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# 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-availablity 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. Pertinant 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 pharmacologyical/ 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 *Albizzia 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. *Albizzia lebbek* (L.) Benth.

Seeds of *Albizzia 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. | *Abelmoschus esculentus* | Lady's finger | Bhindi, Okra, | Malvaceae | 210 |
| 2. | *Albizzia lebbeck* | Woman's tongue | Sirin, Siris | Mimosaceae | 384 |
| 3. | *Allium cepa* | Onion | Vasal, Piaz | Alliaceae | 350 |
| 4. | *Aloe barbadense* | Pakistani Aloe | Kuwargandal | Liliaceae | 408 |
| 5. | *Azadirachta indica* | Margosa tree | Neem | Meliaceae | 218 |
| 6. | *Cassia italica* | Italian senna, | Gidar toora | Caesalpinaceae | 83 |
| 7. | *Cassia fistula* | Indian laburnum. | Amaltas | Caesalpinaceae | 108 |
| 8. | *Cicer arietinum* | Chick pea, gram | Chanra, channa | Papilionaceae | 309 |
| 9. | *Citrullus lanatus* | Water melon | Hindwana | Cucurbitaceae | 419 |
| 10 | *Cordia dichotoma* | Sebestan Plum | Lasuri, lasora | Boraginaceae | 420 |
| 11. | *Coriandrum sativum* | Coriander | Dharian, dhania | Apiaceae | 298 |
| 12. | *Crotalaria burhia*. | Unknown | Sassai | Papilionaceae | 75 |
| 13. | *Cucumis melo* | Musk melon | Kharbuza | Cucurbitaceae | 421 |
| 14. | *Dalbergia sissoo* | Indian rose wood | Tali, shishum | Papilionaceae | 328 |
| 15. | *Foeniculum vulgare* | Fennel | Saunf, kalwo | Apiaceae | 32 |
| 16. | *Ficus benghalensis* | Banyan tree. | Bohir, bargad, | Moraceae | 402 |
| 17. | *Ficus carica* | Fig | Anjeer | Moraceae | 326 |
| 18. | *Grewia asiatica* | Phalsa | Phalsa | Tiliaceae | 8 |
| 19. | *Hordeum vulgare* | Barley | Jau | Poaceae | 418 |
| 20. | *Mangifera indica* | Mango | Aam, amb | Anacardaceae | 318 |
| 21. | *Phyla nodiflora* | Capeweed | Bukan | Verbenaceae | 32 |
| 22. | *Portulaca oleracea* | Purslane | Lunrak | Portulacaceae | 40 |
| 23. | *Prosopis cineraria* | Jandi, Jand | Saranga | Mimosaceae | 89 |
| 24. | *Sonchus asper* | Spiny sow thistle | Bhathal | Aseraceae | 16 |
| 25. | *Syzygium cuminii* | Java plum | Jamu, Jaman | Myrtaceae | 326 |
| 26. | *Tamarix aphylla* | 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 7days. 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. *Abelmoschus esculentus*** (Malvaceae) | | |
| Plant: oleic and linoleic acid | Stimulative; improve the vision, neurotransmission; prevention of distinct heart vascular diseases. | Kimbonguila *et al*., 2010. |
| **2. *Albizzia lebbek*** (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 *et al*., 2008 |
| Leaves | Night blindness, syphilis and ophthalmia | Hussain *et al*., 2008; Ahmad, 2007 |
| Root | Hemicramia, astringent property | Hussain *et al*., 2008 |
| Flowers | Asthma, snake bite, cooling medicine and externally applied in boils eruption and swellings, also reputed for aphrodisiac | Hussain *et al*., 2008; Panhwar and Abro, 2007 |
| Whole plant | Psychological disorders, insomnia, warts, insecticidal, antiparasitic, antidysentric and antitubercular activities | Hussain *et al*., 2008 |
| **3. *Allium cepa*** (Alliaceae) | | |
| Plant | Antidermatophytic, antitoxigenic | Zohri *et al*., 1995 |
| Plant | Antidiabetic | Kumari *et al*., 1995 |
| Plant | Antibacterial | Kim *et al*., 1997 |
| Plant | Antimutagenic, free radical scavenging | Shon *et al*., 2004 |
| Plant | Antimicrobial | Park *et al*., 2008 |
| Plant | Anticancer | Galluzzo *et al*., 2009 |
| Plant | Antihistaminic, antiinflammatory and antioxidant activities | Kaiser *et al*., 2009 |
| Onion Juices | Antioxidant and antihyperglycemic | El-Demerdash *et al*., 2005 |
| Plant: Thiosulfinates, volatile sulfur compounds | Cancer, coronary heart disease, obesity, hypercholesterolemia, diabetes type 2, hypertension, cataract and disturbances of the gastrointestinal tract | Lanzotti, 2006 |
| **4. *Aloe barbadense*** (Liliaceae) | | |
| Leaf exudate alkaloids, triterpenes, cyanidines, proanthocyanidines, tannins and saponins | Leishmanicidal activity (in four *Leishmania donovani* strains) and may provide a new lead agent in the treatment of Leishmaniasis | Dutta *et al*., 2008 |
| Leaves Juice | Tonic and anthelmintic | Rahman *et al*., 2008 |
| Mucilage | Wound and itches | Rahman *et al*., 2008 |
| Leaf gel | Antibacterial (two Gram-positive bacteria *Shigella flexneri* and *Streptococcus progenes*) | Cock, 2008 |
| Plant specific compounds | Antimicrobial | Cock, 2008 |
| Plant | Gentle detoxifier, cleanser, and vermifuge | Rahman *et al*., 2008 |
| **5. *Azadirachta indica*** (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 nimbionone | Antibacterial activity against G-positive organisms, *Bacillus substilis*, *Staphylococcus epidermidis*, *Staphylococcus aureus*, and G-negative organisms, *Klebsiella ozaenae* | 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 *et al*., 2008; Rasheed, 2002 |
| Fruit | Purgative, emollient, anthelmintic, astringent to the bowels, biliousness, cardiac troubles. | Rasheed, 2002; Ahmed, 2007 |
| Seeds: 7-acetylneotrichelinone | Anticancer activity in vitro; antioxidant activity, anti-implantation effect; | Rasheed, 2002 |
| Bark: phenol glycosides | Ulcer and gastric hyperacidity; analgesic | Rasheed, 2002 |
| **6. *Cassia italica*** (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 *et al*., 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 *In vitro* | 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. *Cassia fistula*** (Caesalpinaceae) | | |
| Bark extract: oxyanthraquinone and dihydroxyanthraquinone | Inhibition of metamorphosis of *Disdercus koenigii* | Rizvi *et al*., 2009 |
| Leaves | Laxative, antipyretic; heal ulcers, used in rheumatism, cough, ringworm infections, treating bone fracture | Ahmed, 2007; Rizvi *et al*., 2009 |
| Leaves and pods (sennoside and rhein) | Used in traditional medicine as strong purgatives and laxatives due to presence of sennoside and rhein | Rizvi *et al*., 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 *et al*., 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 anti-bacterial activities | Rizvi *et al.,* 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 *et al*., 2009; Ahmed, 2007 |
| **8. *Cicer arietinum*** (Papilionaceae) | | |
| Fruits and seeds: isoflavones biochanin A and formononetin | Estrogenic and hypolipidemic activity | Ravikumar *et al*., 2007 |
| Plant: pangamic acid and a free nucleotide, theophylline-9-ß-D-glucopyranosyl-6'-monophosphate | Antistress, antihyperlipidemic and stamina building activity; stimulant, tonic, aphrodisiac, anthelmintic, and useful in bronchitis and biliousness | Ravikumar *et al*., 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. *Citrullus colocynthis*** (Cucurbitaceae) | | |
| Whole plant | Used as a hypoglycemic agent; have toxic effects including hypokalamia, oliguria and edema, gastrointestinal disorders; hepatocyte necrosis and liver fibrosis | Batanouny *et al*., 2005; Dehghani & Panjehshahin, 2006 |
| Whole plant | Reported to have analgesic and antiinflammatory activities | Marzouk *et al*., 2009 |
| Whole plant | Antihistaminic, anti acetylcholine, cardiac depressant activities and anti-bacterial activities | Batanouny *et al*., 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 *et al.*, 2008; Marzouk *et al*., 2009; Panhwar & Abro, 2007 |
| **10. *Cordia dichotoma*** (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 *et al*., 2009; Sharma *et al*., 2010; Afzal *et al*., 2007 |
| **11. *Coriandrum sativum*** (Apiaceae) | | |
| Plant | Used as carminative, diuretic, hypoglycemic; antihelmintic stimulant, stomachic, refrigerent, aphrodisiac and analgestic | Saeed & Tariq, 2007 |
| Volatile oil | Used for its anti-inflammatory effect and appetizer | Suliman *et al*., 2008 |
| Essential oil | Antibacterial; antimicrobial activity against the species of *Candida*; antidiabetic, anti-inflammatory and cholesterol lowering activities; also have antimicrobial properties against food borne pathogens such as *Salmonella* species | Cantore *et al*., 2004; Begnami *et al*., 2010; Saeed & Tariq, 2007 |
| Fruits | Has been reported to lower lipid profile levels and increased HDL-c levels in rats | Suliman *et al*., 2008 |
| **12. *Crotalaria burhia*** (Papilionaceae) | | |
| Aqueous extract | Has reported to have very low antibacterial activity against *Pseudomonas aeruginosa, E. coli, P. vulgaris and Stahylococcus aureus* | Naseem *et al*., 2006 |
| Branches and leaves | Used as a cooling agent to alleviate fever | Panhwar & Abro, 2007 |
| **13. *Cucumis melo*** (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. *Dalbergia sissoo*** (Papilionaceae) | | |
| Extract of aerial parts | Showed bronchodilation as well as significant antipyretic, analgesic, and estrogen-like activities | Sarg *et al*., 1999 |
| Dried leaves | Antibacterial, antiprotozoal, antiinflammatory activities | Niranjani *et al*., 2010 |
| Leaf juice | Eye ailments | Niranjani *et al*., 2010 |
| Leaf Juice | Used in gonorrhoea | Rahman *et al*., 2008 |
| Oil | Shows repellant activity against *Anopheles stephensi, Aedes aegypti* and *Culex quinquefasciatus,* 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 *et al*., 2010. |

**Table 2. (Cont'd.).**

| Parts /compound used | Pharmacological properties / Medicinal uses | References |
|---|---|---|
| Wood paste | Used in wound, itches, abscess and vomiting | Rahman *et al*., 2008 |
| **15. *Ficus bengalensis*** (Moraceae) | | |
| Aqueous extract | Antibacterial activity against pathogenic bacteria, *Stahylococcus aureus*, *Pseudomonas aeruginosa* and *Klebsiella pneumonia* | Gayathri & Kannabiran, 2009; Patil & Patil, 2010 |
| Water extract of the bark | Antioxidant effect; antiallergic and antistress potential in asthma | Shukla *et al*., 2004; Taur *et al*., 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, gonorrhea, 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 *et al*., 2008 |
| Seeds | Cooling and tonic | Patil & Patil, 2010 |
| **16. *Ficus carica*** (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 *et al*., 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. *Foeniculum vulgare*** (Apiaceae) | | |
| Fruit oil | Acaricidal activities against *Dermatophagoides farinae* and *D. pteronyssinus* | Lee, 2004 |
| β-thujaplicin | Antifungal and antibacterial activities | Chowdhury *et al*., 2009 |
| Essential oil and seed extract | Have shown antimycobacterial and anticandidal activities and could be used as fungicides against *Sclerotinia sclerotiorum*; antibacterial effect against foodborne pathogens such as *E. coli* and *Bacillus megaterium*; *Salmonella typhimurium* and *S. aureus*; has shown the potential for the control of multi-drug resistant *Acinetobacter baumannii* infections | Kaur & Arora, 2010 |
| Stem | A phenyl propanoid derivative, dillapional of the stems was found to be an antimicrobial principle against *Bacillus subtilis* | Kwon *et al*., 2002 |
| **18. *Grewia asiatica*** (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. *Hordeum vulgare*** (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. *Mangifera indica*** (Anacardaceae) | | |
| Leaves | Leaves have reported to exhibit anthelmintic activity; and traditionally are used as anthelmintic | Hussain *et al*., 2008 |
| Vimang (an aqueous extract) and mangiferin | Antiallergic and anthelmintic properties were investigated in nematode, *Trichinella spiralis*. Results suggest that vimang and mangiferin may be useful in the treatment of diseases of this type | Hussain *et al*., 2008 |
| Gum | Used in itches | Rahman *et al*., 2008 |
| Young leaves | Decoction of young leaves are used in burning sensation during micturition, fever and toothache. | Rahman *et al*., 2008 |
| Seeds | Used in anemia, hypotension,diuretic, rheumatism, diabetes, asthma, syphilis, gastric and hepatic disorders, astringent, tonic, emetic, toothache, dysentery, diarrhea, cough | Rahman *et al*., 2008; Wauthoz *et al*., 2007 |

**Table 2. (Cont'd.).**

| Parts /compound used | Pharmacological properties / Medicinal uses | References |
|---|---|---|
| **21. *Phyla nodiflora* (**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 *et al*., 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. *Portulaca oleracea*** (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. *Prosopis cineraria*** (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. *Sonchus asper*** (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 *Plasmodium falciparum*, fungi and inflammations | Grubben, 2004 |
| Latex | Has been used to treat warts. | Grubben, 2004 |
| **25. *Syzygium cuminii*** (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 *et al*., 2008 |
| Seeds | Astringents | Brito *et al*., 2007 |
| Bark extract | The ethanolic bark extract has been reported to have antiinflammatory activity | Brito *et al*., 2007 |
| Decoction of the bark | Used for dysentery and diarrhoea | Migliato *et al*., 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 *et al*., 2007 |
| **26. *Tamarix aphylla*** (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 capititis. | 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 *et al*., 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 1glass 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. *Phyla 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 cuminii* (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 -1gm 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 cuminii* seeds is recommended for diabetes.

Recent research work dealing with the pharmacologyical/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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