

CHECKLIST OF NOXIOUS WEEDS OF DISTRICT MANSEHRA, PAKISTAN

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ABSTRACT

A study was conducted to investigate weed flora of District Mansehra, Hazara, Pakistan. Studies revealed that 63 weed species belonging to 32 families are common in four major crops viz. wheat, maize, rice, tobacco and vegetables. In total 23 weeds were perennial, 37 weeds were annual and three weeds were parasitic. Two species *Cuscuta reflexa* and *Viscum album* were found as major parasitic weeds on trees. *Viscum album* has been damaging *Juglans regia* (Walnut tree) badly while *Cuscuta reflexa* is growing on all type of bushes and trees. In tobacco crop productivity is badly affected by the attack of a parasitic plant *Orobancha cernua*. In wheat crop five weeds *Avena fatua*, *Cyperus rotundus*, *Stellaria media*, *Taraxacum officinale* and *Tulipa stellata* were found major weeds affecting wheat production. In maize crop *Commelina benghalensis*, *Convolvulus arvensis*, *Digitaria* sp., and *Ipomoea alba* were recorded as highly problematic weeds. Highest numbers of weeds 12 each were belonging to family Asteraceae and Poaceae. Many weeds are ethnobotanically important and utilized by the local community. Weed species like *Stellaria media*, *Taraxacum officinale*, *Malva neglecta*, and *Medicago denticulata* are used as vegetables. *Fumaria indica*, *Cannabis sativa*, and *Chenopodium album* are utilized as othnomedicines to cure different ailments. *Avena fatua* is used as fodder.

Key words: Weed flora, crops, questionnaire, ethnobotany, Northern Pakistan.

INTRODUCTION

Mansehra is located in the Hazara Division of the North West Frontier Province (NWFP) Pakistan. The district lies between 34^o-15' to 35^o-12' North latitudes and 72^o-50' to 74^o-07' East longitudes. Most of the people of the district are mostly dependent on agriculture and livestock. In Pakistan tea has successfully been cultivated at Shinkiarri and Ichrian in Mansehra. Plain areas are irrigated by Siran and Ichar rivers. Plant whose negative values are more than its positive values is called a weed. A plant growing at wrong place or where it is not desired, therefore, may be a weed (Leela, 2002). It long has been recognized that human-made (anthropogenic) habitats, especially in settlements, are prone to invasion by alien species which is attributable to habitat heterogeneity, frequent and diverse disturbances, and intensive propagule pressure typical of this environment (Gilbert, 1989, Kowarik, 2003). Weeds decrease the crop yield by competing for water, nutrients, space and light. Some weeds are also allelopathic and adversely affect crops.

Weeds always act as energy drains in the entire managed ecosystem such as agricultural crops, forestry, range management, aquaculture and horticulture. Weeds decrease the crop yield by competing for water, nutrients, space and light. Some weeds are also allelopathic and adversely affect crops. (Gressel and Holm, 1964; Sukhadia and Jaychandra, 1980). Besides contaminating seeds, weeds provide habitat for harmful insects and organisms, may act as alternate hosts for pathogens and other organisms. Some of the weeds may be poisonous to livestock. Weeds also reduce human efficiency through causing allergies and poisoning. Indirectly they compete with and parasitize man utilizing at least part of the energy which in their absence might have become available to man through food-chain.

Noxious weeds as the name indicates are 'harmful' weeds that adversely affect crop productivity, cause health hazards in humans and animals and lower fish production. They choke irrigational and navigational canals, affecting agriculture and transport respectively. Noxious weeds differ from other weeds in being more aggressive, having peculiar characteristics that make them more competitive. They smother all other weeds around them and establish a kingdom of their own within a short period of time. These weeds are generally associated with commercially important crops having export potential. They also lower the quality of the produce resulting in heavy losses to the farmer. Keeping in view the importance of weed flora of the area, present studies were carried out to explore weeds because no research work has been carried out earlier in this field in the research area.

MATERIALS AND METHODS

Field trips of 60 days duration to various parts of Mansehra, Hazara, Pakistan were undertaken from January 2004 to January 2005 to collect various weed species. The main target sites in the District were Baffa, Hathi Maira, Shinkhari, Banda Piran, Dhodial, Dadar, Jabori, Jacha, Mandagucha, Panjul and Lassan Nawab. Field numbers were given to the specimens and field data like scientific names, vernacular names, family, season of the weed, and ethnobotanical importance were recorded. Information about different weeds was collected from local farmers and field staff of Agriculture Department. A questionnaire was constructed and survey was carried out in every selected village. The collected material was pressed, dried using blotting papers for about two weeks at room temperature and identified through the available literature (Nasir & Ali, 1971-2001). The dried material was poisoned using Mercuric chloride and absolute alcohol (2 g mercuric chloride dissolved in 100 ml of absolute alcohol).

RESULTS AND DISCUSSION

Studies revealed that 63 weed species belonging to 32 families are common in four major crops viz. wheat, maize, rice, tobacco and vegetables. In total 23 weeds were perennial, 37 weeds were annual and three weed were parasitic. There are thousands of weeds existing on this earth, of which some are noxious and adversely affect the growth of crops, health of animals and humans and transport. The noxious weeds have characteristics peculiar to them that help their survival better than other weeds. These weeds grow on lands (Terrestrial), as parasites on other plants (Parasitic) and in water bodies (Aquatic). The losses caused by noxious weeds are enormous, leading to abandonment of cultivable land and shifting to other places. The terrestrial noxious weeds mostly attack commercially important crops and forest trees. The losses caused to agri-horticultural crops by noxious weeds like *Avena fatua*, *Cyperus rotundus* and *Chenopodium album* are substantial. These weeds also act as alternate hosts to

viruses causing anemone mosaic, barley stipe mosaic, beet curly top, beet mosaic and beet yellows (Holm *et al.*, 1977). Increasing the density of *Phalaris minor* to 200 plants m⁻² decreased the grain yield of wheat by 36% (Anonymous, 1992). Phillips and Timmons (1954) working over a period of 12 years, reported 30, 39, 36 and 75% average yield reductions in wheat, barley oats and sorghum respectively in associations with *Convolvulus arvensis*. *C. arvensis* also acts as alternate host of viruses, which attack potato, tobacco and tomato. Parasitic species *Cuscuta reflexa* causes lots of damage to fruit orchids. In India pulses have been reported to be attacked by this parasite (Anonymous, 1989). *Orobanche* attacks tobacco crop and is a big menace in Pakhli Plain, District Mansehra where best tobacco of Pakistan is grown. The removal of immature plants of *Orobanche* from the soil and before they form seeds prevents its spread (Anonymous, 1992). Another parasitic plant found on the forest trees especially *Juglans regia* (walnut) is *Viscum album*.

The health hazard to animals and humans from terrestrial noxious weeds are many. The leaves and seeds of *Lantana camara* are toxic to many animals resulting in the death of sheep and calves. *L. camara* acts as potential breeding place for Tse Tse Fly (Eastern Africa). In spite of their toxicity, noxious weeds have some useful uses. For example *Sorghum halepense* and *Avena fatua* (wild oat) are used as fodder. *Chenopodium album* and *Imperata cylindrica* are used as feed for livestock. *Cyperus rotundus* tubers are eaten during famine by people. Essential oil is extracted from tubers, which is used in perfumery. Some weeds like *Cynodon dactylon*, *Cyperus rotundus*, *Verbena officinalis*, *Convolvulus arvensis*, *Artemisia absinthium* and mistletoes have medicinal properties and find use in pharmaceutical industries. *Imperata cylindrica* is also used as thatching material and in paper making. *Chenopodium album* and *Stellaria media* are cooked as vegetables.

Some of the weeds reported from research area are ethnobotanically important and utilized by local community as ethnomedicines, fodder, vegetables and fuel. Weed species like *Stellaria media*, *Taraxacum officinale*, *Malva neglecta* and *Medicago denticulata* are cooked as vegetables. Many weeds are ethnomedicinally important. *Fumaria indica* is used as blood purifier, *Cannabis sativa* as narcotic and *Chenopodium album* is used as anthelmintic. Similarly *Avena fatua* is utilized as green fodder and hay for cattle. More research is needed in the field of weed control, weed biology and weed utilization as the components of the integrated weed management.

Table-1. List of weeds alongwith their habit and habitat collected from the different locations in District Mansehra, Hazara, Pakistan.

S.No	Weed Species	Local Name	Family	Habit	Crops					
					Wheat	Maize	Rice	Tobacco	Veg.	Trees
1.	<i>Acorus calamus</i>	Bach	Araceae	Perennial	-	-	+	-	-	-
2.	<i>Alliaria petiolata</i>	Adrak	Cruciferae	Annual	+	-	-	-	-	-
3.	<i>Amaranthus viridis</i>	Chalvera	Amaranthaceae	Annual	-	+	-	-	+	-
4.	<i>Anagallis arvensis</i>	-	Primulaceae	Annual	+	-	+	+	+	-
5.	<i>Argemone mexicana</i>	Kandiari	Solanaceae	Annual	+	-	-	-	-	-
6.	<i>Artemisia absinthium</i>	Dack chaw	Asteraceae	Perennial	+	-	-	-	+	-
7.	<i>A. scoparia</i>	Chaw	Asteraceae	Annual	+	-	-	-	-	-
8.	<i>Avena fatua</i>	Jangli Jai	Poaceae	Annual	++	-	+	-	+	-
9.	<i>Bidens tripartite</i>	Booti	Asteraceae	Annual	-	-	+	-	-	-
10.	<i>B. pilosa</i>	Booti	Asteraceae	Annual	+	-	-	-	+	-
11.	<i>Boerhaavia diffusa</i>	Kindari	Nyctaginaceae	Annual	+	-	-	-	+	-
12.	<i>Cannabis sativa</i>	Bhang	Cannabinaceae	Perennial	+	-	-	-	-	-
13.	<i>Cardus acanthoides</i>	Kadiari	Asteraceae	Annual	+	-	-	-	-	-
14.	<i>Carthamus lanatus</i>	Kandiari	Asteraceae	Annual	+	-	-	-	-	-
15.	<i>Chenopodium ambrosoides</i>	Gandi booti	Chenopodiaceae	Perennial	+	+	-	-	-	-
16.	<i>C. album</i>	Bathu	Chenopodiaceae	Annual	-	+	+	+	+	-
17.	<i>Cichorium intybus</i>	Hand	Asteraceae	Perennial	+	-	-	-	-	-
18.	<i>Commelina benghalensis</i>	Kanchara	Commelinaceae	Annual	-	++	-	-	+	-
19.	<i>Convolvulus arvensis</i>	Ilri	Convolvulaceae	Perennial	-	++	-	+	+	-
20.	<i>Capsella bursa-pastoris</i>	Booti	Cruciferae	Annual	+	-	-	-	-	-
21.	<i>Cuscuta reflexa</i>	Niladari	Cuscutaceae	Parasite	-	-	-	+	-	+

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					Wheat	Maize	Rice	Tobacco	Veg.	Trees	
22	<i>Datura stramonium</i>	Datura	Solanaceae	Annual	+	-	-	-	-	-	-
23	<i>Digitaria saguinalis</i>	-	Poaceae	Perennial	+	-	-	+	-	-	
24	<i>Digitaria sp</i>	-	Poaceae	Perennial	-	++	+	+	-	-	
25	<i>Echinochloa colonum</i>	-	Poaceae	Perennial	+	+	-	-	-	-	
26	<i>Elysiue indica</i>	-	Poaceae	Perennial	+	+	+	-	+	-	
27	<i>Euphorbia helioscopia</i>	Dodal	Euphorbiaceae	Annual	+	-	-	-	+	-	
28	<i>E. hirta</i>	Dodal	Euphorbiaceae	Annual	+	-	-	-	+	-	
29	<i>Fumaria indica</i>	Papra	Fumariaceae	Annual	+	-	-	-	+	-	
30	<i>Galinsoga parviflora</i>	-	Asteraceae	Annual	+	-	-	-	-	-	
31	<i>Galium aparine</i>	-	Rubiaceae	Annual	+	-	-	-	-	-	
32	<i>Ipomoea alba</i>	Ilri	Convolvulaceae	Annual	-	++	-	-	-	-	
33	<i>Imperata cylindrical</i>	-	Poaceae	Annual	-	+	+	-	-	-	
34	<i>Lactuca serriola</i>	-	Asteraceae	Annual	+	-	-	-	-	-	
35	<i>Lantana camara</i>	-	Verbenaceae	Perennial	+	+	-	-	-	-	
36	<i>Malva neglecta</i>	Sonchal	Malvaceae	Perennial	+	-	-	-	-	-	
37	<i>Malvastrum sp</i>	-	Malvaceae	Perennial	+	+	-	-	-	-	
38	<i>Medicago denticulata</i>	Singi	Papilionaceae	Annual	+	-	-	-	+	-	
39	<i>Oenothera rosea</i>	-	Onagraceae	Annual	+	+	-	-	-	-	
40	<i>Orobanchae cernua</i>	-	Orobanchaceae	Parasite	-	-	-	++	-	-	
41	<i>Oxalis corniculata</i>	Khutkuria	Oxalidaceae	Perennial	+	+	+	+	+	-	
42	<i>Panicum repens</i>	Kha	Poaceae	Perennial	-	+	-	-	-	-	
43	<i>Parthenium hysterophorus</i>	-	Asteraceae	Perennial	+	-	-	-	-	-	

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					Wheat	Maize	Rice	Tobacco	Veg.	Trees	
44.	<i>Paspalum distichum</i>	-	Poaceae	Annual	-	+	-	-	-	-	
45.	<i>Portulaca oleracea</i>	Kulta	Portulacaceae	Annual	-	-	-	-	-	+	
46.	<i>Ranunculus muricata</i>	-	Ranunculaceae	Perennial	+	+	+	-	-	+	
47.	<i>R. scleratus</i>	Chachumba	Ranunculaceae	Annual	-	+	+	-	-	-	
48.	<i>Solanum nigrum</i>	Kachmach	Solanaceae	Annual	-	+	-	-	-	+	
49.	<i>Sonchus oleraceus</i>	Dodal	Asteraceae	Annual	+	-	-	-	-	-	
50.	<i>S. arvensis</i>	Dodal	Asteraceae	Annual	+	-	-	-	-	-	
51.	<i>Sorghum halepense</i>	-	Poaceae	Perennial	-	+	-	-	-	-	
52.	<i>Stellaria media</i>	Laloori	Caryophyllaceae	Annual	++	-	-	-	-	+	
53.	<i>Taraxacum officinale</i>	Hand	Asteraceae	Annual	++	+	-	-	-	-	
54.	<i>Trifolium repens</i>	Shaftal	Papilionaceae	Annual	+	-	-	-	-	+	
55.	<i>Tulipa stellata</i>	Kukar muna	Liliaceae	Annual	++	-	-	-	-	-	
56.	<i>Xanthium strumarium</i>	Pohli	Asteraceae	Annual	-	+	-	-	-	-	
57.	<i>Verbena officinalis</i>	-	Verbenaceae	Perennial	+	-	-	-	-	-	
58.	<i>Viscum album</i>	Guch	Loranthaceae	Parasite	-	-	-	-	-	+	
59.	<i>Veronica arvensis</i>	Neela	Scrophulariaceae	Annual	-	+	-	-	-	-	

Key: +=Problematic ++=Very Problematic - =Not found

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