International Journal of Botany Studies
ISSN: 2455-541X; Impact Factor: RJIF 5.12
Received: 18-06-2019; Accepted: 20-07-2019
www.botanyjournals.com
Volume 4; Issue 5; September 2019; Page No. 37-44

Floristics of weeds in *Triticum aestivum* L. fields of Tehsil Shabqadar, District Charsadda, KP, Pakistan

Akhtar Zaman[1], Asadullah[2], Lal Badshah[3], Zahir Muhammad[4], Abdul Razzaq[5], Ghulam Jelani[6], Usman Ali[7], Nazish Raees[8], Muhammad Nauman Khan[9]

[1-4, 6-8] Phytoecology Lab Department of Botany, University of Peshawar, Peshawar, Pakistan
[5] Department of Botany, Islamia College Peshawar, Pakistan
[9] Department of Botany, Bacha Khan University, Charsadda, Pakistan

Abstract
a comprehensive survey of weed flora was conducted in the wheat (*Triticum aestivum* L.) fields of Tehsil Shabqadar, District Charsadda during February and end of April. This preliminary survey shows that there were 32 weed species belonging to 17 families. Out of these 17 families, 1 family belongs to monocots while 16 families belong to dicots. The family with largest number of species was Asteraceae having 6 species, followed by Poaceae (5 species), Fabaceae (4 species), Amaranthaceae (2 species), Brassicaceae (2 species), Polygonaceae (2 species). Rests of the families were represented by 1 species each. *Biological spectrum shows that Therophytes were the major life form class (*78.1*%) and Hemicryptophytes were (*9.3*%) Chamaephytes (*6.2%) and Geophytes *were* (6.2%). *Leaf size classification shows that Microphylls (*40.6%) *were the major leaf size class followed by Nanophylls (*21.8*%), Leptophylls (18.7%) and Mesophylls (18.7%) respectively. Life span of the reported weed taxa shows that annual weeds (23 sp,* 71.85%) are more rapidly grow in single season while Perennial (7 sp, 21.87%) and Biennial (2 sp, 6.25%) required more time for growth. The most disastrous species were *Avena sativa, cannabis sativa, convolvulus arvensis, Emex spinosa* and *Euphorbia helioscopia.*

Keywords: floristics, weeds, *Triticum aestivum* L, shabqadar

Introduction
Shabqadar is situated on the outskirts of Mohmand Agency and falls under the jurisdiction of District Charsadda of Khyber Pakhtunkhwa. Geographically it is located at 34°16' and 34°47'N latitude71°33' and 71°59'E longitude (Fig.1). It has an altitude of 343m (1128 feet). Here the average value for temperature ansd precipitation is 22.4 °C and 417 mm respectively per anum. It is situated in the North-Western direction of District Charsadda at a distance of 35.3 km via Shabqadar road. Most of its land is used for agricultural purposes. Wheat is the major rabi crop of this area which is grown in canal irrigated fields as well as rain irrigated fields.

Wheat
Bread wheat (*Triticum aestivum* L.) is a king cereal crop in all the agro-ecological zones of the World. It is staple food of masses and enjoys the pivotal position in the Pakistan agricultural system and occupying the largest area in Punjab, Pakistan of wheat cultivation during 2005-08 which was 6.10 million hectares; producing 15.36 million tons. It contributes a major share of the agricultural economy of the country, providing around 72% of wheat to the national food basket every year (Hussain and Bangash, 2017) [12] Wheat is the most important stable food crop for more than one third of the world population and contributes more calories and proteins to the world diet than any other cereal crops. It is nutritious, easy to store and transport and can be processed into various types of food.

Weeds
Weed is an everyday term which is used in variety of senses, usually to describe a plant considered undesirable within a certain context (Hanif *et al*. 2004) [8]. Indeed, a number of plants that may consider weeds are often intentionally grown in gardens and other cultivated settings. Weeds are the major challenging agents in this area. They are undesirable plant species growing in the agricultural fields along with domesticated crops (Dangwall *et al*. 2010). They affect crops through struggle for light, space, nutrients, allelopathy and seeds contamination (Jan *et al*. 2012) [14]. The intake of essential nutrients like nitrogen, potassium and magnesium is three to four times faster by weeds containing crops in comparison with weed free crops (Schwerzeland Thomas, 1971) [16].

The grouping of a plant as a weed is not grounded on any inherent character or living feature, but depends on human beliefs related with a specific point of reference (Perrins *et al*. 1992) [23]. Different literature is available on the weed flora of wheat crop from different areas of Khyber pakhtunkhwa by (Shah *et al.* 2006, Hadi *et al.* 2014, Hussain *et al.* 2009, Akhtar and Hussain 2007, Shah *et al.* 2014, Sher *et al.* 2011, Hussain *et al*. 2012, Ullah *et al.* 2011 and Marwat *et al.* 2013) [27, 30, 5, 6, 1, 16, 31, 34, 19]. Floristic composition and ecological prevalence of weeds in the wheat and sugarcane fields of Tehsil Charsadda has been reported (Inayat *et al.* 2014, Khan *et al.* 2017, Khan *et al.* 2018) [13, 16, 17] but no such work is done in the villages of Tehsil Shabqadar, District Charsadda.

The present work will help in taxonomic assessment of the weed flora from different wheat fields of Matta Mughal Khel, Tehsil Shabqadar. In regard to the present study Family Asteraceae was the dominant weed family, followed by Poaceae, and Fabaceae as the 3rd largest family. The Current paper reports the dispersal of weeds species within wheat fileds of Charsadda and will be helpful for recognizing the severity of weeds invasion in wheat crop and weed competition in the area.

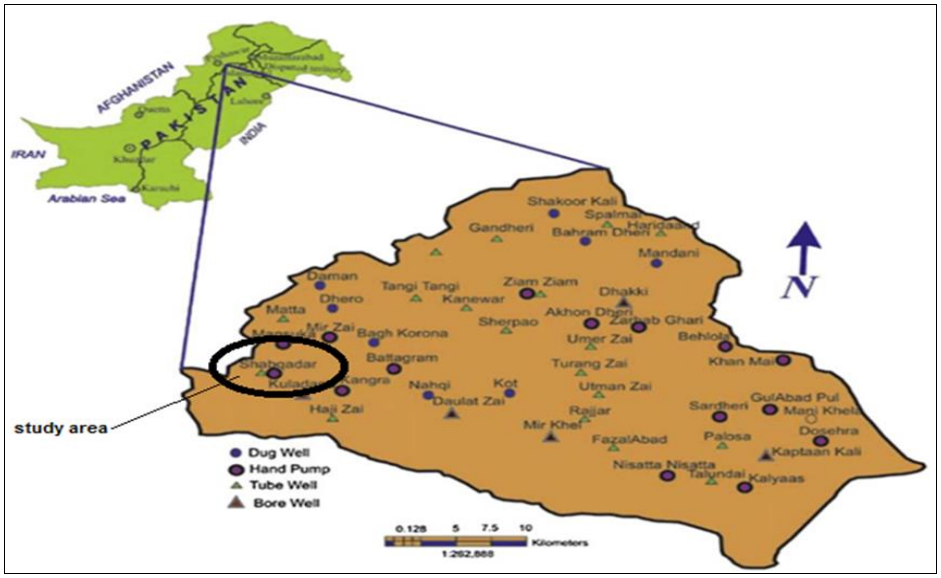

Fig 1: Map of study area

Material and Methods

This research work was done in the villages of Tehsil Shabqadar of District Charsadda in the wheat growing season during 2014-15. Five different stations were selected viz.Matta Mughal Khel, Haji zai, Battagram, Katozai and Khwajawos in the flowering season.

The data about density and frequency of weed species was determined using 1x1 m^2 quadrats in each of the designated spots after (Hussain, 1989) [10]. Weeds were collected via hand picking, digging through agricultural tools and local information (Spiny weeds), field photographs of the specimens were taken by using cannon digital camera.

The specimens were cleaned by removing the soil particles, dust, attached insects and other plant parts. The specimens were then wrapped in blotter papers and newspapers for absorbing moisture content and then placed in a wooden plant presser (locally designed) for drying and pressing.

The pressed specimens were then mounted on herbarium sheets using glue, preserved for long time by using naphthalene powder spray, identified with the help of Flora of Pakistan (Nasir and Ali, 1970-1989; Ali and Nasir, 1989-1991; Ali and Qaisar, 1993-2018) [21-22, 22] and by comparing it already available weed specimens in herbarium of University of Peshawar. The specimens were then assigned botanical names, common names, family names and deposited in Herbarium at Department of Botany, University of Peshawar, Khyber Pakhtunkhwa, Pakistan.

Results and Discussion

The study area is encompassed by 32 weed species comprising 31 genera and 32 species across 17 families (1 monocot and 16 dicot) (Table 1). The most prominent weeds developing in wheat crops were *Avena sativa*, *Chenopodium album*, *Cirsium vulgare*, *Convolvulus arvensis*, *Cynodon dactylon*, *Emex spinosa*, *Euphorbia helioscopia*, *Medicago polymorpha*, *Melilotus indica*, *and Rumex dentatus*. The rest of reported weeds were of infrequent existence. The detail list of weeds reported from wheat fields in the study area beside their botanical names, families, English, local names and main diagnostic characters are specified in Table 1 and 2.

The pre dominance was presented by Asteraceae, Poaceae and Fabaceae representing 6, 5 and 4 weed species respectively. Amaranthaceae, Brassicaceae and Polygonaceae included two weed species each. The remaining families were represented by one weed species each.

Family having highest relative percentage is Asteraceae (18.75%), followed by Poaceae (15.625%), Fabaceae (12.50%), Amaranthaceae, Brassicaceae and Polygonaceae (6.25%) each while all the remaining families have a relative percentage of (3.125%) each.

The data is mostly related with the findings agree with (Malik and Hussain, 1990, Rashid *et al*., 1998, Murad *et al.*, 1995, Nasir *et al.*, 2002, Shah *et al.*, 2006; Ullah and Rashid, 2007; Sher and Khan, 2007; Hussain *et al.*, 2009; Hadi *et al.*, 2009a; Hadi *et al.*, 2009b and Shah and Hussain, 2011) [18, 24, 20, 22, 27, 33, 32, 9, 6, 7, 29]. (Akhtar *et al.* 2007, Ullah *et al.*, 2011, Sher *et al*., 2011, Hussain *et al.* 2012, Marwat *et al.* 2013, Khan *et al.* 2018) [1, 34, 31, 11, 19, 17]. All these reporters have shown nearly similar floristic configuration of the weed flora for various crops and some of the species are of common scattering pattern definitely in the case of wheat.

The yield of wheat crop is basically loss by abundant of weeds in wheat crop, 60-70% yield losses due to 6 main weeds which effect the crop (Iffat *et al*. 2010). Life form of the plants is more reliable which is based upon principle of position and degree of protection during the unfavorable or adverse condition (Raunkiaer, 1934) [25]. In contrast to life form species, 25 species (78.125%) were classified as Therophytes, 3 species (9.375%) Geophytes and 2 species (6.25%) each in Hemicryptophytes and Chaemophyte (Fig.2). According to leaf size spectra Microphylls are the

leading one (13 species, 40.625%), followed by Nanophylls (7 species, 21.875%), Leptophylls and Mesophylls having 6 species, 18.75% (Fig.3).

These values meet with the findings of Inayat *et al.* 2014, who reported that most of the weed species belong to Microphylls. Most of the weeds are annuals if eradication before maturation is carried out in vegetative condition then these weeds can be easily controlled. According to Hadi *et al*. (2009) most of the weeds taxa are leptophylls which need sunlight, less food and grow well in any adverse condition. Some weeds are very important medicinally as they were effective against any diseases like *Galium aparine* is used against skin diseases; *Convolvulus arvensis* is useful against joint pain.

There are many sources like wind, contaminated seed, animals and water through which weed seed enter to the cultivated field, therefore complete eradication of weed flora is very difficult (Hadi *et al*., 2014) [5]. For the increases in crop yield; chemical, biological and physical eradication are recommended to control these weeds. Some weeds are very important medicinally as they were effective against any diseases like *Galium aparine* is used against skin diseases; *Convolvulus arvensis* is useful against joint pain. However, no such work is available from this study area.

The present effort therefore was aimed at all ecological assignment of some weeds species for the first time from weeds fields of Shabqadar, District Charsadda.

The findings helped in the management of weeds in wheat crops fields.

Table 1: Floristic Inventory of Weeds in Wheat Crop of Shabqadar, Charsadda

S.NO.	Botanical Name	Family	English name	Local name	Group
1.	*Achyranthes aspera* L.	Amaranthaceae	Prickly chaff flower	Puthkanda.	Dicot
2.	*Amaranthus viridis* L.		Green pigweed	Ganhar	Dicot
3.	*Anagallis arvensis* L.	Myesinaceae	Blue pimpernel	Mangotegul/billibooti	Dicot
4.	*Avena fatua* Retz.	Poaceae	Common wild oat	Jamdar	Monocot
5.	*Avena sativa* L.		Oat	Jamdar	Monocot
6.	*Cynadon dactylon* L.		Bahama grass	Kabal	Monocot
7.	*Polypogon monspeliensis* L.		Annual beard grass	Gidarpucch	Monocot
8.	*Sorghum halepensis* L.		Johnson grass	Dhrab	Monocot
9.	*Brassica napus* L.	Brassicaceae	Field mustard	Sharsham	Dicot
10.	*Sisymbrium irio* L.		Wild mustard	Zangliwoeri	Dicot
11.	*Cannabis sativa* L.	Cannabaceae	Marijuana	Bhang	Dicot
12.	*Chenopodium album* L.	Chenopodiaceae	Goose foot	Sarme	Dicot
13.	*Circium vulgare* (savi) Ten.	Asteraceae	Common thistle	Azghake	Dicot
14.	*Conyza Canadensis* L.		Horseweed	Janglihaloon	Dicot
15.	*Eclipta prostrate* L.		False daisy	Theriza	Dicot
16.	*Silybum marianum* L.		Gaertner Milk thistle	Kandiali/ kareza	Dicot
17.	*Taraxacum officinale* L.		Dandelion	Zeergulay	Dicot
18.	*Xanthium stromarium* L.		Rough cocklebur	Malkonday	Dicot
19.	*Convolvulus arvensis* L.	Convulvulaceae	Field bindweed	Lehli/prewata	Dicot
20.	*Emex spinosa* L.	Polygonaceae	Spiny dock	KabalayMalkunday	Dicot
21.	*Rumex dentatus* (Meissin) Rich.		Dock	Shalkhay/janglipalak	Dicot
22.	*Euphorbia helioscopia* L.	Euphorbiaceae	Sunspurge	Chhatridodak/ Mandaro	Dicot
23.	*Fumaria officinalis* L.	Papaveraceae	Earth smoke	Sua	Dicot
24.	*Mazus japonicus* (Thunb.) O. Kuntze	Scrophulariaceae	Japanese mazus	Sqabotay	Dicot
25.	*Medicago polymorpha* L.	Fabaceae	California burclover	Pishtaray	Dicot
26.	*Melilotus indicus* L.		Sweet clover	Lewanay/sengi	Dicot
27.	*Trifolium repens* L.		White clover	Shaotal	Dicot
28.	*Vicia sativa* L.		Common witch	Kharawara/rewari	Dicot
29.	*Mentha longifolia* L.	Lamiaceae	Wild mint	Enalay	Dicot
30.	*Oxalis corniculata* L	Oxalidaceae	Creeping woodsorrel	Trewakay	Dicot
31.	*Ranunculus muricatus* L.	Ranunculaceae	Rough seed butter cup	Chaghana	Dicot
32.	*Stellaria media* L.	Caryophyllaceae	Chickweed	Phullanbooti	Dicot

Table 2: Floristic composition and Biological spectrum of weeds

S.NO.	Botanical Name	Family	Life Form	Leaf Size	Life Span
1.	*Achyranthes aspera* L.	Amaranthaceae	TH	Mes	Perennial
2.	*Amaranthus viridis* L.		TH	Mic	Annual
3.	*Anagallis arvensis* L.	Myesinaceae	TH	Lep	Annual
4.	*Avena fatua* Retz.	Poaceae	TH	Mic	Annual
5.	*Avena sativa* L.		TH	Mic	Annual
6.	*Cynodon dactylon* L.		H	Lep	Perennial
7.	*Polypogon monspeliensis* L.		TH	Nan	Annual
8.	*Sorghum halepensis* L.		H	Mic	Perennial
9.	*Brassica napus* L.	Brassicaceae	TH	Mes	Annual
10.	*Sisymbrium irio* L.		TH	Nan	Annual
11.	*Cannabis sativa* L.	Cannabaceae	TH	Mic	Biennial
12.	*Chenopodium album* L.	Chenopodiaceae	TH	Mic	Annual
13.	*Cirsium vulgare* (savi) Ten.	Asteraceae	TH	Mic	Annual

14.	*Conyza Canadensis* L.		TH	Lep	Annual
15.	*Eclipta prostrate* L.		G	Lep	Perennial
16.	*Silybum marianum* L.		TH	Mes	Annual
17.	*Taraxacum officinale* L.		H	Mic	Annual
18.	*Xanthium stromarium* L.		CH	Mes	Biennial
19.	*Convolvulus arvensis* L.	Convulvulaceae	TH	Mic	Perennial
20.	*Emex spinosa* L.	Polygonaceae	TH	Mes	Annual
21.	*Rumex dentatus* (Meissin) Rich.		TH	Mes	Annual
22.	*Euphorbia helioscopia* L.	Euphorbiaceae	TH	Nan	Annual
23.	*Fumaria officinalis* L.	Papaveraceae	TH	Lep	Annual
24.	*Mazus japonicus* (Thunb.) O. Kuntze	Scrophulariaceae	TH	Nan	Annual
25.	*Medicago polymorpha* L.	Fabaceae	TH	Nan	Annual
26.	*Melilotus indicus* L.		TH	Nan	Annual
27.	*Trifolium repens* L.		TH	Nan	Annual
28.	*Vicia sativa* L.		TH	Mic	Annual
29.	*Mentha longifolia* L.	Lamiaceae	G	Mic	Perennial
30.	*Oxalis corniculata* L	Oxalidaceae	CH	Mic	Perennial
31.	*Ranunculus muricatus* L.	Ranunculaceae	TH	Mic	Annual
32.	*Stellaria media* L.	Caryophyllaceae	TH	Lep	Annual

Key:
Life from: TH=Therophytes,H=Hemicryptophytes, CH= Chamaephytes,G=Geophytes
Leaf size: Lep=Leptophylls, Nan=Nannophylls, Mic=Microphylls, Mes=Mesophylls

Table 3: Life form percentage

Life form classes Percentage Table			
S.NO.	**Life Form Classes**	**No. of Species**	**Percentage**
1	Therophytes	**25**	**78.125**
2	Hemicryptophytes	**03**	**9.375**
3	Chamaephytes	**02**	**6.25**
4	Geophytes	**02**	**6.25**

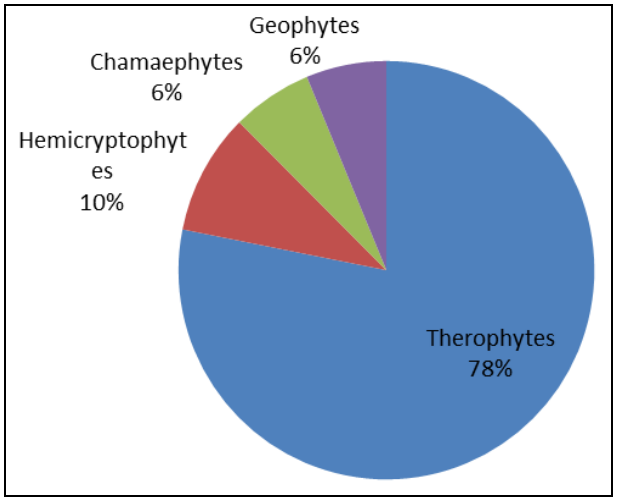

Fig 2: Percentage of life form classes

Table 4: Leaf size Percentage

Leaf Classes Percentage Table			
S.NO.	**Leaf Classes**	**No. of Species**	**Percentage**
1	Leptophylls, 25sq. mm.	06	18.75
2	Nannophylls, 9x25sq. mm.	07	21.875
3	Microphylls, 9^2x25sq. mm.	13	40.625
4	Mesophylls, 9^3x25sq. mm.	06	18.75

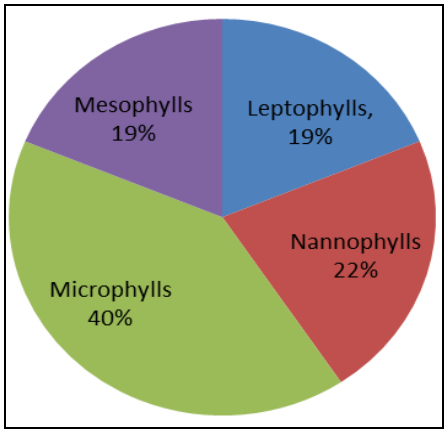

Fig 3: Percentage of leaf size classes

Table 5: Life span percentage

Life Span Percentage Table			
S.NO.	**Life Span Classes**	**No of Species**	**Percentage**
1	Annual	23	71.85
2	Biennial	02	6.25
3	Perennial	07	21.875

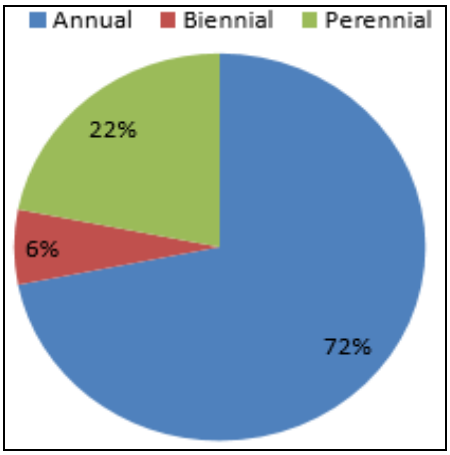

Fig 4: Percentage of life span

Table 6: Family wise distribution of weeds of Shabqadar

S. No	Family	No	Group
1.	Amaranthaceae	02	Dicot
2.	Asteraceae	06	Dicot
3.	Brassicaceae	02	Dicot
4.	Fabaceae	04	Dicot
5.	Polygonaceae	02	Dicot
6.	Rananculaceae	01	Dicot
7.	Chenopodiaceae	01	Dicot
8.	Euphorbiaceae	01	Dicot
9.	Poaceae	05	Monocot
10.	Scrophulariaceae	01	Dicot
11.	Canabaceae	01	Dicot
12.	Caryophyllaceae	01	Dicot
13.	Convolvulaceae	01	Dicot
14.	Myesinaceae	01	Dicot
15.	Papaveraceae	01	Dicot
16.	Lamiaceae	01	Dicot
17.	Oxalidaceae	01	Dicot

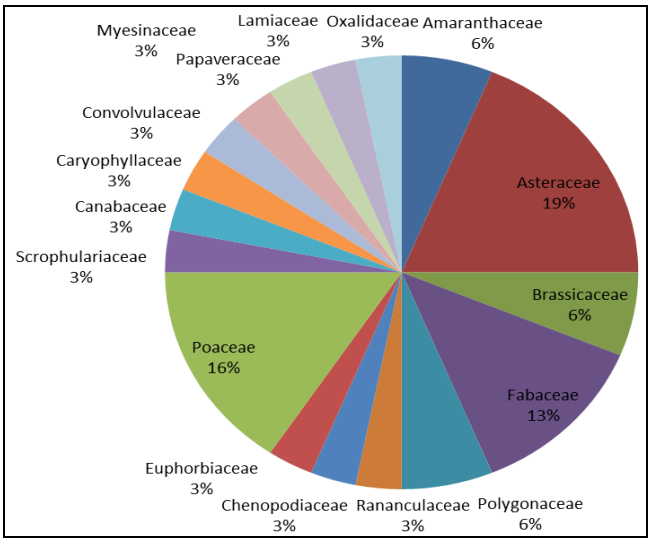

Fig 5: Family wise % distribution of weeds

Some Key Plates

Fig 1: *Achyranthes aspera* L

Fig 2: *A maranthus viridis* L

Fig 3: *Anagallis arvensis* L

Fig 4: *Avena fatua* Retz

Fig 5: *Avena sativa* L

Fig 8: *Chenopodium album* L

Fig 6: *Brassica napus* L

Fig 9: *Cirsium vulgare* (savi) ten

Fig 7: *Cannabis sativa* L

Fig 10: *Convolvulus arvensis* L

Fig 11: *Conyza canadensis* L

Fig 12: *Cynadon dactylon* L

Conclusion

The present study of floristics of Weeds revealed that 32 weed species which belonged to 17 families are worked out in Wheat fileds of Shabqadar Charsadda. This is the first work which has been done for the first time in Shabqadar Charsadda. It was concluded that Hoeing and Weeding, Tillage, Bar Harrowing, Crop Rotation and Chemical Control are the basic methods for the eradication of these weeds from the crop fields of Wheat because these weeds severely threatened the important crop flora in the area.

Acknowledgment

The auther are thankful to Mr. Ghulam Jelani Lecturer-Curator Herbarium Departnment of Botany, University of Peshawar for identification of Weeds flora.

References

1. Akhtar N, Hussain F. Weeds of wheat fields of Village Qambar, District Swat, Pakistan. *Pakistan.* Journal Plant Sciences. 2007; 13(1):33-37.
2. Ali SI, Nasir YJ. (Eds.) Flora of Pakistan Department of Botany, University of Karachi: Karachi, 1989-1991; Vol. 191-193.
3. Ali SI, Qaiser M. (Eds.) Flora of Pakistan; Department of Botany, University of Karachi: Karachi, 1993-2018; Vol. 194-222.
4. Dangwal1 LR, A Singh, T Singh, A Sharma, C Sharma. Common Weeds of Rabi (winter) Crops of Tehsil Nowshera, District Rajouri (Jammu & Kashmir), India. Pakistan Journal of Weed Sciences Research. 2010; 16(1):39-45.
5. Hadi F, Rahman A, Ibrar M, Dastagir G, Arif M, Naveed K. *et al*. Weed diversity with special reference to their Ethnomedicinal uses in wheat and maize at Rech valley, Hindukush range, Chitral, Pakistan. Pakistan. Journal Weed Science. Research. 2014; 20(3):335-346.
6. Hadi FM, Naseem SM, Shah A Ullah, Hussain F. Prevalence and ecological characteristic of summer weeds incrop and vegetable fields of Botanical Garden Azakhel, University of Peshawar, Pakistan. Pakistan Journal of Plant Sciences. 2009a; 15(2):101-105.
7. Hadi F, Shah SM, Ullah A, Ali SG, Hussain F. Ecological Characteristics of Weeds in the Rice Fields of Botanical Garden Azakhel, University of Peshawar, Pakistan. Pakistan Journal of Plant Sciences. 2009b; 17(1):51-54.
8. Hanif Z, Khan SA, Marwat KB, Khan IA, Ikramullah. Important weeds of wheat crop of Malkandher Farm, NWFP. Agricultral University, Peshawar. Pakistan Journal of Weed Sciences Research. 2004; 10:109-112.
9. Hussain F, Shah SM, Hadi F, Ullah A. Diversity and ecological characteristics of weeds of wheat fields of University of Peshawar Botanical Garden at Azakhel, District Nowshera, Pakistan. Pakistan Journal of Plant Sciences. 2009; 15(4):283-294.
10. Hussain F. Field and Laboratory Manual of Plant Ecology. NAHE, UGC. Islamabad, 1989.
11. Hussain Z, Munsif F, Shah SIA, Gul B, Khan N, Kakar SUD, Ahmad A. Assessment of weed problems in wheat crop of Peshawar, Pakistan. Pakistan Journal of Weed Sciences Research. 2012; 18(3):357-366.
12. Hussain A, Bangash R. Impact of Climate Change on Crops' Productivity across selected Agro-ecological zones in Pakistan. The Pakistan Development Review. 2017; 56(2):163-187.
13. Inayat N, Ullah A, Rashid A. Floristic composition and ecological prevalence of the weed species growing in wheat and sugar cane fields of district Charsadda, Khyber Pakhtunkhwa, Pakistan. Pak. J Weed Sci. Res. 2014; 20(3):405-415.
14. Jan HU, Jan A, Shinwari ZK. Distribution of weeds in wheat fields of District Bannu, Khyber Pakhtunkhhwa, Pakistan. Pak. J Weed. Sci Res. 2012; 18(3):393-411.
15. Khan MN, Hadi F, Bibi M, Khan N Shah SM. Utilitarian Aspects of Weeds of Wheat Fields in Charbagh Valley, District Swat, Pakistan Spec. J Agric. Sci. 2018; 4(3):1-8.
16. Khan MN, Hadi F, Razaq A, Shah SM, Utilitarian aspects of weeds and their ecological characteristics in Ochawala valley, District Charsadda, Pakistan APRN J Agric. and Biol. Sci. 2017; 12(5):182-189.
17. Khan MN, Khan N, Hadi F, Shah SM, Razzaq. Ecology of Riparian Vegetation of Lund Khuwar, District Mardan, KP, Pakistan. Nat Prod Ind J. 2018; 14(1):119.
18. Malik ZH, Hussain F. Distribution of some weeds in the wheat fields of Kotli, Azad Kashmir. Sarhad. J Agric. 1990; 6:1-4.

19. Marwat SK, Usman K, Khan N, Khan MU, Khan EA, Khan MA, Rehman AU. Weeds of Wheat Crop and Their Control Strategies in Dera Ismail Khan District, Khyber PakhtunKhwa, Pakistan. Ame J Plant Sci. 2013; 4:66-76.
20. Murad A, Hussain F, Marwat Q, Muhammad Z. Floristic composition, life form and leaf size spectra of some weeds ofwheat, maize and potato fields of Mastuj, District Chitral. Pak. J Pl. Sci. 1995; 1:153-164.
21. Nasir E, Ali SI. (Eds.) Flora of Pakistan; Department of Botany, University of Karachi: Karachi, 1970-1989; Vol. 1-190.
22. Nasir ZA, Sultan S. Floristic, biological and leaf sizespectra of weeds in gram, lentil, mustard and wheat field of District Chakwal. Pak. J. Bio. Sci. 2002; 5(7):758 762.
23. Perrins J. Williamson M, Fitter A. A survey of differing views of weed classification: implications for regulation of introductions. *Biol. Conserv*. 1992; 60:47-56.
24. Rashid A, Khan S, Hussain F. Distribution of some weedsin Turmeric fields of District Bannu. Pak. J Agric. Res. 1988; 9(4):566-560.
25. Raunkiaer C. The Life Forms of Plants and Statistical Plant Geography. Clarendon Press Oxford, 1934.
26. Schwerzel PJ, Thomas PEL. Weed competition in cotton PANS. 1971; 17(1):30-34.
27. Shah GM, Khan MA. Checklist of noxious weeds of district Mansehra, Pakistan. *Pak.* J Weed Sci. Res. 2006; 12(3):213-219.
28. Shah GM, Khan MA. Checklist of noxious weeds of District Mansehra, Pakistan. Pakistan Journal of Weed Sciences Research. 2006; 12(3):213-219.
29. Shah SM, Hussain F. Floristic diversity and ecological characteristics of weeds of sunflower crop of University of Peshawar Botanical Garden, Azakhel, District Nowshera, Pakistan. Pak. J Pl. Sci. 2011; 17(2):117-120.
30. Shah SM, Ullah A, Hadi F. Ecological characteristics of weed flora in the wheat crop of Mastuj valley, District Chitral, Khyber Pakhtunkhwa, Pakistan. Pakistan Journal of Weed Sciences Research. 2014; 20(4):479-487.
31. Sher Z, Hussain F, Badshah L, Wahab M. Floristic composition, communities and ecological characteristics of weeds of wheat fields of Lahor, District Swabi, Pakistan. Pak. J Bot. 2011; 43(6):2817-2820.
32. Sher Z, Khan ZD. Floristic composition, life form and leaf spectra of the Vegetation of Chagharzai Valley, District Buner. Pak. J Pl. Sci. 2007; 13(1):57-66.
33. Ullah A, Rashid A. Weeds and Livelihood in Mankial valley, Hindukush Range, Pakistan. Pakistan Journal of Weed Sciences Research. 2007; 13(1-2):27-32.
34. Ullah I, SM Wazir, Farooq A, Khan SU, Hussain Z. Identification of common weeds and its distribution pattern in wheat fields of FR Bannu, Khyber pakhtunkhwa, pakistan. Pakistan Journal of Weed Sciences Research. 2011; 17(4):407-416.
35. Haydar FA, Ahamed MS, Mohiuddin M, Siddique AB, Nasiruddin M. Statistical analysis of yield components in the genotypes of wheat (Triticum aestivum L.).