



**European Journal of Medicinal Plants**  
1(2): 18-25, 2011

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# **Sustainable Utilization of Medicinal Plants by Local Community of Uttarkashi District of Garhwal, Himalaya, India**

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**Research Article**

**Received 18<sup>th</sup> December 2010**  
**Accepted 25<sup>th</sup> December 2010**  
**Online Ready 31<sup>st</sup> January 2011**

## **ABSTRACT**

A study was conducted in the Uttarkashi district of Garhwal, Himalaya, India to document the medicinal plants used by the local communities. 56 plant species distributed in 46 families were documented. Of the total plant species 52% were herbs, 25% trees, 20% shrubs and 3% climbers. 17 different plant parts were used by local communities for different ailments. Some of the plants viz. *Aconitum heterophyllum*, *Angelica glauca*, *Commiphora mukul*, *Dactylorhiza hatagirea*, *Picrorhiza kurroa* and *Saussurea costus* are very rare in the wild. *Zanthoxylum armatum*, *Rumex nepalensis*, *Cinnamomum tamala*, *Zingiber officinale*, *Allium sativum* and *Angelica glauca* were the preferred medicinal plant species. The main indications for plants use were against common colds, asthma, skin and liver diseases.

*Keywords: Uttarkashi, Himalaya, medicinal plants, local communities;*

## **1. INTRODUCTION**

Himalaya, one of the richest hot spots of biodiversity in the world, offers immense opportunities in various fields of biological domains and associated patterns of sustainable life support systems (Gaur, 2004). Biological diversity of ethnobotanical species generates considerable benefits from social and economic perspectives. However, the ongoing management strategies and traditional

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values of ethnobotanical species are difficult to reconcile with the acute conflicts between the local people and foresters. According to WHO approximately 80% of World population in developing countries depends on traditional medicines for primary healthcare (WHO, 2002) and in modern medicine too, nearly 25% are based on plant derived drugs (Tripathi, 2002). Medicinal plants constitute the base of health care systems in many societies. The recovery of the knowledge and practices associated with these plant resources are part of an important strategy linked to the conservation of biodiversity, the discovery of new medicines and increasing of the quality of life of poor rural communities (Almeida et al., 2006). Ethnobotanical studies of medicinal plants have taken many paths, sometimes testing hypotheses of use and knowledge (Reyes-Garcia et al., 2005; Vandebroek et al., 2004) or sometimes describing the use of plants in given cultural contexts (Gazzaneo et al., 2005). Medicinal plants have been used to cure a number of diseases. Though the recovery is slow, the therapeutic use of medicinal plant is becoming popular because of its inability to cause side effect and antibiotic resistant microorganisms. These plants are still serving as remedies for various ailments in crude form, as modern medicine has not adequately armed the therapeutic arsenal of the natives of remote areas. Documentation of such practices is required in view of gradual disappearance of this knowledge in new generations. Therefore, an attempt has been made to record the medicinal plants used by various communities of Uttarkashi district of Garhwal, Himalaya.

## **2. MATERIALS AND METHODS**

Uttarkashi district is located in the catchment of two major river system of India i.e. Ganga and Yamuna and tributaries. The district lies between N 30° 29' to 30° 27' latitude and E 78° 54' to 79° 25' longitude and has a total geographical area approximately 8016 sq. km. It is the north most district of the Uttarakhand bordering Himachal Pradesh to northwest, Chamoli district on eastern side Dehradun district on western side, Tibbet on northern side and Tehri district on southern side (Fig. 1).

The district is a homeland of the several tribes dominated by Bhotias, Pravatis and Banganis (Similar to Jaunsari tribe of Dehradun). The present study was conducted during 2007- 2009 and the following steps were undertaken:

- i) Various field visits were made in the different parts of the tribal areas and interviewed through questionnaire (Table 1),
- ii) Commonly traditionally useful plants were collected,
- iii) In order to verify the identity of plant species mentioned by the respondents, field visits were undertaken with the respondents or any other person of his family who is aware about the concerned species,
- iv) In case of medicinal plant species, the respondents were also asked about the plant parts used and the local uses of medicinal plant species selected by them as the priority species,
- v) The plants used by traditional healers and tribal communities were identified with the help of taxonomist and later verified with the help of officials of forest department in the region of the study area,
- vi) The identified species were classified according to their local name, habit, family, different parts used medicinally and the disease treated.

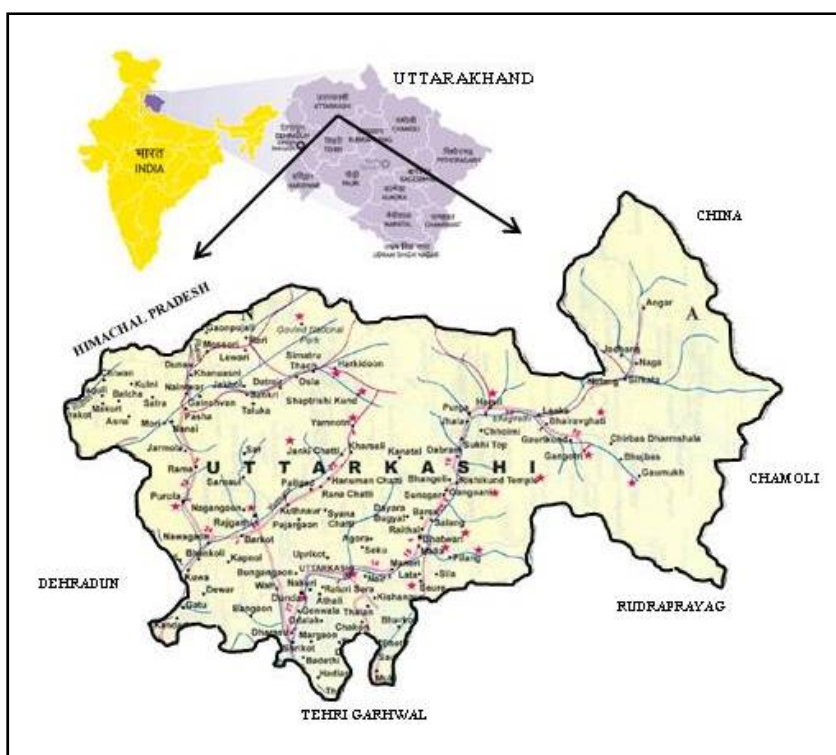


Figure 1. Location map of the study area

Table 1. Villages selected for the study

| Sl. No. | Developmental Blocks | Visited villages  |
|---------|----------------------|---|
| 1       | Mori                 | Liwari<br>Gangar<br>Masri<br>Dhara<br>Kasla<br>Osala<br>Sankari<br>Doni<br>Motwar<br>Bainol |
| 2       | Purola               | Vasantnagar<br>Khalari<br>Shikaro<br>Jarmola<br>Karada                                      |
| 3       | Naugaon              | Thali<br>Barakote   |
| 4       | Bhatwari             | Rajgari<br>Barsu<br>Jhala<br>Raithal  |

### 3. RESULTS AND DISCUSSION

Fifty-six plant species distributed in 46 families were documented (Table 2) that was used in treating various ailments by the local communities of the district Uttarkashi. Of the total plant species 52% were herbs, 25 % trees, 20 % shrubs and 3 % climbers (Figure 2).

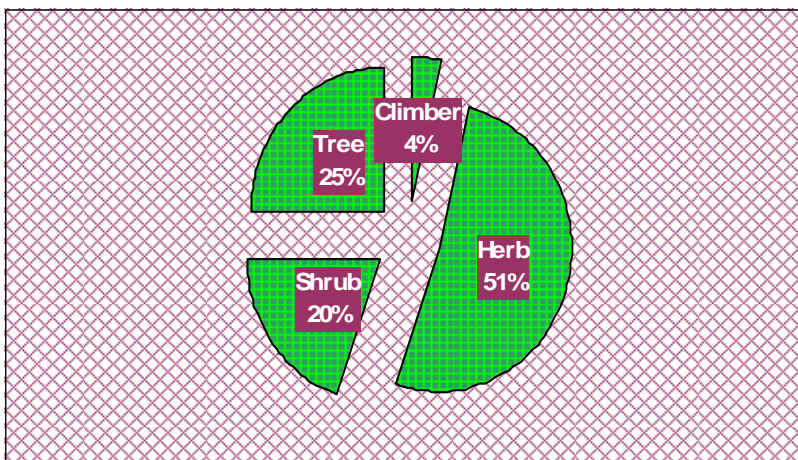


Figure 2. Percentage of different habit of plants

The indigenous treatment is mainly focused on ailments like gastric problem, diarrhoea, cough and cold, skin diseases, fever (Table 2). The findings of this study indicate that people of the district evolved the mechanism of utility of various resources based on its availability.

However the knowledge about the importance of medicinal plants is more or less uniformly distributed among the local communities and it is a traditional knowledge. 17 different plant parts were used by local communities for different ailments (Figure 3).

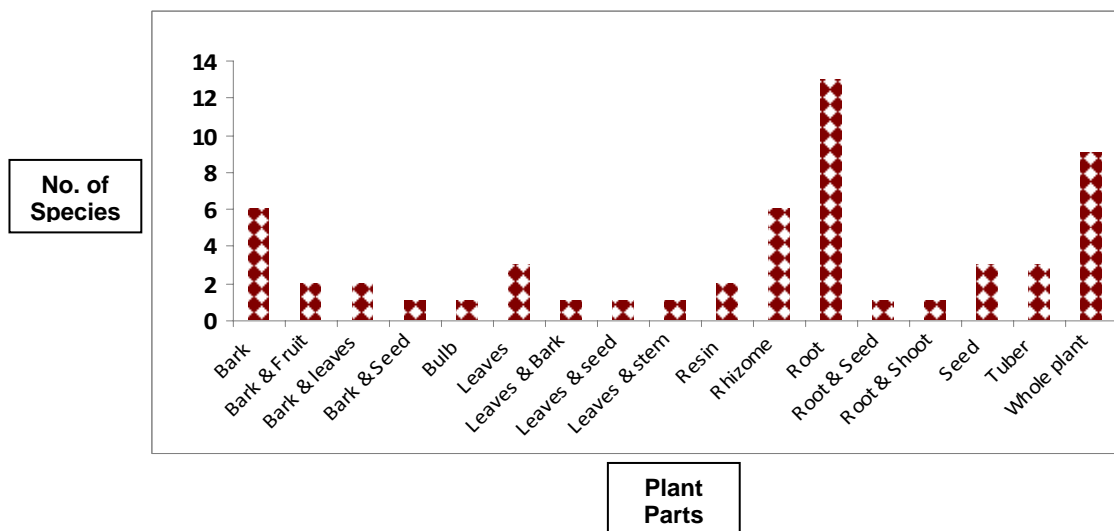


Figure 3. Different plant parts used in different ailments

**Table 2. List of ethnomedicinal plants of Uttarkashi district, Himalaya**

| Sl. No. | Botanical name                | Locale name | Habit | Family           | Uses  |
|---------|-------------------------------|-------------|-------|------------------|---|
| 1       | <i>Abies pindrow</i>          | Morinda     | T     | Pinaceae         | Resin used in dyspepsia   |
| 2       | <i>Abutilon indicum</i>       | Kanghe      | H     | Malvaceae        | Leaves and bark used in fever, dysuria                            |
| 3       | <i>Aconitum heterophyllum</i> | Atis        | S     | Ranunculaceae    | stomachic, bitter tonic, antiperiodic dysentery, diarrhoea, cough |
| 4       | <i>Acorus calamus</i>         | Bach        | H     | Araceae          | Dyspepsia, bronchitis, dysentery, snake bite insectifuge, asthma  |
| 5       | <i>Aesculus indica</i>        | Kanor       | T     | Hippocastanaceae | Seeds are used in rheumatic pain                                  |
| 6       | <i>Allium sativum</i>         | Lahsus      | H     | Amaryllidaceae   | Bulbs are used in blood and digestive disorders                   |
| 7       | <i>Angelica glauca</i>        | Chora       | H     | Apiaceae         | Roots are used in gastric disorder, constipation                  |
| 8       | <i>Asparagus adscendens</i>   | Kairu       | T     | Liliaceae        | Tuber are used in diabetes, dysentery dysuria                     |
| 9       | <i>Bacopa monnieri</i>        | Bhrami      | H     | Scrophulariaceae | Leaves are used in purifying blood and liver complaints           |
| 10      | <i>Berberis aristata</i>      | Kilmoda     | S     | Berberideceae    | Curing of skin disease, alaria, piles, alaria and eye diseases    |
| 11      | <i>Bergenia stracheyi</i>     | Pashnbhed   | H     | Saxifragaceae    | Diuretic, analgesic and antiinflammatory                          |
| 12      | <i>Betula utilis</i>          | Bhojpatra   | T     | Butaceae         | Bark used as spermicidal, piles, stomachic                        |
| 13      | <i>Cannabis sativa</i>        | Bhang       | H     | Cannabaceae      | Leaves and seeds are used in headache, healing of wounds and cuts |
| 14      | <i>Cedrus deodara</i>         | Diar        | T     | Pinaceae         | Cough, bronchitis   |
| 15      | <i>Cinamomum tamlam</i>       | Dalchini    | T     | Lauraceae        | Bark/Leaf Dyspepsia and throat irritation                         |
| 16      | <i>Commiphora mukul</i>       | Guggul      | H     | Burseraceae      | Blood purifier, cough and cold                                    |
| 17      | <i>Corydalis govaniana</i>    | Indrajata   | H     | Fumariaceae      | Arthritis   |
| 18      | <i>Crotalaria prostrata</i>   | Chunchui    | H     | Fabaceae         | Roots used in dysentery   |
| 19      | <i>Dactylorhiza hatagirea</i> | Panza       | H     | Orchidaceae      | Narvine tonic, aphrodisiac, diarrhoea, dysentery                  |
| 20      | <i>Delphinium denudatum</i>   | Nirvishi    | H     | Ranunculaceae    | Root parts used in stimulant, toothache and snake-bite            |

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| Sl. No. | Botanical name                  | Locale name | Habit | Family           | Uses  |
|---------|---------------------------------|-------------|-------|------------------|---|
| 21      | <i>Dioscorea bulbifera</i>      | Banalu      | H     | Dioscoreaceae    | Tuber of this plant is used in chronic fever, healing of cuts and wounds            |
| 22      | <i>Ephedra gerardiana</i>       | Tutgautha   | S     | Ephedraceae      | Root and shoots are used in blood pressure, joint pain                              |
| 23      | <i>Geranium nepalense</i>       | Ratanjot    | H     | Geraniaceae      | Fever, renal disorder, eczema, itching  |
| 24      | <i>Hedychium accuminatum</i>    | Ban haldi   | H     | Zingerberaceae   | Rhizome is used in dyspepsia, snake bite, inflammation                              |
| 25      | <i>Hippophae rhamnoides</i>     | Amlach      | S     | Eloegnaceae      | Bark and Fruits are used in scabbies, digestive disorder and ulcer                  |
| 26      | <i>Juglans regia</i>            | Akhrot      | T     | Juglandaceae     | Bark is used as toothache   |
| 27      | <i>Juniperus communis</i>       | Hapsa       | S     | Cupressaceae     | Bark and leaves used in leucorrhoea and skin ailments                               |
| 28      | <i>Melia azedarach</i>          | Bakain      | T     | Meliaceae        | Skin disorder, rheumatic pain, antiseptic, wormicide                                |
| 29      | <i>Mentha longifolia</i>        | Pudina      | H     | Lamiaceae        | Leaves and stem used fever, vomiting, diarrhoea, headache, rheumatism               |
| 30      | <i>Nardostachys grandiflora</i> | Mansi       | H     | Valerianacea     | Roots are used in palpitation of heart and mental tention,                          |
| 31      | <i>Nastertium officinale</i>    | Jairi       | H     | Crucifereae      | Goitre, vermifuge, constipation   |
| 32      | <i>Paris polyphylla</i>         | Satwa       | H     | Liliaceae        | Rhizome is used in anthelmintic, tonic  |
| 33      | <i>Picea smithiana</i>          | Rai         | T     | Pinaceae         | Resin used in cuts and body pain  |
| 34      | <i>Picrorhiza kurroa</i>        | Kutki       | H     | Scrophulariaceae | Roots are used in severe cough, fever, stomach disorder,                            |
| 35      | <i>Pittosporum eriocarpum</i>   | Agni        | S     | Pittosporaceae   | Bark used in narcotic, expectorant, bronchitis                                      |
| 36      | <i>Podophylum haxandrum</i>     | Vankakri    | H     | Podophylaceae    | Roots used as stimulant   |
| 37      | <i>Prinsepia utilis</i>         | Bhekal      | S     | Rosaceae         | Root and seed oil used in debility and arthritis, root is given in bloody dysentery |
| 38      | <i>Punica granatum</i>          | Darim       | T     | Punicaceae       | Bark and fruit used in cough, cold and fever  |

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| Sl. No. | Botanical name                   | Locale name  | Habit | Family         | Uses  |
|---------|----------------------------------|--------------|-------|----------------|---|
| 39      | <i>Quercus leucotrichophora</i>  | Banj         | T     | Fagaceae       | Seeds used in urinary disorder  |
| 40      | <i>Quercus semecarpifolia</i>    | Khashu       | T     | Fagaceae       | Seeds used in scabies   |
| 41      | <i>Rhododendron anthopogon</i>   | Simrish      | S     | Ericaceae      | Leaves used in fever, cough and cold  |
| 42      | <i>Rhododendron arboreum</i>     | Buras        | T     | Ericaceae      | Bark used in digestive and respiratory disorders                                  |
| 43      | <i>Rumex nepalensis</i>          | jangli palak | H     | Polygonaceae   | Root paste applied on boils, pimples and ringworm                                 |
| 44      | <i>Saussurea costus</i>          | Kuth         | H     | Asteraceae     | Roots in cough and cold, asthma, skin diseases and joint disorders                |
| 45      | <i>Saussurea obvallata</i>       | Bhramkamal   | H     | Asteraceae     | Root paste applied on wounds and cuts, flower bud used in Reproductive disorder   |
| 46      | <i>Skimmia laureola</i>          | Kedarpati    | S     | Rutaceae       | Roots used in abdominal pain, blood purifier, eye disease                         |
| 47      | <i>Smilax glaucophylla</i>       | Srya         | C     | Smilacaceae    | Roots used in fever   |
| 48      | <i>Solanum nigrum</i>            | Makai        | H     | Solanaceae     | Leaf paste applied on headache and burn   |
| 49      | <i>Sonchus brachyotus</i>        | Choply       | H     | Asteraceae     | Roots used in cough, bronchitis   |
| 50      | <i>Stephania glabra</i>          | Gindaru      | C     | Menispermaceae | Tuber of this plant used in asthma, fever   |
| 51      | <i>Taxus baccata</i>             | Thuner       | T     | Taxaceae       | Bark used as a plaster, headache  |
| 52      | <i>Urtica dioica</i>             | Kandali      | S     | Urticaceae     | Bodyache, jaundice, antiseptic  |
| 53      | <i>Viola serpens</i>             | Banafsha     | H     | Violaceae      | Root paste applied on hidden muscular pain/hurt                                   |
| 54      | <i>Withania somnifera</i>        | Ashwagandha  | H     | Solanaceae     | Bark used in abdominal pain, bodyache, anxiety, urinary disorder and menstruation |
| 55      | <i>Zanthoxylum acanthopodium</i> | Timru        | S     | Rutaceae       | Bark and seeds used in toothache, tooth decay                                     |
| 56      | <i>Zingiber officinale</i>       | Adrak        | H     | Zingerberaceae | Rhizome used in headache, toothache, cough  |

**Abbreviations: C- Climber, H- Herb, S- Shrub, T- Tree**

Some of the plants viz. *Aconitum heterophyllum*, *Angelica glauca*, *Commiphora mukul*, *Dactylorhiza hatagirea*, *Picrorhiza kurroa* and *Saussurea costus* are very rare in the wild. *Zanthoxylum armatum*, *Rumex nepalensis*, *Cinnamomum tamala*, *Zingiber officinale*, *Allium sativum* and *Angelica glauca* were the preferred medicinal plant species. The availability of

medicinal plants as a part of the surrounding natural vegetation and the knowledge of these plants acquired traditionally helped these people to collect process and trade them. Due to intensive utilization of medicinal plant and heavy biotic pressure many important plant species have become rare and are at the verge of extinction. Due to rapid socioeconomic and cultural changes in many communities the traditional knowledge vanishing in this part of the Himalaya. Due to this the documentation of this knowledge is valuable both for the communities and their future generations and for scientific consideration of wider uses of the knowledge.

#### 4. CONCLUSION

The traditional system of medicine is an integral part of our country living in the remote areas where the modern system medical treatment has failed to reach and flourish. These herbal medicines which have a high diversity of medicinal plants that are still poorly studied cured the sufferer of synthetic drugs and proved their remarkable curative properties. Besides, this participation of public and private associations in management and utilization of medicinal plants in sustainable approach is indispensable to contest human pressures on these valuable natural resources. Thus the ethnomedicinal system needs to be exhaustively studied and used for the economic regeneration of the local people.

#### ACKNOWLEDGEMENT

Gratitude is expressed to the elder people of the study area for their ethical and logistic support.

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