Pak. J. Weed Sci. Res., 22(1): 147-156, 2016

CONSERVATION ISSUES OF MEDICINAL PLANTS OF ZEWAR VALLEY UPPER CHITRAL, HINDUKUSH RANGE PAKISTAN

Asad Ullah[1,*] and Aziz Ur Rehman

ABSTRACT

Local knowledge regarding 42 medicinal species belonging to 26 families and 38 genera were documented, among them 38 species were angiosperm and 2 were gymnosperm. Asteraceae with 6 species was leading, followed by Chenopodiaceae with five (5) and Rosaceae with four (4) species. The study revealed that 85 various ailments are cured by using indigenous knowledge regarding these 42 species. It is noted that stomach diseases are cured by 11 species, skin diseases are cured by 10 and 6 species are used as blood purifier. Some species have multiple uses i.e. Ferula narthex is used for asthma, as cardio tonic, in cough, diarrhea, gastric troubles, malaria and tooth ache. Capparis spinosa is used as sun block, stomachache, in abdominal pain, typhoid, malaria, in jaundice, as face pack and in joint diseases. In majority of cases decoction is used and roots are also used for preparation of remedies. The stem, leaves, bark, latex and rhizome of various species are also used for this purpose. The plants in the entire valley are under severe threat due to anthropogenic activities, deforestation, medicinal uses, over exploitation, over grazing, over harvesting, soil erosion and unscientific collection. Significant decrease in number of medicinal plants has been noticed in the recent past and it is feared that this will ultimately lead to loss of many important medicinal plants and will destabilize ecosystem, which will ultimately leads to genetic erosion. All these species are growing in the wild except Populus nigra and Salix iliensis. The present study is designed to provide base line information for further research, conservation and sustainable utilization of the plants growing in the valley and remedies practiced by the local inhabitants in the isolated region of the country for improvement of their livelihood.

Key words: Anthropogenic, deforestation, ethnomedicinal.

Citation: Ullah, A. and A.U. Rahman. 2016. Conservation issues of medicinal plants of Zewar Valley Upper Chitral, Hindukush Range Pakistan. Pak. J. Weed Sci. Res. 22(1): 147-156.

[1]Centre of Plant Biodiversity, University of Peshawar, Khyber Pakhtunkhwa, Pakistan
*Corresponding author's email: asadbotanist@yahoo.com

INTRODUCTION

Zewar valley lies at 72^0 $05^/$ to 72^0 $32^/$ E longitudes and 36^0 $36^/$ to 36^0 $37^/$ N latitudes in the Hindukush range of Pakistan. The altitude ranges from 3516 m to 6550 m. It is drained by Zewar Gol, River Rech and other waterfalls rolling down over irregular rough stony mountainous steep. The climate of the area is snowy extreme cold from December to April and arid hot in summer. The short duration is favorable for growth of vegetation possess great diversity in distribution of vegetation and sharp change in altitude also co enforce this variation. It possesses Dry temperate vegetation in mountain foot, followed by subalpine shrubby vegetation and herbaceous alpine vegetation with increasing altitude. Zeewar Valley is isolated from adjoining areas surrounds by zigzag mountainous range. Torkhow valley is situated with Mastuj in the East, Booni in South and Wakhan stripe in North West. Being isolated from other region of the country the people have their own belief and traditional knowledge about uses of local plants as medicines. On the other hand these plants provide alternative traditional health care system for the people. It is concluded that traditional healers, nomads, tenants and farmers are collecting medicinal plants and they are generating money from it. Very less information regarding the local utilization aspects of plants growing in the valley are available due to language barrier. Many workers have carried out studies on various aspects of medicinal plants i.e. Khan *et al*. (2011, 2013), Shinwari and Qaiser (2011), Hazrat *et al.* (2011), Ali and Qaiser (2009), Hussain (2007), Shinwari and Qaiser (2011), Ullah and Rashid (2005), Hussain and Sher (2005), Pei (2001), and Fransworth and Soejarto (1991).

The Zewar valley is located in the extreme north of the country which is inaccessible and therefore, the local knowledge is still unexplored. The local inhabitants rely upon plants and plant products for their day to day ailments and curing various diseases. Many precious medicinal plants are growing in the research area therefore; the present research was designed to document the indigenous ecological knowledge and conservation issues of the people residing in the far flung area of the country.

MATERIALS AND METHODS

For collection of diverse information regarding the medicinal plants growing in Zewar valley visits were arranged to 10 different localities during June to October 2013-2014. Emphasis was given to the areas which were not explored previously with the help of a local guide. The local people were interviewed with the help of a questionaire following Croom (1983) and Lipp (1989). The inhabitants

were asked regarding local names, parts used, flowering, habit, life period, preparation and ingredients of remedies for various ailments.

The plants were collected, pressed, documented and mounted on herbarium sheets. The available literature included Nasir and Ali (1970-1989), Ali and Nasir (1989-1991), and Ali and Qaiser (1993-2015). Boulos (1983) was followed for using various medicinal terminologies. Voucher specimens were deposited in Botanical Garden University of Peshawar Herbarium (UPBG).

RESULTS AND DISCUSSION

During the present studies 42 species were investigated belonging to 38 genera and 26 families. Out of them 38 were angiosperm and two were gymnosperm. Asteraceae with 6 species was the leading family, followed by Chenopodiaceae (5 species), Rosaceae (4 species), Apiaceae, Polygonaceae, Lamiaceae, and Salicaceae having three species each. While Berberidaceae, Betulaceae, Capparidaceae, Tamaricaceae, Solanaceae, Scrophulariaceae, Ranunculaceae, Moraceae, Malvaceae, Juglandaceae, Hypericaceae, Euphorbiaceae, Ephedraceae, Cupressaceae, and Convulvulaceae were presented by one species each. It is noted that 85 various diseases are cured by 40 different species. Out of these 85 diseases it was noted that 18 diseases are common e.g. blood pressure, constipation, diarrhea, dried skin, face pack, gastric problem, hypertension, jaundice, joint diseases, .nausea, pimples, piles, stomach problems, sunburn, typhoid, ulceration and urinary diseases. Some plants which have multiple uses regarding various ailments such as *Capparus spinosa* is taken to abdominal pain, cure jaundice, used as face pack, malaria, sun block, and as stomachache, typhoid. *Ferula narthex* is taken to cure asthma, cardiotonic, cough, diarrhea, gastric, malaria and toothache. *Anthemis cotula* is taken as recipe for diuretic, stomachache and typhoid and Some ailments are cured by many species such as stomach diseases are cured by *Anthemus cotula, Berberis lycium, Carum carvi, Capparus spinosa, Coriandrum sativum, Cichorium intybus*, *Chenopodium murale, Ferula narthex and Sophara giriftii,* For cough *Anthamus cotula, Carum carvi,* and *Elaeagnus angustifolia* are taken while *Elaeagnus angustifolia, Mentha arvensis, Rosa alba* and *Artemisia parvifolia* are taken. Some ailments such as constipation is cured by 5 species, cough (5 species), cosmetics (3 species) diarrhea (2 species), dried skins and freckles (7 species), jaundice(5 species), joint diseases (3 species), hypertension (2 species), stomach ache (6 species), and typhoid (3 species), The diverse information regarding these species are given in table no. 1.

Man has explored information regarding importance of medicinal plants since his inception. According to Partel (2005) the

human beings are using plants for curing various ailments since very long. According to Hussain (2008), human beings are using the plants since long and many plants are considered to be used in the indigenous system for curing various diseases. Today's traditional medicines have their roots in Greek medicines which were adopted by Arabs and it was spread towards Europe (Iqbal and Humayun, 2004). Although the modern allopathic system of medicines is now accessible and health facilities are available more than the previous time but still people in poor countries believe in practicing traditional medicines due to its less side effect and very low price (Khan, 2013).

About 70 to 80 % of the world population depends directly on plants to cure different ailments (Ullah, 2010). Though modern pharmacy is advanced form but yet most of the world population uses local remedies to cure various diseases particularly in developing countries due to their easy access. The local inhabitants are using these traditional medicines due to many reasons including easy availability, less price, lack of communication, access to modern medicines and poverty. Since Zeewar valley is situated in the far flung area presenting a great floral diversity and wealth of knowledge about how to use plant locally. It is interesting that the local knowledge is seems to be ancestral and it is transferred through various generations by verbal expression. Plants are the only source of income of the inhabitants as compared to other areas of the country.

The present study showed that the local people of the area are rich in indigenous knowledge of plants in treating various ailments. The people of the area use 40 different plants species for curing 85 various diseases including blood pressure, diarrhea, dried skin, hypertension, jaundice, joint disease, stomachache, typhoid and ulceration. The people earn their livelihood from cutting forests, herding, exploiting medicinal plants, agricultural products and growing some medicinal plants. The plant collectors are often herders, shepherd or other poor village dwellers. The global importance of the medicinal plants is still unveiled to the local inhabitants. This complex of factor is responsible for vanishing away of important plant recourses that is ultimately resulting into genetic erosion. It was observed that about 94% of *Ferula narthex* plants were destroyed due to over exploitation (Ali and Qaiser, 2009). *Betula utilis* is also facing over exploitation. Therefore, it is recommended that awareness program regarding importance of these plants may be launched to conserve the traditional knowledge and plant biodiversity growing in the area. The Conservation issues including over exploitation, deforestation, over harvesting, habitat destruction and un scientific agricultural practices must be controlled to make ensure the sustainable utilization of the plant Biodiversity growing in the valley.

Table-1. Diverse information regarding Botanical, local names, voucher number, locality, part used, recipes and medicinal uses of plants collected from Zeewar valley Upper Chitral, Hindukush Range of Pakistan

S#	Family	Botanical names	Local Names	Locality	Part used/Recipes	Medicinal uses
1.	Apiaceae	*Ferula narthex* Boiss.	Raw Aziz-01	Estich	Whole plant is taken as vegetable	It cures asthma, cough, cardio tonic diarrhea joint diseases, gastric problem, tooth ache and malaria
		Coriandrum sativum L.	Danu Aziz-02	Khot	Stem, leaves and fruit are used	It is carminative, diuretic and antimalarial
		Prangos pabularia Lindl.	Mushen Aziz-03	Yorwaht	Oil extracted from stem and leaves for external use	Pain reducing and scorpion bite
2.	Asteraceae	*Artemisia brevifolia* Wall. ex. DC.	Dron Aziz-04	Washich	Extraction of dry powder of leaves after boiling is used	Use in jaundice and gastric problems
		Artemisia parvifolia Roxb. ex. D. Don.	Khar Kharich Aziz-05	Khot	Wheat flour and seeds are boiled in water	It is anthelmintic, used in diabetes, blood pressure, for weight loss, as blood purifier and in abdominal pain
		Anthemus cotula L.	Shirisht Aziz-06	Wezmich	Liquor of boiled flowers is directly drunk	Diuretic, stomach ache and typhoid
		Carum carvi L.	Shunjmuk Aziz-07	Khot	Leaves, stem and seeds decoction is used	It is used in scurvy, cough, diarrhea and bronchitis
		Carthamus cotula L.	Pom Aziz-08	Washich	Extractions of dried flowers are taken after boiling	Used in sting, noxious, toxic, itching, diaphoretic, diuretic, cough, aromatic, dyeing of food, emetic and emmenagouge
		Cichorium intybus L.	Kahsti Aziz-09	Rabat	Flowers tea is prepared and it is also boiled in milk	It is digestive, used in nausea, typhoid, fever, constipation and jaundice
3.	Berberidaceae	*Berberis lycium* Royle.	Chowenj Aziz-10	Torkhow	Fruit, root and rhizome are boiled and decoction is taken	Anemic patients, antispasmodic, backache, colic, diuretic, dyspepsia, fever, pharyngitis, typhoid and intestinal parasites

4.	Betulaceae	*Betula utilis* D. Don.	Bulee Aziz-11	Yorwaht	Flower and bark are ground and applied externally	Pimples and wound are cured and it is devil repellent
5.	Capparidaceae	*Capparus spinosa* L.	Kaveer Aziz-12	Zangla sht	The flowers are taken as vegetable after cooking	Considered as a remedy in joint pain, as face pack, in abdominal pain, jaundice, in malaria, as sun block, stomach ache and typhoid
6.	Chenopodiaceae	*Chenopodium album* L.	Khodur Aziz-13	Zangla sht	The fruits are grinded and boiled in water and a syrup is prepared	Used in piles, jaundice, stomach pain, laxative, as blood purifier and in diarrhea
		Chenopodium foliosum Asch.	Pililio March Aziz-14	Washich	Fruits are mixed with water and used externally	It is used in eyes infections and dyeing of food
		Chenopodium murale L.	Darkunakh Aziz-15	Zewar	Entire plant is used as vegetable	Used in constipation, piles, eye diseases, diuretic, aphrodisiac, anthelmintic and abdomen pain
7.	Convulvulaceae	*Convolvulus arvensis* L.	Meeshk Aziz-16	Washich	Decoction of leaves and stem is used	Sexual tonic, stomachache and it is also used in epilepsy
8.	Cupressaceae	*Juniperus excelsa* M. Bieb.	Saruuz Aziz-17	Bakata	Cones and seed are used in powdered form	Anthelminthic, antioxidant, back ache, inflammation, joint swellings, split heels and sciatica
9.	Elaeagnaceae	*Elaeagnus angustifolia* L.	Shinjoor Aziz-18	Chitral	Latex and fruit are used	Latex is a hair tonic, fruits are directly taken for temperature, sore throat, blood purifier, cough, asthma, dyspepsia and constipation
		Hippophae rhamnoides L.	Mirghinz Aziz-19	Torkhow	Ripe fruits Juice is used	It is used for nervous system improvement, eyes infection, hemorrhage, fever and abdominal pain
10.	Ephedraceae	*Ephedra gerardiana* Wall ex. Stapf.	Sumani Aziz-20	Zewar	Stem and extracted oil from it are used. Syrup is prepared from chopped leaves	Used to cure wounds, sun burn, mouth disease, cracking lips and dried skin and as a stomach ache
11.	Euphorbiaceae	*Euphorbia prostata* Ait.	Kunakh Aziz-21	Washich	Stem is taken as vegetable.	Constipation, inflammation of digestive tracts, and ulceration

12.	Hypericaceae	*Hypericum perforatum* L.	Zerbali Aziz-22	Torkhow	Tea is prepared from petals	Blood purification, hypertension and kidney stone
13.	Juglandaceae	*Juglans regia* L.	Birmogh Aziz-23	Chitral	Seed is edible while bark and leaf are for external use	Cosmetics, dye, increase of memory, intestinal worm, tooth cleanser, and tonics
14.	Lamiaceae	*Nepeta cataria* L.	Mutrich Aziz-24	Wezmich	Cream is prepared by adding crushed seeds with dhesi ghee and applied externally	Back ache, injury, inflammation, swellings, and sunburn
		Menthe arvensis L.	Bein Aziz-25	Rabat	Stem and leaves are taken as vegetable	Used for allergy, blood purification, carminative, diarrhea, dysentery, jaundice, and vomiting
15.	Malvaceae	*Althea rosea* L. Cav.	Lein Aziz-26	Washich	Leaves and petals are boiled to make tea	Blood purification
16.	Moraceae	*Morus alba* L.	Mrach Aziz-27	Washich	Fruit is edible	Constipation, as drug, jaundice, loss of appetite, stomach problems, sexual disorder, and weakness
17.	Papilionaceae	*Sophora mollis* Royle.	Baishu Aziz-28	Shagram	The stem and flowers are grinded in to powder for external use	It is used for wounds, swellings, sun burn and pimples
18.	Polygonaceae	*Rheum emodi* Wall ex. Miessn.	Ishpar Aziz-29	Razdan	Stem and leaves are edible	Gum disease, loss of appetite, sexual disorder, and snuff preparation
		Rumex hastatus D. Don.	Zhirkonju Aziz-30	Shagram	The plant is taken as vegetable	It has medicinal importance regarding astringent, constipation, chuttnies, diuretic, jaundice purgative, and ulcer
19.	Ranunculaceae	*Delphinium nordhageni* Wendelbo.	Jaagh Joshu Aziz-31	Washich	Roots and flowers are crushed and mixed with mustard oil	Used as hair tonic

20.	Rosaceae	*Crataegus songarica* C. Koch.	Gooni Aziz-32	Torkhow	Fruit is edible and bark is boiled to make juicy syrup	Used in hemorrhage, hypertension, cough, asthma, epilepsy and as cardio tonic
		Cotoneaster nummularia Fish. & Mey.	Mekin Aziz-33	Bakata	Fruits are directly taken	Used in ulcer and as blood purifier
		Rosa webbiana Wall. ex. Royle	Thorny Aziz-34	Zewar	Decoction is prepared from dried and chopped stem	Intestinal inflammation, loss of appetite, stomachache and ulcer
		Rosa alba Wall. ex. Royle	Gulab Aziz-35	Evenly distributed	Tea is prepared from dried petals	Blood purifier and pneumonia
21.	Salicaceae	*Populous alba* L	Romenu Aziz-36	Washich	Latex is obtained and used	Skin freckles and split heels
		Salix iliensis Regel.	Teli Aziz-37	Torkhow	Brown color cream is produced which is locally called Puru	Cosmetic
22.	Saxifragaceae	*Bergenia stracheyi* L.	Bisabur Aziz-38	Wezmich	Gel is produced from stem, rhizome, and leaf by boiling in water	It is used to cure bleeding gum, cosmetics dried skin, tooth ache and pimples
23.	Scrophulariaceae	*Verbascum thapsus* Medik.	Gordoghkaru Aziz-39	Rabat	Paste of leaves prepared and placed on effected part	Used for curing inflammation
24.	Solanaceae	*Solanum nigrum* L.	Pilmilik Aziz-40	Washich	Crushed fruits are used for external application	Used as a sun block, in freckles, dry skin and as cosmetic
25.	Tamaricaceae	*Tamarix dioica* L.	Hinju Aziz-41	Riverian track	Stem is chopped, mixed with water and applied externally	Intestinal parasites and piles
26.	Vitaceae	*Vitis vinifera* L.	Roch Aziz-42	Shahgram	Fruits are edible	Used to cure dyspepsia

REFERENCES CITED

Ahmad, M. and H. Sher. 2003. Medicinally important plants of district Chitral. Environment Rehabilitation Project, Saidu Sharif, Swat, N.W.F.P. 1-2.

Ali, H. and M. Qaiser. 2009. The ethnobotany of Chitral valley, Pakistan with particular reference to Medicinal plants. Pak. J. Bot. 41(4): 2009-2041.

Ali, S.I. 2008. Significance of flora with special reference Pakistan. Pak. J. Bot. 40(3): 967-971.

Ali, S. I. and M. Qaiser. 1993-2012. Flora of Pak. Nos. 194-219. Department of Botany, University of Karachi, Pakistan.

Ali, S. I. and Y. J. Nasir. 1991-1993. Flora of Pakistan. 191-193. Department of Botany, University of Karachi, Pakistan.

Croom, E.M. 1983. Documenting and evaluating herbal remedies. Economic Bot. 37: 13-27.

Fransworth, N.R. and D. D. Soejarto, 1991. Global importance of medicinal plants. *In*: O. Akerele, V. Heywood and H. Synge, (Eds.): The conservation of medicinal plants: Proc. Intl. Consultation 21-27 March 1988, Chiang Mai, Thailand. Cambridge Univ. Press, Cambridge. 25-51.

Hazrat, A., M. Nisar, J. Shah and S. Ahmad. 2011. Ethnobotanical study of some elite plants belonging to Dir, Kohistan valley, KP, Pakistan. Pak. J. Bot. 43(2): 787-795.

Hussain, F. 2007. Traditional resource evaluation of some plants of Mastuj, Chitral, Pakistan. Pak. J. Bot. 39 (2): 339-354.

Hussain, I., A. Bano and F. Ullah. 2011. Traditional drug therapies from various medicinal plants of Central Karakoram National Park, Gilgit-Baltistan, Pakistan. Pak. J. Bot. 43(SI): 79-84.

Jan, G., M.A. Khan, H. Ahmad and F. Gul. 2011. Indigenous medicinal plants used by local people of Shahi, Lower Dir (Khyber Pakhtunkhwa) southern Himalayan regions of Pakistan. Int. J. Biol. Biotech. 8(2): 345-353.

Khan, N., M. Ahmad, A. Ahmad, S. S. Shaukat, M. Wahab, M. Ajaib, M.F. Siddiqui and M. Nasir. 2011. Important medicinal plants of Chitral Gol National Park (CGNP) Pakistan. Pak. J. Bot. 43 (2):797-809.

Khan, M.A., F. Wahid and Umm-e-Kulsoom. 2013. To investigate the major weeds of wheat in different agro-ecological zones of Khyber Pakhtunkhwa Pakistan. Pak. J. Weed Sci. Res. 19(1): 59-70.

Khan, S. W. and S. Khatoon. 2008. Ethnobotanical studies on some useful herbs of Haramosh and Bugrote valleys in Gilgit, Northern areas of Pakistan. Pak. J. Bot. 40 (1): 43-58.

Lange, D. 2006. International trade in medicinal and aromatic plants. *In*: R.J. Bogers, L. E. Craker & D. Lange, (Eds.); Medicinal and Aromatic Plants, pp. 155-170.

Lipp, F.J. 1989. Methods for ethno-pharmacological field work. J. Ethnopharmacol. 25: 1939-150.

Partel, M., R. Kalamees, U. Reier, E. Tuvi, E. Roosaluste, A. Vellak and M. Zobel. 2005. Grouping and prioritization of vascular plant species for conservation: combining natural rarity and management need. Biol. Cons. 123:271-278.

Pei, S. 2001. Ethnobotanical approaches of traditional medicine studies: some experiences from Asia. Pharmaceutical Bot. 39: 74-79.

Hussain, F., S.M. Shah and H. Sher. 2007. Traditional resource evaluation of some plants of Mastuj, district Chitral, Pakistan. Pak. J. Bot. 39 (2): 339-354

Shinwari, Z. K. and M. Qaiser. 2011. Efforts on conservation and sustainable use of medicinal plants of Pakistan. Pak. J. Bot. 43 (SI): 5-10.

Shinwari Z. K., A. A. Khan and T. Nakaike. 2003. Medicinal and other useful plants of Swat Pakistan. Nature Conservation Society of Japan, pp. 9-34.

Ullah, A., N. Parveen and A. Rashid. 2005. Role of tree in livelihood of local communities of Bumbret valley, Chitral. Proc. Nat. Workshop on Conserv. Linked to Livelihood Opportunities, pp. 32-34.

Ullah, A., A. Rashid and S. Aman. 2006. Trees and livelihood of Gabral valley, Swat, Kohistan, Pakistan. Pak. J. Forest. 56 (1): 46-52.

Ullah, A. and A. Rashid. 2007. Weeds and livelihood in mankial valley, Hindukush range, Pakistan. Pak. J. Weed Sci. Res. 13(1-2): 27-32.

Ullah, A. and A. Rashid. 2011. Medicinal remedies practiced by torwal and gujars communities of Mankial valley, Hindukush Range, Pakistan. Int. J. Biol. Biotech. 8(3): 423-426.