

INDIGENOUS KNOWLEDGE OF FOLK MEDICINE BY THE WOMEN OF KALAT AND KHUZDAR REGIONS OF BALOCHISTAN, PAKISTAN

RASOOL BAKHSH TAREEN, TAHIRA BIBI*, MIR AJAB KHAN,
MUSHTAQ AHMAD** AND MUHAMMAD ZAFAR****

Department of Botany, University of Balochistan, Quetta- Pakistan

**Department of Botany, Sardar Bahadur Khan Women's University, Quetta, Pakistan*

***Department of Plant Sciences, Quaid-i-Azam University Islamabad, Pakistan
rbtareen@yahoo.com*

Abstract

Kalat and Khuzdar regions of province Balochistan possess a rich history and culture of tribal society with regard to medicinal plants. Women use medicinal plant resources of the area for their ailments mainly digestive complaints, stomach problems, fevers, liver complaints, diabetes, children diseases and birth related problems. Information on useful folk medicines known to the women through experience of ages is usually passed on from generation to generation. Ethnomedicinal field surveys and field studies are important for systematic documentation. In the present paper 61 species of medicinal plants belonging to 56 genera of 34 families are traditionally used as medicines by the women for treatment of various diseases. Maximum number of species belongs to family Lamiaceae (9 species) followed by Asteraceae (7 species), Apiaceae, Papilionaceae (Leguminosae), Solanaceae and Zygophyllaceae (3 species each). It is concluded that, at present transmission of such knowledge from saniasi, herbalists and hakims to folks has been tremendously decreased as indicated by old women of the area. However, due to the ethnobotanical research activity in Balochistan, awareness in the local community and overall global trend towards the herbal medicine resurgence of the transmission of knowledge from the herbalist to local community has been initiated. Traditional herbalist or jogi do not tell the specific prescription to the local people as indicated from the present research. Hence most of the prescription possessed by the folks is related to the problems of digestive systems, fever or cough etc. Folk knowledge may be preserved and utilized for conservation.

Introduction

Balochistan is the largest province, representing 44% of the land cover of Pakistan. The climate is arid to semi-arid, ranging from coastal tropical to cool temperate in the north. Major ecological zones are; dry temperate forest, sub tropical forest, tropical dry mixed deciduous forest, and desert and mangrove forest. Baluchistan is blessed with diverse flora and fauna due to diverse ecological conditions (Anonymous, 1998).

Geo-Climate of District Kalat

Kalat district is the central part of Balochistan. It lies between 28° 57' & 29° 20' north and 66° 36' & 67° 30' east. Its total area is 6621 sq. Km (Fig. 1) and elevation varying from 1525 to 1982 meters from sea level. Kalat is one of the coldest districts of Balochistan. The average monthly rainfall is 15.24 mm in winter, during December and January snowfall is also recorded. Annual minimum mean temperature for the years 1993-1998, recorded at the meteorological centre Kalat was -4.34 °C in the month of January, while the maximum mean temperature was 31.72 °C in the month of July.

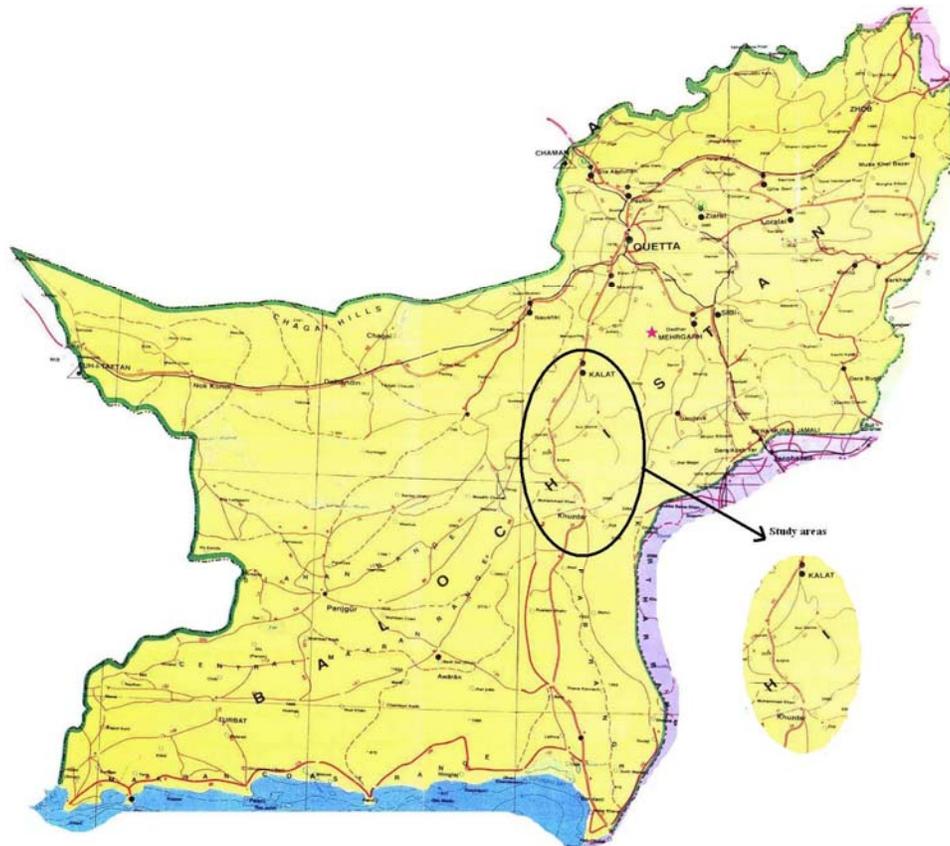


Fig. 1. Map of Kalat and Khuzdar in Pakistan.

Geo-Climate of District Khuzdar

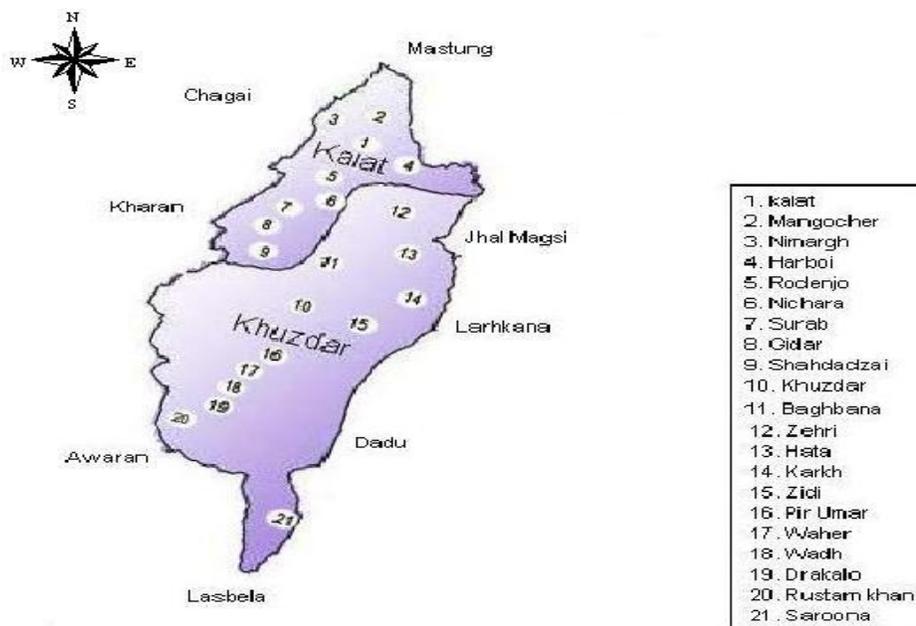
Khuzdar district lies between $25^{\circ} 43'$ and $28^{\circ} 52'$ north latitudes and $67^{\circ} 29'$ east longitudes. The total area of the district is 35380 square Km (Fig. 1). The elevation of the district is varying from 300 to 1800 meters above sea level. Minimum mean temperature for the years 1971-1990 was 3.2°C in the month of January, while the maximum mean temperature was 38.1°C in the month of June.

Previous Ethnobotanical work in Balochistan

Hocking (1958-62) wrote a series of papers on medicinal plants of Pakistan and included some information on Balochistan. Shinwari and Malik (1989) studied plant wealth of Dear Bugti area. Malik *et al.*, (1990) gathered some preliminary ethnobotanical information from six districts of Balochistan. Goodman and Ghafoor (1992) conducted ethnobotanical study in Balochistan province of south western Pakistan. They collected information about 114 plant species used by nomads and village dwellers for nutritional, utilitarian and medicinal purposes, and a total of 56 species prescribed or dispensed by

herbalists or herbal doctors residing in population centers. Leporatti & Lattanzi (1994) studied 27 medicinal plants in Makran (Southern Pakistan). They discussed their traditional medicinal uses. Shinwari *et al.*, (1995) reported the ethnobotanical information about Kharan district of Balochistan. Tareen *et al.*, (2002a & 2002b) conducted ethnobotanical studies of medicinal and aromatic plants of Shireen valley and Juniper forest Ziarat. Shah *et al.*, (2006) conducted ethnobotanical studies of the flora of district Musakhel and Barkhan in Balochistan. Ahmad *et al.*, (2008) studied germplasm evaluation of medicinal and aromatic plants in highland Balochistan. Achakzai *et al.* (2009) studied response of plant parts and age on the distribution of secondary metabolites of plants found in Quetta and Kakar *et al.*, (2010) investigated impact of municipal wastewater of Quetta city on biomass, physiology and yield of Canola.

During the present investigation two districts of Balochistan including Kalat and Khuzdar and their villages were chosen where local communities were actively engaged in medicinal herbs collection and their uses. As far as the plants are concerned, from ancient times, the local men and women are associated with the activities like farming, making ropes, mats, handicraft, caps and ornamental goods from leaves and stems of the plants. They use wood as fuel wood and for selling to fulfill their earning needs. Plants are also used and sold as medicine and used as fodder from the past by the indigenous people. The methods and techniques of utilization were adopted from the people of other areas and being transmitted from generation to generation.



Plant collection sites of District Kalat and Khuzdar

The aim of this pilot survey of women from communities in the areas of known medicinal plants occurrence is to provide an insight of the unmonitored aspects of medicinal plants and their socio-economic influence on these low income groups. It is considered important to understand the women knowledge of medicinal plants used for sustainable health in these regions of the country.

Materials and Methods

The study was conducted during 2003-2006 by a team, comprising 6 male and 4 female members. The questionnaire was devised modified from Croom (1983) and Lipp (1989) to identify the knowledge of rural women and their immediate family about the collection of medicinal plants and their use in sustainable health in the community. The survey was unique in that the emphasis was on women. The two districts Kalat and Khuzdar including their valleys and remote villages were chosen based on variation in ecological zones, rich diversity of medicinal plants and ethnomedicinal culture of the local community (Goodman and Ghafoor 1992). The female interviews were conducted at allocated meeting places, house, school or conducted individual interviews from house to house. The interviews began with a brief introduction of the team and the purpose for the study which helped to gain the trust of the women, therefore allowing them to talk freely and openly.

A total of 300 women of different ages were interviewed regarding traditional uses of plants and their local names; part used and indigenous recipes for health care. Plants were collected properly from different sites of the districts. The plants were collected from the hills, plains and water courses. Identification of plants was confirmed by Flora of Pakistan (Nasir & Ali, 1970-1979, 1980-1989; Ali & Nasir, 1989-1992 and Ali & Qaiser, 1993-2009).

Results

Present data on folk uses of medicinal plants of Kalat and Khuzdar districts shows that in total of 61 species belonging to 56 genera of 34 families are traditionally used by local inhabitants for the treatment of various diseases. Maximum number of medicinal plant species belongs to family Lamiaceae (9 species) followed by Asteraceae (7 species), Apiaceae, Papilionaceae (Leguminosae), Solanaceae and Zygophyllaceae (3 species) for each family.

Botanical name: *Achillea wilhelmsii* C.Koch
Vernacular name: Boh-e-Madran, Gozh madar
Family: Asteraceae
Distribution: Kalat, Mangocher, Harboi, Nichara, Surab.
Part used: Whole plant
Folk Medicinal uses: The whole plant is soaked in water and the decoction is used for farting, stomach pain, fever and motion of children. The whole plant is boiled in water; take two cups of this decoction in the morning and two cups in the evening to cure jaundice.

Botanical name: *Acroptilon repens* (L.) DC.
Vernacular name: Talkha

Family: Asteraceae
Distribution: Kalat, Mangocher, Nimargh, Harboi, Nichara.
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and the decoction is drunk for fever, stomach pain and blood purification. Flowers and leaves are dried and grinded to make powder which is soaked in water and the decoction is used for stomach pain of small children. The leaves of the plant are grinded and mixed with small amount of flour and water to make a paste. This paste is applied externally on belly for dysentery.

Botanical name: *Alhagi maurorum* Medic
Vernacular name: Seez/Shing
Family: Papilionaceae (Leguminosae)
Distribution: Kalat, Rodenjo, Nichara, Surab, Khuzdar.
Part used: Roots and flowers
Folk Medicinal uses: The flowers are ground with sugar and powder is used for eyes diseases, which clean the eyes. One tea spoon of powdered is taken in the morning one in the evening which improves eyesight. The powder of dry flowers is used for stomach pain. The roots are soaked in water and extract is useful for liver complaints.

Botanical name: *Amygdalus brahuica* subsp. *afghanica* (Pachomj) Browicz
Vernacular name: Mazhmonk/Mashmonk
Family: Rosaceae
Distribution: Kalat, Harboi, Nichara.
Part used: Gum
Folk medicinal uses: The gum powder of the plant is mixed with water and the mixture is rubbed with both hands to make them thread like forms, which is applied on the wounded eyes. It is also used for chest infection.

Botanical name: *Artemisia scoparia* Waldst. & Kit.
Vernacular name: Jir/Bootae
Family: Asteraceae
Distribution: Harboi, Kalat. Mangocher, Surab, Gidar, Zehri.
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and the decoction is used for fever, vomiting and motion of children. The tea of its leaves is useful for cough, undetected fever (mubaraki) and for cooling effect. Whole plant is boiled in water and takes the steam (in local language "cultap") which is useful for the cold. The whole plant is ground to obtain paste which is used externally to heal cough and other chest problems.

Botanical name: *Berberis baluchistanica* Ahrendt
Vernacular name: Zarch

Family: Berberidaceae
Distribution: Harboi, Kalat.
Part used: Roots and sap
Folk medicinal uses: The powder of roots and sap is mixed with milk to obtain syrup which is used to heal pain of joints and other kinds of pain in the body such as pain through injury, rheumatism and chest infection.

Botanical name: *Calotropis procera* (Willd.) R. Br.
Vernacular name: Aragh/Karag
Family: Asclepiadaceae
Distribution: Khuzdar, Wadh, Drakalo, Rustam Khan.
Part used: Flowers and milky latex
Folk medicinal uses: This is poisonous plant, but it is used for snake and insects bite. The milk is applied externally on effected area to reduce the poison's effect. The flowers of the plant are dried to make a tablet from its powered to use for constipation.

Botanical name: *Capparis decidua* (Forssk.) Edgew.
Vernacular name: Kallair/Kaled
Family: Capparidaceae
Distribution: Zidi, Waher, Wadh, Saroona, Shahdadzai.
Part used: Stem and twigs
Folk medicinal uses: Stem and branches are burnt to obtain ash, which is mixed in sugar candy and is taken ½ spoons in the morning and ½ in the evening for cough and chest problems. The wood is burnt and 5gm of coal & ash are mixed with one liter milk of goat and is used for 4 days to cure the broken bones.

Botanical name: *Capparis spinosa* L.
Vernacular name: Kirrav pith
Family: Capparidaceae
Distribution: Zehri, Waher, Wadh, Drakalo, Saroona, Shahdadzai.
Part used: Whole plant
Folk medicinal uses: Whole plant is boiled in water and the decoction is used for injuries of the body.

Botanical name: *Caralluma tuberculata* N. E. Brown
Vernacular name: Marmootk/ Marmoot
Family: Asclepiadaceae
Distribution: Nimargh, Harboi, Nichara, Gidar.
Part used: Whole plant
Folk medicinal uses: The whole plant is dried and ground to obtain powder which is taken with water for jaundice, dysentery, stomach pain, constipation and hepatitis B & C. The fresh plant is chewed for freckles, pimples and for blood purification. The plant is also cooked as a vegetable and is used for diabetes and high blood pressure.

Botanical name: *Cardaria chalepensis* (L.) Hand.-Mazz.
Vernacular name: Garbust
Family: Brassicaceae
Distribution: Kalat, Surab, Nichara.
Part used: Leaves
Folk medicinal uses: It is cooked as vegetable. The leaves are grinded and applied for skin disease called Mamur in local language.

Botanical name: *Citrullus colocynthis* (L.) Schrad.
Vernacular name: Kharengirirhi
Family: Cucurbitaceae
Distribution: Khuzdar, Pir Umar, Rustam Khan, Saroona, Shahdadzai.
Part used: Fruits and seeds
Folk medicinal uses: Fruits are dried and grinded to obtained powder which is used for dropsy (Jalandari). It is also used for constipation and diabetes.

Botanical name: *Cocculus pendulus* (J.R. & G. Forst) Diels
Vernacular name: Zamur
Family: Menispermaceae
Distribution: Gidar, Pir Umar, Waher, Wadh.
Part used: Leaves
Folk medicinal uses: Dry leaves of the plant are grinded to obtained powder which is mixed in small amount in milk, which is externally applied on the eyes with the help of cotton for the whole night till morning. It is useful for eyes irritation. Plant is soaked in water and decoction is used for motion and dysentery.

Botanical name: *Corchorus depressus* (L.) Stocks
Vernacular name: Bundairy/Mundairy
Family: Tiliaceae
Distribution: Khuzdar, Pir Umar, Waher, Wadh.
Part used: Whole plant
Folk medicinal uses: The whole plant is soaked in water and the extract is used to stop the diarrhea of children and dysentery. Roots are grinded and mixed with water and drunk to cure gonorrhea and swelling of urinary bladder.

Botanical name: *Cousinia stocksii* C. Winkler
Vernacular name: Naryan Band
Family: Asteraceae
Distribution: Kalat, Mangocher, Nimargh, Rodenjo.
Part used: Gum and roots
Folk medicinal uses: The whole plant is used as diuretic and antiseptic. Fresh juice of the plant is used for the dropsy, hematuria and vomiting. The juice is also used for chronic diarrhea and dysentery. It is also used asthma and liver complaints.

Botanical name: *Cynodon dactylon* (L.) Pers
Vernacular name: Chadd
Family: Poaceae
Distribution: Kalat, Mangocher, Nimargh, Khuzdar, Zehri.
Part used: Whole plant
Folk medicinal uses: Whole plant is soaked in water and drunk early in the morning for stomach ulcer. Seeds are soaked in water and the decoction is used for motion.

Botanical name: *Dodonaea viscosa* (L.) Jacq.
Vernacular name: Anartirk/Hanartirk
Family: Spaindaceae
Distribution: Khuzdar, Wadh, Drakalo, Rustam Khan, Saroona.
Part used: Leaves, flowers and seeds
Folk medicinal uses: Leaves are boiled in water and mix one spoon of sugar and some coconut and use to cure chest infection. The leaves are soaked in water and extract is used for pimples, which release pus and makes pimples dry. Seeds, flowers and leaves are boiled in half liter of water and applied in the mouth of injured animals for three to four days. It is also used for wounds internally as well as externally.

Botanical name: *Ephedra intermedia* Stapf
Vernacular name: Naromb
Family: Ephedraceae
Distribution: Harboi, Nichara.
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and the decoction is used for asthma and chest infection. The decoction is also used for typhoid.

Botanical name: *Fagonia arabica* L.
Vernacular name: Karhkawa
Family: Zygophyllaceae
Distribution: Rodenjo, Wadh, Drakalo, Rustam Khan, Saroona, Shahdadza.
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and the patient of the hepatitis takes bath from this water. The decoction is also used for swelling of body, undiagnosed fever which damage kidney and liver diseases. It is also used for itching, pimples and purification of blood.

Botanical name: *Ferula oopoda* (Boiss. & Buhse) Boiss.
Vernacular name: Hing
Family: Apiaceae
Distribution: Harboi, Nichara.
Part used: Seeds, leaves and sap

Folk medicinal uses: The sap of the plant is called Ingapatric (in local language) is used to treat toothache. The seeds are boiled and decoctions are used for the cough of infants. The stem is boiled and used to kill intestinal worms.

Botanical name: *Gentianodes olivieri* (Griseb.) Omer, Ali and Qaiser
Vernacular name: Bhanghera/Bangera
Family: Gentianaceae
Distribution: Harboi, Nichara.
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and the decoction is used for jaundice, cough and chest problems. The whole plant is dried and grinded with *Ziziphora clinopodioides* and powder is used with honey for throat problems.

Botanical name: *Glycyrrhiza glabra* L.
Vernacular name: Madav/Khawzhdar
Family: Papilionaceae (Leguminosae)
Distribution: Kalat, Nichara.
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and the decoction is used for cough, chest problems and to reduce obesity.

Botanical name: *Haloxylon griffithii* (Moq.) Bunge ex Boiss.
Vernacular name: Bundi
Family: Chenopodiaceae
Distribution: Kalat, Surab, Zehri.
Part used: Flowers, leaves and fruits
Folk medicinal uses: The whole plant is boiled in water and the decoction is drunk for stomach pain and skin diseases. The leaves and fruits are boiled and put 4 drops from this decoction into the ear for ear ache. The stem of the plants is grinded into powder form and mixed with some oil to make a thick paste and massage on the body called (Logarh) in local language. It is also useful for measles (Soruk). The whole plant is boiled in water and takes bath from this water for measles.

Botanical name: *Heliotropium dasycarpum* Ledeb.
Vernacular name: Sagdaroo
Family: Boraginaceae
Distribution: Kalat, Nimargh, Zehri.
Part used: Leaves
Folk medicinal uses: The fresh plant extract is used for eye diseases.

Botanical name: *Hertia intermedia* (Boiss.) O. Ktze.
Vernacular name: Manguli
Family: Asteraceae
Distribution: Kalat, Mangocher, Nimargh, Harboi, Nichara, Surab, Zehri.

Part used: Leaves
Folk medicinal uses: In severe fever when mind become unconscious then warm leaves of the plant are tied on the head. Leaves of the plant, sugar and some oil are boiled and decoction is used to save abortion. Leaves are grinded and the paste is put on the head for headache. Leaves are boiled in water and the decoction is used for pain of stomach. Regular drinking of this decoction at night is useful for all sorts of problems of menstrual cycle.

Botanical name: *Jaubertia aucheri* Guill.
Vernacular name: Thusso
Family: Rubiaceae
Distribution: Khuzdar, Zidi, Wadh.
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and decoction is used for itching of body (lapharh). The whole plant is grinded to make in powder form and used for the effected gums. Dry powder of leaves and flowers are mixed in the milk of mother and give to the infant for indigestion and fever.

Botanical name: *Juniperus excelsa* M. B.
Vernacular name: Hapurhus/Apurs
Family: Cupressaceae
Distribution: Harboi , Nichara.
Part used: Seeds and leaves
Folk medicinal uses: Seeds of the plant are rubbed on a clean stone with water and use this water for eyes disease, with small piece of stick. Seeds are boiled in water and the decoction is used for chest infection and itching of body (Laphar).

Botanical name: *Malva neglecta* Wallr.
Vernacular name: Pochko
Family: Malvaceae
Distribution: Kalat, Mangocher, Harboi, Rodenjo, Nichara.
Part used: Whole plant
Folk medicinal uses: The leaves are grinded and mixed with some flour and water is knead to form ointment for skin diseases (it local Maram). Decoction of whole plant is used for diarrhea and dysentery.

Botanical name: *Microcephala lamellata* (Bunge) Pobed.
Vernacular name: Pehunphulli
Family: Asteraceae
Distribution: Kalat
Part used: Whole plant
Folk medicinal uses: The whole plant is boiled in water and the decoction is used for jaundice, long standing fever and colic pain. The whole plants is grinded and add some flour, mixed it with water to make a paste and put some oil and tie it on belly for night to cure the dysentery of children.

Botanical name: *Nannorrhops ritchieana* H. Wendl
Vernacular name: Piesh
Family: Aricaceae
Distribution: Wadh.
Part used: Fruits and leaves
Folk medicinal uses: Fruits are delicious and used as a tonic. Leaves are boiled in water and decoction is used for dysentery.

Botanical name: *Nepeta praetervisa* Rech. f.
Vernacular name: Simsok
Family: Lamiaceae
Distribution: Mangocher, Nimargh, Harboi, Nichara.
Part used: Leaves
Folk medicinal uses: The leaves are boiled in water and the decoction is used for cold and chest problems, and permanent usage is best for tuberculosis. Tea is made from the leaves is useful for fever, cold and dry cough.

Botanical name: *Oligomeris linifolia* (Vahl) Macbride
Vernacular name: Shootk
Family: Resedaceae
Distribution: Mangocher, Nimargh.
Part used: Seeds
Folk medicinal uses: Seeds are soaked in water and put some sugar in it. It is used to cure back pain, abnormal menstrual cycle and for motion of children.

Botanical name: *Peganum harmala* L.
Vernacular name: Kisankoor
Family: Zygophyllaceae
Distribution: Kalat, Mangocher, Gidar, Khuzdar, Wadh, Drakalo, Rustam Khan.
Part used: Leaves and seeds
Folk medicinal uses: Seeds are grinded to make it in powder form and used for pain of legs, and seeds are also chewed for stomach pain. The plant is burnt and the smoke is given to the patient of measles and the seeds are crushed and 2-3 drops of extract are poured in ear for earache.

Botanical name: *Perovskia abrotanoides* Karel
Vernacular name: Dresha
Family: Lamiaceae
Distribution: Kalat, Harboi.
Part used: Leaves, flowers and seeds
Folk medicinal uses: Flowers and leaves are boiled in water and the decoction is used to cure typhoid, headache and gonorrhoea. The whole plant is grinded and soaked it in water at night to takes bath from this water in the morning, which is useful in motion and vomiting of children.

Botanical name: *Perovskia atriplicifolia* Bth.
Vernacular name: Gowaridarna
Family: Lamiaceae
Distribution: Kalat, Harboi.
Part used: Whole plant
Folk medicinal uses: The plants upper tender shoots and flowers are dried and soaked in water over night and the decoction is given to diabetic patient to bring sugar level down. The decoction is also given to patients of chronic dysentery.

Botanical name: *Pistacia atlantica* Desf. subsp. *cabulica* (Stocks) Rech. f.
Vernacular name: Gowan
Family: Anacardiaceae
Distribution: Khuzdar
Part Used: Leaves, fruits and Gum
Folk medicinal uses: Leaves are boiled in water and the decoction is used for dysentery and cough. Gum of *Pistacia atlantica* Desf. subsp. *cabulica* and *Caralluma tuberculata* plant are cooked in a pot with water, dried and make powder of it , which is given for jaundice and gas trouble.

Botanical name: *Plantago lanceolata* L.
Vernacular name: Bar-e-Thang
Family: Plantaginaceae
Distribution: Kalat, Mangocher, Nimargh, Harboi, Rodenjo, Nichara, Surab.
Part used: Seeds
Folk medicinal uses: Leaves are grinded and applied on the chest for cough and chest diseases. The seeds are mixed in tea for the cough, cold and chest problem of children. Fresh leaves are mashed and put on wounds. The seeds are boiled in water and given to children for constipation.

Botanical name: *Plantago major* Aitch.
Vernacular name: Phidahri/Ispaghool
Family: Plantaginaceae
Distribution: Kalat, Mangocher, Saroona, Shahdadzai.
Part used: Seeds
Folk medicinal uses: Seed coat or husk is put in water or milk which is useful for constipation. The husk is soaked in water and mixed some sugar in it, which is used for the motion and dysentery.

Botanical name: *Psammogeton biternatum* Edgew.
Vernacular name: Izbotk
Family: Apiaceae
Distribution: Kalat, Harboi.
Part used: Whole plant
Folk medicinal uses: The whole plant is grinded to form powder, which is taken with water for undetected fever (mubaraki), the powder form

of the plant is mixed into flour and knead it with water to make bread of it and tie it on the head overnight for undetected fever. Whole plant is boiled in water and mixed some sugar in it and the decoction is used for cough, typhoid and chest problems.

Botanical name: *Prosopis cineraria* (Linn.) Druce
Vernacular name: Babbur
Family: Mimosaceae (Leguminosae)
Distribution: Khuzdar, Wadh
Part used: Stem
Folk medicinal uses: The hard coat of the stem is boiled to make a thick decoction and is used for the backache.

Botanical name: *Pteropyrum olivieri* Jaub. & Spach.
Vernacular name: Karwan Kush
Family: Polygonaceae
Distribution: Kalat, Harboi.
Part used: Leaves
Folk medicinal uses: The leaves are boiled and the decoction is used for the itching of children and to prevent excessive bleeding in menses.

Botanical name: *Rhazya stricta* Dcne.
Vernacular name: Aeshark/Aizhwarg
Family: Apocynaceae
Distribution: Khuzdar, Wadh, Saroona, Shahdadzai.
Part used: Whole plant
Folk medicinal uses: The dry leaves are grinded to make powder and keep the powder in mouth for a while for the blisters of mouth. The powder of the root is used to remove the intestinal worms and keep small amount from this powder on the effected teeth to remove the teeth infection. The decoction of the leaves and fruits are used for (Laphar) itching of the body. Roots are cooked on hot iron pan and made in powder form, which is used for the dysentery. The roots are soaked in water at night and early in the morning mix some sugar in it, which is very useful for jaundice.

Botanical name: *Saccharum bengalense* Retz.
Vernacular name: Kashum
Family: Poaceae
Distribution: Khuzdar, Wadh.
Part used: Roots
Folk medicinal uses: Dry roots are boiled in water and the decoction is used in the morning and evening with a teaspoon of pure ghee for severe stomach ache.

Botanical name: *Salvadora persica* L.
Vernacular name: Kabbarh/Kokar
Family: Salvadoraceae
Distribution: Khuzdar, Wadh, Rustam Khan.
Part used: Seeds and roots
Folk medicinal uses: Seeds in local language called “Kabbarh Na Pairoo”. The seeds are soaked in water and used for constipation. Decoction of leaves is used for cough and stomach pain. Grinded seeds of plants with a white onion are applied on area of scorpion bite.

Botanical name: *Salvia bucharica* M. Pop
Vernacular name: Gul-e-Kakar, Sursanda
Family: Lamiaceae
Distribution: Harboi, Nichara
Part used: Leaves and flowers
Folk medicinal uses: The whole plant is soaked in water and the decoction is used for colic pain, kidney pain, jaundice, malaria fever and high blood pressure.

Botanical name: *Salvia cabulica* Bth.
Vernacular name: Matetav
Family: Lamiaceae
Distribution: Kalat, Harboi.
Part used: Whole plant
Folk medicinal uses: The leaves are soaked in water and the decoction is used for stomach ache, fever and liver disorder.

Botanical name: *Scorzonera tortuosissima* Boiss.
Vernacular name: Shamahur/Shamahurk
Family: Asteraceae
Distribution: Kalat, Khuzdar
Part used: Roots, gum, flowers and leaves
Folk medicinal uses: Decoction of roots, barks, flowers and leaves are used for cough and chest problems. The gum of the plant is sweet in taste and chewed as chewing gum.

Botanical name: *Solanum nigrum* L.
Vernacular name: Tol angur
Family: Solanaceae
Distribution: Kalat, Mangochir, Surab.
Part used: Fruits and eaves
Folk medicinal uses: The decoction of the fruits is used for tonsillitis and decoction of the leaves is used for cold, cough, swelling of throat and chest problems.

Botanical name: *Solanum surattense* Burm. f.
Vernacular name: Bahera

Family: Solanaceae
Distribution: Khuzdar, Wadh.
Part used: Whole plant
Folk medicinal uses: Decoction of the whole plant is given to children for swelling of the body, paleness and for colic pain called "Kaza" (local language).

Botanical name: *Sophora mollis* (Royle) Baker subsp. *griffithii* (Stocks) Ali
Vernacular name: Shampashteer
Family: Papilionaceae (Leguminosae)
Distribution: Kalat, Mangochir, Harboi, Nichara, Surab.
Part used: Leaves
Folk medicinal uses: The decoction of the leaves are used to kill lice and also useful for healthy hairs. The leaves (fresh) are grinded and applied on the head for headache and healthy hairs.

Botanical name: *Tamarix stricta* Boiss.
Vernacular name: Kirri
Family: Tamaricaceae
Distribution: Khuzdar, Wadh.
Part used: Leaves, stem, gum
Folk medicinal uses: The powders of the leaves are mixed with some flour and cooked bread, tied this bread on the head for jaundice. The decoction of the stem is used to protect skin from infection. The gum of the plant (kirri shaker / kirri na susur) is grinded and powder is used with water for cough and chest problems.

Botanical name: *Tecomella undulata* (Sm.) Seem
Vernacular name: Purpak
Family: Bignoniaceae
Distribution: Khuzdar, Wadh
Part used: Stem and flowers
Folk medicinal uses: The decoction of the bark is used for constipation, stomach pain and abnormal menstrual cycle. Flowers are used to make tea which is beneficial for sterile women. The tea is taken for 3-4 days during menses. The flowers are soaked in water and the extract is taken to reduce thirst. The fresh leaves are grinded and paste placed on the head for migraine.

Botanical name: *Teucrium stocksianum* Boiss.
Vernacular name: Kalpora
Family: Lamiaceae
Distribution: Kalat, Harboi, Nichara.
Part used: Stem, flowers and leaves
Folk medicinal uses: The decoction of the stem and leaves is used for undiagnosed fever. The whole plant is soaked in water for night and the decoction is taken early in the morning for typhoid and knee ache. Decoction of the leaves is also used for jaundice and typhoid.

Botanical name: *Thymus linearis* Benth. subsp. *hedgii* Jalas
Vernacular name: Tormori
Family: Lamiaceae
Distribution: Kalat
Part used: Whole plant
Folk medicinal uses: The decoction of the whole plant is used for typhoid and cough. The plant is grinded to make powder and add some oil and then applied on the body for typhoid fever.

Botanical name: *Tribulus terrestris* L.
Vernacular name: Gurguduk/Gurgundoo
Family: Zygophyllaceae
Distribution: Kalat, Khuzdar
Part used: Seeds
Folk medicinal uses: Seeds are soaked in water and the decoction is used for stomach pain, backache and for removal of kidney stones. Seeds are also eaten for constipation.

Botanical name: *Trichodesma africanum* (L.) R. Br.
Vernacular name: Charmahing
Family: Boraginaceae
Distribution: Saroona, Shahdadzai.
Part used: Leaves and fruits
Folk medicinal uses: The decoction of the plant is used for serious cough and chest problems.

Botanical name: *Vitex agnus-castus* L.
Vernacular name: Gowanik
Family: Verbenaceae
Distribution: Khuzdar, Wadh.
Part used: Whole plant
Folk medicinal uses: Seeds are boiled in water and the decoction is used for stomach pain and kidney stone. The decoction of the leaves is useful for jaundice and the decoction of the fruits is also useful for menstrual cycle.

Botanical name: *Withania coagulans* Dunal
Vernacular name: Panirbank/Panirbad
Family: Solanaceae
Distribution: Khuzdar
Part used: Fruit and seeds
Folk medicinal uses: Fruits and seeds are soaked in water at night and taken the extract early in the morning for purification of blood, gastric trouble and face pimples. Seeds are also chewed for purification of blood.

Botanical name: *Zataria multiflora* Boiss.
Vernacular name: Izghand

Family: Lamiaceae
Distribution: Nichara.
Part used: Stem and leaves
Folk medicinal uses: The whole plant is grinded, boiled in water and the decoction is used for cough and gastric problem. The tea of Izghand and Simsok together are useful for cough and chest problems.

Botanical name: *Ziziphora clinopodioides* Lam.
Vernacular name: Mashana Poorchink/Tilmoori/Yak talia porching
Family: Lamiaceae
Distribution: Harboi
Part used: Whole plant
Folk medicinal uses: The whole plant is soaked in water and the decoction is given to the children to reduce thirst. It is also useful for motion and vomiting of children and for gastric problems.

Botanical name: *Zozimia absinthifolia* (Vent.) Link
Vernacular name: Gowatk
Family: Apiaceae
Distribution: Bhagh Bana, Zidi, Pir Umar.
Part used: Seeds
Folk medicinal uses: The seeds are boiled in water and the decoction is used for throat problems and to reduce the thirst of children.

Discussion

In Indo-Pak first record of plant medicine were compiled in Rig Veda between 4500-1600 BC and Ayurveda, 2500-600 BC. This system traces its origin to Greek medicine, which was adopted by Arabs and then spread to India and Europe (Ahmad, 1999). People living in tribal localities and in villages are using indigenous plants as medicines from long ago because this knowledge passed from generation to generation, and is based on experience (Shinwari and Khan, 1998). Pakistan is bestowed with a unique biodiversity, comprising of 9 major ecological zones. Due to its salubrious climate, Pakistan is quite rich in medicinal herbs which are scattered over a large area. The country has about 6,000 species of wild plants of which about 400-600 are considered to be medicinally important (Hamayun *et al.*, 2005). Out of which only 1010 species are so far identified as having medicinal value. Of these 456 medicinal plants are traded in the domestic market and their sustainability and availability never cease to exhaust and form a potential source for the indigenous herbal industry (Usmaghani, 1997). However Pakistan still imports a fair amount of medicinal plants for its drug industry and local use. It indicates a potential use of medicinal plants in Pakistan.

The plants are used by local inhabitants for many diseases like jaundice, cold, cough, stomachache, headache, diarrhea, gonorrhea, dysentery, eyes and skin diseases, kidney pain, toothache, typhoid, for hair, abortion purposes, sun stroke, joints pain, swelling of body, purification of blood, constipation, intestinal worms, pimples and many other ailments. The area has great potential for its natural resources. Women of the area possessed sufficient knowledge of various ailments. The ethnobotanical knowledge in the area is gradually being passed on from generation to generation. Medicinal plants are

used in the crude form locally and also transported to the market of Quetta and other parts of the country. Awareness among local inhabitants was created to conserve and wisely use of the plants. There are a large number of plants whose medicinal evaluation is yet to be done. Most of medicinal and aromatic plants are reported in this survey still need detail chemical investigation for the confirmation of active ingredients which are used for the treatment of various diseases by local people. Most of species listed are under severe threat and are being rapidly depleted due to drought, cutting, overgrazing, deforestation, urbanization, negligence and over exploitation. Rehabilitation management, good governance and conservation of these plants are urgently needed to control severe genetic erosion and depletion of useful genotypes from the population.

Herbal medicine is a recognized system of medicine throughout the world. For centuries, it has been the major form of treating illnesses. Recent introduction of orthodox or allopathic medicine, the knowledge, skills, and faith in Herbal medicine have somewhat sadly declined. In the tribal society of Balochistan, generally women are much involved in the domestic affairs including agriculture, collection of fodder, fuel and medicinal plants. As our study revealed that they possessed sufficient knowledge of medicinal plants. The older women of the community were found to be more knowledgeable than their younger counterparts. It indicates that folk knowledge is disappearing rapidly and the present effort will be helpful to promote awareness in the history of folk medicine in Balochistan. Hence there is an urgent need to document indigenous knowledge. In all areas surveyed, the number of medicinal plants actually known by the women was higher than that of men. In many areas the knowledge of the women was highly credible, in that they were able to give a comprehensive account about numerous medicinal herbs, with details of parts used and treatment regimes. However, this was an initial effort to document some folk uses of medicinal plants used by the women in this area. Despite the vast knowledge of medicinal plants existed in the area, very few attempts had been carried out to document ethnobotanical knowledge in Balochistan. However (Goodman and Ghafoor, 1992) investigated the ethnobotany of southern Baluchistan with particular reference to medicinal plants.

By comparing present applications of medicinal plants with available literature reported from other regions of Pakistan and Balochistan it appears that there are many medicinal uses for the treatment of various ailments in the study areas were rarely reported before this. Present investigation shows that extract of *Achillea wilhelmsii* is used for farting, stomach pain, fever, motion and jaundice, while (Jan *et al.*, 2009) and (Shah *et al.*, 2006) reported that *Achillea millefolium* is used as a diuretic, a stimulant, for piles, cold and to stop perspiration. In Kalat and Khuzdar roots and sap of *Berberis baluchistanica* is used for the treatment of joint pain and injury, which is in accordance as mentioned by (Inam *et al.*, 2000); (Shah and Khan 2006); (Hussain *et al.*, 2008) and (Abbasi *et al.*, 2009). *Calotropis procera* is used to cure snake and insect bite (Shah *et al.*, 2006); (Hussain *et al.*, 2008) and (Abbasi *et al.*, 2005) reported that same plant is used to cure asthma, abdominal diseases, joint, waist pain, backache, cough, piles, rheumatism, skin infection and malaria. Whole plant extract from *Cynodon dactylon* is used for stomach ulcer and motion in the study areas. Same species was found astringent, diuretic, demulcent, laxative, haemostatic, useful against leprosy, cuts, wounds, piles and eye ache (Arshad and Akram 1999); (Shinwari and Khan, 1998); (Dastagir, 2001); (Ahmad *et al.*, 2007) and (Ahmad and Husain, 2008). Leaves, flowers and seeds of *Dodonaea viscosa* were found useful for pimples and injuries, while same plant was found astringent, toothache, febrifuge to cure swelling, burns, wounds and rheumatism

(Haq and Hussain, 1995); (Badshah *et al.*, 1996); (Dastagir, 2001) and (Hussain *et al.*, 2008). Leaves and seeds of *Peganum harmala* are used to cure leg and stomach pain, measles and earache in the study sites while the same plant was reported to be useful for asthma, joint pain, bones crakes and anti-phlegmatic (Shah *et al.*, 2006). Seeds of *Plantago major* are used for abdominal problems, while (Abbasi *et al.*, 2005) reported that same plant is used against cough, asthma and phlegm. In Kalat and Khuzdar fruits and leaves of *Solanum nigrum* are used to treat tonsillitis, swelling throat, cold, cough, earache, and chest problems, while (Shah *et al.*, 2006); (Ahmad *et al.*, 2007) mentioned that this plant is used to cure flu, cough, fever, stomach diseases, burnt skins and wounds. Decoction from whole plant of *Solanum surrantense* is given against swelling, colic pain, paleness and joint problems. Same plant species was reported to be useful against toothache, fracture, cough and asthma (Abbasi *et al.*, 2005). Stem and flowers decoction of *Tecomella undulata* is useful against constipation, abnormal menstrual cycle and stomach pain. According to (Shah *et al.*, 2006) bark of the same plant is useful for abdominal diseases. Present uses of *Tribulus terrestris*, *Withania coagulans* are in accordance to as reported by (Shah *et al.*, 2006) and (Hussain *et al.*, 2008). Seeds, leaves and fruits of *Vitex agnus-castus* were found useful against stomach pain, motion, jaundice, kidney stone and menstrual cycle. (Haq and Hussain, 1993) and (Abbasi *et al.*, 2005) reported that same plant species is useful against skin infections. *Ziziphora clinopodioides* is used for motion and vomiting of children and for gastric problems. (Ali & Qaiser, 2009) has reported the similar result for *Ziziphora clinopodioides*. It was found that diagnostic techniques were often very primitive. Diseases such as diarrhea, dysentery, skin infections, bites, dysmenorrheal, rheumatism etc, were obviously easily diagnosed by the old men and ladies. General physical condition and tongue or eyes color of the patient are used as indicators of the patient's problem. For external use, poultices, lotions, and the dried ground herb have been used topically. Fresh and dried plant parts were both used. The optimal method for drying herbs according to (Bartarm, 1995) is to spread the unwashed, dust-free, organic plants out on racks in a well ventilated room away from sun lights, and excessive heat.

Often the women had difficulties in answering the questions. For example, sometimes when a male would enter the surveying area, the female would stop talking, give very vague answers, or contradict her previous statements.

Conclusions and Recommendations

The vast area and varied agro-climatic conditions of the area make it possible for almost all different kinds of medicinal plants in particular and other useful plants in general to grow. Plantation of medicinal plants and other useful plants can play an important role in Kalat and Khuzdar areas, in particular and our country's economy in general, by earning valuable foreign exchange and fulfilling our domestic requirements. Because every year a considerable amount of foreign exchange is involved in the import of the drugs and other products of foreign origin. The utilization of indigenous drug resources (Medicinal Plants) will increase the importance of the drugs and other products of foreign origin. The utilization of indigenous drug resources (Medicinal Plants) will increase the importance of the local industry on the one hand and will minimize the expenditure incurred on the purchase of foreign drugs on the other. It can also provide direct and indirect employment to a large number of people and also by supporting a number of herbs-based industries. In view of the present study of indigenous knowledge

about folk medicine and other useful plants, research, development and conservation efforts should be focused on these plants. It is proposed to established comprehensive research project to boost up the production of medicinal and other useful plants in this area. For sustainable and long term conservation of natural resources of the area, there is a need to actively involve the acquiescence of local people in evaluation, planning, implementation and monitoring process as they are the best judges of the area. Further research should be carried out in the field of phyto-chemistry, pharmacology and biotechnology of these resources in order to sustainable and long term development in these areas. As indicated from the folk uses of the area mostly related to the ailments of digestive system, stomach problems, fever, liver problems, diabetes and ailments of children. Some of the common problems of present time such as diseases of cardiovascular system, ailments of kidney, hepatitis C and the other problematic ailments of this century such as HIV virus and bird flue are not treated by the ethnic tribes. Tradition knowledge is generally passed on / transmitted from herbalist (Hakims) and Saniasi or Jogies (Traditional herbalists).

At present time transmission of such knowledge from herbalists to folks had been tremendously decreased. However due to the involvement of ethnobotanical research, awareness in the local community and overall global trend towards resurgence of the transmission of knowledge from the herbalist to local community has been initiated. As we learn from the history of traditional herbalist or jogi do not tell the specific prescription to the local people as is indicated from the present research and many parallel studies in the field that most of the prescription possessed by the folks are related to the problems of digestive systems fever or cough etc.

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