbitaceae	*Citrullus lanatus* (Thunb.) Mats	H	TH	Mes
		Cucimus prophetarum L.	H	TH	Mes
		Cucurbita maxima Duchesne.	H	TH	Mg
		Cucurbita pepo L.	H	TH	Mg
		Luffa cylindrica (L.) Roem.	H	TH	Mg
		Momordica charantia L.	H	TH	Mes
17	Cuscutaceae	*Cuscuta reflexa* Roxb.	H	P	Lep
18	Cyperaceae	*Cyperus compresus* L	H	Hem	Lep
		Cyperus rotundus L.	H	Hem	Lep
		Cyperus scarlosus R.Br.	H	Hem	Lep
19	Euphorbiaceae	*Chrozophora oblique* (Vahl) A. Juss.	H	CH	Mes
		Chrozophora tinctoria (Linn) Raffin.	H	NP	Mic
		Euphorbia helioscopia Mewski	H	TH	Na
		Euphorbia hirta L.	H	TH	Mic
		Euphorbia prostrata L.	H	TH	Lep
		Riccinis communis L.	S	NP	Mg
20	Fabaceae	*Indigofera hirsute* L	H	CH	Na
21	Fumariaceae	*Fumaria indica* (Hausskn) Pugsley	H	TH	Lep
22	Laminaceae	*Ajuga bractiosa* Wall. Benth.	H	TH	Mic
		Ajuga parviflora Benth	H	TH	Mic
		Mentha arvensis L.	H	Geo	Mic
		Mentha longifolia L.	H	Geo	Mic
		Ocimum basilicum L	H	CH	Mic
		Selvia moorcroftianaWall. ex Benth	H	CH	Mg
23	Liliaceae	*Allium sativum* L.	H	Geo	Mic
		Oxalis caniculata L	H	TH	Na
24	Malvaceae	*Abelmoschus esculentus* L.	H	TH	Mic
		Malva neglecta Wallr.	H	TH	Mic
		Malvastrum coromandelianum(L.) Garcke	H	TH	Mic

25	Meliaceae	*Melia azedarach* L.	T	MP	Mic
26	Mimosaceae	*Acacia modesta* Wall.	T	MP	Lep
27	Moraceae	*Broussonitia papyrifera(L.) Vent*	T	MP	Mg
		Ficus carica Hausskn. Ex. Boiss.	T	MP	Mes
		Ficus palmata Forssk.	T	MP	Mes
		Ficus religiosa L.	T	MP	Mes
		Morus alba L.	T	MP	Mes
		Morus nigra L.	T	MP	Mes
28	Myrtaceae	*Eucalyptus camaldulensis* Dehnh.	T	MP	Mic
		Eucalyptus lanceolatushoney	T	CH	Mic
29	Nyctaginaceae	*Boerhaavia procumbens* Banks ex Roxb.	H	CH	Mic
		Mirabilis jalapa L.	H	CH	Mes
30	Oxalidaceae	*Oxalis corniculata* L.	H	Geo	Mic
31	Papaveraceae	*Papaver rhoeas* L	H	TH	Mic
		Papaver somniferum L.	H	TH	Mic
32	Papilionaceae	*Alhagi maurorum* Medic.	S	TH	Na
		Vicia sativa L	H	TH	Na
33	Poaceae	*Avena sativa* L.	H	TH	Mic
		Bromus japonicus Thumb ex Murr	H	Hem	Mic
		Cenchrus ciliaris L.	H	TH	Na
		Chymbopogon jawaracosa L.	H	TH	Mic
		Cymbopogon distans (Nees ex Steud.)Watson	H	Hem	Mic
		Cynodon dactylon L. Pers.	H	Hem	Lep
		Daicanthium annulatumForssk.) Stapf	H	TH	Na
		Desmostachya bipinnata(L)	H	Hem	Mes
		Hardeum murinum L	H	TH	Na
		Hordeum vulgare L	H	TH	Mic
		Imperata cylindrica (L.) P. Beauv	H	Hem	Mic
		Phalaris minor L	H	CH	Mic
		Saccharum spontaneum L.	S	Hem	Mic
		Sorghum halepense (L.) Persoon	H	Hem	Mic
		Zea mays L.	H	TH	Mg
34	Polygonaceae	*Polygonum barbatum* L.	H	CH	Mic
		Polygonum plebjum R. Br.	H	CH	Mic
		Rumex dentatus L.	H	TH	Mes
		Rumex hastatus D.Don	H	TH	Na
		Rumix dantatus L.	H	TH	Lep
35	Portulacaceae	*Portulaca oleraceae* L.	H	Hem	Na
36	Punicaceae	*Punica granatum* L.	T	MP	Na
37	Rhamnaceae	*Ziziphus jujuba* Mill.	T	MP	Mic

38	Rosaceae	*Prunus persica* (L.) Batsch	T	MP	Mic
		Rosa indica L.	S	NP	Mic
39	Rubiaceae	*Gallium aparine* L.	H	TH	Lep
40	Rutaceae	*Citrus aurantifolia* Christmann	S	NP	Mic
41	Sapindaceae	*Dodonaea viscosa* (L.) Jacq.	S	NP	Mic
42	Scrophulariaceae	*Verbascum traipses* L	H	NP	Mic
43	Simaroubaceae	*Alianthus althesema* (Mill.) Swingle	T	MP	Mic
44	Solanaceae	*Datura metel* L.	S	NP	Mes
		Datura stramonium L.	H	NP	Mes
		Physalis minima L	H	CH	Mic
		Solanum nigrum L.	H	TH	Mic
		Solanum surattense Burm.f	H	TH	Mic
		Withania somnifera (L) Dunal.	S	CH	Mes
45	Tamaricaceae	*Tamarix indica* Willd.	T	MP	Na
46	Verbenaceae	*Lantana camara* L.	H	CH	Mic
		Verbena hastata L.	H	NP	Mic
47	Zygophyllaceae	*Fagonia cretica* Burm.	H	TH	Na
		Peganum harmala L	H	Hem	Mic
		Tribulus terrestris L.	H	TH	Mic
		Zygopylum simplex L.	H	TH	Lep

IV. Discussion

The work will indubitably present much help out to future investigator assets trying in this field in this area. The area consists of both hills and plains, differing much in floristic composition. Irrigation facilities are very less in the area, depending on rainfall. Due to lack of irrigation conveniences the Flora, particularly cultivated Flora has much difference from highly irrigated areas of Khyber Pakhton Khawa. The chief Agriculture crops are Wheat, different legumes, fodder crops and barely, grown. On hills different grasses, Acacia modesta, Achyranthus aspera, Calotropis procera, Carthamus oxycantha, Conyza aegyptiaca, Xanthium strumarium, Opuntia littoralis, Sorghum halepense and Fagonia cretica etc are commonly found. Mostly the Xerophytes such as Broussonitia papyrifera(L.) Vent, Ficus carica Hausskn. Ex. Boiss., Ficus palmata Forssk., Morus alba L., Eucalyptus camaldulensis Dehnh., Eucalyptus lanceolatus honey etc are found on road sides while Melia azedarach L., Ficus religiosa L., Prunus persica (L.) Batsch, Alianthus althesema (Mill.) Swingle, Tamarix indica Willd etc. are commonly found in Grave-yards. Such type of study was also taken by Khan et al., (2011a,b, 2012, 2013). With the passage of time, increase in population and rising in need of facilities in the culture declining the natural habitats. Our result is similar with that of Khan et al., (2012). The natural assets are being over-used, unclear and spoil. In the research area, commonly people depend on agricultural and domestic animals. They also collect medicinal plants, fodder, fuel wood and timber.

According to the Raunkiaer (1934) that climate of a region is characterized by life form. Plant species were identified and classified into major life forms to build biospectrum. The biological spectra is helpful to comparing geographically far and wide separated plant communities and used as an indicator of prevailing environment. Biological spectrum may be significantly changed due to preface of therophytes like annual weeds, biotic pressure like agricultural practices and grazing, deforestation and trampling etc. The dominance of therophytic life form showed that the area was under heavy biotic pressure. Our results agree with that of Khan et al., (2011a,b) and Khan, et al., (2012). Comparisons of the percentage of the life form classes of the research area with Raunkiaer standard biological spectrum (RSBS), therophyte form the largest life form class and their percentage is more than thrice (47.73%) that of the RSBS (13.0%). The phanerophytes forms, the second highest class with (21.21%). Their percentage was 46.0 in the RSBS. Thus, the biological spectrum of the research area marker "Therophytic" Phytoclimate at the same time as this class proves the greatest deviation from the standard spectrum. Hemicryptophyte is equal (9.85 %) with that of the RSBS (9.00 %). Cryptophytes was less percentage 3.03 than in the RSBS (6.00 %) (Table. 3). In this study, the domination

of therophytes and phanerophytes over other life forms give the idea to be a response with to the warm dried up weather, topographic divergence, human being and creature disturbance. The dominance of therophytes occurs due to un-favorable environment conditions as definite by a lot of research (Shimwell, 1971, Khan et al., 2011c, 2012). The current results in this regard also agree with them. Khan et al., (2012) considered chamaephytes and therophytes as the major life form in unfavorable environment in desert region. In the investigated area arid conditions, low temperature in winter, high temperature in summer, wind and biotic factors result in un-favourable conditions paving way for therophyte. Saxina et al., (1987) stated that hemicryptophytes dominated temperate zone in overlapping and loose continuum. Therophytes continue in unfavorable condition during seeds production. The predominance of therophytes in unstable conditions such as dry, hot or cold met for low to higher elevation might be the reason for their higher percentage in the present study.

The present study shows that leptophylls were high at the hilly area while microphylls and nanophylls were present in plain area. Species with large leaves take place in warmer wet climates while smaller leaves are characteristic of cold and arid climates and degraded habitats. A high percentage of microphylls might be due to dry climate in area. Leaf size spectrum of the plant revealed that microphyllous species followed by nanophylls species were dominant in the investigated area. Microphylls are usually characteristic of steppes while nanophylls and leptophylls are characteristic of hot deserts (Khan et al., 2013; Tareen & Qadir, 1993). The soil was poorly developed with thin sheet that banned root penetration. Furthermore, roots absorb low moisture and nutrients under dry conditions. In this region's the plant face drought during winter especially in dry soil. The species with microphyllous leaves were abundant due to ecological adaptation for these arid conditions. The present findings agree with those of Khan 2013 who reported high percentage of microphylls in the dry climate of Tehsil Takht-e-Nasratti. These data indicated that the percentage of various leaf form classes varied with increasing altitude. Khan (2013) and Khan et al., (2013) also observed that the percentage of microphylls was positively linked with the increasing altitude and this also hold up our findings. According Dolph & Dilcher (1980 a, b) large leaved species were dominant in tropical wet forest. This difference is mainly due to climatic variation such as temperature and wet tropical condition. The situation in our case is far more xeric than in the wet tropics. The size of leaves alone could not be used to identify specific leaf zone or climates. Other features of plants such as habit and root system might also play important role in biodiversity.

An ecologically operating problem of the area is grazing, browsing, and trampling by domestic animals (Figure 10). These elements cause species not to reach its climax stage. Grazing is one of the depressing aspects, which has caused the reduction in vegetation (Khan and Hussain, 2012). In these processes the palatable species are selected and these make the non-palatable species to increase. This can be noticeably seen in many places, which results in stunting growth and not reaching to flowering stage: so these are a danger of their extinction. The most important factors disturbing the Flora of area are humidity, light, temperature, soil conditions, topography, elevation from sea level, rain fall and other forms of precipitation. On soil having high Nitrogen content are found Malva neglecta, Chenopodium album etc, as occurring near human duellings, on compost heaps and in back yards. The finding is similar with that of Khan et al., (2012, 2013), Khan and Hussain (2013) and Khan (2013).

Table 2 : Total number of plant species and percentage of life-form and leaf size classes of Shahbaz Garhi District Mardan

Life-form classes	No. of species	Percentage	Leaf size classes	No. of species	Percentage
Therophytes	63	47.73	Microphylls	62	46.97
Chamaephytes	24	18.18	Mesophylls	28	21.21
Megaphanerophytes	15	11.36	Nanophylls	18	13.64
Hemicryptophytes	13	9.85	Leptophylls	15	11.36
Nanophanerophytes	12	9.09	Megaphylls	9	6.82
Geophytes	4	3.03			
Parasite	1	0.76			

Table 3 : Comparison of biological spectrum of the area with Raunkiaer's Standard Biological Spectrum (SBS).

Spectrum	PP	ChP	TP	HP	CrP	Total
RSBS	46	26	13	9	6	100
Current study	21.21	18.18	47.73	9.85	3.03	100
Deviation in Percentage	24.79	7.82	-34.73	-0.85	2.97	0

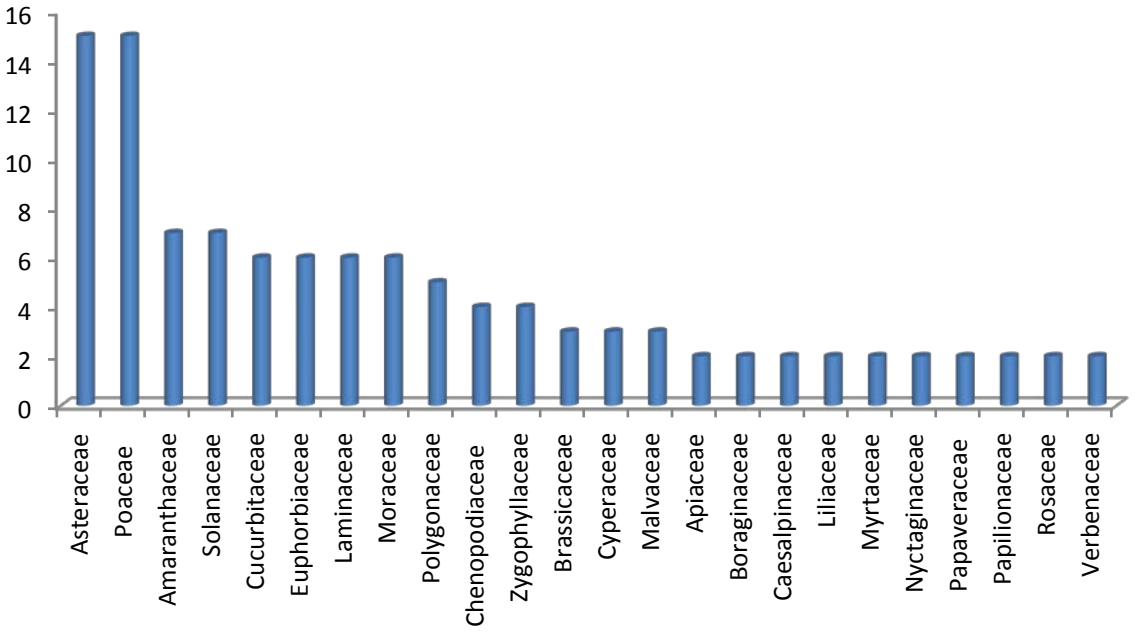

Fig. 6 : Family of plant species recorded in research area

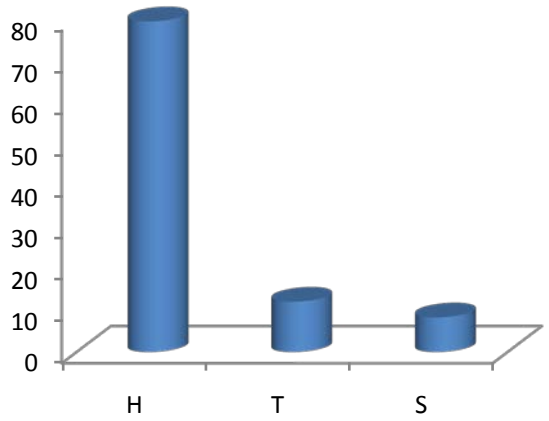

Fig. 7 : Habit of plant species in research area

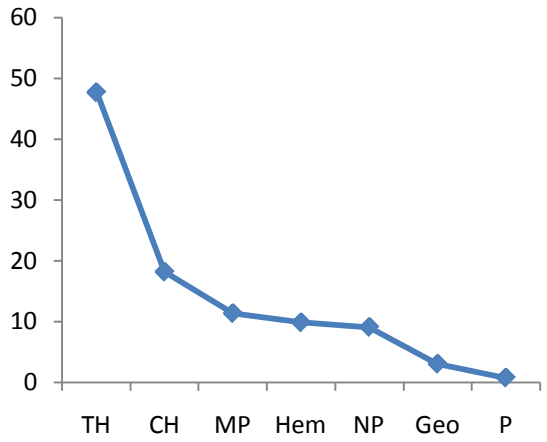

Fig. 8 : Life form classes of plant species in research area

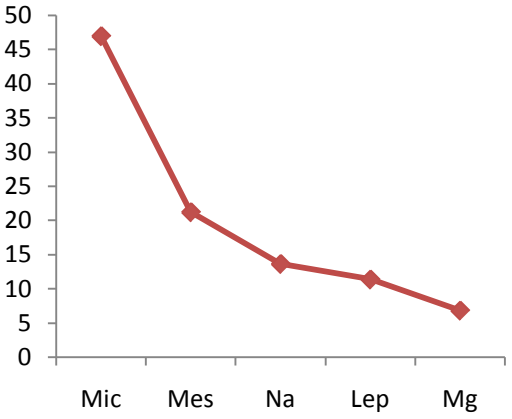

Fig. 9 : Leaf size classes of plant species in research area

Fig. 10 : Goat graze plant species in research area

V. Conclusion

The region is extremely prosperous in biodiversity. In the current study, the high percentage of therophyte is supported in the study region for the reason that the region is semiarid zone of Khyber Pakhtonkhawa. The dominance of therophytes indicated that the investigated area was under heavy biotic pressure due to deforestation and over grazing. Most of the plants were uprooted for burning purposes and grazed by the livestock. Many plant species were decreasing in the area and special care is needed for their plant life conservation. Many fruits are worn out annually due to non-availability of marketplace. The market convenience has fine result on plants and on nation. Medicinal farm should be set up in the area to support the essential importance of the plants and its conservation.

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