

Phytomedicinal Studies of Kurram Agency in the Federally Administered Tribal Areas (FATA) of Pakistan

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ABSTRACT

The present studies were aimed to identify medicinal plants, folk knowledge and to use local recipe for different diseases in the study area of kurram agency. The questionnaire method was adopted for documentation of folk indigenous knowledge. The Preliminary data were collected from the local community, experts, knowledgeable person, Herdsmen and main users of medicinal plants such as Hakims, old wise woman etc. The ethno medicinal data on 21 plants species belonging to 19 families were properly identified i.e. their vernacular names, chemical constituents, scientific names, families, part used, habitat conservative status and locality during the research work. The plants were collected, pressed dried, preserved, mounted and identified through the literature and were confirmed by the experts in plants sciences department, Kohat university of Science and Technology, Pakistan. The specimens were deposited in the herbarium at plant sciences department, Kohat University of Science and Technology, Pakistan.

INTRODUCTION

The study area is called Kurram agency Parachinar, Pakistan. Kurram agency, situated at the border of Afghanistan, is one of the seven tribal agencies in the Federally Administered Tribal Area (FATA). The major town of the agency, Parachinar, is close to the spot where 34th parallel of latitude crosses the 70th parallel (Stewart *et al.*, 2003) and can be easily located on the map. The word "KURRAM" takes its name from river Kurram that passes through the length of the valley (Khan *et al.*, 2005). The 12th century description of Kurram, as mentioned in the " Rig

vide book" reveals that a Hindu spiritual leader named Karma hence the name Kurram River originated. After the Kurram River, the name of the area became "Kurram valley". The agency lays between 33.20 to 34.03 North latitudes and 69.50 to 70.45 East longitudes. Kurram Agency is bordered in the west and north by Afghan provinces of Paktia and Ningarhar respectively, in the East by Orakzai and Khyber Agencies, in the South East by Hangu District and in the South by North Waziristan (wikipedia.org/wiki/Kurram_Valley). The Agency is 115 Km long with a total area of 3380 squares Km. The administrative head quarter of the agency is Parachinar which is at a distance of 74 Km from Thall on the main road. The research area in this work covers a total 87,742 hectares. It starts from Sultan in Southwest and end on Pekar Kotal (Durand line).

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The climate of Kurram varies at different altitudes and presents striking contrasts from sultry oppressive heat to bitter cold. Within a few hours journey, one can pass from a region where snow never falls to recesses where it never melts (Anonymous 2005). The climatic condition of Kurram is high land type. In January and February the climate is harsh from snow, rain and chill weather and sometimes foggy.

The lowest temperature at Kurram was recorded -13.4°C on 29th January 2005 and the highest temperature 39.9°C on 27th June 2005 (Anonymous, 1999). The principal mountain range in the Agency is "KOH--E--SUFAD" or "SPINGHAR" with a peak of "SIKARAM SAR" which is 4,728 meters (15602 feet) high and forms a natural boundary and water shed with Afghanistan. It remains covered with snow throughout the year. The altitude of the town Parachinar is 5600 feet above sea level.

The Kurram River enters into the Agency in the West near Kharlachi from Afghanistan and runs in North West to the South East direction and leaves the Agency at Thall district. Several hill torrent and Nullahs join Kurram valley (Shinwari *et al.* 2003). The research area i.e. Upper Kurram agency, starts from Sultan village and it ends on Teri mangle (Pewar Kotal). The people in the entire study area have reported "bombing" as a result of talibanization as a major cause of wild life disturbance. Forests depletion and absence of community capacity to manage and develop their natural resources were also causes of biodiversity depletion.

The use of plants in medicines is a very old and reliable practice. Medicinal plants remained the primary source of treatment throughout the world. Any plant or parts of plants like root, stem, leaf, bark, fruit, and seed which contain active chemical constituents in the tissue that produce a definite physiological response in the treatment of various diseases in human and in the animals are called medicinal plants (Bussmann *et al.*, 2006). Plants produce complex organic molecules and therefore are considered rich sources of chemicals. These active chemicals extracted from plants and purified are used for medicinal purposes and are referred as herbal medicines [Khan *et al.*, 2001].

Ethno botany is also the most important approach to study natural resource management of indigenous people. Ethno botany is the science of human interaction with plants and its ecosystem (Aburjai *et al.*, 2006). By surveying the literature it has been concluded that only a single paper by Gilani *et al.*, has been published on the ethno botany of five villagers of Upper Kurram (Zeran, Kirman, Shalozan, Pewar and Malana).

The people living in remote areas and in villages are using indigenous plants as medicines from long ago because this knowledge reaches to them through generation to generation (Mujtaba *et al.*, 2006). They reported 21 medicinal plants belonging to 19 families.. Present studies covered the Medicinal plants' vernacular names, families name, scientific name, locality habitat, part used, chemical constituents and their status of the whole Upper Kurram agency medicinal plants.

MATERIALS AND METHODS

The field trips of 80 days duration to various parts of Kurram Agency were undertaken from February 2005 to April 2006 to collect various plants species of ethno medicinal importance present in the area in different seasons. All the relevant information and materials were collected and thoroughly studied before going into the field. The study trips mostly were scheduled according to the blooming seasons of different plant species. The trips for plant collection were made in spring seasons of 2005 and 2006. The main target sites in Parachinar kurram agency were Shalozan, Zeran, Kirman, Piwar, Krakhal and hill area of Malana & Shalozan. The field work was also carried out in order to investigate the folk knowledge, vernacular names, scientific names, status of plants, family name and to determine the chemical constituents and other relevant information was noted in the field work. The collected material was pressed, dried using blotting papers for about two weeks at room temperature and identified though the available literature (Nasir *et al.*, 2001) The field work plants were preserved, dried material was poisoned using mercuric chloride and absolute alcohol means 2 gram HgCl_2 dissolved in 100 ml ethyl alcohol. The plants were mounted on the standard size herbarium sheets. The local herds men, Hakim and local medicinal plants expert all were interviewed for ethnobotanical information of the area were collected.

RESULTS AND DISCUSSION

The energy stored in our food comes from sunlight. The solar energy is converted to usable energy by green plants. Photosynthesis by green plants is the main source of oxygen supply in the Earth's atmosphere. Plants provide us medicines, food, forage and fodder for our domestic animals, flowers, fuel wood, materials for making agricultural tools, timber and many more (Hussain *et al.*, 1996).

The present study of medicinal plants provides information about therapeutic uses in different traditional recipes of 21 plants species belonging to 19 families. In this research we determined the botanical names, local names, common names, growth habits, parts used and their local recipes were documented [Table. 1]. Medicinal plants reported from this area have multiple uses e.g. *Adiantum capillus* locally used for skin allergy, *Daphne mucronata* good for skin allergy, *Artemisia vulgars* used for blood diseases (blood cancer), *Artemisia absinthium* is used for blood purification, and is antipyretic, *Fumaria indica* is a good drug for blood purification and antipyretic, *Asparagus officinal* is used for constipation, *Bergenia ciliata* is used for stomach problems, *Mentha viridis* is used in chest and stomach pain, *Cannabis sativa* is used as sedative and sexual stimulat, *Datura stramonium* is used for mental disorder, *Equiestum arvense* is useful in diarrhea, *Plantago major* is useful in diarrhea, *Marrubium vulgare* is used as antiseptic, *Quercus ilex* is used as anti-diabetes, *Seriphidium kurramensis* is a good anti-malarial drug, blood purifier and

antipyretic, *Viola canescens* are used for cough, *Cichorium intybus* is used as antipyretic, *Hypericum perforatum* is used as carminative, and *Papver somniferum* capsule decoction are used as anti-cough. Market survey of the main city of Parachinar, Sadda, Village Bughday, Lalmai, Mulabagh, Shalozan, Pekar and Larzer was conducted. Based on the market survey it was identified that, there are no coordinated method in use for the collection and sale of medicinal plants, except *Seriphidium kurramensis*, *Artemisia absinthium*, *Teucrium stocksianum*, *Tanacetium artemisioides* and *Morchella esculenta*. The maximum produced medicinal plants are *Seriphidium kurramensis*, followed by *Teucrium stocksianum* and *Artemisia absinthium* because of their occurrence in the adjacent fields. *Seriphidium kurramensis* and *Artemisia absinthium* are traded from Lalmai, Bughday, Pekar and Larzer Shalozan. Both are anthelmintic in nature. *Teucrium stocksianum* was marketed from Pekar, Nastikot, Malikhial and Bughday and are used as insect repellent, antipyretic, blood purifier, antisugar and reduce obesity. In the study area, the above mentioned five species were available but Pekar, Shalozan and Lalmai are famous for *Seriphidium kurramensis* and *Artemisia absinthium* whereas Bughday is famous for *Teucrium stocksianum*. There was one trader available at Kirman road, one in Shalozan and one in Pekar and Bughday road, who purchases plant material from local people, in dry form and finally carries it to Rawalpindi. That trader was belonging to Bajaur Agency. Based on discussion with local people it was concluded that season of *Artemisia absinthium* starts after *Teucrium stocksianum* (Gilani et al., 2003). Nowadays there is no trade except *Artemisia absinthium* and *Morchella esculenta*. In case of *Morchella esculenta*, children, men and women equally participate in the collection. The expensive more plant i.e. *Morchella esculenta* is mainly collected by villagers living in the foothill of Koh-e-sufaid range (Pekar, Shalozan, Speenashga, Malana, Zeran, Mulabagh and Kirman).

There were five vendors in Parachinar bazaar involved in the trade of *Morchella esculenta*, while three vendors, one each on Shalozan Larzer road, Pekar Bughday and Kirman road dealing were trading in *Artemisia absinthium* and *Teucrium stocksianum*. From there it is carried to Lahore, Karachi and finally exported to France and Germany. There is no technical method used by the collector for the processing of medicinal plants. However they use

local methods for drying, transportation and marketing the plants. *Artemisia absinthium* and *Teucrium stocksianum* are kept in a soft cloth for drying in the sunlight. In the past people used this practice for domestic uses of the plants and majority of the people were users of the plant material while contrary to this presently, awareness regarding the uses of medicinal plants has reduced and it has become limited to only commercial purposes. The reason given by the locals for decreasing trend of using folk knowledge of medicinal plants against the diseases is that more effective allopathic drugs have replaced that century's old traditional medicine. The people did not have problems in collecting those plants. Those living in the foothills of Kohe-sufaid (especially Saper Khel, Mullabagh, Arghanga kali, Landiwan, Mastayri Kali, Shalozan Thangia, Khaiwas, Nari Kali and Speenashga) had more approach to *Morchella esculenta* because of its occurrence in those higher elevations. Other medicinal plants like *Seriphidium kurramensis* and *Teucrium stocksianum* were mostly in the use of lower parts of the Upper Kurram. Over grazing in research area is threatening the very existence of the medicinal plants. The conservation of the medicinal plants and their trade on sustainable basis must be ensured. The research area (Upper Kurram) is rich in term of biodiversity like flora, fauna and especially medicinal plants. The local community uses most of medicinal plants for their domestic purpose. Few local Hakims also make drugs for commercial purposes, which are sold in the market in two shops.

Kurram agency has a treasure of plant resources and diverse flora. However, sustainable use of these plants is necessary because ruthless use of these plants may cause the loss of valuable flora and fauna.

The primitive people had knowledge about medicinal plants that they had acquired on the trial and error basis. These plants are still used for the treatment of diseases in indigenous system of medicines, where the whole plant, plant part or its extracts is used. In Kurram agency the precious medicinal plants and tree is a need of further exploration of the area in this regard, the main aim of this traditional local used medicinal plants is to bring to the screen that what type of plants does the people of valley use medicinally. The conservation programme can protect the medicinal plants of kurram agency by participation of local community.

Table. 1: Medicinal plants using for local Recipes.

S.No	Species	Local Name (Pashto)	English Name	Habitat	Constituents	Locality	Status
1	<i>Aconitum heterophyllum</i> Wall	Pishoser gull	Pakistani Atees	Herb	Aconitic acid, heterophylline, aitisine, aconitine and ananthorine	In hilly areas of upper Kurram Agency	Critical Endangered
The rhizomes are first dried, crushed and a small amount is boiled in water to make the recipe. A cup is taken once or twice a day to improve the sexual desire							
2	<i>Adiantum capillus - veneris</i> L	Zulfi-e-laila	Maidenhair fern	Herb	Tannine, heterosides of kaempferol, hydroxyadantone, quinic acid, flavonoid, glucoside, luteolol and quercetol	Common in Kurram	Vulnerable
The whole plant is crushed and extracted; the juice is applied on irritants area of external body of humans, which gives relief (Anti skin allergy).							
3	<i>Allium sativum</i> L	Wooga	Garlic	Herb	Allicin, epinephrine, phycidine, phytonides, ascorbic acid and oxalic acid.	Common cultivated in Kurram agency.	Secured
Bulb is used in high blood pressure. The bulb is buried in hot ashes for twenty minutes and then eaten as such which is very effective for dry cough. Fresh leaves are also used as vegetable for high blood pressure.							
4	<i>Artemisia vulgars</i> L	Darlong	Warm seed	Herb	Scoparin, essential oil santonin and Succinic acid	Kurram Agency	Endangered

Roots are boiled in water to prepare the recipe which is useful in blood diseases and also used for blood cancer.

5	<i>Artemisia absinthium</i> Waldst. & Kitam	Mastiyara	Worm wood	Herb	Santonine and Artimesine	Shalozan Dogoo kali, MastyriKali Upper Kurram Agency	Critical endangered
The whole mature plant is exposed to sun light, it becomes dry then is made into powder and little amount is eaten with water. Good antimalarial drug, useful in skin allergy and blood purification.							
6	<i>Bergenia ciliata</i> (Haw.) Sternb	Kamargul	Stonebreaker	Herb	Tannic, gallic acid, metarbinalbum, glucose, mucilage & mineral salts	In hilly area of Kurram	Critical endangere
Rhizome is dried, crushed, a good drug for removal of kidney stones, useful in dysentery and stomach pain							
7	<i>Chenopodium album</i> L	Sarmi	Goose foot	Herb	Chenopodin, saponin, lanolinicacid, cholinbetalin , albuminoids and vitamin C	Common in Upper Kurram	Vulnerable
Dried roots are boiled in water. One cup recipe is used twice in a day for the curing of jaundice, urinary diseases. The fresh leaves are laxative and improve the sexual desire (aphrodisiac)							
8	<i>Colchicum luteum</i> Baker	Surinjan	Golden Collyrium	Herb	Colchicines alkaloids	In few hilly area of Upper Kurram	Critical endangered
Dried corm is crushed and little dried powder are put in water to make recipe which is very effective in arthritis (joint pains)							
9	<i>Cucurbita maxima</i> <i>Duch</i>	Kado	Red gourd, Pumpkin	Climbing herb	Saponin, curcubitin and lutein	Common in Kurram	Secure
Leaves, flowers and are used as vegetable, a good tonic & seeds also. Mature fruit are boiled and mixed with milk the recipe used for indigestion, blood cleaner and intestinal problems							
10	<i>Daphne mucronata</i> Royle	Laghoni	Daphne plant	Shrub	Glucoside, daphnin, and umbelliferone	Common in Kurram	Vulnerable
The leaves and flowers are crushed and extracted juice used on irritant skin which is very effective in skin allergy. The fresh branches are also put on wound which is useful in wound healing							
11	<i>Hypericum perforatum</i> L	Sheen chai	Stjohn' swort	Herb	Hypericin, hypericum red, resin, and tannin	Shalozan, Zeran and Kirman	Critical endangered
The whole plant is dried and crushed to make powder. Make the recipe and take once or twice in a day which is very effective in gastric disorder, and locally used as green tea for fast digestion							
12	<i>Juglans regia</i> Linn	Waghaz	Walnut	Tree	Tannin, Juglone, juglandic acid, fixed oil, and oxalic acid	Common in Kurram Agency	Endangered
Fruit is good tonic of brain, fresh kernel is used for healthy gums, and useful in dysentery and oil is extracted from seeds, is used in joints pain							
13	<i>Marrubium vulgare</i> L	Bootaka	White horehound	Herb	Marrubin, and essential oil	Zaghmay, Shalozan Tangi and Malana in Kurram Agency	Critical endangered
Whole dry plants boiled in water decoction used for cough and leaves are crushed and put on the wound, and useful in wound healing of Goats, Sheep, and Cows etc							
14	<i>Melia azedarach</i> L	Daraka	Bead tree	Tree	Azardine, resin, tannin, meliotannic acid, and benzoic acid and bakayanin	Shalozan, Krakhala and Malana in Kurram Agency	Critical endangered
Leaves and flowers are crush then leaves's juice is used for strengthening hair, hair fall and juice is also used for skin problems							
15	<i>Mentha viridis</i> L	Wailani	Spearmint	Herb	Volatile oil, tannin, and resin	Common in upper Kurram	Secure
Leaves are put in pot than warm on fire and kept on chest good for the chest problems and Cough. The leaves are crushed and juice of leaves mixed with sugar which is useful in stomachache and colic pain.							
16	<i>Morus alba</i> L	Speentoot	White mulberry	Tree	Mulberrin, morusin and albactalol	Common in upper Kurram	Vulnerable
Leaves are used as food for silk worms and its fruit is used as anti-cough							
17	<i>Oxalis corniculata</i> L	Bibimalga	Indian sorrel	Herb	Acid potassium oxalate	Common in upper kurram.	Secure
The whole plant body is crushed and juice of the plant is given in stomach troubles, and for removal of kidney stone							
18	<i>Papaver somniferum</i> L	Deda	Opium poppy	Herb	Morphine, codeine, thebaine, narcotine, narceine, and Papavarine	Common cultivated herb in Kurram Agency	Endangered
Capsule boiled in water and use for cough, pain killer and seed as nutritive. Secretion i.e. Afum is used as anti-cough as local use							
19	<i>Plantago major</i> L	Ghuiazaba	Plantain	Herb	Glycosideau Cubin and saponin	Common in Upper Kurram	Vulnerable
Leaves crushed then applied on wound, good wound healer and seed antidyenteric							
20	<i>Polygonum plebejum</i> L	Banduke	Knot grass	Herb	Polygenic acid glycoside quercetin and 3 arabinosolis	Common in upper Kurram	Vulnerable
Whole plant used as tonic and also use in sex and urine problems							
21	<i>Punicagranatum</i> L	Anar	Pome grenate	Tree	Alkaloid, psudopelletierine, pelletierine, isopeletierine and methylpetetierine	Common in U.Kurram	Vulnerable
Fruit rind is used in chronic cough and in diarrhea							

CONCLUSION

The present studies were aimed to identify medicinal plants, folk knowledge and to use local recipes for different diseases in the study area of kurram agency. The ethno medicinal data on 21 plants species belonging to 19 families were properly identified i.e. their vernacular names, chemical constituents, scientific names, families, part used, habitat conservative status and locality during the research work. The specimens were deposited in the herbarium at plant sciences department, Kohat University of Science and Technology, Pakistan to getting further information about them.

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