

## UTILIZATION OF PLANT NATURAL RESOURCES BY THE LOCAL COMMUNITIES IN LANDI KOTAL VALLEY KHYBER AGENCY, PAKISTAN

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### ABSTRACT

Indigenous knowledge regarding the local and medicinal uses of 34 species belonging to 21 families and 30 genera by the inhabitants of Landi Kotal Valley, Khyber Agency was documented. It is noted that 2 species were monocot while 32 were dicot. Lamiaceae and Solanaceae are represented by 4 species each, Asteraceae by 3 and Asclepiadaceae, Chenopodiaceae, Mimosaceae, Moraceae and Oleaceae are represented by 2 species each. Apocynaceae, Cannabaceae, Celastraceae, Colchicaceae, Elaeagnaceae, Fumariaceae, Liliaceae, Meliaceae, Papilionaceae, Salicaceae, Sapindaceae, Simaroubaceae, Zygophyllaceae are represented by 1 species each. It is concluded that 29 different diseases and ailments are cured through using these species. Different parts including bark, flowers, fruits, leaves, root, rhizome and seeds of these plants are used by the local inhabitants. All these species are collected from the wild and are regularly utilized by the local inhabitants. Various anthropogenic activities, over exploitation, over harvesting, grazing, soil erosion and unscientific collection are depleting the local flora and eroding the genetic diversity therein. The inhabitants of the Landi Kotal valley are mostly dependent on these plant species and it is important to carry out measures for the conservation of local knowledge and plant natural resources especially medicinal plants growing in the valley for future planning and research endeavors.

**Key words:** Anthropogenic, inhabitants, Landi Kotal Valley, medicinal plants, over exploitation.

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### INTRODUCTION

Khyber agency is located between 33° 45' and 34° 20' North latitudes and 70° 27' and 71° 32' East longitude. Its name derives from the world famous Khyber Pass which is the most vital and important link between South and Central Asia. Khyber is a word of "Hebrew" origin meaning "a fort" (Anonymous, 1998). It is covering an area of 2576 km<sup>2</sup> with a population of 3 lacs and is divided into three sub-sections namely Bara, Jamrud and Landi Kotal. It is bounded on west by Afghanistan, on the north by Mohmand agency, on the east by Peshawar district, on the south by Orakzai agency and tribal areas adjoining Kohat district and on the west by Kurram agency. The valley is mountainous with diverse altitudinal and topographic variation.

Some workers have carried out studies on the plant natural resources of Khyber Agency. The first visitor was Inayat Khan in 1899 for the plant collection and recently Naseeb Khan of Pakistan Forest Institute, Peshawar made some collection from the Tirah Valley of Khyber Agency. It is believed that about 70-80% of the world population use traditional medicine for curing their illness and ailments (Farnsworth and Soejarto, 1991; Pei, 2001). The percentage was decreased in developed countries 40-50% in Germany, 42% in the USA, 48% in Australia and 49% in France (Titz, 2004). It might be due to the decrease of the medicinal plants in the wild habitat. For the period of 1991-2003, an average of 467,000 tones (valued at US \$ 1.2 billion) of pharmaceutical plants were traded globally, with the dominance of few countries (Lange, 2006). For Pakistan a total of 1572 genera and 5521 species are identified, most of which are confined to the mountainous areas (Ali, 2008 and Ali and Qaiser, 1986). Very few attempts have been made to document the medicinal uses of the plants species (Sher, 2002 and Ahmad and Sher, 2003). Various workers have carried out similar studies on various areas of the country regarding local and medicinal uses of plants i.e. (Hussain, 2003; Shinwari *et al.*, 2003; Thoms and Shengji, 2003; Hussain, 2007; Khan and Khatoon, 2008; Qureshi *et al.*, 2009; Ullah *et al.*, 2009; Abbasi *et al.*, 2010; Hazrat *et al.*, 2010; Hazrat *et al.*, 2011; Hussain *et al.*, 2011; Jan *et al.*, 2011a; Jan *et al.*, 2011b; Khan *et al.*, 2011; Shinwari and Qaiser, 2011; Shaheen and Shinwari, 2012 and Ullah and Rashid, 2013). After thorough studies it is evident from the previous research that no authentic herbarium specimens are collected by these workers from this area. The present research deals with the medicinal plant wealth, which is generally in practice by the local inhabitants. This study will help in documentation of the indigenous knowledge regarding medicinal plants growing in the valley and it will provide baseline information for further research.

### MATERIALS AND METHODS

Regular study trips were arranged through out the valley and the data was collected during spring and monsoon for two years i.e. 2010-2012 and studies were conducted at 10 localities. Preference was given to the un-explored

and non collected areas and collection was made during blooming period. Field notes were recorded including various information regarding the plant i.e. habit, flowering period, phenology and altitude etc. Local inhabitants of different ages, belonging to different walks of life were interviewed regarding local name, part used and local uses of the plants. The collected data was made authentic by comparing with the collected data from diverse age groups. For data collection questionnaire was designed to collect data about plants on the spot after (Ali and Qaiser, 2009; Croom, 1983 and Lipp, 1989). The collected specimens were pressed, dried and mounted on the standard herbarium sheets. Identification and nomenclature was carried out with the help of Flora of Pakistan and other available literature (Nasir and Ali, 1970-1989; Ali and Nasir, 1989-1991 and Ali and Qaiser, 1993-2012) while medicinal terminology was followed after (Boulos, 1983). The vouchers specimens were deposited in the Herbarium of Centre of Plant Biodiversity, University of Peshawar (UPBG).

## RESULTS

Thirty four (34) plant species, belonging to 21 families and 30 genera were recorded for their various uses. Two (2) species were monocot while 32 were dicot. Lamiaceae and Solanaceae are represented by 4 species each, Asteraceae by 3 and Asclepiadaceae, Chenopodiaceae, Mimosaceae, Moraceae and Oleaceae are represented by 2 species each while Apocynaceae, Cannabaceae, Celastraceae, Colchicaceae, Elaeagnaceae, Fumariaceae, Liliaceae, Meliaceae, Papilionaceae, Salicaceae, Sapindaceae, Simaroubaceae, Zygophyllaceae are presented by 1 species each. Plant utilization by the isolated communities for curing various ailments have supplied tremendous knowledge which can be properly utilized in planning for utilization of the endemic knowledge for better planning of the plant natural resources for the well-being of the community in general and for medicinal plants utilization in particular (Table 1).

## DISCUSSION

Medicinal plants are used by the human beings since long (Lama *et al.*, 2001 and Partel *et al.*, 2005). While Rig Veda between 4500-1600 BC and Ayurveda Between 2500-600 BC are the first medicinal books in the sub continent. The medicinal plants practice is very old and in present era of technology still people believe in traditional use of medicinal plants (Ali and Qaiser, 2009). The people of the valley are using 34 taxa for curing 29 different ailments including hypertension, snake bite, dog bite, asthma (9 species), diabetes, skin diseases, malaria, ear ache, diarrhea (11 species), dysentery, respiratory diseases, sedative, sore eyes, aphrodisiac, anthelmintic, abdominal pain (11 species), treatment for piles, diuretic, blood purifier, antipyretic, sore throat, wounds, weakness, constipation, urinary bladder problems (10 species), toothache, headache, epilepsy and increase of milk production (4 species). Other ethnobotanical uses of these plants include making edges of mud roofs, fresh fodder, fuel wood (15 species), plant as ornamental (10 species), aromatic, furniture, fencing, soil binder and for making agricultural implements (7 species).

As Landi Kotal is a tribal and rural area so the inhabitants are more dependent on these plant species because of lack of facilities. Proper training, education regarding importance of medicinal plants and proper harvesting techniques are of imminent importance for the proper exploitation and exploration of the plant natural resources growing in the area. The local people are unaware about the importance of plants as medicines and its role in the global economy. It has been noticed that majority of the collectors are small children or women and they are not aware about the proper collection, drying, storing and marketing procedure. Moreover, due to lack of awareness regarding importance of medicinal plants the local plant wealth has been wasting with rapid rate and it is suggested that proper measures should be taken to ensure the sustainable utilization and proper exploitation of these plants growing in the area.

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Table 1. Diverse information regarding family, botanical name, local name, part used and uses of various species of Landi Kotal Valley, Khyber Agency.

S#	Family	Botanical name	Vr. No.	Local name	Part used	Uses
1.	Apocynaceae	1. <i>Nerium indicum</i> Mill	SU-1	Ganderay	Flower, leaves and roots	Ornamental, skin diseases and snake bite
2.	Asclepiadaceae	2. <i>Calotropis procera</i> (Wight) Ali 3. <i>Caralluma tuberculata</i> N. E. Brown 4. <i>Aristolochia scapularis</i> Walp. & Kit.	SU-2 SU-3 SU-4	Spurnay Panankay Jaukay	Whole plant Stem Leaves, shoots and seeds	Asthma, dog bites and ornamental Diabetes, hypertension and vegetable Ear ache, edges of mud roofs and respiratory stimulant
3.	Asteraceae	5. <i>Conyza canadensis</i> (L.) Cronq.	SU-5	Malloch	Vegetative portion	Used in diarrhea and dysentery and as fresh fodder
4.	Cannabaceae	6. <i>Xanthium strumarium</i> L. 7. <i>Cannabis sativa</i> L.	SU-6 SU-7	Ghiskay Bhang	Leaves, fruits Leaves and flowering tops	Malaria Chars is prepared from it. Narcotic, sedative and tonic
5.	Celastraceae	8. <i>Gynocarpia royleana</i> Wall. ex Lawson	SU-8	Soor azghay	Whole plant	Fodder and Fuel wood
6.	Chenopodiaceae	9. <i>Chenopodium murale</i> L.	SU-9	Tora sarmay	Whole plant	Abdominal pain, anthelmintic, aphrodisiac, diuretic, piles and sore eyes
7.	Colchicaceae	10. <i>Chenopodium botrys</i> L.	SU-10	Sikha botay	Whole plant	The plant is anti asthmatic
8.	Fumariaceae	11. <i>Colchicum luteum</i> Baker 12. <i>Fumaria indica</i> L.	SU-11 SU-12	Suranjani-e-sherin Papra	Rhizome Whole plant	Used as blood purifier and laxative Antipyretic, blood purifier, cattle food and pot-herb
9.	Elaeagnaceae	13. <i>Hippophae rhamnoides</i> L.	SU-13	Subakthan	Fruit	Abdominal pain, anthelmintic, irritated eyes, ornamental split heels
10.	Lamiaceae	14. <i>Ajuga bracteosa</i> Wall. ex. Benth. 15. <i>Mentha longifolia</i> (L.) L. 16. <i>Oxystegia limbata</i> Benth. 17. <i>Teucrium stockianum</i> Boiss.	SU-14 SU-15 SU-16 SU-17	Bootei Villanay Spin azghay Khawandi botay	Whole plant Whole plant Leaves Leaves shoots	Used for treatment of aches, hypertension and sore throat Aromatic, dysentery and diarrhea and ornamental. Ornamental and curing wounds Ornamental and curing sore throat
11.	Liliaceae	18. <i>Tulipa clusiana</i> (Hook) Regel	SU-18	Gharitol	Flower	Ornamental
12.	Meliaceae	19. <i>Melia azadirach</i> L. 20. <i>Acacia nilotica</i> Benth.	SU-19 SU-20	Shardai Kikar	Whole tree Stem	Diabetes, fuel wood, furniture and shade tree Fuel wood
13.	Mimosaceae	21. <i>Acacia modesta</i> Wall.	SU-21	Palosa	Gum, leaves, flowers and wood	Curing dysentery, fuel wood and weakness
14.	Moraceae	22. <i>Ficus carica</i> L. 23. <i>Morus alba</i> L.	SU-22 SU-23	Inzar Spin toot	Fruit, latex, leaves and wood Wood, leaves and fruit	Constipation, fruits are dried and eaten, Fuel wood, piles and urinary bladder problems Fruits are dried and eaten, leaves as fodder and fuel wood

15.	Papilionaceae	24. <i>Indigofera heterantha</i> (Wall. ex Baker) Ali	SU-24	Ghureja	Shoots and braches	Shoots as fodder, fencing and fuel wood and ornamental
16.	Salicaceae	25. <i>Salix tetrasperma</i> Roxb.	SU-25	Wala	Whole tree	Fuel wood, light furniture and soil binder
17.	Sapindaceae	26. <i>Dioscorea viscosa</i> (L.) Jacq.	SU-26	Ghwaraskay	Leaves, seeds, wood.	Fencing. Shoots are used for making brooms and ornamental
18.	Simaroubaceae	27. <i>Ailanthus altissima</i> (Mill.) Swingle	SU-27	Backyanra	Leaves, trunk and bark.	fodder, and furniture
19.	Solanaceae	28. <i>Datura innoxia</i> Mill.	SU-28	Dhatura/ Mangaz	Leaves and seeds	Epilepsy, headache, narcotic and toothache
		29. <i>Solanum nigrum</i> L.	SU-29	Kachmachu	Berries, leaves	Fresh fodder, skin diseases, washing and cleaning wounds
		30. <i>Solanum surattense</i> Burm.	SU-30	Manraghotay	Whole plant	Asthma, cough, chest pain, fever and ornamental
		31. <i>Withania somnifera</i> (L.) Dunal	SU-31	Khapyanga	Leaves	Ornamental and heal wounds
20.	Oleaceae	32. <i>Jasminum humile</i> L.	SU-32	Yasmin	Whole plant	Ornamental
		33. <i>Olea ferruginea</i> Royle	SU-33	Khona	Fruit, leaves and trunk	Antidiabetic, agricultural tools, fuel wood and toothache
21.	Zygophyllaceae	34. <i>Peganum harmala</i> L.	SU-34	Spelanay	Seeds/leaves	Eye disorders and milk production

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