

A Survey of Weeds of Wheat Crop Fields in Narwana Region, India

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Abstract-

The wheat cropping system is very important in India. Also, the weed infestation is a major problem in the productivity of wheat. The present work is based on field research conducted from January, 2017 to March, 2017 in Narwana region of Haryana state, India. Multiple field visits were performed to investigate weed species in wheat crop. The plants were identified with the help of available literature and through comparison with the already identified plant species. Data inventory has been documented in the form of family, Botanical name, vernacular name, life form and habit. Total 54 weed species were collected, related to 50 genera and 22 families. Maximum number of species were of family Poaceae (11 species) followed by family Asteraceae (10 species) and Fabaceae (08 species). Out of the 54 weed species, there were 46 annuals and 08 perennials. This study will be helpful as an additional tool in maintaining the floristic composition of Narwana region as well as in controlling the weed problem.

Keywords- Weed, Wheat crop, Narwana, Floristic diversity

Introduction-

A weed is a plant species which grows as a wild plant and competes with the growth of cultivated crops and generally has no aesthetic and economic values (Lesley, 1993). Weeds are undesirable due to competitive and allelopathic behavior (Zaman et al., 2011). Weeds usually have a negative association but on the other hand weeds may also have a large number of benefits. For example, *Chenopodium album*, *Melilotus alba* are extensively used as leafy vegetables (FAO, 2013). Wheat (*Triticum aestivum* L.) is a staple food crop and is grown by one third of the total world population (Johnson, 1984). Weed infestation is one of the major impediments to wheat yield, besides disease, pest and climatic influences (Qureshi et. al., 2009). Weeds consume available nutrients and compete for space and sunlight with crop plants. They compete for available N supply and light during the early growth stage (Cousen, 1996). Therefore, uncontrolled growth of weed plants in wheat crop is most important factor for reduction in wheat yield.

Narwana sub-division is a part of Jind district of Haryana State, India. This region is characterized by hot summer and cool winter. Intense fog is common in January every year. Narwana branch canal is main source of irrigation besides tube wells and submersible pumps. The present work is an attempt to explore weeds diversity in Narwana regions. The main purpose of the study was to achieve knowledge about availability of total number of species present in this region, because survey, identification and documentation of weed diversity is necessary before solving the menace of weeds in a particular region. Many Botanical studies have been conducted by various researchers in different regions of India like Duthie (1929), Hooker (1875), Jain et. al. (2000), and Maheshwari (1963). However, Narwana region is very less explored as to weed and floristic diversity; although very few works have been reported so far, e.g. Kumar et. al. (2016). So, keeping in view the diversity and status of weeds, this study was conducted in order to record the severity of weed infestation.

Materials and Methods-

The study was conducted during January, 2017 to March, 2017 to explore weed diversity. Standard methods were followed for collection of specimens, preservation and preparation of herbarium (Jain and Rao, 1977).

Selection of sites- For convenience, six wheat growing localities (villages) in Narwana region were surveyed, viz. 1. Dumarkha Kalan 2. Badhowal 3. Dublain 4. Darodi 5. Belarkhan 6. Dhakal. All villages are within the radius of 10 km from Narwana town. Field visits were performed multiple times in each village. Fifty quadrates each measuring 1m² size were randomly placed in each village for exploring the weed diversity (Hussain, 1989). Local inhabitants were also interviewed to get vernacular names of weeds (Waheed et. al., 2009).

Plant collection – Various parts (roots, twigs, leaves, flowers and fruits) of each specimen were collected and kept in polythene bags. Thereafter, collected specimens were placed in thick paper sheets.

Herbarium preparation- Then plant specimens were pressed using herbarium press. The paper sheets were changed at regular interval of ten days. After drying and pressing, specimens were mounted on herbarium sheets for preparation of herbarium.

Preservation of specimen and sheets- Herbarium sheets were protected against damages from insect and fungal attack by poison-treating them with 1% Mercuric Chloride solution. Naphthalene balls were also used to protect herbarium from insects.

Plant Identification- The collected plant species were identified on the basis of available literature like Stewart (1869), Bentham and Hooker (1876), Bamber (1916), Parker (1918), Jain (1978), Bhandari (1978), Jain et. al. (2000), Kumar (2001), Sharma and Khosla (1989), Sharma (1990), Hajra et. al. (1995), Sharma et. al. (2006), Marwat (2013). The specimens were identified by

observing the morphological and anatomical feature of vegetative and of reproductive parts also.

Results and Discussion-

During the survey, 54 weed species belonging to 50 genera and 22 families were recorded (Table-1). The major families which contributed to the weed flora were Poaceae with 11 species, Asteraceae with 10 species and Fabaceae with 08 species (Table-2). Most of the synonyms mentioned in different flora and research papers have been included here. These synonyms often refer to populations where plants vary in height, leaf shape, flower color, fruit size and branching pattern of shoots depending upon soil and climatic conditions. *Phalaris minor* was reported in all localities followed by *Rumex dentatus* and *Fumaria indica*. Other dominant species were *Coronopus didymus*, *Chenopodium album*, *Spergula arvensis* etc. Presence of *Phalaris minor* as dominant species indicates the well irrigated soil conditions. *Phalaris minor* being the dominant weed may decrease the grain yields of wheat considerably if this weed happens to attain a dense growth. The other members of Poaceae are inhabitants of a wide range of ecological conditions.

Weed plants like *Spergula didymus* and *Cynodon dactylon* being acidophilus up to large extent are known to be well suited to saline conditions (Rao, 1980 ; Jhakar et. al., 2005). Narwana region has been characterized by both types of weed i.e. grassy weed and broad leaved weeds. Therefore, edaphography of Narwana region is not uniform in all localities. The species like *Anagalis arvensis*, *Lathyrus odoratus*, *Vicia sativa* are known as neutrophiles. *Asphodelus tenuifolius* comes under basophiles. Therefore, soil properties as well as mode of irrigation like ground water, river- canal system also affects the weed diversity in study area. It indicates the great adaptability of weeds to wide range of soil environment.

The problem of weed control, especially in the canal irrigated areas is very much intricate. Canal water is principal sources of dissemination of

weed seeds (Marwat et. al., 2013). The noxious weeds have certain specific features that help in their survival better than other weeds. There may be deep root system (*Phragmites karka*), different mode of propagation like root suckers (*Cynodon dactylon*, *Cyprus rotundus*), twining habit (*Lathyrus odoratus*, *Convolvulus arvensis*). These adaptations enable them to consume large amount of habitat resources and compete with cultivated crops. Weeds like *Trigonella* sp. and *Phalaris minor* after maturation are harvested with the wheat resulting in mixing of their seeds with wheat grains. Seeds of these weeds are sown accidentally along with wheat seed every year resulting in their reappearance with wheat crop in

growing season. In this way, the continuity of this phenomenon increases the weed infestation and directly influences the crop production. However, in spite of negative impact on yield, weeds were reported to consume by local people for various purpose. For example, *Chenopodium album*, *Lathyrus odoratus*, *Phalaris minor*, *Cirsium arvense* are extensively utilized as fodder for livestock. *Chenopodium album* is cooked as vegetable and a very popular dish 'Bathua Ka Raita' and 'Buthua Ki Bhujji' are prepared by villagers. Finally, this study will provide a brief information on weed composition of Narwana region

Table-1. Weeds of wheat crop recorded in Narwana region during the present study.

Families	Botanical Names	Local/Vernacular Name (if any)	Life Forms	Habit
Asteraceae (Compositae)	<i>Parthenium hysterophorus</i> L.	Congress Ghas	Annual to Perennial	Herb to Shrub
	<i>Conyza canadensis</i> (L.) Cronquest	Canadian Horseweed	Annual	Herb
	<i>Eclipta alba</i> (L.) Hassk	Bharangraj	Annual	Herb
	<i>Blumea eriantha</i> DC	Kakronda	Annual	Herb
	<i>Cirsium arvense</i> (L.) Scop.	Dhudi Kandai	Annual	Herb
	<i>Sonchus asper</i> (L.) Hill	Kachi Kandai, Dodak	Annual	Herb
	<i>Cichorium intybus</i> L.	Kasni	Annual	Herb
	<i>Ageratum conyzoides</i> L.	Gandhil	Annual	Herb
	<i>Echinops echinatus</i> Roxb.	Utakatira	Annual	Herb
	<i>Launaea procumbense</i> (Roxb.) Ramaya & Rajgopal	Jangli Gobhi	Annual to Perennial	Herb
Brassicaceae (Cruciferae)	<i>Coronopus didymus</i> (L.) Smith. Syn. <i>Lepidium didymium</i> L.	Pitpapda	Annual	Herb
	<i>Sisymbrium Irio</i> L.	Khubkala	Annual	Herb
	<i>Lepidium sativum</i> L.	Pepper Ghas	Annual	Herb
Chenopodiaceae	<i>Chenopodium album</i>	Bathua	Annual	Herb
Euphorbiaceae	<i>Euphorbia hirta</i> L.	Dudh Ghas	Annual	Herb
Amaranthaceae	<i>Amaranthus viridis</i> L.	Chaulai	Annual	Herb
Fabaceae (Sub.F. Papilionatae)	<i>Lathyrus odoratus</i> L.	Jangli Matarbel	Annual	Herb
	<i>Lathyrus aphaca</i> L.	Matri	Annual	Herb
	<i>Alhagi maurorum</i> Medic. Syn. <i>Alhagi camelorum</i> Fischer	Jawasa	Perennial	Shrub
	<i>Vicia sativa</i> L.	Chana Bel	Annual	Herb
	<i>Vicia faba</i> L.	Bakla	Annual	Shrub
	<i>Trigonella polycerata</i> Auct.	Jangli Metha	Annual	Herb
	<i>Trifolium alexandrianum</i> L.	Jangli Barsam	Annual	Herb
Malvaceae	<i>Tephrosia purpurea</i> (L.) Pers. Syn. <i>Mollugo pentaphylla</i> L.	Sharpunka, Jangli Neel	Annual to Perennial	Herb to Shrub
	<i>Malvestrum coromandelianum</i>	Kharenti	Annual	Herb

	(L.) Garcke			
Oxalidaceae	<i>Oxalis corniculata</i> L.	Khatti Butti, Kaga Roti	Annual	Herb
Polygonaceae	<i>Polygonum plebejum</i> R.Br.	Machechi	Annual	Herb
	<i>Rumax dentatus</i> L.	Jangli Palak	Annual	Herb
	<i>Rumax nepanensis</i> Spreng.	Adak Palak	Annual	Herb
Poaceae (Gramineae)	<i>Polypogon monspeliensis</i> L.(Desf.)	Annual Bread Grass	Annual	Herb
	<i>Eragrostis cilianesis</i> All.	Stink Grass	Annual	Herb
	<i>Eragrostis minor</i> Host.	Kush Ghas	Annual	Herb
	<i>Poa annua</i> L.	Annual Blue Grass	Annual	Herb
	<i>Cynodon dactylon</i> (L.) Pers.	Doobdi, Doob Ghas	Annual	Herb
	<i>Bothriochloa pertusa</i> (L.) A. Camus	Silver Grass	Annual to Perennial	Herb
	<i>Avena sativa</i> L.	Jai	Annual	Herb
	<i>Phalaris minor</i> Retz.	Mandushi, Birti	Annual	Herb
	<i>Cymbopogon citratus</i> (DC) Stapf.	Lemon Grass	Annual	Herb
	<i>Dichanthium annulatum</i> (Forssk.) Stapf.= <i>Andropogon annulatus</i> (forssk.) ex F. Schmidt. Syn <i>Lysimachia arvensis</i> (L.)U. Manns & Anderb	Moti Ghas, Doka Ghas	Annual	Herb
	<i>Phragmites Karka</i> (Retz.) Trin	Narkul	Annual	Shrub
Solanaceae	<i>Solanum nigrum</i> L.	Mako, Falfotan	Annual	Herb
	<i>Nicotiana plumbaginifolia</i> Viv.	Jangli Tambakhoo	Annual	Herb
Moraceae	<i>Cannabis sativa</i> L.	Bhang	Perennial	Herb to Shrub
Convolvulaceae	<i>Convolvulus arvensis</i> L.	Hiran Khuri	Perennial	Herb
Cyperaceae	<i>Cyperus rotundus</i> L.	Dilla	Perennial	Herb
Portulacaceae	<i>Portulaca oleracea</i> L.	Lunia, Punarva	Annual	Herb
Primulaceae	<i>Anagallis arvensis</i> L.	Krishan Neel	Annual	Herb
Fumariaceae	<i>Fumaria indica</i> (Haussk.) Pugsley	Gajar Ghas	Annual	Herb
Caryophyllaceae	<i>Spergula arvensis</i> L.	Kalri Booti	Annual	Herb
	<i>Stellaria media</i> (L.) Vill.	Fool Booti	Annual	Herb
Molluginaceae	<i>Mollugo nudicaulis</i> Lamk.	Jhadasi	Annual	Herb
Papaveraceae	<i>Argemone maxicana</i> L.	Peeli Kandai	Annual	Herb
Liliaceae	<i>Asphodelus tenuifolius</i> L.	Caller Gantha	Annual	Herb
Scrophulariaceae	<i>Veronica anagallis</i> L.	Blue Scarlet Pimpernel	Annual	Herb

Conclusion-

The present work shows that many species of weeds with respect to habitat, habit and edaphography, are infesting the wheat crop in Narwana region. These weeds cause heavy losses

to yield of wheat crop. In order to obtain better yield, it is necessary to employ appropriate and sustainable management strategies including biological, mechanical and chemical, for weed control. And this information can be a useful tool for selection of weed control methods.

Table-2. Taxonomic data of explored weed plants with their families, genera and species.

Sr. No.	Families	Genera	Species
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1.	Poaceae	10	11
2.	Asteraceae	10	10
3.	Fabaceae	06	08
4.	Brassicaceae	03	03
5.	Solanaceae	02	02
6.	Caryophyllaceae	02	02
7.	Polygonaceae	02	03
8.	Chenopodiaceae	01	01
9.	Euphorbiaceae	01	01
10.	Amaranthaceae	01	01
11.	Malvaceae	01	01
12.	Oxalidaceae	01	01
13.	Moraceae	01	01
14.	Convolvulaceae	01	01
15.	Cyperaceae	01	01
16.	Portulacaceae	01	01
17.	Primulaceae	01	01
18.	Fumariaceae	01	01
19.	Molluginaceae	01	01
20.	Papaveraceae	01	01
21.	Liliaceae	01	01
22.	Scrophulariaceae	01	01

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