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FLORAL DIVERSITYAND LIFE FORM OF WEEDS IN THE FIELD OF *TRITICUM AESTIVUM* IN SOME SELECTED AREAS OF DISTRICT BHIMBER AZAD KASMIR

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ABSTRACT

Present study was conducted to document the ecological diversity of weeds in wheat fields. Ten weed communities at different elevations from 340m to 520m were studied in District Bhimber Azad Kashmir. Forty (40) weed species belonging to 22 families and 39 genera were reported in wheat fields. Grassy weeds were dominant in all the selected sites. The dominant families on the basis of family importance values (FIV) in wheat were Poaceae and Asteraceae. The biological spectrum of weeds showed that therophytes dominate with 70.73% followed by 15.45% geophytes. The soil texture differs from loam, clay loam and sandy loam. Basic pH and organic matter varied from 0.55 to 1.04, saturation from 48% to 22%, phosphorus 4.00 to 8.00ppm, potassium 68 to 146ppm and electrical conductivity 0.144 to 0.45. This research work forms the basis towards the organization of a weed flora, which could be useful in the same way for both taxonomists as well as other plant scientists.

Key words: Bhimber. Hemicryptophyte. Life form. Weeds**.**

INTRODUCTION

Triticum aestivum is the cash crops in the irrigated and Barani (non-irrigated) lands of District Bhimber. Weed infestation is one of the major impediments to wheat yield including diseases pest and climatic influences. They consume available moisture, nutrients and compete for space and sunlight with crop plants and result in yield reduction (Khan *et al*., 2004). Weeds are undesirable on account of their competitive and allelopathic behavior and providing habitats for harmful organisms. Weeds are plants that interfere with the healthy or normal growth and development of crops (Qureshi *et al*., 2009). The yield per acre of wheat

can be increased by agronomic practices including weed control. However, the authentic identification and distribution has always been a pre-requisite for weed management. Weeds from wheat fields of different parts of the country by different workers, Hussain *et al*., (1985), Ayaz *et al*, (1993), Qureshi & Bhatti, (2001), Hussain *et al*., (2004), Marwat *et al*., (2006), Naveed and Hussain, (2007), Waheed *et al*., (2009) and Qureshi *et al*., (2009) have been reported. Life form is primarily determined by hereditary selection, it may be regarded as an adjustment of the vegetative plant body and life history to the habitat (Nasir and Sultan, 2002).

CHARACTERISTICS OF WEEDS

Like crop plants weeds also possess some features by virtue of which they are recognized as wild plants or unwanted plants. Weeds have the capacity to survive under adverse climatic conditions due to better adaptation to a varied type of habitat. The genetic makeup of the weeds is such that they can tolerate adverse climatic conditions. For example, *Calotropis procera* and *Saccharum officinarum* can tolerate high temperature and limited soil moisture condition due to thick cuticle and deep root system. (Walia, 1987). Some weeds resemble morphologically with the crop and it is very difficult to identify these especially at the time of hoeing. e.g., *Phalaris minor, Avena fatua*. (Walia, 1987). Seed of weed remain buried for a long time in the soil. Due to seed dormancy power of germination is retained. Such as, *Chenopodium album* (Walia, 1987). Like crops weeds also have tendency to reproduce. Most of the annual weeds mature earlier than crops. Weed grow in close vicinity of the crop plants. Both have same requirements for normal growth and development. When weeds have taller and dense canopies they suppress the growth habit, such as tall growing, more leaf area, rapid early growth, spreading habit e. g. *Cyperus rotundus, Cynodon dactylon*. Perennial weeds have very deep root system and it is difficult to remove all the vegetative parts of these weeds e.g., *Convolvulus glomerates* (Walia,1987).

CLASSIFICATION OF WEEDS

Weeds can be classified as;

Weed plants which complete their life cycle in one year are called as annual weeds e.g. *Silybum uranium, Bidens bipinnata***.** Weed plant which complete their life cycle in two years are called as biennial weeds e.g. *Cirsiu marvense, Xanthium strumarium***.** Weeds which

complete their life cycle within three years are called as perennial weeds. They propagate through roots, stolon's, tubers and rhizome etc. e.g., *Cynodon dactylon, Cyperusiria*. (Walia, 1987).

USEFUL ASPECTS OF WEEDS

Weeds are not always harmful but may have useful aspects for human beings and animals. (Brar and Walia, 1989). Soil erosion is mainly due to strong wind bellowing or water flowing. *Saccharum* spp. Help in reducing wind erosion. *Cynodon dactylon* due to its mat type growing habit help in *minimizing* water erosion. Weed Spp. Such as *Oxalis corniculata*, *Xanthium strumarium*, *Desmodium gangeticum* are used to cure diseases like skin diseases, snake bite etc. Some grasses like *Phalaris minor*, *Phalaris arvensis*, *Imperata cylindrica* etc. are used as fodder of animals. Weeds like *Saccharum officinarum* and *Cynodon dactylon* are used for making mats. Blue green algae like Anabaena and Nostoc fix atmospheric nitrogen when they come in contact with leguminous weeds like *Melilotus alba*, *Medicago liciniata* improve fertility level of soil not only by fixing nitrogen but also by adding organic carbon. Fibers are obtained from *Cannabis sativa*.

MATERIALS AND METHODS

The present study was done during moon soon, 2013 to see the floristic composition of weeds of wheat and millet in Bhimber fields. Quadrat method was used for the phytosociological attributes of weeds. Quadrats were laid randomly in each community. The number of quadrats for sampling the herbaceous Spp. Were 15. The size of quadrat was 0.5m×0.5m (Malik, 2005). Life form reflect the adaptation of plants to climate. The relative proportion of different life form for a given region or area is called its biological spectrum or bio spectrum. The plants were classified into different life form as follows after Raunkiaer (1934) and Mueller-Dumbois and Eilenberg (1974). Family importance values were calculated after (Malik, 2005). FIV can be calculated by dividing the species list in to their reported families and add I.V of each family of all spp. From all the communities in a family.

RESULTS

Soil analysis

In investigated area soil varied from sandy loam to loamy and clay loam. pH varied from 7.5-7.9. Phosphorous varied from 4.00-8.00ppm, potassium from 68-146ppm, organic matter from 0.01-0.97, electrical conductivity varied from 0.14-o.45ds/m and saturation from 22-48% at different elevations. (Table 4.2)

Floristic composition

In wheat fields 40 weed species belonged to 22 families were observed. Poaceae and Asteraceae were the dominant families with 09 and 05 species, respectively. There were followed by Euphorbiaceae (04 species), Papillionaceae (03 species) and Rubiaceae (02 species). The remaining 17 families had only one species each. (Table 4.3)

Life form

The biological spectrum of weeds present in wheat field were presented in (Table 4.26a) (appendix). In *Xanthium-Evolvulus-Convolvulus* community total species were 12. Out of which 75.00% were therophyte, 16.66% species were hemicryptophytic and 8.33% species were chamaephytic (Table 4.26b) (Figure-4.1)

In *Brothriochloa-Taraxacum-Poa* community total species were 12. Out of which 75.00% were therophyte, 16.66% species were hemicryptophytic and 8.33% species were geophytic (Table 4.26b).

In *Oxalic-Lythrus-Ranunculus* community total species were 13. Out of which61.54% were therophyte, 15.37% were hemicryptophytic and 23.08% were geophytic (Table 4.26b)

In *Sonchus-Taraxacum-Parthenium* community total species were 13. Out of which 61.54% were therophyte, 15.37% species were hemicryptophytic and 23.08% species were geophytic (Table 4.26b).

In *Silene-Anagallis-Solanum* community total species were 15. Out of which 73.33% were therophyte followed by hemicryptophytic (13.33%) and 23.08% species were geophytic (Table 4.26b).

In *Xanthium-Coronopus-Euphorbia* community total species were 11. Out of which 81.81% were therophyte and 18.18% were geophytic. (Table 4.26b)

In *Avena-Melilotus-Cyperus* community total species were 11. Out of which 63.64% were therophyte, 27.27% were geophytic and 9.09% hemicryptophytic. (Table 4.26b)

In *Vicia-Dichanthium-Cynodon* community total species were 13. Out of which 69.23% were therophyte followed by equal share of hemicryptophytic and geophytic 15.38% each respectively. (Table 4.26b)

In *Oxalis-Anagallis-Cynodon* community total species were 11. Out of which 72.72% were therophyte followed by 18.18% hemicryptophytic and 9.08% were geophytic. (Table 4.26b) In *Ranunculus-Trifolium-Galium* community total species were 12. Out of which 75.00% were therophyte followed by 16.66% geophytic and 8.33% were hemicryptophytic (Table 4.26b) As a whole therophyte species 70.73% were dominant followed by 13.01% hemicryptophytic, 15.45% species were geophytic and 0.81% chamaephytic.

Table-4.3: Floristic list of weeds present in wheat fields in Bhimber

S. No.	Name of species	Family	S. No.	Name of species	Family
1	*Calotropis procera* (Ait.) Proder	Ascelpidaceae	21	*Oxalis corniculata* L.	Oxalidiaceae
2	*Taraxacum officinales* Weber	Asteraceae	22	*Vicia sativia* L.	Papilionaceae
3	*Xanthium strumarium* L.	//	23	*Melilotus alba* Deser	//
4	*Sonchus asper* (L.) Pers	//	24	*Medicago lacinata* (L.) Mill	//
5	*Eclipta prostrata*	//	25	*Cynodon dactylon* (L.) Pers	Poaceae
6	*Prathenium parviflorum* L.	//	26	*Poa annua* L.	//
7	*Amaranthus virids* L.	Amaranthaceae	27	*Imperata cylindrica* L.	//

8	*Cannabis sativa* L.	Cannabaceae	28	*Avena fatva* L.	//
9	*Silene conodiea*	Caryophyllaceae	29	*Brothriochloa ischaemum* (L.) Keng	//
10	*Chenopodium album*	Chenopodaceae	30	*Saccharum officinarum* L.	//
11	*Convolvulus glomerates* L.	Convolvulaceae	31	*Dichanthium annulatum* (L.) Stapf	//
12	*Coronopus didymus* L.	Cruciferae	32	*Phalaris minor* Retz	//
13	*Cyperus rotundus*	Cyperaceae	33	*Agrostis viridis* L.	//
14	*Euphorbia hirta* L.	Euphorbiaceae	34	*Rumex dentatus* L.	//
15	*Euphorbia prostrata* L.	//	35	*Anagallis arvensis* L.	Polygonaceae
16	*Euphorbia heliscopia* L.	//	36	*Ranunculus muricatus* L.	Primulaceae
17	*Evolvulus alsinoides* L. Bioss	//	37	*Galium plegans* Wall	Ranunculaceae
			38	*Trifolium dubium* Smith	Rubiaceae
18	*Fumaria indica*	Fumaraceae	39	*Solanum nigrum*	Solanaceae
19	*Laythrus aphaca* L.	Leguminosae (Fabaceae)	40	*Fugonia cretica*	Zygophyllaceae

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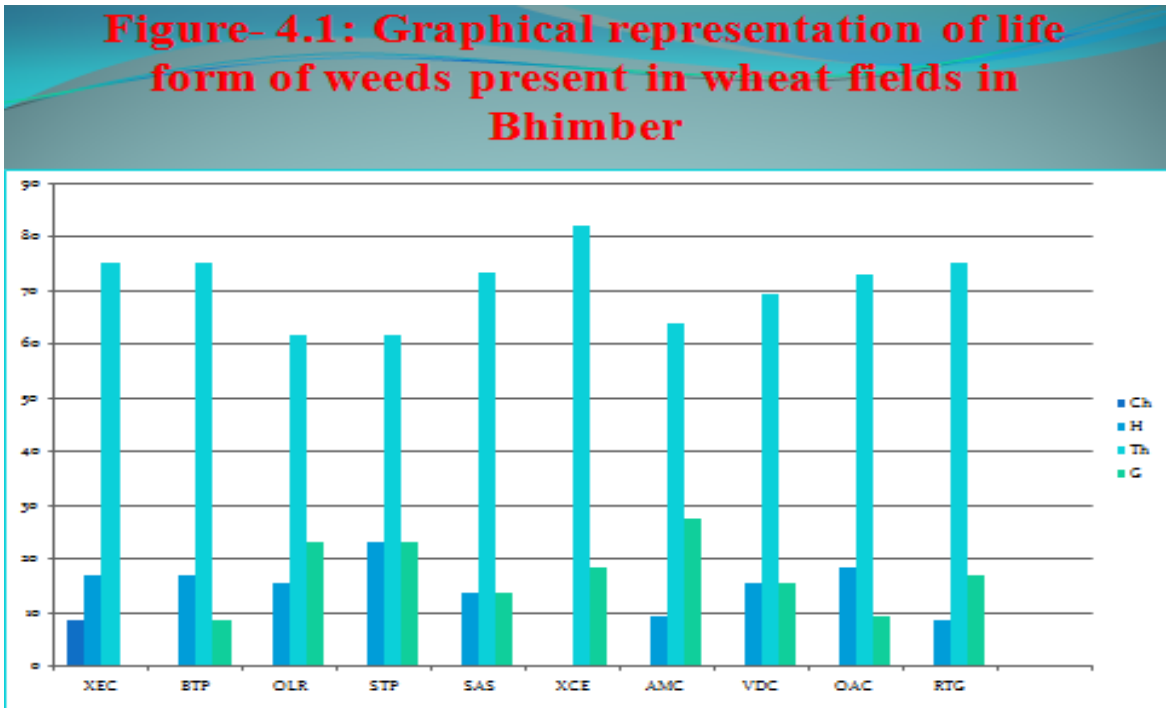
Table-4.26(b): Summary of life form recorded from wheat fields of Bhimber during, 2013.

S. No	Name of communities	Total Spp.	Ch	H	Th
1	*Xanthium-Evolvulus-Convolvulus*	12	1(8.33)	2(16.66)	9(75.00)
2	*Brothriochloa-Taraxacum-Poa*	12	-	2(16.66)	9(75.00)
3	*Oxalis-Lythrus-Ranunculus*	13	-	2(15.37)	8(61.54)
4	*Sonchus-Taraxacum-Parthenium*	13	-	2(23.08)	8(61.54)
5	*Silene-Anagallis-Solanum*	15	-	2(13.33)	11(73.33)
6	*Xanthium-Coronopus-Euphorbia*	11	-	-	9(81.81)
7	*Avena -Melilotus-Cyperus*	11	-	1(9.09)	7(63.64)
8	*Vicia-Dichanthium-Cynodon*	13	-	2(15.38)	9(69.23)
9	*Oxalis-Anagallis-Cynodon*	11	-	2(18.18)	8(72.72)
10	*Ranunculus-Trifolium-Galium*	12	-	1(8.33)	9(75.00)
	Total	**123**	**1**	**16**	**87**
	%		**0.81**	**13.01**	**70.73**



DISSCUSION

Weeds compete with crop for light, nutrients and water; has been a matter of great concern for growth (Rajput *et al*., 2008, Sultan and Nasir, 2007). The losses caused to agricultural crops by *Avena fatua, Cyperus rotundus and Chenopodium album* is significant (Marwat *et al*., 2006). Ten weed communities at different elevation from 340m to520m from mean sea level were recorded in District Bhimber Azad Kashmir. Due to altitudinal and climatic differences each community shows different dominant species. Ten weed communities in wheat field were recorded. Most of dominant communities in the wheat field were *Xanthium-Evolvulus-Convolvulus, Brothriochloa-Taraxacum-Poa, Oxalis-Lythrus-Ranunculus, Sonchus-Taraxacum-Parthenium, Silene-Anagallis-Solanum, Xanthium-Coronopus-Euphorbia Avena -Melilotus-Cyperus, Vicia-Dichanthium-Cynodon, Oxalis-Anagallis-Cynodon and Ranunculus-Trifolium-Galium.* Wahab *et al.*, (2011) reported geophytes redevelop from sucker, rhizomes and bulb and fight crop better than annuals. Biological spectra change due to different factors like deforestation, agricultural practices, climatic change, grazing etc. The data of family importance value were indicated that Poaceae (721,05), Asteraceae (304.11), Papillionaceae (263.73) and Euphorbiaceae (209.99) were dominant families. Similar conclusion by other workers a ganged in weed ecology (Malik, 2007). So, our findings are agreed with them. Weeds share importance value due to reason

that they produced more viable seeds or reproduce vegetative that make them more competitive and tolerate existing conditions. The weed species with high IV and frequency might compete better to reduce growth and yield of related crop. (Hussain *et al* ., 1983)

Methods to weed control

Cultural control method

Weeds can also be controlled by cultural method. Crop rotation is the best and non-monetary for weed management because are associated with certain crops due to their identical ecological requirements

Preventive method

Cure should be taken while growing crops. Weed seed free must be used. Sieve the seeds of crops to remove the weed seeds. Irrigation channels should be kept free from weeds in order to improve water use good organization. Many new weeds species separate from one place to another with the transport of nursery fruit, ornamental or vegetative plants. Proper care should be taken after transplanting these sampling in the field and remove all the new weed species before flowering. All type of cultivating equipment used in machinery must be after plugging weedy fields.

Chemical control method

Control of weeds with the use of inorganic chemical called herbicides that are toxic to certain categories of plant is called as chemical weed control method. Chemicals eliminate early crop weed competition that is generally between 2-6 weeks after sowing. Herbicides are applied before weed competition start.

Mechanical control method

Removing the weeds with tools is called mechanical method. Tillage is done for two purposes. First to uproot the weeds growing in the field and second is to pulverize the soil in order to create ideal conditions for the seed to germinate. Different implements which are used for this purpose are cultivators; mound board plough etc. tillage helps in reducing seed soil bank to a great extent. Mowing method is very effective for cutting excessive growth of undesirable plants for Lawns, playgrounds and road sides. It is used to control annul weeds.

Perennial weeds again come out from root stock but due to repeated cutting the reserve food is exhausted weed may die. This method also adds organic matter in the soil. Hand hoeing is most commonly and widely used method for controlling annual weeds from crop fields. A small implement like khurta or wheel hoe can be used for uprooting weed plants.

Biological control method

Biological inhibition is an effective, environmentally safe, technically appropriate, economically viable and socially acceptable method of pest management. It involves the use of living organisms, such as insects, disease causing organisms, herbivorous fish, other animals and competitive plants to limit their infestation. Bacteria *verutana* a shoot boring moth was reported to control this weed USR. India and Pakistan. The beetle called *Zygogramma biclorata* provided biological control of this weed in India during rainy season.

Insects are frequently used for the biological control of weeds because these are very host Specific i.e. one insects species is employed to destroy any one species. This method could not gain its popularly due to the following reasons. After feeding on host plant, these insects may move to economical plants. So there is more risk of damage to economical plants. It is very cost method because screening of insects on large scale is done in lab and majority of insects do not adjust to environmental conditions.

Cluster analysis showed two associations. Grassland association and forb grassland association which have similar soil nutrients, organic matter and electrical conductivity. Most of the species were annual which have effect of moisture. These weeds can easily be eradicated b hoeing.

CONCLUSION

The present study suggest that a diversity of weeds are greatly influence the wheat and millet crops in District Bhimber that may cause losses to yield of wheat and millet crops. Present study may be useful for the scientist, economists, ecologist, agriculturists and the concerned with the management of weeds. For the better yield, it is required to take proper mechanical, cultural, chemical and biological procedure for their control.

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