ETHNOMEDICINAL STUDY OF WEEDS IN MAIZE RICE AND TOBACCO FIELDS OF TEHSIL RAZZAR DISTRICT SWABI PAKISTAN

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ABSTRACT

Weeds flora of maize, rice and tobacco crop, fields were studied at six villages namely Karnal Sher Kalay, Tarakai, Bachai, Kalu Khan, Adina and Ismaila of Tehsil Razzar, District Swabi during summer 2016 with ethnomedicinal perspectives. A total of 62 most common weeds, belonging to 57 genera and 28 families, were found to be used by local folks for the treatment of different ailments. Among the monocots, family Poaceae was the dominant family having nine genera and nine species (14.75 %) followed by dicotyledonous family Asteraceae with seven (7) genera and seven (7) species (11.47%). Amaranthaceae and Brassicaceae were represented by five (5) species each (8.19 %). Chenopodiaceae was represented by one genus having three (3) species (4.91 %) and Euphorbiaceae was represented by three (3) genera with four (4) species (6.55%). Cucurbitaceae, Caryophyllaceae, Malvaceae, Solanaceae and Zygophyllaceae were represented by two genera and two species each (3.27 %), while Papilionaceae has two genera with three species (4.91%). The remaining families were Araceae, Asphodelaceae, Boraginaceae, Cannabaceae, Commliniaceae, Convolvulaceae, Cyperaceae, Fumariaceae, Lamiace, Marsileaceae, Oxalidaceae, Plantaginaceae, Polygonaceae, Portulacaceae, Ranunculaceae and Scorphulariaceae were represented by one species each (1.63 %). The current study revealed that villages of Tehsil Razzar has rich weed flora and though weeds offer competition to the valuable cash crops of maize, rice and tobacco they also have advantages (medicinal properties) to the local communities.

Keywords: Ecological attributes, *Nicotiana tabacum*, Oryza sativa, phytodiversity, phytosociology, *Zea mays.*

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INTRODUCTION

Swabi lies between the Indus and Kabul rivers, between 33°55′ and 34°-23′ North latitudes and 72°-13′ and 72°-49′ East longitudes. The entire district's precipitations are mainly concentrated in March (as high as 160 mm) as well as in summer from July-August (Monsoon rains). It is bounded in the North by Buner, on the East by Haripur, in the South by Attock and on the West by Nowshera and Mardan districts (Fig.1). The total area of the district is 1543 km^2 with an altitude of 316 m ASL (above sea level). Wheat, sugarcane, tobacco, rice and maize are the main crops, especially tobacco is of prime quality and leading national and multinational tobacco companies have their factories and warehouses built here (Said, 1978). In the present research our study area includes crop fields of maize, rice and tobacco crops of Tehsil Razzar of District Swabi, including the villages Karnal Sher Kalay, Tarakai, Bachai, Kalu Khan, Adina and Ismaila. From the climatic viewpoint, the research area falls into the sub-tropical and humid zones with four distinct seasons. The winter season is of short duration from November to February; summer is long, hot and humid. Spring and Autumn are also of shorter duration.
Weeds can be defined as an undesirable plant that grows in any cultivated crop or more accurately we can define weed as a plant that grows out of its place (Hussain *et al.*, 1988). Weeds grow in every field crop and vegetable fields and offer competition, produce allelopathic effects and provide habitats for other harmful organisms including pests and thus are a cause of immense problems throughout the plant life i.e., during harvesting, ploughing, seed purification and management of the land that ultimately leads to reduction in the yield of crops and vegetables.
The concept of weed, came with agriculture, as that has long been associated with man's use of plants for food, fibre and recreational purposes (Hussain *et al*., (1988). Though these weed plants are useful, but they cause heaviest loss to the crops by competing with them for all natural resources i.e., soil water, sunlight and mineral nutrition. Moreover they also act as hosts of pests. Weed identification is very important before applying any method to control weeds growth and their eradication including biological , chemical or physical methods. Rice (*Oryza sativa* L.) is one of the leading cereal crops of Pakistan and plays a pivotal role in the country's economy. It is the second largest agricultural export commodity of Pakistan, cotton being the first. Weed infestation is a main element in limiting crop yield in addition to other factors in Pakistan (Yousaf, 1998). It has been estimated that uncontrolled weed growth is responsible for rice reducing rice yield upto 25- 57% (Singh *et al*., 1999) and the total rice production can be enhanced by 28% through efficient weed control (Ashraf and Yousaf ,1985).
Maize (Zea *mays*), a grain yielding crop is usually grown in tropical and temperate regions of the world, with highly drained and fertile soil (Mills, 1994). According to global crop diversity trust maize is cultivated from equator to high latitude in north and south in the areas with altitudes up to more than 3000 meters from sea level. It is used as staple food, raw material for several industries and is a valuable livestock feed (Kumar and Jhariya, 2013). Maize growth and yield can be affected by several factors and the most severe one is crop-weed competition for available resources (Khan *et al*.,2017). Weeds can reduce maize population at initial stage of growth (Mitchell *et al*., 2005).
Tobacco *(Nicotiana tabacum)* production in Pakistan has a long tradition and for many families it is the basic source of living. Tobacco makes a significant contribution to different sectors of the economy. This plant is considered one of the few crops entering world trade entirely on the leaf basis and is the most widely grown commercial non-food plant in the world. In Pakistan and in our province Khyber Pakhtunkhwa a fair amount of research has been done on weeds found in wheat and maize (Hussain *et al*., 2009; Hadi *et al*., 2009; Rehman *et al*.,2014) but still no research work has been done on the weeds of maize, rice and tobacco fields

of Tehsil Razzar, District Swabi. So the aim of the present study was to identify and enlist the common weeds of maize, rice and tobacco fields and their ethnomedicinal uses by the common people of the area.

MATERIALS AND METHODS

A field survey of the villages Karnal Sher Kalay ,Tarakai, Bachai, Kalu khan, Adina and Ismaila of Tehsil Razzar, District Swabi was carried out for the ethnomedicinal studies of weeds of maize, rice and tobacco fields during summer, 2016. Plants specimens were collected from the cultivated fields of maize, rice, and tobacco and the information about their habit, habitat, life form, phonological status, and abundance was collected. Plants were dried by pressing with a plant presser, poisoned by sprinkling with naphthalene powder in order to protect them from insects and mites and then mounted on standard size herbarium sheets (40 x 25 cm^2) and identified with the help of different volumes of flora of Pakistan and other related literatures (Nasir and Ali (1974-1991), Ali and Qaiser (1995-2008). The morphological, phenological and ecological behaviour (Life form and leaf size spectra) of the weeds were determined after Hussain (1989). The distribution of weed species was calculated by following scale developed by Oosting (1956).

Phenologically, the plants were classified by field observation into prereproductive, reproductive and post-reproductive stages. Information regarding uses of plants by the local community was collected by semi-interview method from shopkeepers, timber dealers, fuel wood sellers, local herbalists (*Hakeems*) and farmers and main concern was given to the elderly citizens as they have a lot of knowledge about the plants and their traditional uses .

RESULTS AND DISCUSSION

An ethnomedicinal study of weeds infesting maize, rice and tobacco fields was carried out in summer 2016, in order to document the uses of these plants by the experienced old people of the area. Results of this study are presented in Table-1. Total number of reported plant families, number of plants in each family, vernacular name and description of the plant parts used by the people, ailment cured by the plant are clearly mentioned in Table-1. Moreover, the disease they cure and the method of description in which they are used to cure the ailment is also included in the data (Table-1). The data also showed their presence or absence in different fields, which are represented by abbreviations. Total 62 weed species were found, distributed in maize, rice and tobacco fields belonging to 57 genera and 28 families. Out of 28 plants families, one family *Marsileaceae* (Pteridophytes) with only one genus *Marsilea* and single species *minuta* from the rice field was recorded, which accounts as 1.63% of all collected weeds. Five families of monocots namely Araceae represented by one genus *Pistia* and one species (1.63%) in rice field, *Asphodelaceae* was represented by one genus and one species (1.63%), *Poaceae* with nine genera and nine species (14.75 %), *Commliniaceae* with one genus *Commlina* and one species *benghalensis* (1.63%) and *Cyperaceae* was represented by one genus *Cyperus* and one species *rotundus* (1.63%).

Rest of the 22 families belonged to dicotyledons, consisting 43 genera and 48 species. Asteraceae was the most abundant family having seven genera and seven species (11.47%) followed by Amaranthaceae (8.19 %) and Brassicaceae with 5 genera and 5 species (8.19 %) each, Euphorbiaceae with 3 genera and 4 species (6.55%). Chenopodiaceae has one genus with 3 species (4.91 %), while Papilionaceae has 2 genera with 3 species (4.91%). Caryophyllaceae (3.27 %), Cucurbitaceae (3.27 %), Malvaceae (3.27 %), Solanaceae (3.27 %) and Zygophyllaceae (3.27 %) were represented with 2 genera and 2 species each. The remaining families including including Boraginaceae, Cannabinaceae, Convolvulaceae, Fumariaceae, Lamiaceae, Oxalidaceae, Plantaginaceae, Polygonaceae , Portulacaceae,

Ranunculaceae and Scorphulariaceae have one genus and one species each (1.63 %). Our results are supported by the earlier findings of Hadi *et al.*, (2014) who reported that Poaceae and Asteraceae were the leading families in a study of weed flora of maize and wheat fields of Chitral. Results of our study revealed that the weeds are locally used as astringent, diuretic, laxative and anti-anthelmintic agents. The local communities use these plants as blood purifier, in stomach disorder, as skin emollient, in the treatment of piles, abdominal pain and diabetes (Table -1). Our findings are in line with the work of Ali *et al*. (2016) who also reported ethnomedicinal uses of wild plants of Chail valley of Swat. Maximum plant species were used as purgative (7 species- 11.47 %), 4 as purgative and laxative (6.55 %) and 3 as laxative (4.91%) followed by 4 plants species (6.55 %) used as anti-inflammatory, 2 (3.27 %) used for promoting hair growth. Two plants (3.27 %) were used as diuretic, 1 as astringent (1.63%) and 5 plants (8 %) as nutritive (fodder) and stomachache. Some were as remedy for the treatment of leucorrhoea (1.63%). Four plants (6.55%) were useful in skin problems and few plants were helpful in healing of wounds (4.91%), 1 (1.635%) for menstrual disorder, 2 as narcotic and sedative (3.27%), 3 were found effective in purification of blood(4.91%), while some were found having antipyretic properties (3.27%). Rest of the families were of lesser medicinal use (Fig.2).Among the most common plant parts used for the different ethno-medicinal purposes, 23 plant species were used as whole plants (37.70 %), followed by 21 plants whose leaves were used as the effective parts (34.42 %). Seeds of 12 plants were used for medicinal purposes (19.67%). Shoots of 5 plants (8.19%), roots of 2 plants (3.27 %) and fruits of 2 plants (3.27 %) and florets of one plant from *Asteraceae* (1.63 %) were considered valuable by the common people of the area (Fig. 3).

Ecological study of weed flora of maize, rice and tobacco fields at different villages in Tehsil Razzar revealed that majority of the weeds were classified as therophytes (63.93 %) in tobacco field followed by 62% weeds in maize field and 39% weeds in rice crop field. Next dominant life-form class was hemi-cryptophytes represented by 18% weeds in rice field followed by 16.39 % weeds in both maize and tobacco field (Fig.4). The results obtained in this study reveals that hemicryptophytes and therophytes are the largest life form classes of the study area. Our findings are approved by Hadi *et al.* (2014) who reported that majority of the weeds were of therophytes type in wheat and maize field in Chitral. Cain and Castro (1959) and Shimwell (1971) have explained that hemicryptophytes life-form is the characteristic of temperate climates while therophytes life-form is the characteristic of dry and hot climates. As our study area has harsh cold winter to hot, humid subtropical summer climate, hence, the life form spectra clearly indicate these important climatic features, which favor the higher percentage of therophytes and hemicrytophytes. The present study supports the concept of Cain (1950) and Hussain *et al*. (2015) that dry climate, overgrazing and trampling which is so prevalent on grasslands, tend to increase the percentage of therophytes through the introduction and spread of weedy grasses of this life form.

According to leaf-size classes, 47 % weeds showed the microphyllous leaf character in both maize and tobacco fields and 34% in rice field, followed by mesophyll with 21% in maize and 19% in tobacco field (Fig.5). According to Hussain and Chudhary (2009) moist environmental conditions support microphyllous leaf spectra in vegetation that supports our present findings. The explanation by Hussain *et al*. (2015) that regional climatic condition plays a key role in the determination of leaf spectrum dominancy, justifies our present findings as weed species were growing in irrigated fields of maize, rice and tobacco, so the conditions were almost ideal for plant growths, which resulted in the microphyllous leaf spectra in majority of the weeds.

Relating to Oosting classes of consistency, 11.5 % weed species had

very rare distribution and belong to class-I, 27 % weed species had rare distribution and belong to class- II, 21 % weeds fall in class III with common distribution, 16% weeds fall in class IV and 18% plants classified as class V in maize fields. In rice fields, 39% weeds fall in the class- I and 11.5 % in class- II category. Rest of the weeds in rice belong to class III, IV and V each (4.9%). In tobacco field 31 % weeds belonged to class - I, 27 % to class-II and 26 % to class- III. 8% weeds were constant species that fall in constancy Class IV and 3% weeds to Class V with maximum distribution (Fig.6). Habit character of weeds showed that most of the weeds of maize, rice and tobacco were classified as annual herbs (AH) i.e., 80 % each in maize and tobacco and 49 % in rice field (Fig.7). As the occurrence of weeds common to the three fields is concerned, 22 weeds species were found in maize and tobacco fields and were found absent from rice field. While 38 weeds were found most common in all the three crops i.e., maize, rice and tobacco fields.

Results showing the different phenoligical stages of weeds revealed that 62% weeds species were in the post-productive phase of life cycle. 37% weeds were found in reproductive stage of life cycle and only 1% in pre-reproductive phase of their life cycle (Fig.8). Maximum number of weeds were annuals which mostly spread by seeds. Such weeds need to be removed in vegetative stage before seed

production in order to reduce their chances of survival and future emergence. However, even under best agronomic practices, the annual weeds can germinate, as soil always remains as seed bank that is a constant source of weed persistence. Weed seeds enter the cultivated fields through water courses, through animals, by wind dispersal mechanism or present as contamination in seeds. Therefore, it becomes more difficult to completely eliminate them. The species which are very common, and are found in all the fields are mostly herbs, so it might be possible that the seeds of these weeds come through the cattle manure, which is commonly used in the study area by local farmers.

It is very important for enhancing crop productivity that proper Pre-reproductive management of these weeds should be practiced in order to reduce weeds growth and distribution. However, the present ethno-medicinal study shows that these weeds may be useful as natural remedies in treatment of different diseases as whole plant, pre-reproductive parts, vegetative parts (leaves, roots) or post reproductive parts. Thus, the proper management and utilization of these weed species might increase their positive side. The current study revealed that villages of Tehsil Razzar has rich weed flora that though offer competition to the valuable and cash crops of maize, rice and tobacco crops but it has medicinal values to the local community. It is suggested from the current information that the local flora of the area needs comprehensive and detailed chemical analysis of medicinal significance that will be helpful in drug development from natural resources.

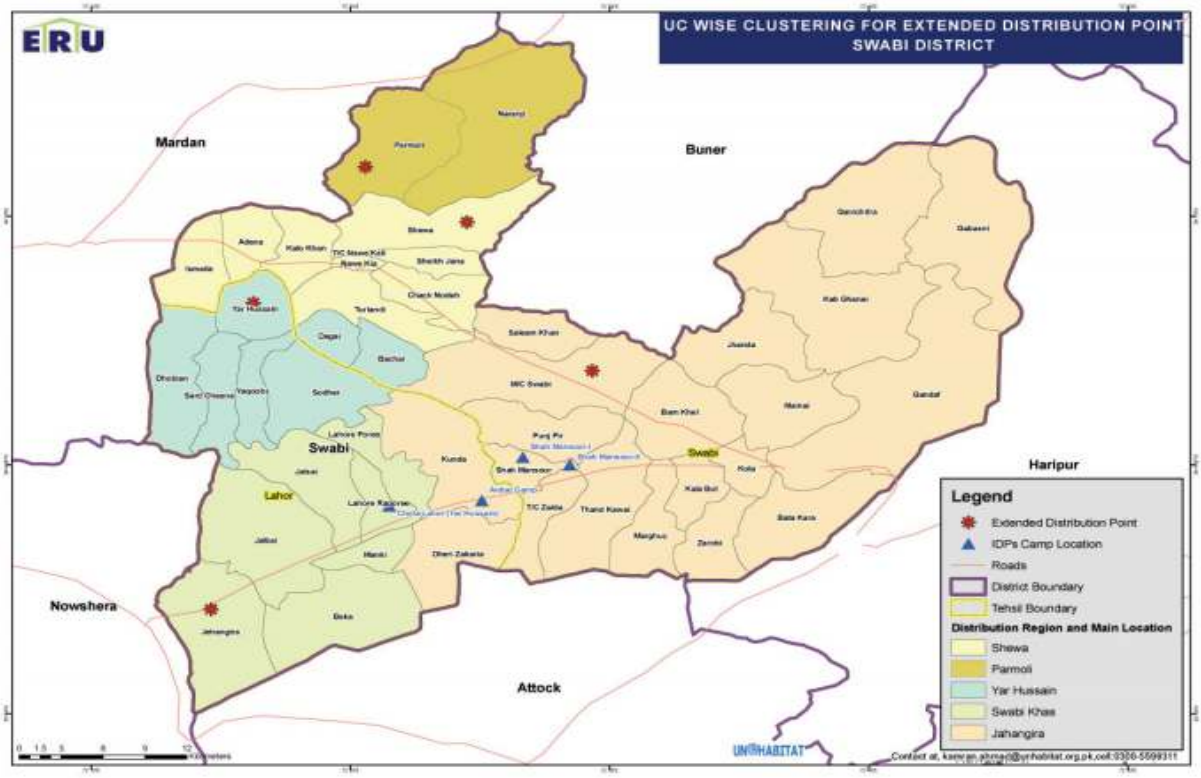

Fig.1. Map showing study area of Tehsil Razzar , District Swabi.

Table-1. Ethnomedicinal study of weeds of maize, rice and tobacco fields of Tehsil Razzar, District Swabi, Pakistan.

S.No	No. of plants	Family	Name of Plant	Vern. name	Part used	Ailment cured	Description	M	R	T
1	5	***Amaranthaceae***	*Achyranthes aspera* L.	Kurushka	Leaves	Leaves are purgative / laxative	Decoction for cough, asthma, upset stomach disorder. Plant Juice for abdominal pain.	+	-	+
			Aerva javanica	Harh Sassa	Whole plant	Anti-inflammatory	Decoction of plant is used as gargle to relief tooth ache.	+		+
			Amaranthus viridis L.	Ranzakey/ Chalway	Whole Plant	Purgative	Cooked as vegetable.	+		+
			Alternanthera sessiles L.	Skha botay	Whole Plant	Purgative	Leaves are cooked.	+		+
			Digera muricata L.	Surmai	Fresh plant leaves	Laxative, purgative	Plant with leaves and flowers is cooked as vegetable.	+		+
2	1	***Araceae***	*Pistia sp.*	Not known	Fresh plant	Nutritive	Dried plants are source of minerals.	-	+	-
3	1	***Asphodelaceae***	*Asphadelus tunifolius Car.*	Jangli piazaki	Seeds	Tonic for hair.	Seeds are crushed, powdered and mixed with hair oil as tonic.	+	-	+
4	7	***Asteraceae***	*Calendula arvensis* L.	Zair Gulley	Leaves and florets	Used in rheumatic conditions.	Both the chopped leaves and florets are heated in canola oil and used for massage to lessen joint pain.	+	+	+
			Carthamus persicus	Kunzala	Seeds	Tonic	Seeds are used for increasing milk production. Oil from its seeds	+	-	+

							is used as brain tonic.			
			Conyza bonariensis	Harh sassey	Leaves	Diuretic and astringent properties.	Infusion is taken.	+	-	+
			Eclipta alba L.	Botey	Leaves	Promotes hair growth.	Fresh leaf extract and coconut oil.	+	+	+
			Parthenium hysterophorus	Botey	Not known	Not known.	Not known.	+	+	+
			Sonchus asper.	Shodapai	Whole plant	Helpful in healing of wounds or burnt skin.	Leaves poultice is applied to wounds.	+	+	+
			Xanthium strumarium L.	Geshay	Aerial parts & root	Not known	Not known	+	+	+
5	5	***Brassicaceae***	*Brassica compestris* L.	Worri	Shoots , seeds	Nutritive, in treating Leucorrhoea.	Shoots are cooked as vegetable, seed oil is used as hair tonic.	+	+	+
			Capsella bursa-pastoris	zangli sarson	Seeds	Nutritive. Used to cure skin problems.	Leaves are eaten raw. Seeds are powdered and applied to wounds.	+	+	+
			Coronopus didvmus	Sarson	Leaves and seeds.	Purgative & laxative.	Leaves are cooked as pot herb for stomach disorder.	+	+	+
			Lepidium sativum L.	Bushta	Shoots	Stomach ailments	Fresh leaves are eaten or cooked.	+	+	+
			Sisymbrium irio L.	Khob kalan	Ripe seeds	Acute pain, sunburn	Paste of Powdered seeds is applied externally for stabbing pain and also used to cure sunburn.	+	+	+
6	1	***Boraginaceae***	*Heliotropium europium* L.	Langaty		inflammations, skin diseases, menstrual disorder, and poisonous bites.	Paste with sesame oil is applied to swollen joint areas, root paste is applied to skin disease.	+	-	+
7	1	***Cannabinaceae***	*Cannabis sativa* L.	Bhang	Leaves and resins of female flowers	Narcotic, sedative and stimulant in small doses.	Plant resin from the whole plant is used to prepare a charas and bhang.	+	-	+

8	2	***Caryophyllaceae***	*Silene canoidea* L.	Sur gul	Seeds	Emollient.	Seed are used.	+	+	+
			Spergula arvensis L.	Botey	Tender shoots and leaves	Laxative, diuretic.	Cooked as vegetable.	+	+	+
9	3	***Chenopodiaceae***	*Chenopodium album* L.	Bathu sag	Leaves	Improves appetite.	Leaves are cooked as vegetable and eaten.	+	+	+
			Chenopodium murale L.	Suba (saag)	Leaves	Purify blood and treats piles.	Cooked as vegetable.	+	+	+
			C. ambrosoides L.	Botey	Leaves	Carminative, anthelmintic, in cough and pulmonary obstructions	Infusion of the leaves is taken as a remedy.	+	+	+
10	1	***Commliniaceae***	*Commelina benghalensis*	Wakha	Leaves/ whole plant	Healing wounds, prickly heat , antipyretic .	Poultice of leaves is applied to wounds. Leaves are boiled with cumin seeds , pepper, corn and is taken as remedy.	+	+	+
11	1	***Convulvulaceae***	*Convolvulus arvensis*	Purvatey	Leaves , root	Stomach disorder.	Decoction of leaves and root is used as purgative.	+	-	+

12	2	***Cucurbitaceae***	*Citrullus colocynthis*	Tarkha manrha	Seeds	Stomach disorder.	Seeds are dried , powdered and then eaten in stomach pain.	+	-	+
			Cucurbita maxima	Kado	Fruit/seeds	Nutritive.	Unripe fruit is cooked as vegetable / seeds when mature are tonic.	+	-	+
13	1	***Cyperaceae***	*Cyperus rotundus*	Dela	Leaves		leaves are used as purgative. Decoction of the leaves is also used as anthelmintic. Paste of the leaves is used in skin disorders.	+	+	+
14	4	***Euphorbiaceae***	*Chrozophora plicata*	Suyahi Botey	Whole plant	Leaves are purgative/laxative.	Leaves are dried or freshly chopped leaves are eaten.	+	-	+
			Euphorbia hirta	Botey	Leaves	Antidiabetic.	Leaf juice is orally administered for diabetes.	+	-	+
			Euphorbia prostrata	Botey	Whole plant	Sedative , anthelmintic, use in intestinal disorder.	Leaves are used as vegetable .	+	-	+
			Rumex sp.	Shalkhay	Whole plant	Nutritive, fodder.	Leves are cooked as saag.	+	+	+
15	1	***Fumariaceae***	*Fumaria indica*	Papra	Green Shoots		Purify blood, antipyretic and stomachache.	+	+	+
16	1	***Lamiaceae***	*Mentha longifolia*	Enaley	Whole plant	Stomachache , vomiting, gas trouble.	The leaves are eaten to relief stomach pain, vomiting and gastric trouble. Herbal tea of the plant is used to control fever.	-	+	+
17	2	***Malvaceae***	*Abutilon indicum* L.	Botey	Whole plant	Demulcent, laxative, diuretic, analgesic, anti-inflammatory and antiulcer	Roots, leaves, flowers, bark, seeds, and stem is used as remedy.	+	-	+

						agents.				
			Malva neglecta Wallr.	Panirak	Fresh plant	Antispasmodic.	Cooked as vegetable to relief constipation and as antispasmodic.	+	-	+
18	1	***Marsileaceae***	*Marsilea minuta*		Leaves	Antidiabetic.	Leaf juice is used for diabetes.	-	+	-
19	1	***Oxalidaceae***	*Oxalis comiculata* L.	Tarvakey	Leaves	Gastric troubles, anthelmintic	Juice of fresh leaves is used. Leaves are used as vegetables as well.	+	+	+
20	9	***Poaceae***	*Aristida adscensionis*	wakha	Whole plant	Nutritive.	As a fodder for animals.	+	+	+
			Cenchrus ciliaris L.	wakha	Whole plant	Nutritive.	Cattle feed.	+	+	+
			Cynodon dactylon	Kabal	Whole plant	Piles, used to stop wound bleeding.	Decoction of leaves and shoots is mixed with milk for curing bleeding piles, irritation of urinary tract and for vomiting. Paste of the fresh leaves and stem is applied on wounds to stop bleeding.	+	+	+
			Dichanthium annulatum	wakha	Whole plant	Fodder, purgative, Dysentery and manorrhagia.	Whole plant is used as fodder. Infusion of leaves is taken in abdominal disorder.	+	+	+
			Desmostachya bipinnata	wakha	Whole plant	Fodder, purgative, hypotensive.	Tea of root is effective against high blood pressure.	+	+	+
			Echinochloa crus-galli	wakha	Whole plant	Fodder	Farmer used it as animal fodder.	+	+	+

			Eragrostis pilosa	wakha	Whole plant	Fodder	As fodder for cattle.	+	+	+
			Poa annua	wakha	Whole plant	Fodder	Fodder and birds feed.	+	+	+
			Sorghum halepense	Dadum	Whole plant	Animal feed	Plant is fed to the cattle as a fodder.	+	+	+
21	3	***Papilionaceae***	*Medicago polymerpha* L.	Peshtarey	Shoots	Anti-helmintic & tonic.	Yong leaves are used as pot herb.	+	+	+
			Medicago minima	Peshtery	leaves		Plant shoots are cooked as pot herb.	+	-	+
			Melilotus indicus L.	Peshtary	Leaves		Plant shoots are cooked as pot herb.	+	+	+
22	1	***Plantaginaceae***	*Plantago minor*	Jabai	Leaves, seeds	Heart burn, jaundice.	The leaves are cooked as vegetable for heartburn and jaundice. One teaspoon seeds are soaked in one glass water and taken to treat diarrhea.	+	+	+
23	1	***Polygonaceae***	*Polygonum plebeium*	Botey	Whole plant, leaves	Cardio-tonic, haemetonic and in cholera.	Fresh and dried plant.	+	+	+
24	1	***Portulaceae***	*Portulaca oleracea*	Warkhorey	Shoots	Digestion, laxative.	Plant is cooked as vegetable. It improves digestion being laxative.	+	+	+
25	1	***Ranunculaceae***	*Ranunculus muricatus* L.	Zer gul	Whole plant	Asthmatic, intestinal disorders.	Decoction of the plant is used to treat the ailments.	+	+	+
26	1	***Schrophulariaceae***						+	+	+
			Verbascum thapsus L.	Khargwag	Leaves	Improves healing of wounds.	Fresh leaves paste is useful in curing of wounds or inflammation.	+	+	+
27	2	***Solanaceae***	*Datura alba*	Barbaka	Whole plant, Leaves/ Seeds	Narcotic.	Leaves along with mustard oil is applied to skin disorders. Flower	+	-	+

							juice is used in ear pain. Seeds are used as purgative, cough, fever and asthma. Seeds are smoked for its narcotic action.			
			Solanum nigrum	Kachmach	Leaves and ripe fruit	Eye diseases, fever, cough.	Fruit juice cures sore eyes while leaves are cooked and eaten to relieve cough, fever.	+	+	+
28	2	***Zygophyllaceae,***	*Fagonia cretica* L.	Spelaghzai	Whole plant	Blood purifier, skin allergies.	Juice prepared by blending/crushing fresh leaves and young branches is mixed with sugar and water and is used for blood purification and allergies.	+	-	+
			Tribulus terrestris L.	Markonday	Seeds/plant	Extract of fresh crushed plant	Produce Cooling effect. Used as diuretic agent.	+	-	+

Key: R=Rice, M= Maize, T= Tobacco, Presence of weed in the field = +, Absence of weed = -

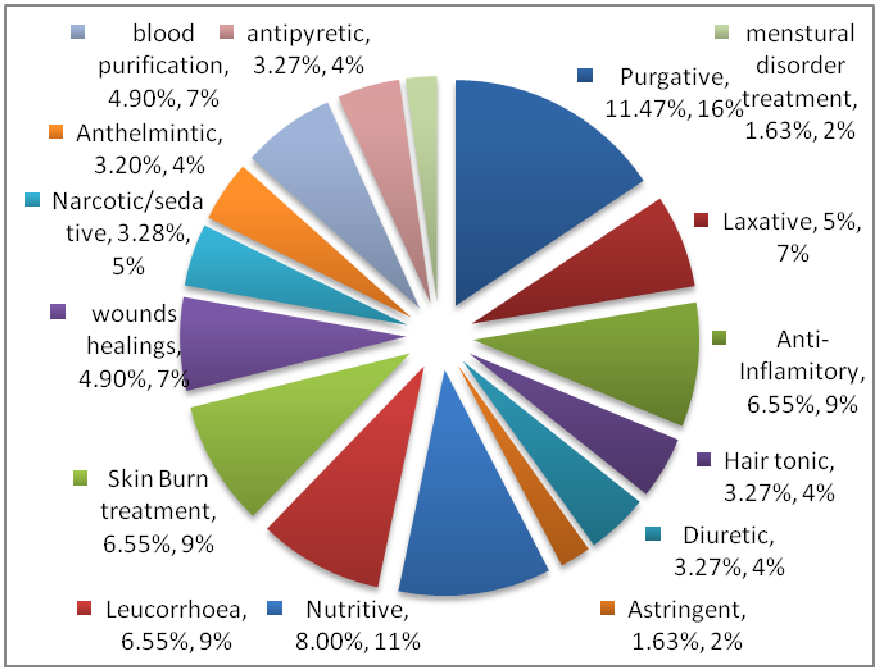

Fig. 2. Uses of various plant species for different ailments (%).

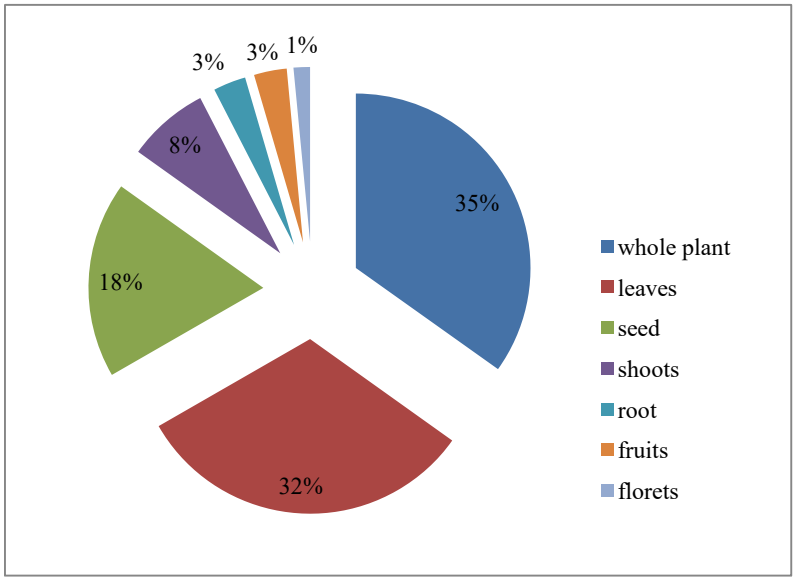

Fig. 3 .Different Plant parts of various weeds used by loacl people of Tehsil Razzar.

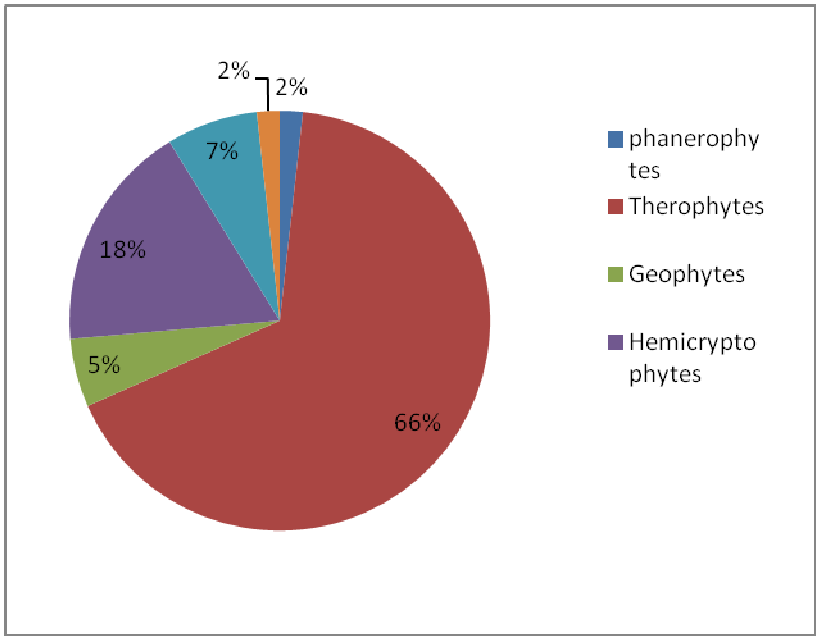

Fig.4. Life-form classes of weeds in maize, rice and tobacco fields Razzar.

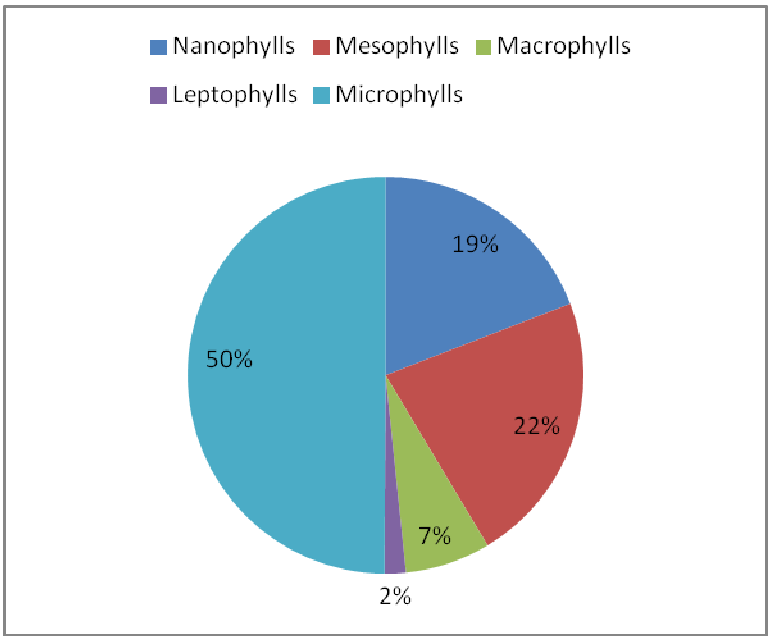

Fig.5. Leaf-size classes of weeds in maize, rice and tobacco fields at Razzar.

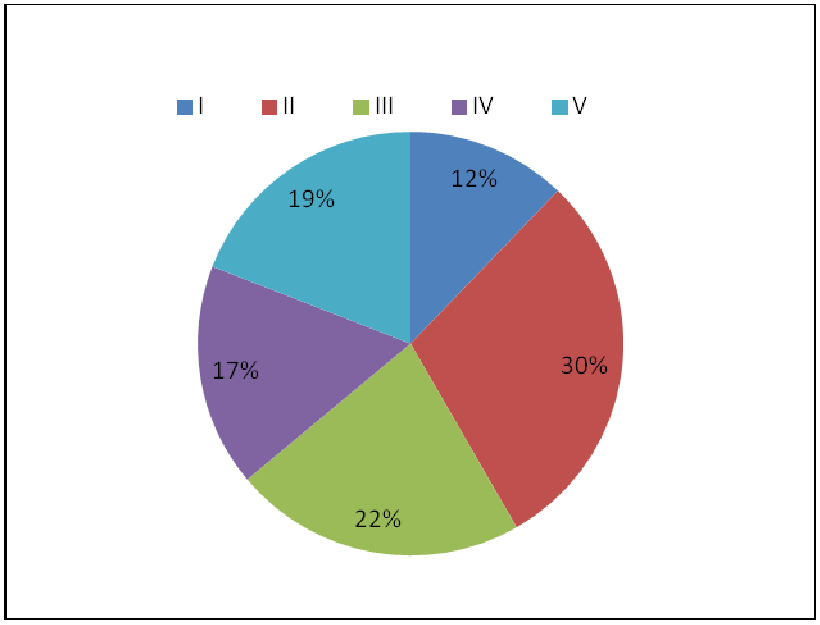

Fig.6. Consistency classes of weeds in maize, rice and tobacco fields at Tehsil Razzar

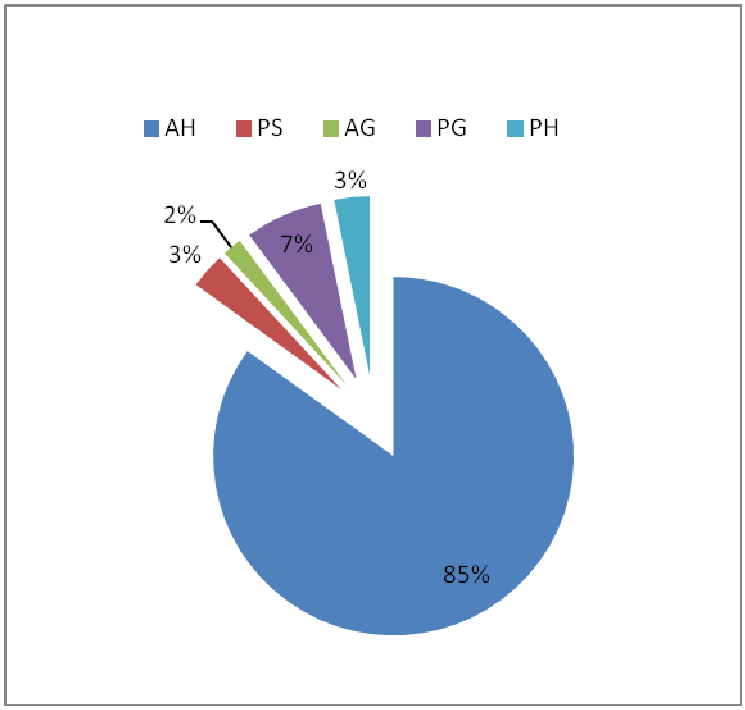

Fig.7. Classification of weeds according to habit classes in the maize, rice and tobacco fields at Tehsil Razzar

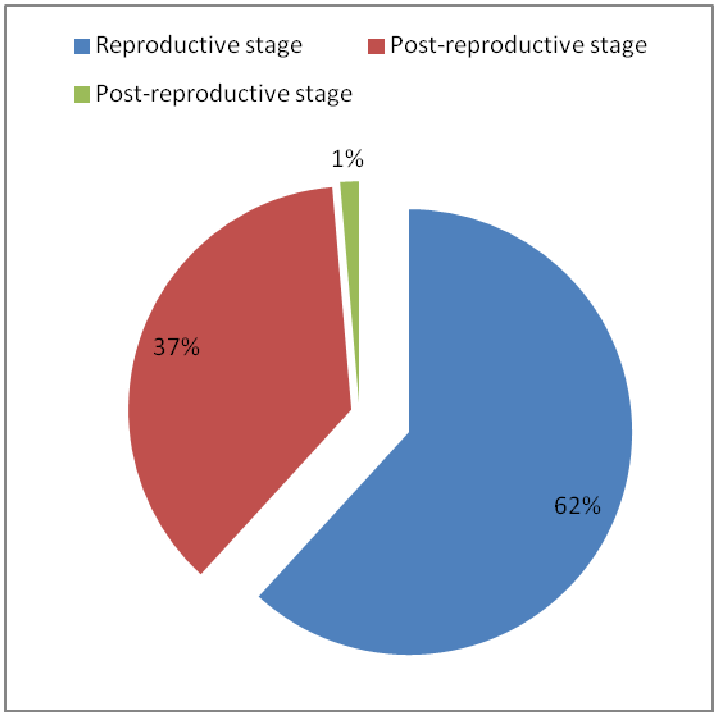

Fig.8. Phenological classes of weeds in maize, rice and tobacco fields at Tehsil Razzar.

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