**WEEDS AS A SOURCE OF MEDICINES FOR THE DESCENDANTS OF ALEXANDER THE GREAT IN KALASH VALLEY, DISTRICT CHITRAL, HINDUKUSH RANGE, PAKISTAN**

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**ABSTRACT**

*The Kalash valley of district Chitral is famous for its inhabitants considered to be the descendants of Alexander the Great, which are practicing an unique religion and culture and spoke an indigenous language for thousands of years. The present survey was carried out in all the three sub-valleys viz: Bumburet, Birir and Rumbor of Kalash valley during 2014 to 2015 to record the medicinal weeds of wheat crops. The result indicated 27 species of weeds belonging to 23 genera and 17 families used by locals for treatment of different diseases. The leaves of 15 (55.55%) species, shoots of 5 (18.52%), fruits and seeds of 3 (11.11%), flowers of 2 (7.41%) and the roots and whole plant of one (3.70%) species each were used as medicines locally. Similarly, 17 (63%) species were used in abdominal problems, 3 (5.43%) each as blood purifier and in jaundice, 2 (7.41%) each for fever and wound healing and one (3.70%) species each was used to treat cardiac problems, eye pain, kidney pains, mouth diseases and sunburn. Asteraceae was dominant family with 6 (6.66%) species followed by Chenopodiaceae with 3 species (5.43%). Brassicaceae, Polygonaceae and Plantaginaceae had 2 species (7.41%) each. All other families have contributed with one species each. The present findings provide first hand information about medicinal weeds of the area and their local uses and might also be helpful for proper management and control of these weeds.*

**Keywords:** Weeds, wheat crops, medicinal uses, Kalash valley, district Chitral, Pakistan.

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**INTRODUCTION**

 Chitral is the extreme north-east district of Khyber Pakhtunkhwa, Pakistan and lies between 710 11´ 32” to 730 51´ 34” east longitude and 350 15´ 06” to 360 55´32” north latitude (DCR, 1998). It is bounded to east by Gilgit-Baltistan, in south by Dir and Swat and in the west and north-west respectively by Nooristan and Wakhan areas of Afghanistan. The present study area Kalash valley is consisting of three sub-valleys viz: Bumburet, Rumbor and Birir that inhabit the historical and unique cultured Kalasha peoples living in these rugged mountainous series of Hindukush range for thousands of years. They are considered to be the descendants of “Shalak-Shaw” who was an invading Army General of Alexander the Great. Wheat (*Triticum aestivum* L.) is most commonly cultivated crop in the foothills along the rivers in all the three localities of the valley. The present study is the first ever attempt to record the medicinal uses of weeds in wheat crops of Kalash valley, district Chitral. Many workers have contributed in weed study of other parts of Chitral and Pakistan i.e. Hussain *et al.* (2004) studied the weeds in wheat fields of Tehsil Mastuj, Chitral and established three communities. Hadi *et al.* (2014) enlisted the ethnomedicinal uses of 31 weed species from Rech valley, Chitral. Shah *et al.* (2014) worked out the weeds of wheat crop of Mastuj valley, Chitral and reported 52 species. Hadi and Ibrar (2015) studied the wheat weeds of Kalash valley, Chitral and reported 59 species. Hamayun 2003; Mohammad *et al.* 2005; Naveed and Hussain 2007; Hussain *et al.* 2009; Qureshi *et al.* 2009; Khan *et al.* 2012 and 2013; Marwat *et al.* 2013; Ullah & Rashid 2013; Khan *et al.* 2014 and Ullah *et al.* 2014 worked on weeds of different crops in different parts of Pakistan.

**MATERIALS AND METHODS**

The weeds were collected from the wheat fields of all the three sub-valleys viz: Bumburet, Rumbor and Birir of Kalash valley during year 2014. The data on medicinal uses of these weeds was obtained by interviewing the local community, while the ecological characteristics of each species were recorded in the field. The plants were pressed, dried and identified by using different volumes of Flora of Pakistan (Nasir and Ali, 1970-1989; Ali and Nasir, 1989-1991; Ali and Qaiser, 1993-2013). The leaf-size classes and life form spectrum were determined after Raunkiaer (1934) and Hussain (1989). Phenological data was obtained in the fields to classify the plants into Pre-reproductive (vegetative), reproductive (flowering) and post-reproductive (fruiting) stages. The percentage distribution of each species in the area was determined through consistency classes and five classes were identified that showed maximum distributed species in class-V and minimum distributed in Class-I.

**RESULTS AND DISCUSSION**

The present study was conducted to collect the weeds of Kalash valley, district Chitral, used as medicines by the locals. 27 different weed species were collected from the area belonging to 23 genera and 17 families (Table-2). Asteraceae was dominant family with 6 (22.22%) species followed by Chenopodiaceae with 3 species (11.11%). Brassicaceae, Plantaginaceae and Polygonaceae had 2 species (7.41%) each. The remaining families like Adiantaceae, Apiaceae, Cannabaceae, Caryophyllaceae, Convolvulaceae, Fumariaceae, Lamiaceae, Malvaceae, Oxalidaceae, Portulacaceae, Schrophulariaceae and Solanaceae were represented by single species each (Fig. 1). The life form classes showed that therophytes was leading group with 21 (77.78 %) species followed by geophytes with 4 (14.81%) species and Hemicryptophytes and Chamaephytes with one (03.70%) species each. Similarly, nannophylls was dominant leaf size class with 13 (48.15%) species followed by mesophylls with 9 (33.33%) species, leptophylls and macrophylls 2 (7.41%) species each and microphylls with one species (table-3). Phenological data showed that 21 (77.78%) species were at reproductive stage (flowering) and 03 (11.11%) species each were in post-reproductive (fruiting) and pre-reproductive (vegetative) stages (Table-3). Consistency classes were used to find the percentage distribution of each species in the area. Species having 0-20 % distribution were grouped in consistency class-I, 21-40 % in consistency class-II, 41-60 % in consistency class-III, 61-80 % in consistency class-IV and 81-100 % in consistency class-V. The result showed maximum (9) species were distribution in consistency class-II followed by class-III having 6 species, consistency class-I had 5 species, consistency class-IV had 4 species and consistency class-V had 3 species (Table-3).

The medicinal uses of these weeds showed that leaves of 15 (55.55%) species, shoots of 5 (18.52%) species, fruits and seeds of 3 (11.11%) species, flowers of 2 (7.41%) species and roots and whole plant of one (3.70%) species each were used as medicines (Figure 3). Similarly, 17 (63%) species were used in abdominal problems, 3 (5.43%) each as blood purifiers and in jaundice, 2 (7.41%) each for fever and wound healing and one (3.70%) species each was used to treat cardiac problems, eye pain, mouth diseases, kidney pains and sunburn (Fig. 2).

**Table-1.** Medicinal weeds growing in Kalash valley, district Chitral, Pakistan

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S# | Plant name  | Family  | Local name  | Part used  | Disease cured  | Description  |
| 1. | *Adiantum venustum* D. Don. | Adiantaceae | Sumbal | Fronds  | Diuretic, cardiac probs. | The extract of fronds is used as cardiac tonic. The spores are pour on wounds.  |
| 2. | *Coriandrum sativum* L. | Apiaceae  | Danu | Shoots  | Carminative, digestive | Shoots are cooked with food or eaten as such as appetizer, carminative. |
| 3. | *Artemisia brevifolia* Wall. Ex DC. | Asteraceae  | Droon | Shoots | Stomachic  | The herbal tea of shots is used as stomachic and treats gastric problems. |
| 4. | *Artemisia parviflora* Roxb. | Kharkhalich  | Seeds  | Anthelmintic and stomachic  | One tea spoon seeds boiled in one glass water are drunk to release worms and relief abdominal pain.  |
| 5. | *Calendula arvensis* L. | Bodeki  | Leaves, flowers | Relieve Joints pain  | The leaves and flowers are crushed in cooking oil and applied to relieve joint pain. |
| 6. | *Cichorium intybus* L. | Kasti  | Roots  | Relieve typhoid fever | Roots are eaten as such or boiled and the extract is taken to relieve typhoid and general fever. |
| 7. | *Matricaria chamomilla* L. | Shirisht  | Flowers  | Gastric pain | Herbal tea is prepared from flowers to relieve abdominal pain. |
| 8  | *Taraxicum officinale* L. | Phowoo | Leaves  | Diuretic, kidney pain, ulcer, laxative | Boiled and taken as vegetable |
| 9. | *Lepidium sativum* L. | Brassicaceae  | Troak kardachi  | Leaves  | Stomachic  | Fresh leaves are eaten or cooked as stomachic |
| 10 | *Sisymbrium irio* L. | Kheli kheli  | Seeds  | Stabbing pain, sunburn  | Paste of Powdered seeds is applied externally for stabbing pain and also used to cure sunburn.  |
| 11 | *Cannabis sativa* L. | Cannabinaceae  | Bong  | Leaves and seeds | Narcotic and stimulant | Leaves are crush to prepare a narcotic drug “chars”. Leaves and seeds are eaten as stimulant  |
| 12 | *Silene conoidea* L. | Caryophyllaceae  | Apopar  | Leaves  | Laxative, purgative  | Leaves are cooked as laxative and purgative |
| 13 | *Chenopodium murale* L. | Chenopodiaceae | Dar kunak | Leaves  | Blood purifier, jaundice, anthelmintic  | Leaves are cooked as vegetable and used |
| 14 | *Chenopodium album* L. | Pililiomrach | Fruits  | Blood purifier, jaundice, piles. | Powdered fruits boiled in water and taken |
| 15 | *Chenopodium* f*oliosum* Asch.  | Pililio March | Fruits  | Softening of skin | The powdered fruits are mixed with water for external use |
| 16 | *Convolvulus arvensis* L. | Convolvulaceae  | Bakar bali/ Mishk | Leaves  | Stomach disorder,  | Leaves are cooked to relief stomach disorder and pain |
| 17 | *Fumaria indica* (Hausskn.) H. N. Pugsley | Fumariaceae  | Shahtara  | Shoots  | Blood purifier, antipyretic, stomachic | The shoots are shade dried and herbal tea is prepared, used to relief stomach pain, fever and blood purifier. |
| 18 | *Mentha longifolia* (L.) Huds | Lamiaceae  | Bain | Whole plant  | Stomachic, 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.  |
| 19 | *Malva neglecta* Wallr. | Malvaceae  | Sawachal  | Shoots  | Antispasmodic  | The shoots are cooked and eaten to relief constipation and are antispasmodic.  |
| 20 | *Oxalis corniculata*L. | Oxalidaceae  |  | Leaves  | Gastric troubles, wound bleeding, anthelmintic | Extract of fresh leaves is used. Leaves are used as vegetables as well. |
| 21 | *Plantago lanceolata* L. | Plantaginaceae  | Brono Achar | Leaves  | Laxative, mouth diseases  | The leaves are cooked as vegetable  |
| 22 | *Plantago major* L. | Ustanbash | Leaves, seeds  | Diarrhea, heartburn, 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 | *Polygonum dumetorum* L.  | Polygonaceae  | Barekijoshu | Leaves  | Constipation | Fresh leaves are cooked and eaten  |
| 24 | *Rumex hastatus* L. | Sirkonzo  | Leaves  | Astringent, constipation, purgative | The leaves are cooked as vegetable and taken |
| 25 | *Portulaca oleracea* L. | Portulacaceae  | Pecheli  | Shoots  | Digestion, laxative  | The shoots are cooked as vegetable to improve digestion and as laxative |
| 26 | *Verbascum thapsus* L. | Schrophulariaceae  | Gordogh karo | Leaves  | Wounds healing | Paste of fresh leaves is used to care wound or inflammation |
| 27 | *Solanum nigrum* L. | Solanaceae  | Pirmelic | Leaves, fruits | Eye diseases, fever, cough  | Fruit juice cures sore eyes while leaves are cooked and eaten to relief cough, fever. |

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**Table-2.** Ecological characteristics of medicinal weeds of wheat field of Kalash valley, Chitral

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| S# | Plant name | Family  | Life-form | Leaf size | Phenology | Consistency class  |
| 1. | *Adiantum venustum* D. Don. | Adiantaceae | G | N | PR | I |
| 2. | *Coriandrum sativum* L. | Apiaceae  | Th  | N  | Rep  | I |
| 3. | *Artemisia brevifolia* Wall. Ex DC. | Asteraceae  | H  | L  | PR | I |
| 4. | *Artemisia parviflora* Roxb. | Asteraceae | Th  | Mes  | PR | I |
| 5. | *Calendula arvensis* L. | Asteraceae | Th  | Mes | Rep  | III |
| 6. | *Cichorium intybus* L. | Asteraceae | Th  | Mes  | Rep  | III |
| 7. | *Matricaria chamomilla* L. | Asteraceae | Th  | N  | Rep  | IV |
| 8  | *Taraxicum officinale* L. | Asteraceae | G  | Mes  | Post-Rep | II |
| 9. | *Lepidium sativum* L. | Brassicaceae  | Th  | N  | Rep  | II |
| 10 | *Sisymbrium irio* L. | Brassicaceae | Th  | Mic  | Post-Rep | V |
| 11 | *Cannabis sativa* L. | Cannabinaceae  | Th  | N  | Rep  | II |
| 12 | *Silene conoidea* L. | Caryophyllaceae  | Th  | N  | Post-Rep | IV |
| 13 | *Chenopodium murale* L. | Chenopodiaceae | Th  | N  | Rep  | II |
| 14 | *Chenopodium album* L. | Chenopodiaceae | Th  | N  | Rep  | I |
| 15 | *Chenopodium* f*oliosum* Asch.  | Chenopodiaceae | Th  | N  | Rep  | IV |
| 16 | *Convolvulus arvensis* L. | Convolvulaceae  | Th  | Mes  | Rep  | III |
| 17 | *Fumaria indica* (Hausskn.) H. N. Pugsley | Fumariaceae  | Th  | N  | Rep  | II |
| 18 | *Mentha longifolia* (L.) Huds | Lamiaceae  | Th  | N  | Rep  | V |
| 19 | *Malva neglecta* Wallr. | Malvaceae  | Th  | Mes  | Rep  | V |
| 20 | *Oxalis corniculata* L. | Oxalidaceae  | Th  | Mes  | Rep  | II |
| 21 | *Plantago lanceolata* L. | Plantaginaceae  | Th  | Mes  | Rep  | III |
| 22 | *Plantago major* L. | Plantaginaceae | G  | Mac  | Rep  | IV |
| 23 | *Polygonum dumetorum* L.  | Polygonaceae  | Th  | N  | Rep  | II |
| 24 | *Rumex hastatus* L. | Polygonaceae | Ch  | N  | Rep  | III |
| 25 | *Portulaca oleracea* L. | Portulacaceae  | Th  | L  | Rep  | II |
| 26 | *Verbascum thapsus* L. | Schrophulariaceae  | G  | Mac  | Rep | II |
| 27 | *Solanum nigrum* L. | Solanaceae  | Th  | Mes  | Rep | III |

**Key:** Life-form classes Th. Therophytes, G. Geophytes, H. Hemicryptophytes, Leaf-size classes: L. Leptophylls, N. Nanophylls, Mic. Microphylls, Mes. Mesophylls, Mac. Macrophylls, Meg. Megaphylls, Ap. Aphyllous.

Phenological classes: PR. Pre-reproductive, Rep. Reproductive, Post-rep. Post-Reproductive.

**Table-3.** Life-form, Leaf-size and Phenology of weeds flora of wheat crops of Kalash valley, District Chitral, Pakistan

|  |  |  |  |
| --- | --- | --- | --- |
|  S #571 | Ecological characteristic | No. of weed species | % age  |
| I.1.2.3.4. | Life-form classesTherophytesGeophytes Hemicryptophytes Chamaephytes  | 21040101 | 77.7814.8103.7003.70 |
| II.1.2.3.4.5. | Leaf-size classesNanophyllsMesophylls Macrophylls LeptophyllsMicrophylls  | 1309020201 | 48.1533.3307.4107.4103.70 |
| III.1.2.3. | Phonological classes Reproductive stage (Flowering)Post-reproductive stage (Fruiting)Pre-reproductive stage (Vegetative) | 210303 | 77.7811.1111.11 |
| IV.1.2.34.5. | Consistency classesIIIIIIIVV | 0509060403 | 18.5233.3322.2214.8111.11 |

Any undesirable and unwanted plants in the crops are weeds. They are mostly allelopathic species and give tough time to crops due to their competition for resources and they also provide habitat for other harmful living organisms. All these factors can affect the growth and development of crops which reduces the per acre production of crops. Therefore, weeds must be properly identified and managed to minimize their growth in the crops which will increase crops production. Asteraceae, Chenopodiaceae, Brassicaceae, Plantaginaceae and Polygonaceae were leading families and most of the species (77.78%) are annuals. Thus proper Pre-reproductive management of these weeds can reduce weeds distribution and will increase the yield of wheat in the area. However, the present study shows that these weeds may be used as medicines in treatment of different diseases and mostly the vegetative parts (Leaves) were used. Thus, the proper management and utilization of these weed species might increase their positive aspect.

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**Figure 1.** Leading families in respect to pecies distribution

**Figure 2.** No. of weed species used in treatment of a disease

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**Figure 3.** The number of species that’s parts is used as medicine

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