

## **ETHNOMEDICINAL STUDIES ON PLANT RESOURCES OF TEHSIL SHAKARGARH, DISTRICT NAROWAL, PAKISTAN**

**ANDLEEB ANWAR SARDAR AND ZAHEER-UD-DIN KHAN**

*Department of Botany, GC University, Lahore, Pakistan*

E-mail: andleebanwar@gcu.edu.pk

### **Abstract**

The present research work was designed to gather indigenous knowledge of local people especially medicinal healers (Hakims) about traditional and medicinal uses of plants. Present study was confined to interview people of remote villages of tehsil Shakargarh, district Narowal, Pakistan from September 2003- August 2004. Indigenous knowledge was collected by interviewing people of different age groups between 40 to 80 years. Frequent field trips were arranged to record local information. A total of 102 species belonging to 93 genera and 62 families were recorded as being used by local inhabitants for various purposes such as fuel, furniture, fodder, making baskets and mats, brushing teeth, medicinal, vegetables and edible fruits.

### **Introduction**

Shakargarh, District Narowal, is bounded on the north and north east by occupied Jammu and Kashmir state, on the east and south east by Gurdaspur and Amritsar Districts of India, on the west and south west by Narowal and Sialkot is situated on its west. Tehsil Shakargarh spreads over an area of 3, 12, 915 square acres. The climate is hot during summer and cold during winter, June and July being the hottest months; while October and March are pleasant. The average annual rainfall is about 1000 mm with highest rainfall from July to September (Punjab Development Statistics, 2000). An area of 6777 acres is under forests. Baen and Basanter (the small water drains) and River Ravi are the sources of water. The soil is sandy clay loam.

About 80% population of the world depends on the traditional system of health care (Ahmad, 1999). These medicines have less side effects and easily available. In Pakistan the ethnomedicinal uses of plants is practised in the remote areas. The ethnobotanical information besides listing the traditional uses of plants help ecologists, pharmacologists, taxonomists, watershed and wild life managers in their efforts for improving the wealth of area (Ibrar *et al.*, 2007). The use of medicinal wild plants has persisted as a long standing tradition in Indo-Pakistan. In recent years, one can notice a global trend in the traditional system of the medicines and ethnobotanical studies have become increasingly valuable in the development of health care system in different parts of the world (Black, 1996; Ahmed, 2007).

Many studies have been conducted on the ethnobotany of medicinal and other useful plants of neighboring countries (Gupta *et al.*, 1995; Singh *et al.*, 1997; Vedavathy & Mrudula, 1997; Siwakoti & Siwakoti, 1998; Ghimireet *et al.*, 1999; Siddique *et al.*, 2000). Ethnobotanical studies in various areas of Pakistan have also been carried out (Hussain *et al.*, 1995; Badshah *et al.*, 1996; Shinwari & Khan, 2000; Durrani *et al.*, 2003; Gilani *et al.*, 2003; Sher *et al.*, 2003, 2004; Hussain *et al.*, 2007; Ibrar *et al.*, 2007). The present study reports indigenous knowledge (IK) of the uses of medicinal plants of Tehsil Shahkargarh which is still available among the local people and medicinal healers

(Hakims). The area of tehsil Shakargarh was selected for the present study because it has a great diversity in its flora. Moreover, it looks from the literature that the documentation of the plant wealth of this area was ignored during the study of Flora of Pakistan and even in the district wise gazzeters of Government of Pakistan.

### Materials and Methods

The area was visited several times for the collection of data during the year 2003-2004. The local names and traditional uses of plants, with emphasis on medicinal uses, were documented by interviewing the local elderly knowledgeable persons including local herbal healers (Hussain *et al.*, 2007). The plants were collected, pressed and later on identified with the help of Flora of Pakistan (Nasir & Ali, 1971-1995; Ali & Qaiser, 1995-2005). Questionnaires were adopted for documenting ethnobotanical knowledge of the area. The data obtained was checked with the available literature.

### Results and Discussion

The present study was conducted in remote villages of Shakargarh. A total of 102 plant species belonging to 93 genera and 62 families were recorded which were used by local inhabitants for various purposes including 5 fuel wood species, 4 furniture wood species, 9 vegetable species, 10 edible fruit species, 2 baskets and mat making species, 2 teeth cleaner species, 6 fodder species, 7 ornamental and 76 medicinal species. It was found that many plants have similar medicinal uses as described by Ahmad *et al.*, (2003) and Ashfaq *et al.*, (2003). Edible fruits and roots are obtained from 12 species including, *Ipomoea batatas*, *Phoenix dactylifera*, *Psidium guajava*, *Punica granatum* and *Mangifera indica*. The data is arranged in the alphabetical order of botanical name followed by family, local name and traditional uses (Table 1).

Local peoples use 76 medicinal species in health care system. The promising species include *Abutilon indicum*, *Achyranthes aspera*, *Artemisia vulgaris*, *Butea monosperma*, *Datura alba*, *Ipomoea batatas*, *Prosopis spicigera* and *Trigonella foenum-graecum*. The results agrees with the findings of Gupta *et al.*, (1995), Lewis & Elvin (1995), Destagir (2001) and Hussain *et al.*, (2005) who reported plants that are traditionally used for curing many diseases and Ibrar *et al.*, (2007) who reported ethnobotanical studies on plant resources of Ranyal Hills, District Shangala.

After establishment of this tehsil uptill today, two wars had been fought with India, in 1965 and 1971. During the war of 1971 more than half area of Shakargarh was occupied by India and nearly most of the trees and shrubs were destroyed except big trees those are worshiped by the Hindu's that is *Ficus religiosa*, *F. bengalensis* and *Mangifera indica*. Thereafter the forests and other vegetation of the area were grown by native peoples and forest department. The present study also contained information on threatened species like *Butea monosperma*, a broad leaved tree growing naturally with dwindling population in some graveyards and forests as severely affected member of the existing biota and playing a vital role in stabilization of the fragile ecosystem, providing medication, a shelter to wild life and recreation for the inhabitants of the surrounding area. Being a remote area no effective measures have yet been taken by the concerned experts for its conservation.

Table 1. Ethnobotanical and medicinal use of plants of Tehsil Shakargarh, District Narowal, Pakistan.

Species	Family	Local name	Traditional local uses
1. <i>Abutilon indicum</i> (Linn.) Sweet.	Malvaceae	Kangi Booti	Seeds are used to cure jaundice.
2. <i>Acacia nilotica</i> (Linn.) Delile	Mimosaceae	Kikar	Fuel wood. Bark is used to treat cough and dysentery, leaves are used to treat ulcer.
3. <i>Acacia modesta</i> Wall.	Mimosaceae	Phulai	Fuel wood. Leaves used for treatment of gas trouble and abdominal diseases.
4. <i>Achyranthes aspera</i> Linn.	Amaranthaceae	Puthkanda	Whole plant laxative, stomachic, carminative and useful in treatment of vomiting and heart diseases.
5. <i>Adiantum capillus-veneris</i> Linn.	Polypodiaceae		Whole plant used in reducing coughs and throat problems.
6. <i>Ageratum conyzoides</i> Linn.	Asteraceae	Neel Kanthi	Shoot used as a decoction for cough, colds and skin diseases.
7. <i>Albizia lebbek</i> (Linn.) Benth.	Mimosaceae	Sharin	Wood is excellent for furniture and house buildings.
8. <i>Allium sativum</i> Linn.	Alliaceae	Thoom	Bulb lets chewed to lower the high blood pressure, heated with mustard oil and oil used for earach.
9. <i>Amaranthus viridis</i> Linn.	Amaranthaceae	Puizao	Its leaves are eaten as a vegetable/ pot herb.
10. <i>Aloe barbadensis</i> Mill	Liliaceae	Kavar	Leaves used for the treatment of gas troubles and abdominal pains and cosmetic purposes.
11. <i>Anagallis arvensis</i> Linn.	Myrtaceae	Gandal	The whole herb used in the treatment of epilepsy and mental problems.
12. <i>Anethum graveolens</i> Linn.	Umbelliferae	Soya	Seeds are used to make tea for treating dysentery and abdominal pains.
13. <i>Artemisia annua</i> Linn.	Asteraceae	Afsantin Jari	Leaves used for the treatment of jaundice, fever and blood purifier.
14. <i>Azadirachta indica</i> A.Juss.	Meliaceae	Neem	Timber wood. Fruit edible and purgative. Twigs used for brushing teeth.
15. <i>Bauhinia variegata</i> Linn.	Cesalpiniaceae	Kachnar	Bark astringent, leaves used as fodder and fruits or flowers as a vegetable.
16. <i>Butea monosperma</i> Lam.	Papilionaceae	Plata	Mucilage from the plant used to treat asthma, abdominal pains and epilepsy. Fuel wood.
17. <i>Calendula officinalis</i> Linn.	Asteraceae	Satburga	Flowers are used in treating chronic ulcer, visceral obstructions, jaundice and for cosmetic purposes.
18. <i>Calotropis procera</i> (Willd.)R.Br.	Asclepiadaceae	Desi Ak	Latex used for skin diseases, leaves purgative, wormicidal and antihelmintic.
19. <i>Camabis sativa</i> Linn.	Cannabaceae	Bhang	Leaves used for medicinal and spiritual purposes.
20. <i>Carissa opaca</i> Stapf.	Apocynaceae	Garamda	Edible fruit.
21. <i>Cassia fistula</i> Linn.	Caesalpiniaceae	Amaltas	Timber wood. The pulp of pods used to flavor the tobacco and to treat throat allergies.
22. <i>Chenopodium album</i> Linn.	Chenopodiaceae	Bathu	Leaves used as a vegetable/ pot herb.
23. <i>Chenopodium murale</i> Linn.	Chenopodiaceae	Bathu	Leaves and shoots are cooked as vegetable/ pot herb.
24. <i>Cichorium intybus</i> Linn.	Asteraceae	Kashni	Flowers used in hepatic enlargement, fever, vomiting and abdominal pain.
25. <i>Citrus aurantifolia</i> (Christm.) Swingle	Rutaceae	Nimboo	Fruit used for refreshing drinks, rich in Vitamin C.
26. <i>Citrullus colocynthis</i> (Linn.) Schard.	Cucurbitaceae	Tumba	Fruit used for strong purgative and hydrogogue action on the intestinal tract. Roots used for snake poison. Helpful in curing abdominal pains.
27. <i>Corchorus trilocularis</i> Linn.	Tiliaceae	Raja jira	Mucilage from the plant is used as a demulcent.
28. <i>Cordia alliqua</i> Willd.	Boraginaceae	Lasura	The bark, leaves and fruits used in stomachache.

Table 1. (Cont'd).

Species	Family	Local name	Traditional local uses
29. <i>Coriandrum sativum</i> Linn.	Apiaceae	Dhania	Chopped leaves and seeds are used to garnish cooked vegetables. Dried seeds carminative.
30. <i>Croton bampiliandianus</i> Boillon	Euphorbiaceae		Whole plant used to treat different ailments like fever.
31. <i>Cucurbita pepo</i> Linn.	Cucurbitaceae	Valaiti Kadoo	Fruit used as a vegetable. Seeds used to remove tapeworm.
32. <i>Cuscuta reflexa</i> Roxb.	Cuscutaceae	Akash bail	Used as purgative.
33. <i>Cynodon dactylon</i> (Linn.) Pers.	Poaceae	Khabal	Used as a fodder for livestock.
34. <i>Cyperus rotundus</i> Linn.	Cyperaceae	Deela	Roots used to treat fever and nausea, pain reduction and muscle relaxation.
35. <i>Datura alba</i> Nees.	Solanaceae	Dahitura	Whole plant used in the treatment of epilepsy, hysteria, insanity and diarrhoea.
36. <i>Dalbergia sissoo</i> Roxb.	Papilionaceae	Tahli	Best furniture wood and also used as fuel wood.
37. <i>Echinochloa crus-galli</i> (Linn.) P.B.	Poaceae	Swank	Fodder for cattle especially in monsoon period.
38. <i>Euphorbia helioscopia</i> Linn.	Euphorbiaceae	Dhodhak	Milky sap from plant used for treating skin diseases applied externally. Oil from seeds used as laxative.
39. <i>E. prostrata</i> Linn.	Euphorbiaceae	Dhodhak	A paste from the plant made is used to stop bleeding and pain.
40. <i>E. royleana</i> Boiss.	Euphorbiaceae	Danda thor	A piece of main branch cut and put on fire for few minutes and extract is used for earache.
41. <i>Eruca sativa</i> Lamk.	Curciferaceae	Taramira	It is cultivated as an oil seed. The oil is locally used for 'massage' on a dry skin infection cases.
42. <i>Ficus carica</i> Linn.	Moraceae	Anjir	Fruits are used for treating diseases of lungs and bladder.
43. <i>Ficus glomerata</i> Roxb.	Moraceae	Gular	Fruits are astringent and carminative, Furniture wood.
44. <i>Foeniculum vulgare</i> Mill.	Umbelliferae	Saunf	Carminative, antimicrobial action. Seeds common to chew as a mouth freshener and to make herbal tea used to enhance the milk of breast feeding mothers.
45. <i>Fumaria indica</i> (Hauusskn.) Pugsley	Fumariaceae	Pit-Papra	Whole herb is diuretic, poultice, blood purifier and used as a fodder.
46. <i>Galium aparine</i> Linn.	Rubiaceae	Grip grass	Diuretic, used for treating different skin diseases.
47. <i>Herniaria hirsuta</i> Linn.	Illecebraceae	Parrai	Used as a fodder for cattle.
48. <i>Ipomoea batatas</i> Lamk.	Convolvulaceae	Shakarkandi	Roots edible.
49. <i>Justicia adhatoda</i> Linn.	Acanthaceae	Bahakar	The leaf extract is used for treating bronchitis, asthma, cough and breathlessness.
50. <i>Lantana camara</i> Linn.	Verbenaceae	Panchphuli	Flowers used to treat malaria fever.
51. <i>Linum usitatissimum</i> Linn.	Linaceae	Alsi	Seed powder roasted in vegetable oil for backache, anticancerous and seed cake is used for feeding cattle.
52. <i>Luffa acutangula</i> Roxb.	Cucurbitaceae	Kali tori	Fruits edible. Juice of leaves used for sores and various animal bites.
53. <i>Mangifera indica</i> Linn.	Anacardiaceae	Aamb	Fruits edible.
54. <i>Medicago sativa</i> Linn.	Papilionaceae	Shatala	Whole herb used as fodder for livestock. Alfalfa leaves, either fresh or dried, have traditionally been used as a nutritive tonic.
55. <i>Melia azedarach</i> Linn.	Meliaceae	Drak	Timber and fuel wood, leaves used as fodder for livestock.

Table 1. (Cont'd.).

Species	Family	Local name	Traditional local uses
56. <i>Mentha piperata</i> Linn.	Lamiaceae	Pudina	Leaved used to ease headaches, sinus and chest congestions, carminative and also boost the digestive system.
57. <i>Mirabilis jalapa</i> Linn.	Nyctaginaceae	Gul-e-abbasi	Diuretic, purgative, vulnerary, used in the treatment of dropsy.
58. <i>Momordica charantia</i> Linn.	Cucurbitaceae	Karela	Demulcent, mild inflammation modulator, fruits used as a vegetable.
59. <i>M. balsamina</i> Linn.	Cucurbitaceae	Jangli kareela	Green fruits are cooked as a vegetable and also used to treat stomach complaints.
60. <i>Morus nigra</i> Linn.	Moraceae	Shah toot	Fruits edible. Infusion is used to bring down blood sugar level and reduction of arterial pressure.
61. <i>M. alba</i> Linn.	Moraceae	Toot safaid	Fruits edible and used for sore throats.
62. <i>Murraya exotica</i> Linn.	Rutaceae	Kari pata	It is grown as an ornamental tree. Milk obtained from plant is used to treat skin diseases.
63. <i>Ocimum basilicum</i> Linn.	Lamiaceae	Niazbo	Fresh leaves are chewed to treat mouth sores.
64. <i>O. sanctum</i> Linn.	Lamiaceae	Tulsi	Grown to repel insects, leaves used to treat common colds, headaches, stomach diseases and malaria.
65. <i>Otostegia limbata</i> (Bth.) Boiss.	Lamiaceae		Paste of the leaves is used to treat wounds.
66. <i>Oxalis corniculata</i> Linn.	Oxalidaceae	Khatti booti	Leaves used as a vegetable, juice of the plant mixed with onion is used to remove warts.
67. <i>Papaver somniferum</i> Linn.	Papaveraceae	Poost	Used to treat diarrhea, diabetes and pains.
68. <i>Parthenium hysterophorus</i> Linn.	Asteraceae	Afsar booti	It is applied to treat tuberculosis and fever. Roots are used to treat stomach problems.
69. <i>Peganum harmala</i> Linn.	Zygophyllaceae	Harmal	Seeds used for skin diseases and as ear purifier with mustard oil.
70. <i>Phoenix sylvestris</i> Roxb.	Palmeae	Dukay	Fruit edible. Leaves used for making mats, baskets and hand fans.
71. <i>P. dactylifera</i> Linn.	Palmeae	Khajor	Fruit edible. Leaves used for making mats, baskets and hand fans.
72. <i>Plantago ovata</i> Forssk.	Plantaginaceae	Isphaghol	Both the dried seeds and the seed husks are demulcent, they are used in treating dysentery.
73. <i>Pongamia glabra</i> Vent.	Fabaceae	Sukhcham	Twigs used for brushing teeth (as muswak).
74. <i>Portulaca oleracea</i> Linn.	Portulacaceae	Kulfa	Pot herb used as a remedy for constipation.
75. <i>Pracitullus fistulosus</i> (Stocks.) P.	Cucurbitaceae	Tinda	Leaves and fruits are cooked as vegetables.
76. <i>Prosopis julifera</i> Linn.	Mimosaceae	Vilayti kikar	Bark used to treat asthma and flowers are mixed with sugar administered to prevent miscarriage.
77. <i>Psidium guajava</i> Linn.	Myrtaceae	Amrood	Decoction made by boiling three to four leaves with one cup of water is taken after lunch for controlling high blood pressure.
78. <i>Punica granatum</i> Linn.	Punicaceae	Anar	Anar is grown for its edible fruits. Juice of the fruits used for treating fever, diarrhea and dysentery.
79. <i>Raphanus sativus</i> Linn.	Curciferaeae	Mooli	Fruit is cut longitudinally; salt is applied and hanged over night, then taken for treating jaundice.

Table 1. (Cont'd).

Species	Family	Local name	Traditional local uses
80. <i>Ricinus communis</i> Linn.	Euphorbiaceae	Arind	Leaves are heated and used as poultice on wounds and swollen places because of wound healing effect.
81. <i>Rosa indica</i> Linn.	Rosaceae	Gulab	Petals of flowers and sugar are mixed in jar for 2-3 days produce gulkand which is taken for constipation and abdominal pain.
82. <i>Rumex dentatus</i> Linn.	Polygonaceae	Janli palk	Roots are used for treating skin diseases.
83. <i>Salene conoidea</i> (Linn.) Boiss.	Caryophyllaceae	Dabbri	Leaves used as vegetable.
84. <i>Silybum marianum</i> Linn.	Asteraceae	Holy basil	Whole plant is diuretic, hepatic and stomachic.
85. <i>Solanum nigrum</i> Linn.	Solanaceae	Makao	Shoots of plant are boiled in water and taken for gastric trouble and ulcer. It is cooked as vegetable.
86. <i>S. surratense</i> Burm.	Solanaceae	Punkhrii	Fruit powder is taken for abdominal pain and gastric trouble.
87. <i>Sonchus asper</i> (Linn.) Hill	Asteraceae	Asgandh	Plant powder applied on burns.
88. <i>Stellaria media</i> (Linn.) Cyr.	Caryophyllaceae	Lahndara	Weed of waste places.
89. <i>Trachyspermum copticum</i> (Linn.) Link.	Umbelliferae	Ajwain	Seeds are taken with little salt for gastric trouble as stomach tonic.
90. <i>Terminalia chebula</i> Retz.	Combretaceae	Hareer	Astringent, purgative, stomachic and laxative. Used for healing wounds.
91. <i>Trapa bispinosa</i> Roxb.	Trapaceae	Singhara	Fruits edible and also used for treating sores of throat and sunburn.
92. <i>Trianthema portulacastrum</i> Linn.	Aizoaceae	It-Sit	Powdered leaves mixed with honey are used to purify blood and to cure pain and swelling of joints.
93. <i>Tribulus terrestris</i> Linn.	Zygophyllaceae	Pakhra	Carminative, diuretic and antitumor. The stems are used to treat different skin diseases.
94. <i>Trifolium repens</i> Linn.	Fabaceae	Shatala	Dried flowers and powder seeds are used to treat coughs and colds.
95. <i>Trigonella foenum-graecum</i> Linn.	Papilionaceae	Methi	Leaves used to lower blood cholesterol level and also have an antidiabetic effect.
96. <i>Typha angustata</i> Chaub & Bory.	Typhaceae	Swank	Used as a fodder for livestock.
97. <i>Verbascum thapsus</i> Linn.	Scrophulariaceae	Gidar Tombacco	Seeds have necrotic properties and used for hunting.
98. <i>Verbena hybrida</i> Voss.	Verbenaceae	Karenta	Leaves used as a febrifuge and tonic and roots for curing asthma.
99. <i>Withania somnifera</i> (Linn.) Dunal.	Solanaceae	Asgandh	Leaves and roots are used to promote sound restful sleep.
100. <i>Xanthium strumarium</i> Linn.	Asteraceae	Bhangra	Leaves decoction used for curing fever.
101. <i>Ziziphus jujuba</i> Lamk.	Rhamnaceae	Bairi	Fruits edible. Leaves used as fodder for livestock.
102. <i>Z. mummularia</i> (Burm.f.) Wight & Prn.	Rhamnaceae	Malah	Edible fruits. Leaves used as fodder for livestock.

There is almost no ethnobotanical and medicinal data available from this remote area bordering India and occupied Jammu and Kashmir. Hopefully, this work may help to add information into the documentation of Red Data Book of Pakistan. The area is under heavy deforestation and overgrazing pressure, which has reduced regeneration of woody plants. Overgrazing has deteriorated the habitat, as there is no management of grazing land. Most of the medicinal plants are uprooted by the local people for selling or for fuel wood purposes and are also grazed heavily. There is a dire need to conserve the resources for our own survival. Forests are the resource that control the environmental pollution and provide livelihood not only to the local communities but to others as well as stated by Ibrar *et al.*, (2007).

## References

- Ahmad, H. 1999. Issues Regarding Medicinal Plants of Pakistan. *Udyana Today*, 6(3): 6-7.
- Ahmad, M., M.A. Khan and R.A. Qureshi. 2003. Ethnobotanical study of some cultivated plants of Chhuchh Region (District Attock). *Hamdard Medicus.*, 46(3): 15-19.
- Ahmed, S.S. 2007. Medicinal wild plants from Lahore-Islamabad Motorway (M-2), Pakistan. *Pak. J. Bot.*, 39(2): 355-375.
- Ali, S.I. and M. Qaiser. 1995-2005. *Flora of Pakistan*. Botany Deptt. Uni. of Karachi, Karachi.
- Ashfaq, S., M. Ahmad and M. Arshad. 2003. Ethnomedicinal observations of medicinally important plants of Tehsil Fateh Jang, District Attock. *Pak. J. Arid. Agric.*, 7(1): 25-33.
- Badshah, L., F. Hussain and Z. Mohammad. 1996. Floristic and ethnobotanical studies on some plants of Pirghar Hills, S. Wizaristan, Pakistan. *Pak. J. Pl. Sci.*, 2: 167-177.
- Balck, M.J. 1996. Transforming ethnobotany for the new millennium. *Annals of the Missouri Botanical Garden*, 83: 58-66.
- Dastagir, G. 2001. Medicinal plants of Mai Dhani Hill, Muzaffarabad, Azad Jammu and Kashmir. *Hamdard Medicus*, 46: 29-35.
- Durrani, M.J., A.M. Malik and F. Hussain. 2003. Folk medicinal plants of Nushkim District Chaghi, Pakistan. *Jour. Sci. & Technol.*, 27(1&2): 45-52.
- Ghimireet, S.K., K.K. Shresta and D. Bafrachary. 1999. Ecological study of some high altitude medicinal and aromatic plants in the Gyasumado valley, Manang, Nepal. *Ecoprint*, 6: 17-23.
- Gilani, S.S., S.Q. Abase, Z.K. Chinaware, F. Hussain and K. Nargis. 2003. Ethnobotanical studies of Kurram Agency Pakistan through rural community participation. *Pak. J. Biol. Sci.*, 6: 1369-1375.
- Gupta, M.P., M.D. Corea, P.N. Soils, A. Jones and C. Galdames. 1995. Medicinal plants inventory of Kuna Indians: Part I. *Journal Ethnopharmacology*, 40: 77-109.
- Hussain, F., A. Khaliq and M.J. Durrani. 1995. Ethnobotanical studies of some plants of Dabargi hills, Swat. *Proceedings of First Training Workshop on Ethnobotany and its application to Conservation*. National Herbarium/PASA/PARC. Islamabad, Pakistan, pp. 207-215.
- Hussain, F., S. Mukaram and H. Sher. 2007. Traditional resource evaluation of some plants of Mastuj, district Chitral, Pakistan. *Pak. J. Bot.*, 39(2): 339-354.
- Ibrar, M., F. Hussain and A. Sultan. 2007. Ethnobotanical studies on plant resources of Ranyal hills, District Shangla, Pakistan. *Pak. J. Bot.*, 39(2): 329-337.
- Lewis, W.H. and M.P. Elvin. 1995. Medicinal plants as source of new therapeutics. *Annals Missouri Botanical Garden*, 82: 16-24.
- Nasir, E. and S.I. Ali. 1970-1995. *Flora of West Pakistan and Kashmir*. Pakistan Agriculture Research Council, Islamabad.
- Sher, H., F. Hussain, S. Mulk and M. Ibrar. 2004. Ethnoveterinary plants of Shawar Valley District Swat, Pakistan. *Pak. J. Pl. Sci.*, 10(1): 35-40.
- Sher, H., Midrarullah, A.U. Khan, Z.U. Khan, F. Hussain and S. Ahmad. 2003. Medicinal plants of Udigram, District Swat, Pakistan. *Pak. J. Forest.*, 53(1): 65-74.

- Shinwari, M.I. and M.A. Khan. 2000. Folk use of medicinal herbs of Margalla Hills National Park, Islamabad. *J. of Ethno pharmacology*, 69: 45-56.
- Siddiqui, T.O., K. Javed and M.M. Aslam. 2000. Folk medicinal claims of western Uttar Pradesh, India. *Hamdard Medicus*, 43: 59-60.
- Singh, V.K., Z.A. Ali and M.K. Siddique. 1997. Fold medicinal plants of Garhwal and Kumaon forest of Uttar Pradesh, India. *Hamdard Medicus*, 40: 35-47.
- Siwakoti, M. and S. Siwakoti. 1998. Ethnomedicinal uses of plants among limbu of Morang district, Nepal. *Ecoprint*, 5: 79-84.
- Vedavathy, S. and V. Mrudula. 1997. Herbal cosmetics from the tropical forest region of Chittoor district, Andhra Pradesh, India. *J. Trop. Fores. Prod.*, 2: 2.

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