

ETHNOMEDICINAL REVIEW OF FOLKLORE MEDICINAL PLANTS BELONGING TO FAMILY APIACEAE OF PAKISTAN

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Abstract

The use of herbs for therapeutic purpose is as old as human history. In Pakistan a major part of population is dependent on the traditional medicine derived from plants for primary health care system. The interest in the use of traditional system of medicine has gained popularity globally. The developed countries are shifting their focus to further research based on the indigenous knowledge collected from aboriginal people. The present study reviews the ethno-medicinal uses of family Apiaceae reported from Pakistan. Out of 167 species reported from Pakistan, 66 are found to be used medicinally. Most commonly treated disorders by use of Apiaceae herbal flora are gastrointestinal tract and liver disorders (28%) followed by cough, cold and respiratory tract problems (11%). The plant parts frequently used are roots (22%) followed by whole plant material (19%), leaf material (18%), fruit (13%), seed (12%), stem, flower, aerial parts (5%) and sap (1%). It is suggested to carry out similar studies for other families to explore the indigenous knowledge for the development of commercial products and to collectively document the scattered existing knowledge.

Key words: Apiaceae, Herbal medicine, Traditional treatments, Pakistan.

Introduction & Background

The traditional methods of healing have been adopted by mankind since ancient times. Despite all the developments and advancements which have been achieved by today's modern science, these traditional treatments are still in use. Traditional healing treatments refers to collective knowledge, skills and practices that are based on the theories, values, and personal experiences developed and used by indigenous people of different cultures to improve health, avoid and reduce disease and its spread, or for complete cure of both physical and mental health (Fabricant & Farnsworth, 2001). The most common practices of traditional health care include traditional Chinese medicine, Ifa, Muti, Acupuncture, traditional African medicine, ancient Iranian medicine, Unani, Siddha medicine, Islamic medicine, Ayurveda, traditional Korean medicine and herbal medicine (<http://ic.steadyhealth.com/>). According to an estimate 80% of the developing countries while half of the industrialized world population is dependent on traditional medicine (Bodeker & Fredi, 2002). Herbalism also termed as herbal medicine is the therapeutic or medicinal use of herbaceous plants or the products obtained from these herbs. Any part of the plant can be used as herbal medicine but the most common parts used are leaves, bark, seeds, roots, fruits and flowers. They are swallowed, eaten, inhaled, drunk or used as a topical application to skin (Acharya & Shrivastava, 2008; Fabricant & Farnsworth, 2001). The herbal medicine is a worldwide growing industry. Out of the 32,000 species of higher plants (Prance, 2001) more than 10 percent are used in different medicinal preparations. According to some estimates global marketing of medicinal plants may reach \$5 trillion by 2050 (Shinwari, 2010). Therefore, herbal remedies are being opted by a huge proportion of globe's population and the original knowledge and worth of information about these plants is cherished by the aboriginal and tribal population (Gul *et al.*, 2012; Sarwat & Ahmad, 2012; Nadeem *et al.*, 2013; Shinwari *et al.*, 2013).

Pakistan has an area of 80,943 km², lies between 60° 55' to 75° 30' E longitude and 23° 45' to 36° 50' N latitude and an altitude that ranges from 0 to 8611 m. This great variation in geographical diversity has led to immense biodiversity. Out of 6,000 higher plant species found in Pakistan 600 to 700 are reported to be used medicinally comprising different plant families (Shinwari, 2010). Anon., (2001) reported that in Pakistan, the major traditional healing system is Unani system of medicine which is being used for treatment of a large number of diseases through local medicinal flora. About 66% of Pakistani population resides in rural areas (Population Reference Bureau, 2003). Majority of the people residing in rural area (70-80%) depend on herbal medicines. There are 45,000 traditional healers in Pakistan. Three-quarters of the traditional healers are practicing in rural areas (Gilani, 1992). Their presence in rural area shows that their services are provided mostly to rural population of Pakistan. The public and private sector in urban and rural areas holds about 52,600 registered Unani medical practitioners. Provincial governments have set up the health departments wherein approximately 360 tibt dispensaries and clinics are facilitating to public with free medication (Rahman, 2003). Pakistan has emerged as the 8th largest exporter of medicinal flora for herbal medicines (Hussain *et al.*, 2006).

The study of use of local flora of a particular region or culture by native people is termed as ethnobotany. The native population of different regions of Pakistan use the plants in their locality for different purposes since ancient times. From generation to generation this wealth of knowledge has been transferred. This medicinal flora is used for the treatment of a wide range of diseases, from headache to stomach ache, cuts and wounds (Bhardwaj & Gakhar, 2005). Although there are different systems of Unani, Ayurvedic (Eastern medicines) which are prevailing even today for primary health care by exploring medicinal properties of plants,

yet there are serious threats of loss to this precious wealth of indigenous knowledge. Not only the proper documentation of this knowledge is required but also the conservation strategies (ex-situ and in-situ measures) should be carried out to deal with the ongoing loss of medicinal plants (Shinwari & Gilani, 2003; Shinwari & Qaiser, 2011).

The present authors have reviewed the already documented ethno-medicinal importance of Apiaceae species found in Pakistan (Fig. 1). The scattered information has been collected from reported literature and compiled here in a single document. Family Apiaceae also known as Umbelliferae is a family of flowering plants comprising 300 to 462 genera and 2,500 to 3,750 species (Cronquist, 1981; Pimenov & Leonov, 1993). The general structure of plants belonging to this family is uniform all over the world. The family is characterized by its inflorescence that is always umbel but rarely in genera like *Blwlesia*, *Centella*, *Hydrocotyle* and *Dorema* it is or appears to be simple umbel (Nasir, 1972). Some species of Apiaceae are used as foods and spices. Some due to the presence of aromatic compounds in

leaves and fruits are used medicinally (Heywood, 1993). Thirty four genera and 123 species of Apiaceae have been reported to possess healing value (Jiaxiang, 1997). There is no document that has the combined medicinal uses of Apiaceae listed though there are many studies that have the ethnomedicinal uses of few species of Apiaceae (Kala, 2005; Hamayun, 2007; Kagyung *et al.*, 2010; Rai & Lalramnghinglova, 2010; Akhtar *et al.*, 2013; Ahmad *et al.*, 2013).

Among the 167 species found in Pakistan (Nasir, 1972), 66 were found to have been used medicinally by different cultures across the world (Table 1). Root was found to be the most used part of these plants followed by whole plant material (19%). Other parts used are leaf material (18%), fruit (13%), seed (12%), stem, flower and aerial parts (5%) and sap (1%) (Fig. 2). Different syndromes that are cured by Apiaceae species are summarized in Table 2. As shown in Fig. 3, these plants are mostly used for treating gastro intestinal tract disorders and liver disorders (28%) followed by cough, cold and respiratory tract problems (11%).



Fig. 1. Study area (Pakistan) shown on globe (Courtesy: Google images).

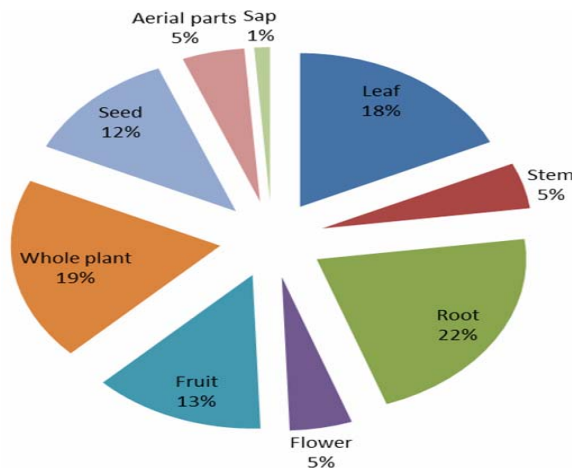


Fig. 2. Different parts of the plants utilized for different disorders.

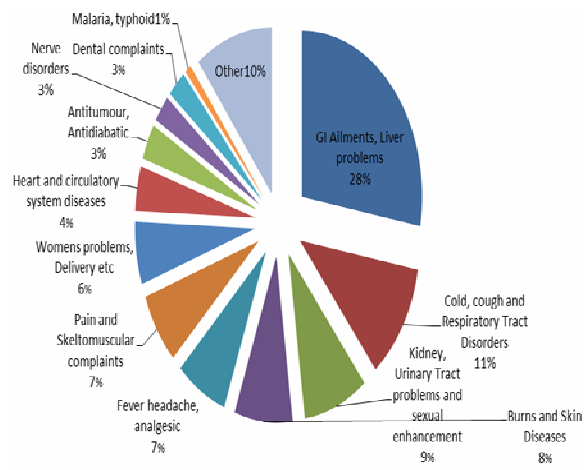


Fig. 3. % age of different syndromes being treated by medicinal plants belonging to family Apiaceae.

Table 1. Ethnomedicinal importance of plant species (Apiaceae) belonging to Pakistan.

S. #	Botanical name	Folk name	Habit	Part used	Ethnomedicinal importance	Literature cited
1.	<i>Anmi majus</i>	Ajowain desi	Herb	Whole plant	Leukoderma vitiligo and psoriasis.	Fabricant & Farnsworth, 2001
2.	<i>Anmi visnaga</i>	Spairkai	Herb	Whole plant	Colic and gastrointestinal cramps, kidney stones, cough and whooping cough, asthma, bronchitis, hypertension, cardiac arrhythmias, mild angina, congestive heart failure, atherosclerosis and hypercholesterolemia, diuretic and for relieving liver and gall bladder disorders, vitiligo, psoriasis, wound healing, inflammation conditions and poisonous bites, painful menstruation.	Abdel-Fattah <i>et al.</i> , 1983; Rose & Hulburd, 1992; Bisset, 1994; Satrami <i>et al.</i> , 2004; Valkova <i>et al.</i> , 2004; WHO, 2007
3.	<i>Anethum graveolens</i>	Sosy	Herb	Seed	Antihypertensive, stomachache, digestive disorders, enteritis, carminative.	Ilker <i>et al.</i> , 2009
4.	<i>Angelica archangelica</i>		Herb	Root	Gastrointestinal disorders, respiratory tract, nervous system, and also against fever, infections, and flu.	Vogl <i>et al.</i> , 2013
5.	<i>Angelica galauca</i>	Choru	Herb	Whole plant, Root	Cardio active, useful in constipation, cure stomach troubles, bilious complaints, menorrhagia, infantile atrophy and as a stimulant.	Chopra <i>et al.</i> , 1956; Anonymous, 1985
6.	<i>Anthriscus nemorosa</i>		Herb	Fruit, Stem	Gastrointestinal ailments, carminative.	Nickavar <i>et al.</i> , 2009; Altundaga & Muntir, 2011
7.	<i>Apium graveolens</i>	Karfias	Herb	Root	Diuretic, analgesic.	Shah & Khan, 2006
8.	<i>Apium leptophyllum</i>	Ajmoda	Herb	Flower	Antirheumatic, antinephritic, carminatives and also useful in the prevention of tumor, anorexia, vomiting and colic pain.	Saraswathy <i>et al.</i> , 2004; Arambarri <i>et al.</i> , 2005; Walck <i>et al.</i> , 2008; Barboza <i>et al.</i> , 2009; Ronse <i>et al.</i> , 2010
9.	<i>Banimum cylindricum</i>		Herb	Fruit	Carminative.	Amiri & Joharehi, 2013
10.	<i>Banimum persicum</i>	Kala zcera	Herb	Fruit	Indigestion, gastrointestinal disturbances and abdominal pain.	Ali & Qaiser, 2009
11.	<i>Bupleurum falcatum</i>		Herb	Whole plant	Anti-inflammatory, anti-tumor, immunomodulatory, estrogen like activities, anti-allergic activities.	Chen <i>et al.</i> , 2003
12.	<i>Bupleurum hamiltonii</i>		Herb	Aerial Parts, Root	Used for fever. Roots are boiled with water and decoction is taken for treating cough and influenza.	Devi <i>et al.</i> , 2013
13.	<i>Bupleurum lanceolatum</i>		Herb	Root, Leaf	Gastric problems.	Kala, 2010
14.	<i>Bupleurum longicula</i>		Herb	Root	Liver troubles and as a diaphoretic. It is also effective in thoracic and abdominal inflammation and fever. Useful in flatulence and indigestion. It is used in malaria and various other fevers.	Qureshi <i>et al.</i> , 2007
15.	<i>Carum carvi</i>	Zira siyah	Herb	Fruit	Gastrointestinal ailments including dyspepsia, various spasmodic conditions, bloating, diarrhea, flatulent colic.	Minayian <i>et al.</i> , 2012
16.	<i>Centella asiatica</i>	Ghohtapre	Herb	Whole plant	Cuts and wounds, snake bites, skin diseases.	Hasan <i>et al.</i> , 2013

Table I. (Cont'd.).

S. #	Botanical name	Folk name	Habit	Part used	Ethnomedicinal importance	Literature cited
17.	<i>Chaerophyllum aromaticum</i>		Herb	Whole plant, Root, Leaf	Indigestion.	Singh, 2009
18.	<i>Chaerophyllum villosum</i>		Herb	Seed, Leaf	Cold, cough and stomach pain caused by cold.	Singh, 2012
19.	<i>Chaerophyllum reflexum</i>		Herb	Stem	Kidney and urinary disorders.	Ballabh <i>et al.</i> , 2008
20.	<i>Cortandrum sativum</i>	Dhania	Herb	Fruit, Leaf	Used for treating flatulence, dysentery, diarrhea, cough, stomach problems, jaundice and vomiting.	Khan & Khatoon, 2008
21.	<i>Cortia depressa</i>		Herb	Flower, Leaf	Fever, rheumatism, sedative and stomachache.	Pandey, 2006
22.	<i>Cuminum cyminum</i>	Zeera Sufaid	Herb	Seed	Knee and waist pain.	Hasan <i>et al.</i> , 2012
23.	<i>Cuminum stellatum</i>		Herb	Seed	Carminative.	Safarnejad <i>et al.</i> , 2011
24.	<i>Daucus carota</i>	Gagar	Herb	Root	Burns, scalds.	Shah & Khan, 2006
25.	<i>Dorena ammoniacum</i>		Herb	Root	Expectorant, anthelmintic, emmenagogue, anticonvulsion.	Amiri & Joharchi, 2013
26.	<i>Eryngium billardierei</i>		Herb	Root	Constipation.	Mosaddegh, 2012
27.	<i>Ferula assa-foetida</i>		Herb	Root	Sexual tonic to encourage potency.	Kassis <i>et al.</i> , 2009
28.	<i>Ferula communis</i>		Herb	Leaf	Analgesic, cardio-kinetic, nervous stimulant.	Tiwari, 2008
29.	<i>Ferula narthex</i>	Hing	Herb	Whole Plant	Used for cough, asthma, gastric problems, toothache and anti-constipation.	Ali & Qaiser, 2009
30.	<i>Ferula oopoda</i>	Hing	Herb	Seed, Leaf, Sap	The sap of the plant 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.	Tareen <i>et al.</i> , 2010
31.	<i>Ferula ovina</i>		Herb	Root	Antitumor.	Matin <i>et al.</i> , 2014
32.	<i>Foeniculum vulgare</i>	Saunf	Herb	Leaf, Seed	Antidiabetic.	Shah & Khan, 2006
33.	<i>Heracleum candicans</i>	Ichflah	Herb	Whole Plant, Seed	Cold, cough, nerve disorders and sexual problems.	Khan & Khatoon, 2008; Hasan <i>et al.</i> , 2013
34.	<i>Heracleum canescens</i>		Herb	Root	Root paste used for skin problem.	Devi <i>et al.</i> , 2013
35.	<i>Hydrocotyle javanica</i>		Herb	Whole Plant	Dysentery, indigestion, fever.	Pant & Samant, 2010
36.	<i>Ligusticum thomsonii</i>	Korshidone	Herb	Root	Powdered root is used for toothache and bleeding from gums.	Noor <i>et al.</i> , 2012
37.	<i>Lisaea heterocarpa</i>	Khar sefid	Herb	Aerial Parts	Antiseptic, wound healing, astringent.	Mojab <i>et al.</i> , 2010
38.	<i>Oenanthe javanica</i>		Herb	Stem	Indigestion.	Kala, 2005
39.	<i>Petroelinum crispum</i>		Herb	Fruit	Emmenagogue, diuretic, carminative, kidney disorders.	Amiri & Joharchi, 2013
40.	<i>Petroelinum sativum</i>		Herb	Leaf	Skin emollient, diuretic, stomach pain.	Tiwari, 2008
41.	<i>Pimpinella acuminata</i>		Herb	Whole Plant	Diarrhea, dysentery.	Rana & Samant, 2011
42.	<i>Pimpinella diversifolia</i>		Herb	Fruit	Cough and cold.	Balami, 2004

Table 1. (Cont'd.).

S. #	Botanical name	Folk name	Habit	Part used	Ethnomedicinal importance	Literature cited
43.	<i>Pimpinella stewartii</i>		Herb	Fruit	Fruits are used as carminative and other stomach diseases.	Awan <i>et al.</i> , 2013
44.	<i>Pleurospermum brunonis</i>		Herb	Stem	The powder of the flowering shoot is mixed with fresh cows butter and massaged over the entire body to allay fever.	Sharma <i>et al.</i> , 2005
45.	<i>Pleurospermum candolei</i>		Herb	Fruit	Dyspepsia, flatulence, renal pain, stomachache.	Rana & Samant, 2011
46.	<i>Pleurospermum hookeri</i>		Herb	Root	Diarrhea.	Manandhar, 1993
47.	<i>Pleurospermum stellatum</i>		Herb	Whole Plant	The plant material is burnt on fire and ash of the plant is mixed with butter and applied on tongue to cure stomatitis.	Srivastava <i>et al.</i> , 1992
48.	<i>Pleurospermum stylosum</i>		Herb	Whole Plant	Plant material is dried, crushed and the powder is given to pregnant ladies to reduce the pain during delivery.	Singh, 2008
49.	<i>Prangos pabularia</i>		Herb	Root, Seed	Indigestion and carminative.	Ballabh & Chaurasia, 2009
50.	<i>Psammogeton biternatum</i>	Izbook	Herb	Whole Plant	Malaria, cough, typhoid and chest problems.	Tareen <i>et al.</i> , 2010; Manzoor <i>et al.</i> , 2012
51.	<i>Psammogeton canescens</i>		Herb	Aerial Parts	Antioxidant, dermatological use as anti-bacterial.	Kazemi & Hajar, 2015
52.	<i>Scandix iberica</i>		Herb	Flower	Rheumatic pain.	Yesilada <i>et al.</i> , 1993
53.	<i>Scandix pecten-veneris</i>	Buti	Herb	Aerial Parts	Palpitation, blood coagulation, body pains.	Mosaddegh, 2012
54.	<i>Selinum candollei</i>		Herb	Whole Plant	Tonic.	Rana & Samant, 2011
55.	<i>Selinum tenifolium</i>		Herb	Whole Plant	Nervine, sedative.	Pant & Samant, 2010
56.	<i>Selinum vaginatum</i>		Herb	Root	Skin diseases.	Sharma <i>et al.</i> , 2005
57.	<i>Selinum wallichianum</i>	Bhutkesh	Herb	Whole Plant	Cold, cough.	Hasan <i>et al.</i> , 2013
58.	<i>Seseli libanotis</i>		Herb	Root	Rheumatic disorders.	Adams <i>et al.</i> , 2009
59.	<i>Torilis arvensis</i>	Sultani butay	Herb	Leaf, Flower	For curing snake bites.	Matin <i>et al.</i> , 2001
60.	<i>Torilis japonica</i>		Herb	Fruit	Lymphadenitis, rheumatism, impotence, infertility, women's diseases, chronic diarrhea, carbuncle.	Ji <i>et al.</i> , 2004; Park <i>et al.</i> , 2006
61.	<i>Torilis leptophylla</i>		Herb	Leaf	Gastrointestinal disorders.	Abbasi <i>et al.</i> , 2013
62.	<i>Torilis nodosa</i>	Atra batra	Herb	Leaf	For liver disorders.	Matin <i>et al.</i> , 2001
63.	<i>Trachydium roylei</i>	Mushen	Herb	Leaf	Antidote, scorpion stings.	Ali & Qaiser, 2009; Shah & Hussain, 2012
64.	<i>Trachyspermum ammi</i>	Ajowain	Herb	Seed	Diarrhea, dysentery, cholera, colic and indigestion, bronchitis, asthma and common colds, cough. Oil extracted from seeds is useful in rheumatism.	Hussain <i>et al.</i> , 2008
65.	<i>Turgenia latifolia</i>		Herb	Fruit, Leaf	Relieves pain in children.	Akan <i>et al.</i> , 2008
66.	<i>Zosina absinthifolia</i>	Gowak	Herb	Leaf, Seed	Diabetes, the decoction obtained from boiled seeds is used for treating throat problems and to reduce the thirst of children.	Tareen <i>et al.</i> , 2010

Table 2. Syndromes which are reported to be cured by medicinal species of family Apiaceae.

Syndromes	Species
Gastrointestinal ailments, liver problems	<i>Ammi visnaga</i> , <i>Angelica archangelica</i> , <i>Anethum graveolens</i> , <i>Angelica galauca</i> , <i>Anthriscus nemorosa</i> , <i>Apium leptophyllum</i> , <i>Bunium cylindricum</i> , <i>Bunium persicum</i> , <i>Bupleurum lanceolatum</i> , <i>Bupleurum longicule</i> , <i>Carum carvi</i> , <i>Chaerophyllum aromaticum</i> , <i>Coriandrum sativum</i> , <i>Cortia depressa</i> , <i>Cuminum stellatum</i> , <i>Eryngium billardierei</i> , <i>Ferula narthex</i> , <i>Hydrocotyle javanica</i> , <i>Oenanthe javanica</i> , <i>Petroselinum crispum</i> , <i>Petroselinum sativum</i> , <i>Pimpinella acuminata</i> , <i>Pimpinella stewartii</i> , <i>Pleurospermum candolei</i> , <i>Pleurospermum hookeri</i> , <i>Pleurospermum stellatum</i> , <i>Prangos pabularia</i> , <i>Torilis japonica</i> , <i>Torilis leptophylla</i> , <i>Trachyspermum ammi</i> , <i>Torilis nodosa</i> , <i>Bupleurum longicule</i>
Cold, cough and respiratory tract disorders	<i>Ammi visnaga</i> , <i>Angelica archangelica</i> , <i>Bupleurum hamiltonii</i> , <i>Bupleurum longicule</i> , <i>Chaerophyllum villosum</i> , <i>Dorema ammoniacum</i> , <i>Ferula narthex</i> , <i>Ferula oopoda</i> , <i>Heracleum candicans</i> , <i>Pimpinella diversifolia</i> , <i>Psammogeton biternatum</i> , <i>Selinum wallichianum</i> , <i>Trachyspermum ammi</i>
Kidney, urinary tract problems and sexual enhancement	<i>Ammi visnaga</i> , <i>Apium graveolens</i> , <i>Apium leptophyllum</i> , <i>Chaerophyllum reflexum</i> , <i>Petroselinum crispum</i> , <i>Petroselinum sativum</i> , <i>Pleurospermum candolei</i> , <i>Ferula assa-foetida</i> , <i>Heracleum candicans</i> , <i>Torilis japonica</i>
Burns and skin diseases	<i>Ammi majus</i> , <i>Ammi visnaga</i> , <i>Centella asiatica</i> , <i>Daucus carota</i> , <i>Heracleum canescens</i> , <i>Petroselinum sativum</i> , <i>Psammogeton canescens</i> , <i>Selinum vaginatum</i> , <i>Torilis japonica</i>
Fever, headache, analgesic	<i>Angelica archangelica</i> , <i>Apium graveolens</i> , <i>Bupleurum hamiltonii</i> , <i>Bupleurum longicule</i> , <i>Cortia depressa</i> , <i>Ferula communis</i> , <i>Hydrocotyle javanica</i> , <i>Pleurospermum brunonis</i>
Pain and skeletomuscular complaints	<i>Apium leptophyllum</i> , <i>Cortia depressa</i> , <i>Cuminum cyminum</i> , <i>Scandix iberica</i> , <i>Scandix pecten-veneris</i> , <i>Seseli libanotis</i> , <i>Torilis japonica</i> , <i>Trachyspermum ammi</i>
Women problems, delivery etc.	<i>Ammi visnaga</i> , <i>Angelica glauca</i> , <i>Bupleurum falcatum</i> , <i>Dorema ammoniacum</i> , <i>Petroselinum crispum</i> , <i>Torilis japonica</i> , <i>Pleurospermum stylosum</i>
Heart and circulatory system diseases	<i>Ammi visnaga</i> , <i>Anethum graveolens</i> , <i>Angelica galauca</i> , <i>Ferula communis</i> , <i>Scandix pecten-veneris</i>
Antitumor, antidiabetic	<i>Apium leptophyllum</i> , <i>Bupleurum falcatum</i> , <i>Ferula ovina</i> , <i>Zosimia absinthifolia</i>
Nerve disorders	<i>Angelica archangelica</i> , <i>Dorema ammoniacum</i> , <i>Ferula communis</i>
Dental complaints	<i>Ferula narthex</i> , <i>Ferula oopoda</i> , <i>Ligusticum thomsonii</i>
Malaria, typhoid	<i>Psammogeton biternatum</i>
Others, antihelmentic, antiseptic, wounds, bites, inflammation, allergy, immune system, tonic, diaphoretic	<i>Dorema ammoniacum</i> , <i>Ferula oopoda</i> , <i>Selinum candollii</i> , <i>Ammi visnaga</i> , <i>Bupleurum falcatum</i> , <i>Centella asiatica</i> , <i>Lisaea heterocarpa</i> , <i>Torilis arvensis</i> , <i>Trachydium roylei</i> , <i>Apium graveolens</i> , <i>Selinum tenuifolium</i> , <i>Bupleurum longicule</i>

Conclusion

There is an intimate and matchless association between the indigenous people and their living environments which has been established over decades. They have developed innovative systems of practices based on their wealth of traditional knowledge for investigating and getting benefited from the biological diversity in these environments. The centuries old indigenous knowledge of medicinal plants is in danger of being lost. Therefore it is required to conserve it. The presence of large number of medicinal plants in a single family shows that Pakistan is provided with lot of useful biodiversity. Research is required to provide scientific basis for their specific medicinal uses. The medicinal properties of these plants can be exploited for the development of large number of pharmaceutical and cosmetic products.

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