

Some Depletive Plants of Kumaon Himalaya Used in Unani Medicine for Treating Non-Communicable Diseases and their Conservation Strategies#

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Abstract

The Kumaon Himalaya of Uttarakhand is rich in floristic composition. It is a land of diverse cultures and ethnic groups. Traditionally the folk people utilize the vegetation of their ambient environment in the form of different products as food, fuel wood, fibre, fodder, timber, medicine, etc. During ethnobotanical explorations of different forest divisions in this region, the authors collected a large number of information on local plants which are used as folk drugs for treatment of a wide range of health related problems. This study has also yielded information on some medicinal plants that are becoming scarce in the area due to overexploitation, unsustainable harvesting practices and loss of habitat. A review of literature revealed that most of these plant species find use in Unani medicine for treating various non-communicable diseases (NCDs). Hence, an attempt has been made to highlight such species in this report. For each plant species are given the correct botanical and vernacular names, habit and habitat, the part used, medicinal use(s) and other observations. The threat of extinction of these useful and commercially viable medicinal plants has been discussed and also the strategies for their conservation have been suggested.

Keywords: Ethnobotanical explorations, Endangered medicinal plants, Conservation, NCDs, Kumaon.

Introduction

Kumaon region of Uttarakhand is situated between 28° 43' 55"- 30° 20' 12" N latitude and 78° 44' 30"- 80° 18' 45" E longitude in Western Himalayas. There is wide range of natural habitats which provide varied plant life including medicinal and aromatic plants. It is also the land of diverse culture and ethnic groups. This Himalayan region has always been reputed as a steady supplier of a good number of potent medicinal herbs and also one of the leading regions in the use of herbal drugs. A number of reports on the use of native floras in traditional medicine of many cultures of this region have been published (Agnihotri *et al.*, 2003; Arya and Prakash, 1999; Arya *et al.*, 1999; Aswal, 1992; Bhatt and Gaur, 1992; Bhatt *et al.*, 1987-88; Datt and Lal, 1993; Garbyal *et al.*, 2005; Gupta, 1960; Joshi, 1993; Joshi *et al.*, 1993; Kalakoti and Pangtey, 1988; Pandey and Pande, 1990; Pandey *et al.*, 1989,1995; Pangtey *et al.*, 1989; Pant and Pandey, 1998; Rawat and Pangtey, 1987; Shah and Gupta, 1976; Shah and Jain, 1988; Shah and Joshi, 1971; Singh and Ali, 1997, 1998; Singh, *et al.*, 1980, 1987; Singh and Maheshwari,

#This paper is based on the data presented by the first author in National Seminar on "The role of Unani medicine in non-communicable diseases", organized by Central Council for Research in Unani Medicine, New Delhi at New Delhi on 14-15 January 2015.

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1990, 1993, 1994). Hence this area was selected for an extensive ethnobotanical study. The main objective of this field study, besides collecting folk medicinal claims prevalent among the indigenous communities, was to prepare an inventory of existing Unani medicinal plants and to record the current status as well as distribution of highly exploited medicinal taxa. Ethnomedicinal uses of plants collected during the present survey have been published by us (Ali *et al.*, 2008, 2010a; 2010b, 2013a, 2013b, 2013c, 2014a, 2014b; Ali and Ahmad, 2008, 2010). In this communication an enumeration of some depletive medicinal plants of Kumaon is presented.

Fieldwork was carried out during the period 1999-2008. The study area includes different forest divisions of Bageshwar, Champawat, Nainital, Pithoragarh, and Udham Singh Nagar districts. In the course of this investigation, it was found that wild plants are still predominantly in use by the natives for their health purposes and all the basic raw drugs are collected from the forest without replenishing the growing stocks. Moreover, the natural habitats are being disturbed due to a variety of factors such as diversion of land for expansion of agriculture, dwellings and other developmental activities; recurring forest fire; soil erosion; invasion of some alien weed species; etc. Consequent to this, populations of some commonly used drug yielding plants have become reduced in this area. A literature survey was carried out. The Unani Pharmacopoeia of India, Part-I (2007-2009), National Formulary of Unani Medicine, Part-I (Anonymous, 1981) and other monographs published by the CCRUM (Standardization of Single Drugs of Unani Medicine, Part-I (1987), Part-II (1992) and Part-III (1997) were mainly consulted for general information as well as therapeutic uses and it was found that most of these plant species are mentioned for treating various non-communicable diseases. The present communication highlights such species along with pertinent information. Earlier authors have reported many threatened medicinal and aromatic plants that were extracted for commercial purposes from this region and suggested their conservation (Pangtey and Samant, 1988; Shah, 1983; Singh, 1993; Shah and Kapoor, 1978; Sinha, 1975). This contribution is an addition to the above reports. The information presented herein is mainly based on our field observations and enquiries made with knowledgeable village elders belonging to various indigenous communities and officials of the forest department. The study might be useful for planning strategies on conservation, and cultivation of medicinal flora particularly threatened taxa of the region. In the following enumeration the plants are listed in alphabetic order by their botanical names with respective family, vernacular names, habit and habitat, medicinal uses and locality. This is followed by a remark on availability and threat categories. All voucher specimens were prepared and preserved in the herbarium of Survey of Medicinal Plants Unit, Regional Research Institute of Unani Medicine, Aligarh (U.P.), India.

Enumeration

Acorus calamus L. (Araceae)

- Vernacular names : Bach, Boj, Ghiroch, Ghurvach (L); Waj-e-Turki (U)
- Habit & habitat : A semiaquatic, perennial herb with aromatic rhizome. Growing in wet places like edges of pond and streams near villages.
- Medicinal uses : Rhizome is anthelmintic and also given for hoarse-ness of voice, dog bite and stomachache.
- Locality : Champawat, Nainital, Pithoragarh, Udham Singh Nagar
- Remark : Not observed in the forest but now, cultivated by the forest department.

Berberis aristata DC. (Berberidaceae)

- Vernacular names : Kingor (L), Darhald (U)
- Habit & habitat : An evergreen shrub. Found in association with other species of *Berberis* along roadsides.
- Medicinal uses : Root is commonly used for controlling diabetes. Root extract is instilled in eye for redness.
- Locality : Nainital, Pithoragarh
- Remark : Overexploited in past for trade. It is an endangered taxon.

Bergenia ciliata (Haw.) Sternb. (Saxifragaceae)

- Vernacular names : Silphori, Patharphori, Pashanbhed (L), Pakhanbhed (U)
- Habit & habitat : A perennial herb with thick rootstock, found in forest, especially on moist rocky slopes.
- Medicinal uses : The root of this plant has from very early times been in much repute for its medicinal properties, particularly for kidney stones. It is also used for diabetes, anuria and furunculosis.
- Locality : Bageshwar, Champawat, Nainital, Pithoragarh
- Remark : Presently common, but the population of this taxon is on decline due to continuous over collection by the unauthorized collectors.

Cinnamomum tamala Nees (Lauraceae)

- Vernacular names : *Kakaria* (L), Sazaj Hindi (U)
- Habit & habitat : An evergreen small tree, found in shady places in forest.
- Medicinal uses : Leaves are used for cough and cold.
- Locality : Nainital, Champawat, Pithoragarh
- Remark : Leaves and stem bark are heavily extracted which have much value for condiments. Low-Risk Near Threatened. Now, it is cultivated.

Curculigo orchioides Gaertn. (Hypoxidaceae)

- Vernacular names : Kali musli (L), Musli Siyah (U)
- Habit & habitat : Herb with tuberous root stock. This species is characteristics in Sal trees in the Tarai-Bhabar belts.
- Medicinal uses : Root is commonly used for sexual weakness and leucorrhoea.
- Locality : Udham Singh Nagar
- Remark : The tuberous root is heavily exploited and also greedily eaten by wild animals. It is a vulnerable taxon.

Dactylorhiza hatagirea (D. Don) Soo (Orchidaceae)

- Vernacular names : Hathajari (L), Salab Panja (U)
- Habit & habitat : A terrestrial orchid with tuberous roots which are digitate or finger shape. Rarely found in damp and shady places in Oak forest.
- Medicinal uses : Tubers are commonly used as general tonic and also believed as an aphrodisiac agent.
- Locality : Bageshwar, Pithoragarh
- Remark : It is a critically endangered taxon. Export already banned (Jain and Sastry, 1980). It is cultivated in Nandadevi Biosphere Reserve by the tribal (Maikhuri *et al.*, 2002).

Drimia indica (Roxb.) Jessop (Liliaceae)

- Vernacular names : Jangli Piyaz, Koli Kanda(L), Isqeel (U)
- Habit & habitat : A scape-bearing herb rarely found in forests of Tarai.

Medicinal uses : The bulb is commonly used for burning micturition.

Locality : Udham Singh Nagar

Remark : A vulnerable taxon.

Eulophia herbacea Lindl. (Orchidaceae)

Vernacular names : Salab Misri (L, U)

Habit & habitat : Herb with tuberous roots, rarely found in forest.

Medicinal uses : Root is commonly used for leucorrhoea and as a general tonic.

Locality : Nainital

Remark : An endangered taxon. Export already banned (Jain and Sastry, 1980).

Gloriosa superba L. (Liliaceae)

Vernacular names : Kalihari (L), Muleem (U)

Habit & habitat : A climbing herb with tuberous rootstock; climbing by means of leaves. It is readily recognized by its beautiful flowers. Rarely found in outskirts of villages in Sub-Himalayan forest tracts.

Medicinal uses : Tuber is used for joint pain.

Locality : Udham Singh Nagar

Remark : Due to removal of tubers, the whole plant is destroyed as such wild populations have been reduced very much. It is an endangered taxon.

Hedychium spicatum Buch.-Ham. ex J.E. Sm. (Zingiberaceae)

Vernacular names : Kapoor kachri, Jangli Haldi (L), Kapura Kachri (U)

Habit & habitat : A robust herb with horizontal root, found in moist and shady places in forest.

Medicinal uses : Root is regarded by the natives as a remedy for inflammation and also used for urticaria and kidney stones.

Locality : Champawat, Nainital, Pithoragarh, Udham Singh Nagar

Remark : It has become vulnerable.

Picrorhiza kurrooa Royle ex Benth. (Scrophulariaceae)

- Vernacular names : Kutki (L, U)
- Habit & habitat : A perennial herb found in the forest between altitudes of 3300-4300m.
- Medicinal uses : Root is given for leucorrhoea.
- Locality : Pithoragarh
- Remark : An endangered taxon.

Rauwolfia serpentina (L.) Benth. ex Kurz (Apocynaceae)

- Vernacular names : Sargandha, Swaitbarua (L), Asrol (U)
- Habit & habitat : A perennial under shrub. It is seen growing wild in shady situations in Sal forest of Sub-Himalayan forest tracts.
- Medicinal uses : The root is believed to be an antidote to snake poison and also considered effective for fever and abdominal pain.
- Locality : Udham Singh Nagar
- Remark : Ramnagar forest is the natural habitat of this plant where it is still occurs in good quantity. This species has been depleted in other forest areas due to excessive exploitation for trade in past. It has poor regeneration. Now, it is under cultivation.

Swertia angustifolia Buch.-Ham. ex D. Don (Gentianaceae)

- Vernacular names : Chiraita(L), Chiraeta Shirin (U)
- Habit & habitat : An erect herb, found in the forest up to 1800m.
- Medicinal uses : Leaves are used for fever in pneumonia.
- Locality : Nainital, Pithoragarh
- Remark : It is highly threatened due to trade and destruction of natural habitat. Now, it is under cultivation.

Taxus baccata L. sbsp. *Wallichiana* (Zucc.) Pilger (Taxaceae)

- Vernacular names : Thuner, Laventa (L), Talispatr (U)
- Habit & habitat : An evergreen tree. Found in the evergreen forest at higher altitudes associated with other species of gymnosperms.

Medicinal uses	: Leaves and stem bark are commonly used to prevent cold.
Locality	: Nainital, Pithoragarh
Remark	: The plant yields taxol, a remedy for cancer. It is threatened to illegal trade and destruction of habitat. Now, it is cultivated by the forest department.

Valeriana hardwickii Wall. (Valerianaceae)

Vernacular names	: Samoy (L), Taggar (U)
Habit & habitat	: Herb with white flowers. Found in forest, but also grows along roadsides near villages.
Medicinal uses	: Root is used for headache. It is also used as an insect repellent by the natives.
Locality	: Bageshwar, Nainital, Pithoragarh
Remark	: Often exploited commercially, in the past. It is vulnerable taxon.

L = Local name; U = Unani name

Discussion

This communication has brought to light 15 medicinal taxa which are dwindling in the forests of the present study area due to various causes. Among other factors, continued exploitation, non-sustainable harvesting practices and destruction of natural habitats are largely responsible for their depletion. It is predicted that some more plants of the area will be decreased in number soon if destruction of forests and their over-exploitation continue to occur. Medicinal plants wealth of a region is one of the vital resources having important bearing on human health, regions' economy and environment. Therefore, preservation of this heritage along with original habitats must be protected on priority basis. Such observations are of special significance for the area where there is a threat to the natural habitats and vegetation owing to increasing human interference. In the situation prevailing here some measures for conserving diversity of medicinal plants are listed below:

1. Large scale cultivation and domestication of wild medicinal species used in pharmaceutical industries and local medicine should be encouraged by the local inhabitants who may reduce the pressure on existing wild population of the plants.

2. Public awareness programmes on conservation of wild medicinal plants should be intensified.
3. Promoting the rationale and sustainable utilization of medicinal plants.
4. Standard methods of cultivation, i.e., agro-technology and preservation of high demand endangered medicinal plants of the area should be developed.
5. Sensitive habitats of the threatened flora should be protected on priority basis.
6. Illegal extraction of medicinal plants from the wild should be curbed.
7. Social forestry operation of fuel, fodder and fibres species should be encouraged.
8. In order to protect and propagate the threatened species, botanical gardens should be established at different agro-climatic zones.
9. Germplasm of rare species should be collected and maintained under protected conditions in the field, plantation, botanical gardens, clonal repositories, gene bank or in plant tissue culture repositories.
10. Endangered medicinal plants which have poor regeneration their breeding system should be studied. Through various tissue culture and micro propagation techniques plants can be regenerated.
11. Local medicine men should be involved in the conservation efforts since they use plant remedies in their homes and are generally respected by the villagers.
12. Harvesting or collection has very much importance. It should be done through trained and experienced plant collectors who could identify the medicinal plants properly and aware of the methodology of preservation of plants and their parts used in medicine.
13. Training should be provided regularly to the persons engaged in the collection of crude drugs. They should be trained for proper and scientific methods of collection, right time of medicinally important plant parts without damaging whole plant. For the collection of different plant parts following points should be taken into consideration:
 - a. Seeds-should be collected after attaining full maturity; b. Leaves-after flowering stage; c. Stems-after leaf fall or fruiting stage; d. Flowers-during full flowering stage; e. Fruits- after full ripening; f. Bark-after raining season; g. Root or root bark- should be collected from the damaged tree or after attaining full growth and the plant should be replenished in nature.

Acknowledgements

We are highly grateful to the Director General, Central Council for Research in Unani Medicine, New Delhi, for providing necessary facilities for carrying out this investigation. We would also record our gratitude to all the informants who cooperated in the collection of information presented herein.

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