

MEDICINAL FOLK RECIPES USED AS TRADITIONAL PHYTOTHERAPIES IN DISTRICT DERA ISMAIL KHAN, KPK, PAKISTAN

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Abstract

This paper is based on the results of an ethnomedicinal research work conducted in Dera Ismail Khan (D.I. Khan) District, Khyber Pakhtun Khwa (KPK), Pakistan, during May 2006 to March 2007. The study was focused for documentation of traditional knowledge of local people about the use of medicinal folk recipes of native plants. During field survey, questionnaires were used to interview the local inhabitants, older people including men and women both, who were familiar with traditional uses of indigenous plants. In total 40 new medicinal folk recipes of 26 plant species, belonging to 19 families were recorded. These folk recipes are used as traditional phytotherapies in the area. Plant specimens were identified, preserved and vouchers were deposited in the Department of Botany, Quaid-i-University Islamabad for future references.

Results were systematically arranged by alphabetic order of botanical names followed by medicinal folk recipes. English name, local name, family name and voucher no., were listed in the Table 1.

Introduction

Plants are an essential component of the universe. After various observations and experimentations many medicinal plants were identified as source of important medicine (Malik, 2001). Medicinal plants have been used since prehistoric period for the cure of various diseases. Since these are in common use by the local people and are of great importance that's why a lot of people are engaged in the trade of important medicinal herbs throughout the world. Especially, people living in villages have been using indigenous plants as medicines (Qureshi *et al.*, 2009).

Knowledge of medicinal values of plants is recognized by almost every society on earth. The inhabitants of the remote places have good knowledge about the utilization of plants because of the non-availability of synthetic drugs. In addition, for the survival, they use the plant-based drugs growing nearby their villages. Based on their right or wrong experiences they discovered the therapeutic agents of these plants in particular diseases. These experiences are transferred from parents to offspring (Qureshi, 2004).

In nearly every country of the world, treatment through herbs and some traditional medicine system is progressing. In Indo-Pak. Subcontinent, these traditional systems are called unani or ayurvedic system (Malik, 2001).

Dera Ismail Khan District (area 7,326 sq km; 31°15' to 32°32'N and 70°11' to 71°20' E) is located in the extreme south of the Khyber Pakhtun Khwa (KPK), Pakistan. The area is gifted with diverse and unique flora, as it is adjacent to the South Waziristan Agency and Sulaiman Range in the West, Koh Sheikh Buddin in the north and Indus River in the east (Anon., 1998).

Materials and Methods

The Research area was extensively surveyed from February 2007 to April 2008 for collection of live specimens and documentation of folk knowledge of medicinal folk recipes used by the local people. During field trips, questionnaires were used to interview the local inhabitants, older people including men and women both who were familiar with traditional uses of indigenous plants. Plants were identified with the help of available literature (Qurashi & Khan, 1971; Nasir & Ali 1972-

1984; Hasan *et al.*, 2007) and by comparing with the already identified plant specimens of the herbarium, Quaid-i-Azam University, Islamabad. After correct identification, the plants were deposited in the Department of Plant Sciences, Quaid-i-Azam University, Islamabad for future references. Pertinent literature dealing with pharmacology of referred plants of the area was consulted.

Results

In total 40 new medicinal folk recipes of 26 plant species, belonging to 19 families, were recorded during field trips of the area. These recipes are used by the local people as traditional phytotherapies for the control and treatment of various diseases. Data was systematically arranged by alphabetic order of botanical names followed by medicinal folk recipes. English name, local name, Family and voucher number were listed in the Table 1. Plant specimens were preserved and vouchers were deposited in the Department of Botany, Quaid-i-University, Islamabad for future references. Recent research work dealing with the pharmacological/ medicinal uses of referred plant species cited in various literatures has been summarized in Table 2.

Medicinal folk recipes

1. *Abelmoschus esculentus* (L.) Moench

Equal quantity of seeds of *Abelmoschus esculentus*, seeds of *Albizia lebbek*, gum of *Acacia nilotica*, seeds of *Plantago ovata* and sugar were mixed and then ground to form powder (safoof) 6-9 gms of this powder is taken with fresh water twice (morning & evening) a day for about one month. This traditional phytotherapy is recommended for the treatment of spermatorrhoea.

2. *Albizia lebbek* (L.) Benth.

Seeds of *Albizia lebbek* are ground to make powder and strained through fine cloth (having small pores). Equal quantity of the strained powder and sugar are mixed. 4 gms of this mixed powder is used twice a day for a period of 40 days. This is an effective phytotherapy for asthma.

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Table 1. List of indigenous medicinal plant species with their general information.

S.#	Botanical name	English name	Local name	Family	V. no.
1.	<i>Abelmoschus esculentus</i>	Lady's finger	Bhindi, Okra,	Malvaceae	210
2.	<i>Albizia lebbek</i>	Woman's tongue	Sirin, Siris	Mimosaceae	384
3.	<i>Allium cepa</i>	Onion	Vasal, Piaz	Alliaceae	350
4.	<i>Aloe barbadense</i>	Pakistani Aloe	Kuwargandal	Liliaceae	408
5.	<i>Azadirachta indica</i>	Margosa tree	Neem	Meliaceae	218
6.	<i>Cassia italica</i>	Italian senna,	Gidar toora	Caesalpinaceae	83
7.	<i>Cassia fistula</i>	Indian laburnum.	Amaltas	Caesalpinaceae	108
8.	<i>Cicer arietinum</i>	Chick pea, gram	Chanra, channa	Papilionaceae	309
9.	<i>Citrullus lanatus</i>	Water melon	Hindwana	Cucurbitaceae	419
10.	<i>Cordia dichotoma</i>	Sebestan Plum	Lasuri, lasora	Boraginaceae	420
11.	<i>Coriandrum sativum</i>	Coriander	Dharian, dhanian	Apiaceae	298
12.	<i>Crotalaria burhia.</i>	Unknown	Sassai	Papilionaceae	75
13.	<i>Cucumis melo</i>	Musk melon	Kharbuza	Cucurbitaceae	421
14.	<i>Dalbergia sissoo</i>	Indian rose wood	Tali, shishum	Papilionaceae	328
15.	<i>Foeniculum vulgare</i>	Fennel	Saunf, kalwo	Apiaceae	32
16.	<i>Ficus benghalensis</i>	Banyan tree.	Bohir, bargad,	Moraceae	402
17.	<i>Ficus carica</i>	Fig	Anjeer	Moraceae	326
18.	<i>Grewia asiatica</i>	Phalsa	Phalsa	Tiliaceae	8
19.	<i>Hordeum vulgare</i>	Barley	Jau	Poaceae	418
20.	<i>Mangifera indica</i>	Mango	Aam, amb	Anacardaceae	318
21.	<i>Phyla nodiflora</i>	Capeweed	Bukan	Verbenaceae	32
22.	<i>Portulaca oleracea</i>	Purslane	Lunrak	Portulacaceae	40
23.	<i>Prosopis cineraria</i>	Jandi, Jand	Saranga	Mimosaceae	89
24.	<i>Sonchus asper</i>	Spiny sow thistle	Bhathal	Aseraceae	16
25.	<i>Syzygium cuminii</i>	Java plum	Jamu, Jaman	Myrtaceae	326
26.	<i>Tamarix aphylla</i>	Athel tamarisk	Ghaz, Frash	Tamaracaceae	106

3. *Allium cepa* L.

Equal amount of extract of Onion bulb and Mint are mixed. One teaspoon of this mixture is taken per hour for a period as needed. This phytotherapy is considered to be useful for Cholera.

A piece of onion bulb is boiled in mustard oil till it becomes black in colour. 2 or 3 droplets of oil are put in the ear when needed. This is traditionally prescribed for earache.

The bulb of the onion is half heated and is used as poultice for the treatment of abscesses.

4. *Aloe barbadense* Mill.

Pulp of leaves, flour of wheat and powder of 2-3 seeds of red pepper are mixed and round tablets are formed. One tablet daily is used for a period as needed. It is useful for treatment of swelling of eyes of domestic birds like cocks, partridges etc.

Two leaves are made spineless and divided each one lengthwise into 2 or 3 slices. These slices of leaves along with common salt are given to the animals. After 48 hours interval second dose is given and similarly third treatment is repeated with the interval of 48 hours. Totally 6 leaves are enough for complete treatment. This phytotherapy is useful for the remedy of scabies and stomach troubles in animals.

5. *Azadirachta indica* (L.) A. Juss.

Leaves are crushed and strained. One part strained water, 3 parts pure water and common salt as needed, are mixed to form syrup. The syrup is used in the morning after breakfast and in the evening before meal.

Clayey pitcher is filled with water and leaves. The strained water is used as needed. The above two recipes are recommended for Jaundice.

About 70 gms dried leaves are crushed to make powder. The powder is spread on the abscesses twice a day for a period

of a week. This is an effective phytotherapy for the treatment of abscesses.

35 gm fresh leaves are crushed and mixed with one glass of water. The water is strained. One glass of strained water is used daily for a week. This phytotherapy is considered to be very effective for treatment of scabies, abscesses and cooling effect.

6. *Cassia italica* (Mill) F.W. Ander.

Fresh leaves of the plant are crushed to make paste; the paste is used as poultice on the affected area by scabies. This is traditionally recommended for the said purpose.

7. *Cassia fistula* L.

A piece of the fruit, containing 10-12 seeds, is slightly ground just to isolate seeds from the fruit wall. The broken fruit is boiled in ½ liter of water. The water is strained and 1-2 teaspoon is given to the children 3 times daily, and 3-4 teaspoon to elders 3-4 times daily. This phytotherapy is traditionally used for chest diseases and stomach troubles.

8. *Cicer arietinum* L.

Dried leaves are soaked in water for 2-3 days; strained water is mixed with sugar and used, as needed, for about 7 days. Useful phytotherapy for sun stroke.

25 gms of seed coat (testa) of roasted grams are soaked in 250 gms of water at night, crushed in the morning and strained. The strained water is taken. This phytotherapy is considered to be useful for spermatorrhoea.

9. *Citrullus lanatus* (Thunb.) Mats. & Nakai

Unripe fruit is wrapped by moist clay and placed in burnt coal to become roasted. Then it is peeled and used with salt twice a day for about 3 months. This is traditionally recommended for Tuberculosis.

Table 2. Indigenous medicinal plant species with their pharmacological / medicinal uses cited in various literatures.

Parts /compound used	Pharmacological properties / Medicinal uses	References
1. <i>Abelmoschus esculentus</i> (Malvaceae)		
Plant: oleic and linoleic acid	Stimulative; improve the vision, neurotransmission; prevention of distinct heart vascular diseases.	Kimbonguila <i>et al.</i> , 2010.
2. <i>Albizia lebbek</i> (Mimosaceae)		
Bark: saponins, tannins and xanthones	Anthelmintic, bitter, cooling, alexiteric activities; used for leucoderma, skin diseases, excessive, itching, perspiration, piles, inflammations, bronchitis, toothache and leprosy	Ahmad, 2007; Hussain <i>et al.</i> , 2008
Leaves	Night blindness, syphilis and ophthalmia	Hussain <i>et al.</i> , 2008; Ahmad, 2007
Root	Hemicrania, astringent property	Hussain <i>et al.</i> , 2008
Flowers	Asthma, snake bite, cooling medicine and externally applied in boils eruption and swellings, also reputed for aphrodisiac	Hussain <i>et al.</i> , 2008; Panhwar and Abro, 2007
Whole plant	Psychological disorders, insomnia, warts, insecticidal, antiparasitic, antidyseric and antitubercular activities	Hussain <i>et al.</i> , 2008
3. <i>Allium cepa</i> (Alliaceae)		
Plant	Antidermatophytic, antitoxigenic	Zohri <i>et al.</i> , 1995
Plant	Antidiabetic	Kumari <i>et al.</i> , 1995
Plant	Antibacterial	Kim <i>et al.</i> , 1997
Plant	Antimutagenic, free radical scavenging	Shon <i>et al.</i> , 2004
Plant	Antimicrobial	Park <i>et al.</i> , 2008
Plant	Anticancer	Galluzzo <i>et al.</i> , 2009
Plant	Antihistaminic, antiinflammatory and antioxidant activities	Kaiser <i>et al.</i> , 2009
Onion Juices	Antioxidant and antihyperglycemic	El-Demerdash <i>et al.</i> , 2005
Plant: Thiosulfates, volatile sulfur compounds	Cancer, coronary heart disease, obesity, hypercholesterolemia, diabetes type 2, hypertension, cataract and disturbances of the gastrointestinal tract	Lanzotti, 2006
4. <i>Aloe barbadense</i> (Liliaceae)		
Leaf exudate alkaloids, triterpenes, cyanidines, proanthocyanidines, tannins and saponins	Leishmanicidal activity (in four <i>Leishmania donovani</i> strains) and may provide a new lead agent in the treatment of Leishmaniasis	Dutta <i>et al.</i> , 2008
Leaves Juice	Tonic and anthelmintic	Rahman <i>et al.</i> , 2008
Mucilage	Wound and itches	Rahman <i>et al.</i> , 2008
Leaf gel	Antibacterial (two Gram-positive bacteria <i>Shigella flexneri</i> and <i>Streptococcus progenes</i>)	Cock, 2008
Plant specific compounds	Antimicrobial	Cock, 2008
Plant	Gentle detoxifier, cleanser, and vermifuge	Rahman <i>et al.</i> , 2008
5. <i>Azadirachta indica</i> (Meliaceae)		
Neem oil	Spermicidal, antimalaria, anthelmintic, antiseptic, febrifuge, vermifuge, antimicrobial, healing agent against various skin diseases, eprosy and rheumatism	Rasheed, 2002
Nimbidin:	Antiarthritic, antiulcer	Rasheed, 2002
Nimbolide	Antimalarial	Rasheed, 2002
Diterpenoid nimbinone	Antibacterial activity against G-positive organisms, <i>Bacillus subtilis</i> , <i>Staphylococcus epidermidis</i> , <i>Staphylococcus aureus</i> , and G-negative organisms, <i>Klebsiella ozaenae</i>	Rasheed, 2002
Laves	Added to poultices to disperse the glandular tumor, and are applied to the eruption of smallpox	Rasheed, 2002
Fruit juice	Mixed with coconut oil used as lice killer, also used in ulcer, eczema, jaundice, prurigo, and liver complaints	Rahman <i>et al.</i> , 2008; Rasheed, 2002
Fruit	Purgative, emollient, anthelmintic, astringent to the bowels, biliousness, cardiac troubles.	Rasheed, 2002; Ahmed, 2007
Seeds: 7-acetylnetrachelinone	Anticancer activity in vitro; antioxidant activity, anti-implantation effect;	Rasheed, 2002
Bark: phenol glycosides	Ulcer and gastric hyperacidity; analgesic	Rasheed, 2002
6. <i>Cassia italica</i> (Caesalpinaceae)		
Antheraquinones	Purgative effect	Schmelzer & Fakim, 2008
Crude ethanolic extract	It has CNS depressant properties, manifested as antinociception and sedation; anti-inflammatory and antipyretic properties	Ali <i>et al.</i> , 1997; Schmelzer & Fakim, 2008
Plant: 1,5-dihydroxy-3-methoxy-7-ethylanthraquinones	Antibacterial activity against G-positive and G-negative bacteria, as well as anticarcinogenic activity <i>In vitro</i>	Schmelzer & Fakim, 2008
Leaves, pods and mature seeds	Taken as a decoction or maceration for stomach complaints, fever, jaundice, venereal diseases, biliousness, as an abortifacient and against intestinal worms	Schmelzer & Fakim, 2008
Roots	Used for treatments of gall bladder disorders, liver complaints, nausea, vomiting and dysmenorrhoea. A maceration of the roots are taken to cure colic and influenza. Boiled roots are used as wound dressing	Schmelzer & Fakim, 2008
7. <i>Cassia fistula</i> (Caesalpinaceae)		
Bark extract: oxyanthraquinone and dihydroxyanthraquinone	Inhibition of metamorphosis of <i>Disdercus koenigii</i>	Rizvi <i>et al.</i> , 2009
Leaves	Laxative, antipyretic; heal ulcers, used in rheumatism, cough, ringworm infections, treating bone fracture	Ahmed, 2007; Rizvi <i>et al.</i> , 2009
Leaves and pods (sennoside and rhein)	Used in traditional medicine as strong purgatives and laxatives due to presence of sennoside and rhein	Rizvi <i>et al.</i> , 2009

Table 2. (Cont'd.).

Parts /compound used	Pharmacological properties / Medicinal uses	References
Root	Useful in skin diseases, leprosy, tuberculosis, glands' cures, burning sensations, also given as a tonic and febrifuge	Ahmed, 2007.
Flowers	They have a flavor with a bitter acrid taste, cooling, astringent, cure biliousness appetite	Rizvi <i>et al.</i> , 2009; Ahmed, 2007
Fruits	Hypolipidemic, in combination with amoxicillin have immunomodulatory effect on humoral immune system in mice; antiinflammatory, hypoglycemic, antiperiodic, antirheumatic, antitumor, antioxidant, hepatoprotective, antifungal and antibacterial activities	Rizvi <i>et al.</i> , 2009
Seeds: galactomannans, crysophenol, oxyanthraquinones, chrysophenol and chrysophanein	Antipyretic, sedative, laxative, and carminative; have analgesic actions, antihypercholesterolemic potential; reduce uterine implantation and suppress pregnancy in rats; sweetish, oily; improve the appetite	Rizvi <i>et al.</i> , 2009; Ahmed, 2007
8. <i>Cicer arietinum</i> (Papilionaceae)		
Fruits and seeds: isoflavones biochanin A and formononetin	Estrogenic and hypolipidemic activity	Ravikumar <i>et al.</i> , 2007
Plant: pangamic acid and a free nucleotide, theophylline-9-β-D-glucopyranosyl-6'-monophosphate	Antistress, antihyperlipidemic and stamina building activity; stimulant, tonic, aphrodisiac, anthelmintic, and useful in bronchitis and biliousness	Ravikumar <i>et al.</i> , 2007
Acid exudation	Used to cure ailments like constipation and indigestion	Oudhia, 2003
Fresh plant	Used for the treatment of painful menses.	Oudhia, 2003
Fresh leaves	Styptic and used as first aid remedy to stop bleeding	Oudhia, 2003
Boiled leaves	Used as poultice to sprained and dislocated limbs	Oudhia, 2003
9. <i>Citrullus colocynthis</i> (Cucurbitaceae)		
Whole plant	Used as a hypoglycemic agent; have toxic effects including hypokalemia, oliguria and edema, gastrointestinal disorders; hepatocyte necrosis and liver fibrosis	Batanouny <i>et al.</i> , 2005; Dehghani & Panjehshahin, 2006
Whole plant	Reported to have analgesic and antiinflammatory activities	Marzouk <i>et al.</i> , 2009
Whole plant	Antihistaminic, anti acetylcholine, cardiac depressant activities and anti-bacterial activities	Batanouny <i>et al.</i> , 2005
Whole plant	Used as an abortifacient and to treat constipation, edema, bacterial infections, cancer and diabetes; use as an analgesic and anti-inflammatory agents is validated; cures tumours, ascites, leucoderma, ulcers, asthma bronchitis, jaundice, enlargement of spleen, tuberculosis	Kumar <i>et al.</i> , 2008; Marzouk <i>et al.</i> , 2009; Panhwar & Abro, 2007
10. <i>Cordia dichotoma</i> (Boraginaceae)		
Extract of fruits: tannins, flavanoids, alkaloids, glycosides, saponins and carbohydrates	Antiulcer activity; anti-inflammatory activity against carrageenan and dextran (ethanol extracts) induced paw edema in rats; strong antioxidant activity	Kuppast <i>et al.</i> , 2009; Sharma <i>et al.</i> , 2010; Afzal <i>et al.</i> , 2007
11. <i>Coriandrum sativum</i> (Apiaceae)		
Plant	Used as carminative, diuretic, hypoglycemic; antihelmintic stimulant, stomachic, refrigerent, aphrodisiac and analgesic	Saeed & Tariq, 2007
Volatile oil	Used for its anti-inflammatory effect and appetizer	Suliman <i>et al.</i> , 2008
Essential oil	Antibacterial; antimicrobial activity against the species of <i>Candida</i> ; antidiabetic, anti-inflammatory and cholesterol lowering activities; also have antimicrobial properties against food borne pathogens such as <i>Salmonella</i> species	Cantore <i>et al.</i> , 2004; Begnami <i>et al.</i> , 2010; Saeed & Tariq, 2007
Fruits	Has been reported to lower lipid profile levels and increased HDL-c levels in rats	Suliman <i>et al.</i> , 2008
12. <i>Crotalaria burhia</i> (Papilionaceae)		
Aqueous extract	Has reported to have very low antibacterial activity against <i>Pseudomonas aeruginosa</i> , <i>E. coli</i> , <i>P. vulgaris</i> and <i>Stahylococcus aureus</i>	Naseem <i>et al.</i> , 2006
Branches and leaves	Used as a cooling agent to alleviate fever	Panhwar & Abro, 2007
13. <i>Cucumis melo</i> (Cucurbitaceae)		
Root	Diuretic and emetic	Green Bro, 2007
Flowers	Expectorant and emetic	Green Bro, 2007
Fruits	Used as a stomachic, cooling, light cleanser or moisturiser for the skin. They are also used as a first aid treatment for burns and abrasions.	Green Bro, 2007
Seed	Antitussive, digestive, febrifuge and vermifuge	Green Bro, 2007
14. <i>Dalbergia sissoo</i> (Papilionaceae)		
Extract of aerial parts	Showed bronchodilation as well as significant antipyretic, analgesic, and estrogen-like activities	Sarg <i>et al.</i> , 1999
Dried leaves	Antibacterial, antiprotozoal, antiinflammatory activities	Niranjani <i>et al.</i> , 2010
Leaf juice	Eye ailments	Niranjani <i>et al.</i> , 2010
Leaf Juice	Used in gonorrhoea	Rahman <i>et al.</i> , 2008
Oil	Shows repellent activity against <i>Anopheles stephensi</i> , <i>Aedes aegypti</i> and <i>Culex quinquefasciatus</i> , and is also resistant to some wood boring insects	Asif & Kumar, 2009
Wood and bark: active extract of bark: carbohydrates, phenolic compounds, flavonoids and tannins	Ayurvedics: abortifacient, anthelmintic, antipyretic, aperitif, aphrodisiac, expectorant, and refrigerant, anal disorders, dysentery, dyspepsia, leucoderma, and skin ailments Yunani: wood useful for blood disorders, scabies, eye and nose disorders, burning sensations, scalding urine, stomach problems and syphilis, boils, eruptions, leprosy and nausea	Asif & Kumar, 2009; Niranjani <i>et al.</i> , 2010.

Table 2. (Cont'd.).

Parts /compound used	Pharmacological properties / Medicinal uses	References
Wood paste	Used in wound, itches, abscess and vomiting	Rahman <i>et al.</i> , 2008
15. <i>Ficus bengalensis</i> (Moraceae)		
Aqueous extract	Antibacterial activity against pathogenic bacteria, <i>Stahylococcus aureus</i> , <i>Pseudomonas aeruginosa</i> and <i>Klebsiella pneumonia</i>	Gayathri & Kannabiran, 2009; Patil & Patil, 2010
Water extract of the bark	Antioxidant effect; antiallergic and antistress potential in asthma	Shukla <i>et al.</i> , 2004; Taur <i>et al.</i> , 2007.
Bark and leaves	Used as astringent, haemostatic, antiseptic; prescribed in diarrhoea, vaginal disorders, leucorrhoea, menorrhagia, deficient lactation, in burning sensation, haemoptysis, ulcers, diabetes, enuresis, gonorrhoea, hyperpiesia, allergic conditions of skin, burning sensations and abscesses	Patil & Patil, 2010
Fruits	Refrigerant and tonic	Patil & Patil, 2010
Latex	Useful in neuralgia, lumbago bruises, nasitis, ulorrhagia, ulitis, odontopathy, cracks of the sole and also beneficial as local application to sores, soles of the feet when cracked or inflamed; used externally in rheumatism and toothache	Patil & Patil, 2010; Rahman <i>et al.</i> , 2008
Seeds	Cooling and tonic	Patil & Patil, 2010
16. <i>Ficus carica</i> (Moraceae)		
Leaf	Antidiabetic properties	Lydia, 2009
Fruit	Source of calcium, a mineral which promotes bone density. Figs also contain flavone, rutin and quercetin, which can be used in cardiovascular disease medicine production. They have other compounds with anticancer activity, specifically benzaldehyde and the coumarins	Lydia, 2009
Fruit	Has been reported to exhibit antioxidant, anti-HSV, haemostatic, hypoglycemic, hypolipidemic, antispasmodic, anti-platelet, cytotoxic activities	Gilani <i>et al.</i> , 2008
Latex	The latex is widely applied on warts, skin ulcers and sores, and taken as a purgative and vermifuge	Lydia, 2009
Figs: tryptophan	Figs contain a nutrient called tryptophan which promotes good sleep and helps the brain use glucose properly, encouraging and stimulating good circulation	Lydia, 2009
17. <i>Foeniculum vulgare</i> (Apiaceae)		
Fruit oil	Acaricidal activities against <i>Dermatophagoides farinae</i> and <i>D. pteronyssinus</i>	Lee, 2004
β -thujaplicin	Antifungal and antibacterial activities	Chowdhury <i>et al.</i> , 2009
Essential oil and seed extract	Have shown antimycobacterial and anticandidal activities and could be used as fungicides against <i>Sclerotinia sclerotiorum</i> ; antibacterial effect against foodborne pathogens such as <i>E. coli</i> and <i>Bacillus megaterium</i> ; <i>Salmonella typhimurium</i> and <i>S. aureus</i> ; has shown the potential for the control of multi-drug resistant <i>Acinetobacter baumannii</i> infections	Kaur & Arora, 2010
Stem	A phenyl propanoid derivative, dillapional of the stems was found to be an antimicrobial principle against <i>Bacillus subtilis</i>	Kwon <i>et al.</i> , 2002
18. <i>Grewia asiatica</i> (Tiliaceae)		
Fruit	Unripe fruit: administered in respiratory, cardiac and blood disorders, as well as in fever. Ripe fruit: useful for cooling, digestible, toxic; aphrodisiac allays thirst and burning sensation, cures inflammation and consumption; also good for throat troubles; helps removal of dead fetus	Morton, 1987; Ahmed, 2007
Bark	Useful for biliousness, removes troubles and burning in vagina. An infusion of the bark is given as a demulcent, febrifuge and treatment for diarrhea; root bark is employed in treating rheumatism	Ahmed, 2007; Morton, 1987
Leaves	have antibiotic action and are applied on skin eruptions.	Morton, 1987
Leaves extract	Significant reduction in blood glucose level was observed especially with the ethyl acetate and methanol extracts	Abou Zeid & Sleem, 2005
19. <i>Hordeum vulgare</i> (Poaceae)		
Whole plant	Reported to have antiinflammatory, antilactagogue, diuretic, antioxidant, aphrodisiac, astringent, demulcent, digestive, expectorent, febrifuge, hypocholesterolemic, emollient, refrigerant, sedative, stomachic, tonic properties, used as a poultice for burns and wounds. According to modern research barley may be of aid in the treatment of hepatitis, also may help to control diabetes	Duke, 1983; PFAF, 2009.
20. <i>Mangifera indica</i> (Anacardaceae)		
Leaves	Leaves have reported to exhibit anthelmintic activity; and traditionally are used as anthelmintic	Hussain <i>et al.</i> , 2008
Vimang (an aqueous extract) and mangiferin	Antiallergic and anthelmintic properties were investigated in nematode, <i>Trichinella spiralis</i> . Results suggest that vimang and mangiferin may be useful in the treatment of diseases of this type	Hussain <i>et al.</i> , 2008
Gum	Used in itches	Rahman <i>et al.</i> , 2008
Young leaves	Decoction of young leaves are used in burning sensation during micturition, fever and toothache.	Rahman <i>et al.</i> , 2008
Seeds	Used in anemia, hypotension, diuretic, rheumatism, diabetes, asthma, syphilis, gastric and hepatic disorders, astringent, tonic, emetic, toothache, dysentery, diarrhea, cough	Rahman <i>et al.</i> , 2008; Wauthoz <i>et al.</i> , 2007

Table 2. (Cont'd.).

Parts /compound used	Pharmacological properties / Medicinal uses	References
21. <i>Phyla nodiflora</i> (Verbenaceae)		
Leaves extract	Reported to have shown a significant anti-inflammatory activity against carrageenin-induced paw edema in rats and a significant antinociceptive activity in acetic acid induced writhing in white albino mice	Ahmed <i>et al.</i> , 2004
Infusion of leaves and tender stalks	Used in indigestion in children and also after delivery in women. It was also used in lithiasis.	Akhtar, 1993
Whole Plant	Used in lack of bowel movement and pain in knee joints. It is febrifuge and used in the form of a paste as maturant for boils, chronic indolent ulcers, erysipelas and swollen cervical glands	Akhtar, 1993
22. <i>Portulaca oleracea</i> (Portulacaceae)		
Stem and leaves	Are sour, bitter and salty, thermogenic stomachic, alexeteric, antibacterial, antiscorbutic, sudorific, aperient, alterant, diuretic, vulnerary and tonic, cooling, anti dysenteric	Warrier & Nambiar, 1995
Leaves	Are sour, bitter, saltish, recommended in bilious conditions and low fevers; allay thirst and headache, tonic, stops vomiting, good in diseases of kidney and the spleen, in stomatitis of children, piles, scabies	Ahmed, 2007
Plant (omega-3 fatty acids)	A rich source of omega-3 fatty acids, which are thought to be important in preventing heart attacks and strengthening the immune system.	Anthony & Dweck, 2001
Leaf extract (levartenol)	It has been found to cause more vigorous contractions of the heart probably due to the presence of levartenol.	Anthony & Dweck, 2001
External Use	Its expressed juice or poultice is used externally to treat skin sores, burns, earache, insect stings, inflammations, ulcers, itches, eczema, abscesses and to relieve muscle spasms	Anthony & Dweck, 2001
Seeds	Used in scalds, burns, strangury and dysentery	Warrier & Nambiar, 1995
Seeds	The seeds are believed to be vermifuge	(Ahmed, 2007).
23. <i>Prosopis cineraria</i> (Mimosaceae)		
Plant	Anthelmintic, antibacterial, antifungal, antiviral, anticancer and several other pharmacological properties; has been used for treatment of dysentery, bronchitis, asthma, leucoderma, piles, leprosy, muscular tremors and wandering of the mind	Malik & Kalidhar, 2007
Stem bark	Has analgesic and antipyretic activities	Manikandar, 2009
Bark	Used as a remedy for rheumatism	Panhwar & Abro, 2007
Leaf paste	Applied on boils and blisters, mouth ulcers in livestock and on open sores on the skin	Malik & Kalidhar, 2007
Smoke of the leaves	Considered to be good for eye troubles	Malik & Kalidhar, 2007
24. <i>Sonchus asper</i> (Asteraceae)		
Root and aerial parts	Sesquiterpene, lactones, especially of the eudesmanolide type, have been isolated from both root and aerial parts; several of them have been to be effective against <i>Plasmodium falciparum</i> , fungi and inflammations	Grubben, 2004
Latex	Has been used to treat warts.	Grubben, 2004
25. <i>Syzygium cumini</i> (Myrtaceae)		
Leaves: condensed tannins	The anthelmintic activity of the plant may be attributed to condensed tannins (CT) which exert direct or indirect biological effects on the control of gastrointestinal parasites. So the leaves are used as anthelmintic	Hussain <i>et al.</i> , 2008
Seeds	Astringents	Brito <i>et al.</i> , 2007
Bark extract	The ethanolic bark extract has been reported to have antiinflammatory activity	Brito <i>et al.</i> , 2007
Decoction of the bark	Used for dysentery and diarrhoea	Migliato <i>et al.</i> , 2009
Juice of unripe fruits	Used for preparing vinegar that is considered to be a stomachic, carminative and diuretic; fruits are astringent.	Zhang & Lin, 2009
Other parts of the plant	Have been reported to possess anti-diabetic, bactericidal and anti-mutagenic properties	Brito <i>et al.</i> , 2007
26. <i>Tamarix aphylla</i> (Tamaracaceae)		
Decoction of the roots	Is effective for tuberculosis, leprosy, smallpox and all contagious diseases.	Salima Benhouhou
Decoction of the leaves and young branches	Used for a swollen spleen. When ginger is added to the same decoction it can be used for problems of the uterus	Benhouhou,
Galls	Galls are used as an astringent and as a dye	Panhwar & Abro, 2007
Bark	Bitter, astringent and aphrodisiac; used in treating eczema and capitis.	Panhwar & Abro, 2007
Bark, gall and leaves	The bark and gall are astringent, aphrodisiac and tonic, and are used for the treatment of hepatitis, eczema and other skin diseases, syphilis and scaly skin conditions. Fumigation of the leaves has germicidal effect; also beneficial in cold and flue. Decoction of the leaves is useful in tetanus. Bark is used as a poultice on wounds	Marwat <i>et al.</i> , 2009

The ripe fruit is extensively used by local patients of jaundice. So this is an effective phytotherapy for the said disease.

10. *Cordia dichotoma* Forster.f.

Eating of fruit, as needed, before meal is recommended for the treatment of masculine sexual weakness.

11. *Coriandrum sativum* L.

About 50 gms of dried fruit of coriander are boiled in one liter of water till half of the water is left. The decoction is used according to the need after meal, twice a day, about 10 days. This phytotherapy is recommended for asthma, cough and bronchitis.

12. *Crotalaria burhia* Buch.-Ham. ex Benth.

Dried plants are ground and mixed with water; after a while the water is strained (filtered) and is given to the animals as needed. This phytotherapy is recommended locally for diarrhoea and other abdominal troubles.

13. *Cucumis melo* L.

Daily use of the fruit in its season is strongly recommended by local people for the treatment of kidney troubles.

14. *Dalbergia sissoo* Roxb.

70 gms of young leaves of buds are crushed. One glass of water is added to it and strained. The strained decoction is taken daily and continued for 10 days. This is useful recipe for piles, night emission, jaundice, feeling of hotness in sole of the feet.

15. *Foeniculum vulgare* Mill.

Equal quantity of fennel fruit, coriander fruit and sugar are mixed and ground together to make powder (safoof). This powder is used twice a day after meal. This phytotherapy is recommended for dyspepsia.

16. *Ficus benghalensis* L.

2-3 drops of latex of the plant are taken with a sweet (Pathasa) twice a day for 2 weeks. This is locally recommended for abdominal pain and man sexual weakness.

Fruit, dried under shade, is ground to form powder. The powder is used with water twice (morning & evening) a day for a period as needed. This phytotherapy is used for night emission and atony of the bladder.

17. *Ficus carica* L.

2-4 figs (fruit) are soaked in water or milk or vinegar at night and used in the morning on empty stomach for 10 days. This is considered to be very effective for the treatment of piles.

18. *Grewia asiatica* L.

One kg fruit is crushed with fingers in 1 liter of water and then strained. Sugar is added to the strained juice to make syrup. The syrup is taken according to the need.

1 kg sugar, 1 glass of water and 2 teaspoon of ghee are heated to make *sheera*. Then 1 kg crushed fruit of *Grewia* is mixed with it and strained through a fine cloth. 2-3 teaspoon strained mixture is used with one glass of water twice a day. The above phytotherapies are recommended for purification of blood and cooling effect.

19. *Hordeum vulgare* L.

250 gms fruits of barley are boiled in 1 kg water. The boiling is continued till half of the water is evaporated. The remaining water is strained and used 1 glass twice a day for a period as needed. It is very effective phytotherapy locally used for diabetes.

20. *Mangifera indica* L.

The inflorescence of mango is rubbed between hands for about 10 minutes. The hands are rubbed with the affected area of snake bite, scorpion, bee and wasp sting or the inflorescence is directly rubbed with the body continuously so as to neutralize the poisonous effect. This phytotherapy is considered to be effective and is, therefore, recommended for the above mentioned effects.

21. *Phyllanthus nodiflora* (L.) Greene

About 100 gms fresh plant is washed in water. It is crushed and is mixed with one glass of pure water. The mixture is then strained. One glass of the strained mixture is taken with salt on empty stomach daily for about one week. This traditional phytotherapy is very useful for piles.

22. *Portulaca oleracea* L.

Equal amount of seeds of *Portulaca*, coriander, *Argyreia speciosa* (samandar sokh) and table sugar are ground to make powder (safoof). 10 gms powder is taken with water twice a day. It is an effective traditional phytotherapy used for night emission.

23. *Prosopis cineraria* (L.) Druce

Crushed leaves are mixed with mustard oil and are used as poultice on the abscesses and wounds.

24. *Sonchus asper* (L.) Hill

The plant is crushed to form a paste. The paste is applied as a poultice on wounds and boils. This is traditionally recommended to be very useful for the said purpose.

25. *Syzygium cumini* (L.) Skeels

250 gms of young leaves along with tender stem are washed with water, well crushed and mixed with 125 gms of pure butter to make paste. The paste is applied to the wounds caused due to burning.

Young leaves (as above) are crushed and filtered through a fine cloth. 1 teaspoon of filtrate is given to children and 3 teaspoon to elders 3 times daily. This phytotherapy is prescribed for kidney and urine troubles.

Seeds are ground to make powder. The powder is taken 3 times daily. This is recommended for diabetes. The eating of its fruit in season is also very useful for diabetes.

Pure leaves are given to the animals. Locally considered to be useful for dysentery.

26. *Tamarix aphylla* (L.) Karst.

Ash of the leaves is mixed with water; after half an hour the water is strained (filtered) and boiled. After boiling the water is evaporated and the salt is left behind. Then ½ -1 gm salt is taken with Shurbat-e Bazoori twice a day for a period as needed. Useful traditional phytotherapy for jaundice.

Harmal seeds are put on the burnt ash of the wood of the *Tamarix*. The inhaling of the smoke is used for bad evils.

Leaves are boiled in water. The water is strained and the hot leaves are tied on the affected area daily. The treatment is continued for a week. This phytotherapy is used for Rheumatism, wound and abscesses.

Discussion

Medicinal plants are a valuable natural resource and regarded as potentially safe drugs. They have been playing an important role in alleviating human sufferings by contributing herbal medicines in the primary health care systems of rural and remote hilly areas where more than 70% of population depends on folklore and traditional system of medicines. The reason for their popularity is due to the high cost of allopathic medicines and side effects which encouraged manufacturers of Greco-Arab and Ayurvedic systems of medicines to merge their orthodox medicine with local traditional medicines in order to spread health coverage at a reasonable price (Marwat *et al.*, 2008).

During this study information about 40 new medicinal folk recipes of 26 plant species belonging to 19 families was obtained about the use of plants by local people and Hakims against medical problems. For example, the mustard oil in which the bulb of *Allium cepa* (onion) has been boiled is used for earache. Similarly, half heated onion bulb is applied as poultice for the treatment of the abscesses. Leaves of *Aloe barbadense* are useful for the remedy of scabies and stomach troubles in animals. Leaves of *Azadirachta indica* are effective for jaundice. Decoction of *Cassia fistula* fruit is traditionally used for chest diseases and stomach troubles. The seed coat (testa) of roasted *Cicer arietinum* (gram) are soaked in water at night and in the morning the strained water is taken which is considered to be useful for spermatorrhoea. The ripe fruit of *Citrullus lanatus* is extensively used by local patients of jaundice. The decoction of dried fruits of *Coriandrum sativum* is recommended for asthma, cough and bronchitis. The powder (safoof) of *Foeniculum vulgare*, *Coriandrum sativum* and sugar is recommended for dyspepsia by local people. Latex of *Ficus benghalensis*, taken with a sweet (Pathasa), is locally recommended for abdominal pain and man sexual weakness. *Ficus carica* fruit is considered to be very effective for the treatment of piles. *Grewia asiatica* syrup is recommended for purification of blood and cooling effect. Fruit of *Hordeum vulgare* is very effective locally used for diabetes. Crushed leaves of *Prosopis cineraria* are mixed with mustard oil and are used as poultice on the abscesses and wounds. Powder of *Syzygium cumini* seeds is recommended for diabetes.

Recent research work dealing with the pharmacological/medicinal uses of referred plant species cited in various literatures has been summarized in Table 2.

During the research project it was noted that the medicinal plant wealth of D.I. Khan. District is not fully exploited. Some

medicinally important plant species are fast dwindling, mainly due to human interference. So, the area needs proper protection for the conservation and survival of bio-resources. The medicinal plants can be protected by the conservation programme by help of local people.

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