

ETHNOBOTANICAL STUDIES ON SOME USEFUL HERBS OF HARAMOSH AND BUGROTE VALLEYS IN GILGIT, NORTHERN AREAS OF PAKISTAN

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Abstract

Field studies were made on the herbaceous medicinal plants of Haramosh and Bugrote valleys. Folk medicinal uses of herbs in these valleys have helped people prevent and cure various diseases such as rheumatism, asthma, diabetes, blood pressure, stomach problems, abdominal problems etc. The most common medicinal herbs found in the region belong to the families Labiateae, Compositae, Ranunculaceae, Umbelliferae and Gentianaceae. In the present paper 98 herbaceous plant species are reported on the basis of information gathered from local peoples of both valleys. Out of 98 plants 21 are cultivated and 77 are wild.

Introduction

Ethnobotany is the study of plants in relation to the inhabitants of an area and deals with folk concepts of classification by habit, habitat and usage or some other parameters (Berlin *et al.*, 1973). Ethnobotany was originally based on quantitative methods such as inventories of plants and their uses, with major focus on the economic importance. Studies by national and international organizations (WHO) have shown that for 75-90 % of the rural population of the world, the local herbalists alone attend to their medical problems. Some ethnobotanical studies have covered total relationship of the target human society with plants but they have been directed mainly to plants used in medicine and food (Aikman, 1977; Morton, 1975; Jain, 1965). Botanists are involved in the investigation of folk medicines (Bolyard, 1981; Morton, 1974; Rao, 1981) and the ecological interaction of people and plants (Bye, 1981). In recent past, ethnobotany has been recognized as a valid discipline having a very strong role in the advancement of many aspects of scientific and historic studies. A number of investigators have devoted their attention to the vast store of knowledge of plant properties still intact in native culture in different parts of the world (Morgan, 1981).

Ethnobotany, being a multidisciplinary study, has not been attempted much in Northern Areas of Pakistan although there is an ample scope. However, such studies recently have gained momentum. The Haramosh and Bugrote valleys of Gilgit district situated in the northern side of Indus River offer immense scope for ethnobotanical studies due to their rich floristic diversity and old civilization of local peoples. There are quite a large number of plants used by the local peoples for various diseases such as fever, rheumatism, asthma, stomach problems, constipation, eye problems, and skin problems. In recent times there has been increasing deforestation in the area (Khan & Khatoon, 2007), resulting in the loss of many important species. In addition, with the intrusion of modern civilization to these areas, local uses of the plants are diminishing day by day with the death of older peoples. Hence, we attempted to record local uses of these plants before the information is lost forever. The present paper is in continuation with the earlier papers (Khan & Khatoon, 2004; 2007) on ethnobotany of these valleys. In this paper ethnobotanical uses of another 98 herbaceous species are documented.

Material and Methods

Plant specimens were collected during the springs of 2001-2006 from various localities of both valleys and identified with the help of Flora of Pakistan (Nasir & Ali, 1970-89; Ali & Nasir, 1989-1991; Ali & Qaiser, 1993-2007). The identification was also done by comparing with the authentic specimens available in the Karachi University Herbarium. After identification voucher specimens were deposited in the Karachi University Herbarium (KUH). During this period those people particularly the old men and women were interviewed whose empirical knowledge was respected by everyone. The data recorded from the local people of both valleys were checked against the available literature (Akbar & Athar, 2006; Basu, 1991; Bown, 1995; Pullaiah, 2006; Robert & Henry, 2002; Sala, 1995). Although some species of the present study are mentioned in these works, but their uses recorded by us were not reported earlier. Thus, the present study provides some additional uses of the species which are otherwise used in other areas.

Results

Ethnobotanical uses were enumerated for 98 herbaceous species (1 Pteridophyte, 12 Monocots, 85 Dicots) belonging to 75 genera (1 Pteridophyte, 6 Monocots, 68 Dicots) and 33 families (1 Pteridophyte, 5 monocots, 27 Dicots). Of these 22 are cultivated (4 Monocot, 18 Dicots) and 76 are wild (1 Pteridophyte, 8 Monocots, 67 Dicots). The data collected through interviews with local people indicate that these species are mostly used in fever, cough, asthma, stomach and abdominal disorders, jaundice, rheumatism, joints pain etc. It is interesting to note that most of these plants were Dicots while Monocots and Pteridophytes constitute only a minor fraction of them. The most important family was Compositae containing 14 species. This was followed by Labiateae with 8 species then Gentianaceae, Ranunculaceae and Umbelliferae (6 species each). The listed plants are grouped under Pteridophyte, Monocots and Dicots. Families and species within them are arranged alphabetically. Local names and uses are provided for each species.

Pteridophytes

Family Equisetaceae

1. *Equisetum arvense* L.

Local name: Chihly

Voucher specimen # 183

Whole plant is used for urine and kidney problems especially for kidney stone.

Angiosperms-Monocots

Family Alliaceae

2. *Allium carolinianum* DC.

Local name: Khush

Voucher specimen # 398

Whole plant is used as vegetable and medicinally used for swellings, dysentery and joints pain and also considered as a tonic.

3. *Allium cepa* L. (Cultivated)

Local name: Kashuh

Leaves and bulbs are mostly used as salads and also used in cooking. Bulbs are chief source of income. Medicinally bulbs are used as aphrodisiac and extract is used in ear pains, flatulence and skin diseases.

4. *Allium humile* Kunth

Local name: Cherum

Voucher specimen # 565

Whole plant is used in blood purification and swellings.

5. *Allium sativum* L. (Cultivated)

Local name: Bukpa

Bulbs are used in kitchens and medicinally it is used for cough, colic, constipation, flatulence, asthma and cardiac troubles.

6. *Allium victorialis* L.

Local name: Faloon

Voucher specimen # 202

Whole plant is used for abdominal troubles, swellings, asthma, respiratory, problems and dysentery.

Family Asparagaceae**7. *Asparagus filicinus* Ham.**

Local name: Not known

Voucher specimen # 57

Roots are internally used for uterine tumor, increase blood formation, leucorrhoea, disturbed menstruation and nervous disorders.

Family Convallariaceae**8. *Polygonatum geminiflorum* Decne.**

Local name: Saat Ashee

Voucher specimen # 196

Roots are used for disturbed menstruation, uterine tumor, swellings and its related problems.

Some people used its roots as general tonic with milk and ghee.

9. *Polygonatum multiflorum* (L.) All.

Local name: Saat Ashee

Voucher specimen # 471

10. *Polygonatum verticillatum* (L.) All.

Local name: Saat Ashee

Voucher specimen # 367

All the uses are same as *P. geminiflorum* and all the species are locally known by the same local name.

Family Orchidaceae11. *Dactylorhiza hatagirea* (D.Don) Soo

Local name: Jadughar Char

Voucher specimen # 513

Roots are used for backache and sexual problems. Some people use it for witchcraft.

Family Poaceae12. *Triticum aestivum* L. (Cultivated)

Local name: Ghoom

Wheat is a chief source of food and straw. Some people use its stem for making domestic items.

13. *Zea mays* L. (Cultivated)

Local name: Makayi

Maize is the second chief source of food and straw and its grain is also used medicinally for dysentery, jaundice and cough problems.

Angiosperms-Dicots**Family Asclepiadaceae**14. *Caralluma tuberculata* N.E. Brown

Local name: Joonay Char

Voucher specimen # 819

Whole plant is extensively used for paralysis and joints pain and fever.

Family Balsaminaceae15. *Impatiens edgeworthii* Hook. f.

Local name: Chatty Char

Voucher specimen # 40

Plant extract is used in burns.

Family Boraginaceae16. *Onosma hispida* Wall. ex G.Don

Local name: Tul Charung

Voucher specimen # 104

Root extract is used for pneumonia and typhoid fever and also used for dyeing hairs.

Family Brassicaceae17. *Brassica napus* Reichb. (Cultivated)

Local name: Molo

Roots and leaves are used as vegetable and medicinally used as tonic and aphrodisiac.

18. *Descurainia sophia* (L.) Webb. & Benth.

Local name: Burribory

Voucher specimen # 18

Whole plant is used for chest complains and cough.

19. *Lepidium sativum* L. (Cultivated)

Local name: Zachik

Seeds are used in constipation, abdominal problems of children and feminine problems during delivery, bleeding, uterine tumors, menstruation, swellings and eye problems.

20. *Raphanus sativus* L. (Cultivated)

Local name: Choo Molo

Roots, seeds and leaves are used for indigestion, stomachic, jaundice, inflammation, colic, flatulence and skin diseases. Some people used these roots against asthma, diarrhoea and paralysis. Seeds are used as aphrodisiac.

Family Campanulaceae

21. *Codonopsis clematidea* (Schrenk) C. B. Clarke

Local name: Pichiktuloooh

Voucher specimen # 21

Roots of this plant are used as aphrodisiac.

Family Cannabaceae

22. *Cannabis sativa* L. (Cultivated)

Local name: Bung

Plant powder is used for cough, bronchitis and chest problems.

Family Chenopodiaceae

23. *Chenopodium album* L.

Local name: Khunnah

Voucher specimen # 318

Whole plant is used for ulcers, swellings and seminal weakness.

24. *Chenopodium botrys* L.

Local name: Hamaghee

Voucher specimen # 275

Whole plant is used as antiseptic and also for abdominal problems, uterus problems, tumors, swellings, bleeding and disturbed menstruation.

25. *Kochia prostrata* (L.) Schrad.

Local name: Us

Voucher specimen # 144

Roots are used for making tooth brush and also used for toothache and whole plant is best fodder for goats.

Family Compositae

26. *Arctium lappa* L.

Local name: Chero

Voucher specimen # 38

Seeds and roots are used for diabetes, blood pressure, joints pain including gout and rheumatism.

27. *Artemisia absinthium* L.

Local name: Kakamush

Voucher specimen # 1018

Extract of plant is externally used for itching and other skin problems. It is also internally used for indigestion, flatulence, colic, ring worms, blood pressure and diabetes.

28. *Artemisia brevifolium* (Wall.ex DC.) Ling & Y.R.Ling

Local name: Zoon

Voucher specimen # 825

Plant extract is internally used for fever, cough, blood pressure and abdominal pains.

29. *Artemisia scoparia* Waldst. & Kit.

Local name: Jaanh

Voucher specimen # 826, 31

Whole plant is used for fever, cough and heart problems.

30. *Artemisia sieversiana* Ehrh. ex Willd.

Local name: Kakamush

Voucher specimen # 948

Whole plant is used for abdominal pains, intestinal worms, blood pressure and indigestion.

31. *Carthamus tinctorius* L. (Cultivated)

Local name: Pungh

Flowers are used for fever, cough, throat problems and typhoid fever. Locally the petals are used as dye for making colour bread particularly in Eid festival days.

32. *Cichorium intybus* L.

Local name: Ishkanachi

Voucher specimen # 1036

Whole plant is used for indigestion, abdominal disorders, headache, asthma, liver complains, gouts, joints pain and jaundice.

33. *Helianthus annuus* L. (Cultivated)

Local name: Chupati Phoonar

Seeds and flowers are used for fever, cough and throat problems.

34. *Inula obtusifolia* Kern.

Local name: Khunay

Voucher specimen # 54

Whole plant is used for tuberculosis, chest problems cough and also used as an antiseptic.

35. *Inula royleana* DC.

Local name: Chupati Phoonar

Voucher specimen # 966

Whole plant is used for intestinal problems.

36. *Saussurea lappa* (Decne.) Sch.

Local name: Minal

Voucher specimen # 970

Roots are internally used for asthma, cough, paralysis, brain problems, nervous problems, rheumatism, gouts, throat problems and influenza and as a sex stimulant.

37. *Tanacetum artemisioides* Schultz-Bip.ex Hook.f.

Local name: Paloyo Zoon

Voucher specimen # 32

Whole plant is used for blood pressure, diabetes, abdominal disorders, ringworms, flatulence, headache and fever.

38. *Tanacetum falconeri* Hook.f.

Local name: Zoon

Voucher specimen # 984

Flowers and leaves of this plant used for ring worms, flatulence, colic, stomach problems, respiratory problems and asthma.

39. *Taraxacum stenolepium* Hand.-Mazz.

Local name: Dado

Voucher specimen # 497

Roots and leaves are used for jaundice, abdominal problems, liver problems and acidity. Some people used its leaves for constipation and diarrhoea.

Family Convolvulaceae40. *Convolvulus arvensis* L.

Local name: Hargul

Voucher specimen # 44

Whole plant was used as detergent for washing clothes and hairs.

Family Cucurbitaceae41. *Cucumis sativus* L. (Cultivated)

Local name: Lawh

Unripe fruits are used for fever, general debility, indigestion and burns.

42. *Cucurbita maxima* Duch.ex Lam. (Cultivated)

Local name: Wun

Unripe and ripe fruits are used as vegetable and medicinally for burns, inflammations, jaundice and nervous disorders.

43. *Lagenaria siceraria* (Molina) Standley (Cultivated)

Local name: Toky

Unripe fruits are used as vegetable and medicinally for jaundice and as a tonic.

The hollowed ripe fruits are used as water and milk container.

Family Cuscutaceae44. *Cuscuta europaea* L.

Local name: Kaay Shain

Voucher specimen # 872

Whole plant is used for jaundice, cough, blood purification, bronchitis and fever.
Some people use it for sex stimulation.**Family Fumariaceae**45. *Corydalis falconeri* Hook. f.&Thomson

Voucher specimen # 445

Local name: Lusker Char

Roots are used for cough, fever, nerve disease and hair elongation.

Family Gentianaceae46. *Comastoma borealis* (Bunge) T.N.Ho.

Local name: Shalay Char

Voucher specimen # 394

Whole plant used for pneumonia, sore throat and fever.

47. *Gentianodes eumarginata* Omer var. *eumarginata*

Local name: Shotay Lileo

Voucher specimen # 1043

Leaves of this plant are used for killing lice and hair elongation and it is very useful for jaundice. Whole plant paste is used for throat problems of children (externally).

48. *Gentianodes tianschanica* (Rupr.ex Kusn.) Omer, Ali & Qaiser

Local name: Kamalay Char

Voucher specimen # 957

Leaves of this plant are commonly used for abdominal disorders, liver problems, cough, bronchitis and jaundice. It is also used for malarial fever, pneumonia, hair elongation, lice control, gastric troubles, dyspepsia, diabetes, eye problems and for blood purification.

49. *Gentianopsis vvedenskyi* (Grossh.) V.V.Pis.

Local name: Not known

Voucher specimen # 760

Whole plant is used for typhoid and pneumonia fever, throat problems and cough.

50. *Swertia cordata* (G.Don) Clarke

Local name: Plamas

Voucher specimen # 573

51. *Swertia petiolata* D. Don

Local name: Plamas

Voucher specimen # 411

Both species are known by the same local name and uses of these plants are also same. Both are used for typhoid fever, pneumonia fever, throat problems and bronchitis.

Family Geraniaceae

52. *Geranium collinum* Stapf ex Willd.

Local name: Kuratkachoo

Voucher specimen # 1035

53. *Geranium lucidum* L.

Local name: Kuratkachoo

Voucher specimen # 283

54. *Geranium pratense* L.

Local name: Kuratkachoo

Voucher specimen # 374

All the members of the genus *Geranium* are known by same local name Khuratkachoo. These plants are used for internal and external wounds, swellings, inflammations, tumors, bleeding, uterus problems and nerve problems.

Family Labiatae

55. *Clinopodium umbrosum* (M.Bieb.) C. Koch

Local name: Nasuray Char

Voucher Specimen # 748

56. *Clinopodium vulgare* L.

Local name: Nasuray Char

Voucher specimen # 629

Both species are known by same local name and used in similar manner. Plant powder is used for wounds, bleeding and cardiac problems.

57. *Lamium album* L.

Local name: Not known

Voucher specimen # 489

Whole plant is used for typhoid fever.

58. *Mentha arvensis* L. (Cultivated)

Local name: Pudina

Leaves are mostly used as salad and medicinally used for stomach problems, allergy and as carminative. Powder of leaves is used for birth control.

59. *Mentha longifolia* (L.) L.

Local name: Bonooh

Voucher specimen # 1026

Plant extract is used for stomach problems, carminative, liver problems, vomiting and indigestion.

60. *Nepeta erecta* (Royle ex Benth.) Benth.

Local name: Not known

Voucher specimen # 459

Leaves are used for blood pressure, cold, cough, fever and influenza.

61. *Ocimum basilicum* L. (Cultivated)

Local name: Gusmaly

Leaf and flower decoction is used for flu, fever, stomach problems and headache.

62. *Salvia nubicola* Wall. ex Sweet

Local name: Khoropo

Voucher specimen # 322

Root decoction is used for cold cough and leaf paste is applied for skin eruptions.

Family Malvaceae63. *Abelmoschus esculentus* (L.) Moench (Cultivated)

Local name: Bhindi

Unripe fruits are used as vegetable and seeds are useful for cough, asthma, diarrhoea, neural disorders, aphrodisiac and general debility.

64. *Malva sylvestris* L. (Cultivated)

Local name: Shaneeh

Young plants are used as vegetable and old plant stem is used for toothache.

Family Papaveraceae65. *Papaver nudicaule* L.

Local name: Ghoshal

Voucher specimen # 352

Flowers are used as a dye and some people prescribed it for cough, fever, chest complains and heart problems.

66. *Papaver somniferum* L. (Cultivated)

Local name: Burdakha

Seeds are used for cough, chest troubles, diarrhoea and dysentery.

Family Papilionaceae67. *Cicer microphyllum* Benth.

Local name: Kukunnory

Voucher specimen # 904

Whole plant is used for increasing milk production and as general tonic for cows.

68. *Glycyrrhiza glabra* L.

Local name: Shalaco

Voucher specimen # 96

Roots are used for cough, bronchitis, asthma, sore throat, fever and abdominal disorders.

69. *Medicago sativa* L (Cultivated)

Local name: Ishpith

It is a chief source of fodder and some people use it as vegetable. Seeds are used for joints pain, gouts and indigestion and also used as a general tonic.

70. *Trifolium pratense* L.

Voucher specimen # 17

71. *Trifolium repens* L.

Local name: Chupatti Phunnar

Voucher specimen # 25

Both species are known by same local name and are used for sore throat, fever, pneumonia, meningitis and feverish feeling.

Family Plantaginaceae72. *Plantago depressa* Willd.

Local name: Kayay Khapay

Voucher specimen # 958

73. *Plantago lanceolata* L.

Voucher specimen # 1034

The uses of these plants are same and they are known by the same local name. Leaf extract is used for wounds and seeds are used for constipation, abdominal problems, eye redness and for washing hairs.

Family Polygonaceae74. *Bistorta affinis* (D.Don) Green

Local name: Chughuy

Voucher specimen # 248

Seeds are used for dysentery and weakness of urinary bladder.

75. *Rheum spiciforme* Royle

Local name: Jaro Chotal

Voucher specimen # 400

Roots are frequently used for the treatment of bone fractures, backache and joints pain.

76. *Rumex acetosa* L.

Local name: Churkuy

Voucher specimen # 887

Whole plant is used for jaundice, vomiting and liver problems.

77. *Rumex nepalensis* Spreng.

Local name: Obabal

Voucher specimen # 18

Roots are boiled in water and applied externally for swellings and joints pain.

Family Primulaceae

78. *Primula macrophylla* D.Don

Local name: Lilio

Voucher specimen # 342

The flowers of this plant are used for eye redness, itching and its related problems.

Family Ranunculaceae

79. *Actaea spicata* L.

Local name: Kayay Zuch

Voucher specimen # 243

Berries and roots are used for asthma, nerves disorders, rheumatism and paralysis.

80. *Aquilegia fragrans* Benth.

Local name: Ghamuk Phoonar

Voucher specimen # 84

Whole plant is used for pneumonia fever and headache.

81. *Clematis orientalis* L.

Local name: Murghushi

Voucher specimen # 674

Plant paste is externally applied for joints problems and as an antiseptic. Leaf extract is used as an insecticide.

82. *Delphinium vestitum* Wall. ex Royle

Local name: Makhooti

Voucher specimen # 79

All the species of the genus *Delphinium* are locally known by the same name (Makhooti) which is widely used by local people of the area. Flower extract is used for eye redness and glaucoma and particularly for infections of eyes. Root decoction is used for heart problems, cough, typhoid, malaria and pneumonia fever.

83. *Ranunculus palmatifidus* H. Riedl

Local name: Not known

Voucher specimen # 169

Leaf and stem paste is externally applied for boils and for removing skin outgrowth.

84. *Thalictrum foetidum* L.

Local name: Halizee

Voucher specimen # 767

Tubers are used for wounds, swellings, uterine tumors, paralysis, joints pain and nervous disorders.

Family Rosaceae

85. *Fragaria nubicola* Lindl. ex Lac.

Local name: Groose

Voucher specimen # 56

Roots are used for heart problems and asthma. Fruits are edible and considered as general tonic.

Family Rubiaceae

86. *Rubia cordifolia* L.

Local name: Chero

Voucher specimen # 51

Roots are used for blood purification, liver problems, swellings, nervous disorders, gouts, rheumatism, uterine tumors, bleeding control, leucorrhoea, wounds, cough, bone fractures and general debility.

Family Solanaceae

87. *Datura stramonium* L.

Local name: Daturoo

Voucher specimen # 55

Leaf paste and extract is externally used for injuries, wounds, bleedings and pains. Seeds in small quantity used for asthma and tonsil problems. The extract of leaves is also used for baldness.

88. *Hyoscyamus niger* L.

Local name: Not known

Voucher specimen # 539

Leaves and seeds are sedative and narcotic, used for cough and asthma in small quantity.

89. *Solanum nigrum* L.

Local name: Ghabil

Voucher specimen # 839

Ripe berries are edible and used for heart diseases and fever and leaves are used for gouts, rheumatism, joints pain, enlargement of spleen and liver. Fruits are also used for hepatitis.

90. *Solanum surattense* Burm. f.

Local name: Not known

Voucher specimen # 312

The decoction of plant is used for sore throat, body pains, fever, rheumatism, cough and chest complains.

91. *Solanum tuberosum* L. (Cultivated)

Local name: Aaloo

The raw tubers paste is used for burns externally. Being widely used as vegetable, potato is one of the best source of income.

Family Umbelliferae

92. *Carum carvi* L.

Local name: Filizooth

Voucher specimen # 12

Seeds are used for stomach problems, ulcers, uterine tumors, internal wounds and dysentery.

93. *Coriandrum sativum* L. (Cultivated)

Local name: Nasky

Fruits and leaves are used as spice and garnishing. Medicinally used for flatulence, dysentery, diarrhoea, cough, stomach problems, jaundice and vomiting.

94. *Ferula assa-foetida* L.

Local name: Sup

Voucher specimen # 231

Resin and roots are used for asthma, stomach problems, ulcer, cough, anxiety and fever.

95. *Foeniculum vulgare* Mill. (Cultivated)

Local name: Badian

Seeds are used for flu, fever, cardiac problems, digestive problems and flatulence.

96. *Heracleum candicans* Wall. ex DC.

Local name: Ichflah

Voucher specimen # 08

Plant is a good fodder for goats which increases milk production and medicinally it is used for nerve disorders and sexual problems.

97. *Selinum papyraeum* C.B.Clarke

Local name: Burdayh

Voucher specimen # 26

Whole plant is used for asthma and heart problems.

Family Valerianaceae

98. *Valeriana himalayana* Grubov

Local name: Not known

Voucher specimen # 687

Roots of this plant are used for psychiatric problems, for increasing memory, and in cough, asthma, paralysis and nerve problems.

Discussion

We have identified 98 species of which many are native having some uses by the resident of both valleys. These plants are mostly used for fever, cough, asthma, respiratory problems, stomach and abdominal disorders, rheumatism, joints pain etc. The present investigation has shown that the local peoples make use of a great range of plants

from their environment. All the 98 plants have one or more medicinal uses. *Caralluma tuberculata*, *Onosma hispida*, *Lepidium sativum*, *Artemisia spp.*, *Carthamus tinctorius*, *Tanacetum artemisioides*, *Legenaria siceraria*, *Gentianodes tianschanica*, and *Geranium spp.*, are extensively used for medicinal purposes by the local peoples. There was a little evidence of this knowledge being transmitted to successive generations except to specific individuals interested in preserving their traditions. Knowledge of the uses of these plants probably will continue to dwindle because of the availability of modern medicines and other facilities. For example, *Convolvulus arvensis*, *Corydalis falconeri*, *Plantago spp.*, *Delphinium spp.*, were used as detergents and for hair elongation but nowadays these plants are not used for such purposes due to availability of modern soaps and many other detergents. Despite the availability of wild medicinal plants, there is a significant reduction in their use. Of these herbaceous plants identified as having some medicinal uses, about 50 percent are not used nowadays. These plants are mostly medicinal and edible for which modern substitutes are now available. In short it would appear that the people have a concept of wild plant species with active constituents that are useful for medicinal and edible purposes but prefer to depend upon few cultivated species, i.e. for food and fodder; there is not a tendency to bring useful wild species into cultivation. A large livestock population cannot be maintained on fodder produced on arable land alone. Therefore, to maintain healthy livestock farmers have to largely depend on the forest resources.

These plants are mostly found in croplands, shaded forests and alpine habitats such as *Actaea spicata* and *Podophyllum emodi*. Due to the deforestation and habitat destruction in the last one decade these plants are becoming locally threatened. On the other hand there is collection of medicinal plants for commercial sale, such as *Delphinium brunonianum*, *Delphinium vestitum*, *Saussurea simpsoniana*, *Rheum spiciforme* and *Aconitum violaceum* var. *weileri*. All these species are found in the alpine zone above 4000m. These commercially exploited species had declined in abundance during the last 5 years. An obvious conclusion to be drawn is that deforestation, habitat destruction, overexploitation, expansion of agriculture, grazing in forest, selective removal of species and environmental degradation would pose a threat to the local occurrence of these species. The increasing human population during the last few decades is demanding developments in all spheres including agriculture. There is a vast expansion of agricultural land to meet the growing need of mankind. Clearing of forest for agriculture is a common activity of local peoples. Grazing in forest land has also led to the excessive removal of undergrowth in the forests. It is estimated that currently over 44,700 animals graze in the forests and as much as 80% of the land is subject to grazing.

In addition to the above, developmental activities such as the growth of large urban areas, road building on hills and forests areas etc. are examples of direct onslaughts on nature resulting in the loss of local flora. On the other hand the rich treasure of indigenous knowledge about local medicinal plants is under threat due to the availability of modern medicines and other facilities. It is now widely accepted that anthropogenic disturbances would result in the extinction of up to 20 % of the world's species over the next 30 years (Arroyo *et al.*, 1992). Hence, intensive ethnobotanical studies are very much warranted to bring out more useful information.

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