

**DIVERSITY OF WEEDS AND THEIR ECOLOGICAL CHARACTERISTICS AT TEHSIL MANKI SHARIF, DISTRICT NOWSHERA, PAKISTAN**

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**ABSTRACT**

*The present study was conducted in order to assess the weed flora of Tehsil Manki Sharif, District Nowshera Pakistan during 2013-14. A total of 46 weed species belonging to 21 families and 43 genera were reported from the research area. The dominant family was Asteraceae with 11 species followed by Papilionaceae and Plantagonaceae with four species each. The family Poaceae was represented by four species; Solanaceae, Euphorbiaceae and Brassicaceae were having two species each, while the remaining families shared only one species each. In survey, the dominant life form was therophyle (36 species with 76%), followed by Geophyte (7 species with 15.2%), and hemicryptophyte (4 species with 8.6%). The leaf size spectra showed that mesophylls were the dominant class with 14 species from the study area, followed by microphyll with 10 species and Nanophyll with 8 species.*

**Key words:** Biodiversity, biological spectra, habitat, Nowshera Pakistan, weeds.

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**INTRODUCTION**

Nowshera is a district in Khyber Pakhtunkhwa devising a total area of about 1,748 km<sup>2</sup> and overall agriculture portion of about is 52,540 ha (Ullah *et al.*, 2011). The zone accepts both irrigated and non-irrigated lands. The soil of Nowshera is variable from place to place and the quality of the soil may be grimy along the canal beds, an area where the water component is surplus due to which the soil is mostly clayey (Hadi *et al.*, 2009). There are different seasons throughout the year. In winter, it is windy and in autumn it is hot and rainy

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likewise that in summer (Hussain *et al.*, 2004). The weed variety and species also vary from an area to area (Sher and Khan, 2007). There is a major variation that occurs in the weeds of the adjacent areas i.e. north east of Nowshera including Swabi which is having 50 different weeds belonging to 26 families. Sher and Khan (2007) reported large number of weed flora that they were noticed in Mardan, Peshawar and Charsadda (Ullah *et al.*, 2014).

## **MATERIALS AND METHODS**

The study area was thoroughly surveyed throughout the year from time to time to study the botanical and ecological characteristics of weeds. The research areas of tehsil Manki Sharif (District Nowshera) were visited and analysed for the weed flora. The survey was brought about during the year (2013-14). The main aim of the study was to assess the ecological characteristics of weeds during the survey time and ecological data of common weeds growing in the target area.

Plant species were collected, dried, pressed and mounted on herbarium sheets. Twelve (12) trips were organized; four in each spells for the plant species that were collected with suitable manner. The plants were identified with the help of the Flora of Pakistan (Ali and Qasir, 1995-2013). The other important features such as life size and biological spectra etc. were traced from the work of Raunkiaer (1934) and Hussain and Shah (1989).

## **RESULTS AND DISCUSSION**

The survey investigated forty six (46) species of 21 families and 43 genera from the research area. The family Asteraceae dominated the area and was represented by 11 (23.91%) species followed by Papilionaceae with 6 (13.04%) species. Poaceae, Plantagonaceae, Brassicaceae, Solanaceae and Euphorbiaceae shared two species each (4.34%); while Cannabinaceae, Chenopodiace, Convolvulaceae, Cuscutaceae, Equistaceae, Cryperaceae, Lamiaceae, Malvaceae, Scrophulariaceae, Fumaraceae, Oxilidaceae, Polygonaceae Verbanaceae and Ranunculaceae shared one (2.17%) species each. The life form indicated that there were 35 (76%) Therophytes, 7 (15.2%) geophytes, and four species (8.6%) were Hemicryptophyte (Table-1). The leaf size spectra showed that mesophylls were the leading leaf size class with 14 (30.43%) species Microphyll and Nanophyll shared equal number of 8 (17.39%) species; while the other were having 3 species of leptophyll, two species of megaphyll and one species was aphyllous.

Weeds are undesirable and unwanted plants on the ability of their competitive and allelopathic feather in contrast to other plants. However, the process of identification and spreading of weed in each

and every area has always been a pre requisite for weed management. Sher *et al.* (2011) mentioned that the addition of soil organic matter and manure to the crops followed by the soil conservation method a weed often offer competition with standing crops and reduce the field of each and every crop. Besides the field shortage, weeds also create problems to farmers during harvesting, cutting, or at collection.

Hadi *et al.* (2009) worked out the flora of Botanical Garden at Azakhel which support our results and they reported 30 weed spp: belonging to 28 genera, and 15 families. The important families included in their study were Poaceae (7 spp.) and Asteraceae (5 spp.). The Leaf size spectra also showed that nanophylls (13 spp.) was the dominating class. Dhole *et al.* (2013) collected 30 weeds species of 15 families and 26 genera from the wheat field in the Marathwada region India. Euphorbiaceae was the leading family with 7 spp., followed by family Asteraceae with 4 spp. Shah *et al.* (2009) recognized the vegetation of Hayat Abad, District Peshawar. A total of 42 plant species belonging to 39 genera and 20 families were identified. The richest families in number of species were Asteraceae, Brassicaceae, Poaceae and Solanaceae.

Life form and leaf size also supported our findings. Malik *et al.* (2000) reported the life form and leaf size spectra of 15 ecologically different plant communities from Ganga Chotti and Bedori Hills of Pakistan. Hemicryptophytes and Therophytes were dominant during spring and monsoon which is however contrary to our findings. Similarly, the microphyllous species were followed by nanophyllous species and both were dominant in the investigated area which favoured our findings.

Chaudhry *et al.* (2001) studied the phyto-ecology of Chhumbi-Surla Wildlife Sanctuary, Chakwal. They recognized 116 plant species belonged to 35 families; Poaceae was the largest family with 41 grass species. Amjad *et al.* (2012) reported life form and leaf spectra from the plants of Basu valley, district Skardu. They calculated the 50 plant species belonging to 22 families. The Chameophytes (26.38%) was the dominant life form of the area.

Leaf size spectra class was dominated by leptophylls (52%). Khan *et al.* (2013) studied the eco-taxonomic study of family Brassicaceae of District Mardan. Life form classes indicated 66% of the therophyte species.



**Table-1.** Diversity and ecological characteristics of weeds at Tehsil Manki Sharif, KP, Pakistan.

S. No.	Plant name	Family Name	Habitat	Habit	Life form	Leafsize
1	<i>Equisetum arvense</i> L.	Equisetaceae	Dry	Erect	G	L
2	<i>Bromus pectinatus</i> Thunb.	Poaceae	Dry	Erect	Th	Mac
3	<i>Cyanodon dactylon</i> L.	Poaceae	Dry	Prostrate	H	Mic
4	<i>Dichanthium annulatum</i> (Forssk.) Stapf	Poaceae	Dry	Erect	H	Mic
5	<i>Phragmites karka</i> (Retz.) Trin. Ex Steud.	Poaceae	Wet	Erect	G	Meg
6	<i>Artimisia vulgaris</i> L.	Asteraceae	Dry	Erect	Th	Meg
7	<i>Cichorium intybus</i> Linn.	Asteraceae	Dry	Erect	Th	Mac
8	<i>Helianthus annuus</i> L.	Asteraceae	Dry	Erect	Th	Meg
9	<i>Lactuca serriola</i> L.	Asteraceae	Dry	Erect	Th	Mes
10	<i>Sonchus aspera</i> (L.) Hill	Asteraceae	Dry	Erect	Th	Mes
11	<i>Taraxacum officinale</i> F. H. Wigg.	Asteraceae	Dry	Erect	Th	Mes
12	<i>Xanthium strumarium</i> L.	Asteraceae	Dry	Erect	Th	Mac
13	<i>Eclipta alba</i> (L.) Hassk.	Asteraceae	Dry	Prostrate	G	N
14	<i>Conyza canadensis</i> (L.) Cronquist	Asteraceae	Dry	Erect	Th	Mic
15	<i>Achyranthes aspera</i> L.	Asteraceae	Dry	Erect	Th	N
16	<i>Parthenium hysterophorus</i> L.	Asteraceae	Dry	Erect	Th	Mes
17	<i>Scandix pecten-veneris</i> L.	Apiaceae	Dry	Erect	Th	N
18	<i>Capsella bursa-pastoris</i> (L.) Medik	Brassicaceae	Dry	Erect	Th	Mic
19	<i>Malcolmia africana</i> (L.) R. Br	Brassicaceae	Dry	Erect	Th	N
20	<i>Cardaria draba</i> (L.) Desv.	Brassicaceae	Dry	Erect	Th	Mes
21	<i>Cannabis sativa</i> L.	Cannabinaceae	Dry	Erect	Th	Mes
22	<i>Chenopodium album</i> L.	Chenopodiaceae	Dry	Erect	Th	Mes
23	<i>Convolvulus arvensis</i> L.	Convolvulaceae	Dry	Prostrate	Th	Mes
24	<i>Cuscuta reflexa</i> Roxb.	Cuscutaceae	Dry	Prostrate	Th	Ap
25	<i>Euphorbia pipulus</i> L.	Euphorbiaceae	Dry	Erect	Th	N
26	<i>Euphorbia helioscopia</i> L.	Euphorbiaceae	Dry	Erect	Th	N
27	<i>Mentha longifolia</i> L.	Lamiaceae	Wet	Prostrate	Th	Mes
28	<i>Malva neglecta</i> Wallr.	Malvaceae	Dry	Erect	Th	Mes

29	<i>Medicago sativa</i> L.	Papilionaceae	Dry	Prostrate	H	N
30	<i>Melilotus officinalis</i> L.	Papilionaceae	Dry	Prostrate	Th	Mic
31	<i>Trifolium repens</i> L.	Papilionaceae	Dry	Prostrate	Th	Mic
32	<i>Trifolium resopinatum</i> L.	Papilionaceae	Dry	Prostrate	Th	Mic
33	<i>Vicia sativa</i> L.	Papilionaceae	Dry	Prostrate	Th	Mic
34	<i>Plantago lanceolata</i> L.	Plantagonaceae	Dry	Erect	Th	Mac
35	<i>Plantago major</i> L.	Plantagonaceae	Dry	Erect	G	Mes
36	<i>Polygonum mucolosa</i> L.	Plantagonaceae	Dry	Erect	Th	Mes
37	<i>Rumex hestatus</i> L.	Plantagonaceae	Dry	Prostrate	Th	Mac
38	<i>Verbascum Thapsus</i> L.	Scrophulariaceae	Dry	Erect	Th	Mac
39	<i>Datura innoxia</i> Mill. NP Mes	Solanaceae	Dry	Erect	Th	Mac
40	<i>Solanum nigrum</i> var. <i>nigrum</i> L.	Solanaceae	Dry	Erect	Th	Mic
41	<i>Fumaria indica</i> (Hauskn.) Pugsley	Fumaraceae	Wet	Prostrate	Th	N
42	<i>Cyperus rotundus</i> L.	Cyperaceae	Dry	Erect	G	N
43	<i>Alhagi maurorum</i> Medic.	Papilionaceae	Dry	Erect	H	L
44	<i>Oxalis corniculata</i> L.	Oxilidaceae	Dry	Prostrate	Th	Mes
45	<i>Polygonum plebejum</i> R. Br	Polygonaceae	Wet	Prostrate	G	Mes
46	<i>Phyla nodiflora</i> L.	Verbanaceae	Dry	Prostrate	Th	L
47	<i>Ranunculus laetus</i> Wall. ex Royle	Ranunculaceae	Dry	Prostrate	G	Mic

**Keys:** Th(therophytes), G(geophytes), H(hemicryptophytes), L(leptophylls), N(nanophylls), Mic(microphylls), Mes(mesophylls), Mac(Macrophylls), Meg(megaphylls), Ap(aphyllous).

**REFERENCES CITED**

- Ali, S.I. and M. Qaisar. 1995-2009. Flora of Pakistan. Pakistan Agricultural Research Council, Islamabad.
- Amjad, M. S., A. Hameed and Z. H. Malik. 2012. Life form and leaf spectra reported from sub-tropical to alpine and subalpine zone of Basu Hills, District Sakardu, Gilgit Pakistan. Int. J. Emerg. Sci. 2(4): 543-551.
- Chaudhry, A. A., M. Hameed, R. Ahamd and A. Hussain. 2001. Phytosociological studies in Chhumbi-Surla wild-life sanctuary, Chakwal, Pakistan. II. Phytoecology. Int. J. Agric. Biol. Pp. 1560-8530.
- Dhole, J.A., K.D. Lone, N.A. Dhole and S.S. Bodke. 2013. Studies on weed diversity of wheat (*Triticum aestivum* L.) crop fields of Marathwada Region. Int. J. Curr. Microbiol. App. Sci. 2(6): 293-298.
- Hussain, F., I. Iqbal and P. Akhtar. 2005. Floristic and vegetation studies of Ghalegay Hills, District Swat, Pakistan. Inter. J. Biol. Biotechnol. 2(4): 847-852.
- Hussain, A., S.N. Mirza, I. A. Khan and M.A. Naeem. 2009. Determination of relative species composition and seasonal plant communities of nurpur reserved forest in scrub rangelands of District Chakwal. Pak. J. Agri. Sci. 46 (1): 55-59
- Hussain, F. and A. Shah. 1989. Phytosociology of vanishing sub-tropical vegetation of Swat with special reference to Docut Hills II in spring aspect. Scientific Khyber, 2: 20-28.
- Hadi, F., M. Naseem, S.M. Shah, Asadullah and F. Hussain. 2009. Prevalence and ecological characteristics of summer weeds in crop and vegetable fields of Botanical garden Azakhel, University of Peshawar, Pakistan. Pak. J. Pl. Sci. 15(2): 101-105.
- Khan, N.A and M. Shah. 2013. Eco-taxonomic study of family Brassicaceae of District Mardan, Khyber Pukhtunkhwa, Pakistan. PJLS. 1(1): 28-35.
- Malik, Z.H., F. Hussain and N.Z. Malik. 2007. Life form and Leaf Size Spectra of plant communities harbouring Ganga Chotti and Bedori Hills during 1999-2000. Int. J. Agric. Biol. 1560-8530.
- Raunkiaer, C. 1934. The life forms of plants and statistical plants geography being the collected Papers of C. Raunkiaer. Clarendon press, Oxford.
- Shah, M. and F. Hussain. 2009. Phytosociological study of the vegetation of Hayat Abad Peshawar, Pakistan. Pak. J. Pl. Sci. 15(2): 123-128.

- Sher, Z. and Z.U. Khan. 2007. Floristic composition, life form and leaf spectra of the vegetation of Chagharzai Valley, District Buner. *Pak. J. Pl. Sci.* 13(1): 57-66.
- Ullah, R., F. Hussain, L. Badshah, M. Shah and I. Hameed. 2011. Phytosociological Study of Tehsil Manki Sharif, Nowshera, Khyber Pakhtunkhwa, Pakistan. *Pak. J. Pl.* 17(1): 65-77.
- Ullah, S., A. Ullah and A. Rashid. 2014. Medicinal diversity of weeds in the historical valley of Landikotal, Khyber Agency, Pakistan. *Pak. J. Weed Sci. Res.* 20(4): 531-539.