

ETHNOBOTANICAL STUDIES OF
GADDIES- A TRIBAL COMMUNITY
IN DISTRICT KANGRA (HP)

THESIS

by

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CERTIFICATE-I

This is to certify that the thesis entitled "**Ethnobotanical study of Gaddies- A tribal community in district Kangra, Himachal Pradesh**" submitted in partial fulfilment of the requirements for the award of the degree of MASTER OF SCIENCE in FORESTRY (Forest Products) to Dr Yashwant Singh Parmar University of Horticulture & Forestry, Nauni-Solan, is a bonafide research work carried out by **Mr. Parveen Kumar Sharma (F-96-14-M)** under my guidance and supervision. No part of this thesis has been submitted for any other degree or diploma.

The assistance and help received during the course of investigations have been fully acknowledged.

Place: Nauni-Solan

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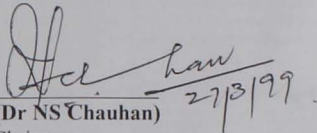
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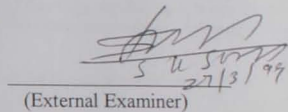
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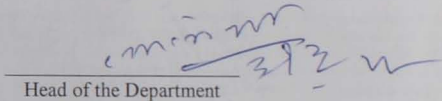
This is to certify that the thesis entitled, "Ethnobotanical study of Gaddies- A tribal community in district Kangra, Himachal Pradesh" submitted by Mr. Parveen Kumar Sharma (F-96-14-M) to Dr Yashwant Singh Parmar University of Horticulture and Forestry, Nauni-Solan, in partial fulfilment of the requirements for the award of the degree of MASTER OF SCIENCE in FORESTRY (Forest Products) has been approved by the Student's Advisory Committee after an oral examination of the same in collaboration with the External Examiner.


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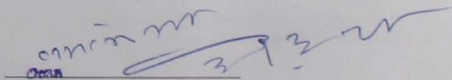
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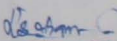
Amongst the worthmentoring and worthremembering persons in this text are my Mama-Mameer - **Sh. Joginder Sharma, Suresh Sharma, Smt. Sarlo Sharma** and **Smt. Anju Sharma**. Doubtlessly, their have been a great contribution towards acquisition all that what I have. In fact, their role in shaping me to the present form will never be forgotten.

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(Parveen Kumar Sharma)

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INTRODUCTION

INTRODUCTION

The *Gaddi* tribe is one of the most dominant and populous tribe among the various tribes of Himachal Pradesh. The people of this tribe are God fearing and hard working. The word *Gaddi* is a generic name (according to census definition) as it embraces under it Brahmins, Rajputs, Khattris, Thakurs and Rathis etc., and seems to have been modified from '*Gadar*' an alpine pasture grazed during autumn in the Himalayas. Now a days, they are called *Gaddis* since they share one common profession i.e., pasturing of their flocks.

Himachal Pradesh, a part of Western Himalayas is situated between 30°22'N to 33°13'N latitude and 75°20'24"E to 79°00'50"E longitude having a maximum east-west stretch of over 513 km and north-south expansion of about 310 km, covering an area of 55,675 sq. km. Himachal Pradesh is a mountainous state with altitude ranging from 247 m to 7000 m above mean sea level (msl). North of the outer Himalayan zone constitutes the lesser part of Himalayas, which rises in elevation towards north. This region constitutes the parallel valley of Dhauladhar located in Kangra and Chamba districts of the state, which constitute the main part of this zone and is a rich repository of medicinal wealth and is also the main habitat of *Gaddis*. The snowy ranges of Dhauladhar that divides the districts of Kangra and Chamba are known as '*Gaderen*' and forms an extensive abode of *Gaddis*. According to 1991 census, the population of Bharmour tehsil of Chamba district is 19,943 persons (10,439 males and 9,504 females). *Gaddis* of this area are treated as scheduled tribe. There is a local saying "*Ujjaria Lahore te besia Bharmour*" which means that Bharmour is inhabited by those who have deserted from Lahore. Their main profession is semi-nomadic, semi-pastoral and semi-agricultural type. During summers they migrate to high hills in search of grass and fodder for their flocks and in severe winters they descend to plains since there is hardly any vegetation left for grazing due to heavy snowfall. Their remarkable cultural features are that they worship Lord **Shiva**, take indigenous mild alcoholic beverage (prepared from local flora), use a lot of local plants for ceremonies and traditions; food

and medicines and have their own dancing style. Patriarchal and patrilineal type of family system prevails in them. *Gaddis* of Kangra district have migrated from Chamba district due to the scarcity of grass and fodder during winters. In the Kangra valley, some of the *Gaddis* are seen working as porters for six months for their livelihood before returning to Bharmour during spring. Kangra district is still called as 'Jander' by *Gaddis*. This might be due to the fact that Kangra was known as Jalandra having territory in the plains as well as a mountain tribe (the present Kangra).

The traditional social stratification amongst the *Gaddis* was that the members of each social group possess their land for agriculture by virtue of which they have been imparting free service to the ruler in exchange for the right to till the land. Hence, their major source of livelihood comes from agriculture and by selling milk and animal products of sheep and goats.

Presently, the *Gaddi* profession is on the declining phase, due to several restrictions and limitations apart from ecological and environmental problems. In the race towards modern civilization the grazing pastures and tracks earlier used by *Gaddis* are being put to other land use such as establishment of Government Offices, Army Cantonment, and forest plantation, etc. According to HP Government, a *Gaddi* cannot adopt his profession as a shepherd if he was not a permit holder in 1965. Besides this, with the changing time, a tendency to seek permanent settlement has cropped up among the *Gaddis*. The decline in their cultural peculiarities and their traditional knowledge about the local floras is spontaneous and fast due to better facilities of transport, communication and education. Keeping these factors in view the present study was carried out to revive the fast loosing ethnobotanically important rich heritage of traditional knowledge perpetuating in this tribe. The present study deals with the special emphasis on the traditional knowledge of ethno-medico-botany. It can be regarded as the pioneer step in this direction to document and understand the vegetational wealth of the area vis-a-vis man-plant relationship. The study thus, is expected to prove an important treatise not only for this tribe of Himachal Pradesh, but also for the science of ethnobotany itself.

The term ethnobotany was first used by Harshberger (1895) and its scope was much elaborated later by Faulks (1958). Since then, there has been a growing interest in this field, which now forms a part of ethnobiology, when linked with a holistic approach, including biodiversity at large (Jain, 1986; Martin, 1994). Ethnobotany specifically deals with the direct relationship of plants with man and includes studies on food, fibre, dyes, tannins, useful and harmful plants, taboos and medico-religious beliefs (Jain, 1987). This plant-man relationship can be briefly classified into two groups viz., abstract and concrete (Jain, 1987). The abstract relationship deals with taboos, avoidances, sacred plants, worship, folklore, etc., while the latter includes mainly the material use centered around economic plants and their intricate community-habitat relationship an important component for the sustainability of the agro-ecosystems. Ethnobotanical studies provide helpful clues for crop domestication and folk selection for better exploitation of resources to meet local needs, but only limited surveys have revealed this even in ethnically, physiographically and floristically rich regions, such as India (Arora, 1987; Jain, 1987). The study of inter-relationship between living organism and human cultures, including studies among tribals for documenting their knowledge of the uses of biological materials which was often kept secret and was passed on orally to the selected ones to the next generation is gaining worldwide significance and it is hoped that such studies will provide new material for ever expanding pharmaceutical industry. Keeping in view, its importance the present investigations were carried out to survey the vegetation and to document the traditional ethnobotanical aspects of the *Gaddi* inhabited areas of Kangra district with the following objectives:

- i) To collect the floristic elements of the study area and making permanent records for preservation of the specimens.
- ii) To identify and collect the information about the local/vernacular names and traditional usage of different plant species used by *Gaddis* of district Kangra.
- iii) To categories these plant species according to their potential uses (immediate as well as ultimate).

REVIEW OF LITERATURE

REVIEW OF LITERATURE

The science of Botany had its start as the study of plants in the field. The first phase of this science was devoted to recording the observations of the naturalists and herbalists. The knowledge thus, gained was applied to the cultivation for food and medicinal plants. This necessitated the plant exploration, identification and classification work all over the world.

The co-evolution of cultures, life-forms and habitats has conserved the biological diversity on this planet. Our knowledge of the intimate relationship between early man and plants has come to us mainly through surviving traditions. This relationship which now forms the core of inter-disciplinary science known as Ethnobotany, has attracted much attention. Therefore, the present work is done on the aspect of Ethnobotanical study of Gaddi inhabited areas of Kangra valley.

The related review to this present study is as under:-

2.1 TAXONOMY

It was Vavilov and his co-workers who realized the value of diversity in crop plants and their wild relatives for plant breeding purposes, and during the 1920's and 1930's expeditions were sent to many parts of the globe in search of crop diversity (Jackson and Ford Lloyd, 1986).

Later on it was realized that the exploration and collection of plant genetic resources must be based on the application of sound scientific principles. Many workers on the global level carried out surveys to scan the regional diversity. Collections and specimen counts from several localities of the Bridge Creek (California) have yielded a total of more than 32,000 leaves and fruits (Chaney, 1942). An annotated list of the

vascular flora of Monroe County, a relatively small area showing remarkable diversity of vegetation was studied by Shanks and Goodwin (1943), while Smith (1945) studied the vegetation of Brazil.

A comprehensive and contemporary record of over 11,300 illustrations, representing 8,870 plant species introduced from far tropical and warm climatic regions of the world was presented along with the information like growth, habit, shape, texture, flower and foliage description by Graf (1973).

Angely (1981) enlisted 7,747 native, naturalized and cultivated species, nomenclatural references, synonyms, distribution and common names. He also described morphological characters, habitat preferences and phenological data of some genera for differentiating species.

Medley (1992) recorded the tropical forest vegetation along the Tana River, Kenya. He described the composition and structure of this riverine forest ecosystem and identified patterns of regional and local diversity. Capote *et al.* (1992) described the flora and vegetation of Cuba and included descriptions of forest formations, thickets, herbaceous formations, various complexes and secondary vegetation.

Talukdar (1993) described the flora of Lesotho (Africa) in sections covering non-flowering plants, flowering plants and also described phenomenon of endemism and speciation alongwith the conservation activities carried out there. Similarly, the diversity and conservation of the vascular flora of Spain was studied by Simon-Zaroso (1994). Turner *et al.* (1994) studied the flora of Singapore and showed that the flora had suffered an extinction of 594 species out of 2,277 species. These represent local, not global, species extinction. The patterns of local extinction in Singapore indicate that coastal and estuarine sites are in greatest demand for development and should, therefore, be given high priority for conservation.

Similar explorations were carried out by Baas *et al.* (1990) on the flora of Malesia; Ying *et al.* (1990) on the flora of Taibai Shan, Quinling mountain range, China; Vaz (1992) on the flora of Atlantic Forest. Petersen (1994) described the flora, vegetation, and soil in broad-leaved ancient and planted woodland and shrubs of Rosnaees, Denmark.

India being a rich source of biodiversity soon attracted the attention of explorers. According to Burkill (1965), the scientific beginning of plant exploration work in India dates back to Gracia da Orta, a great pharmacist from Portugal. He came and settled in Goa in 1534. In his garden, he mainly grew those plants which were used by local physicians for the treatment of various diseases. His knowledge of plants is recorded in his book 'Colloquies' published in 1565. But, it was Heinrich Van Rheede, the Governor of Dutch possession in Malabar in 1667, who made the first real attempt to explore systematically the plant wealth of India. He made 794 excellent illustrations and described about 750 species (Manilal, 1980) with the assistance of various workers from different fields including scientists, plant collectors, artists, physicians and integrators etc. His monumental book 'Hortus Malabaricus' published in 12 Volumes from Amsterdam, became a very important contribution to the Indian botany. Linnaeus in his 'Species Plantarum' based the nomenclature of Indian plants mainly on Rheede's work (Santapau, 1973). During the same period some Britishers under the stimulus from James Petiver and Charles Du Bois gathered plants from Madras Coast. J.G. Koeing, Johan Peter Rattler, William Roxburgh, Benjamin Heyne, Francis Buchanan-Hamilton, Nathaniel Wallich, Robert Wight, J.F. Royle, Victoria Jacquemont and William Griffith were among the outstanding collectors in India till the middle of 19th century (Burkill, 1965).

One of the most significant outcome of all these collections is to be seen in Hooker's (1872-1897) 'Flora of British India' spread over 7 volumes. This pioneer work has formed the basis of all the later provincial or local Indian floras published till date.

Some important regional or local floras have been published during this century. Among these, worth mentioning is by Roxburgh (1832). He described the phenology of Indian plants and arranged them in Candollian order with modern names; preserving the information of wild and cultivated plants. King and Pantling (1898) described the Orchids of Sikkim-Himalayas morphologically and taxonomically with drawings in 3 volumes. Eighty two new and rare Indian plants were described by King *et al.* (1900). Duthie (1905) described the phenology of woody and herbaceous plants in Shiwalik and Sub-Himalayan tracts of Upper Gangetic Plains. Over 4400 species of trees, shrubs, climbers, bamboos and palms in British Indian Empire were described by Brandis (1906). Duthie (1906) made an attempt to give an account of the Orchids of the Western Himalayas. It was a supplement to the splendid work by King and Pantling on the Orchids of Sikkim Himalayas. He illustrated 58 plants. Talbot (1909) described the forest flora of Bombay Presidency and Sind. Fyson (1915) described the wild and introduced flowering plants around the hill station of Ootacamund, Kotagiri and Kodaikanal. He described 500 species, of which 430 were indigenous.

A descriptive key to the flora of Punjab, North West Frontier Province and Kashmir was given by Bamber (1916). He adopted a different method of classification, in which he divided all flowering plants except grasses into erect plants, consisting of trees, shrubs and herbs; climbing plants; prostrate plants; water plants; leafless plants which include many parasites. Parker (1918) described the flora of Punjab with Hazara and Delhi. He divided the area into four parts and described the plants area wise. Gupta (1928) described the tropical, subtropical and temperate climate plants native to and naturalized in Chakrata, Dehradun and Saharanpur forest divisions of Uttar Pradesh.

Rao and Razi (1981) carried out botanical exploration of Mysore district and described 1,601 species of flowering plants belonging to 170 families and 778 genera, with appendix of Unani, Ayurvedic and trade names of drugs. Pollunin and Stainton (1984) described over 1,500 species in the text, 689 illustrated photographically and 316 illustrated by line drawings which are native, naturalized and exotic plants species of

Nepal and parts of India falling in the Western Himalayas spread over an area of 1,450 km. Manilal (1988) did a remarkable work by studying the flora of Silent Valley and recorded a total of 966 species of angiosperms belonging to 559 genera and 134 families.

The botanical explorations made by Gupta and Gupta (1989) over three decades in the five hill districts of the Garhwal Division provide general description of the physical feature, present status of flora, phytogeography, economic uses of plants and their conservation including the endangered species. The major vegetation types of the North-east Indian region are listed by Rao and Murti (1990). The region is a major centre for orchids, ferns, bamboos, *Musa* species, *Rhododendron* species, *Hedychium* species and many wild relatives of cultivated plants. Biswas (1991) while describing the vegetation of Eastern Himalayas listed more than 150 rare and endangered plant species and suggested *ex situ* and *in situ* conservation measures. Similar work was carried out by Dasappa *et al.* (1992) in Thimmalpura forest; Samant and Pangtey (1993) in Kumaun Himalayas and Reddy and Reddy (1994) in Andhra Pradesh.

Kapur and Mitra (1994) described economically potential legumes in India. Pangtey and Rawal (1994) compiled information on the biogeography, ecology and conservation of the Himalayas in general and gave accounts of various aspects of the flora and vegetation.

Chowdhery and Wadhwa (1984) in their analysis of the Flora of Himachal Pradesh have reviewed the work of various earlier workers. The earliest attempt to collect plants from HP was made by William Moorcroft (1765-1825) who collected plants from Kangra, Kullu, Lahaul & spiti valleys in 1821. The Countess of Dalhousie collected about 600 species of plants between April to October, 1829 from Shimla.

The first account of the flora and vegetable products of Lahaul and Spiti region was published by Aitchison (1868). Watt (1881) published notes on the vegetation of Chamba state and British Lahaul.

Collett (1921) reported 1326 species of flowering plants from Shimla region, covering about 500 sq. miles with an altitude range from 600-3,500 m. In Shimla, Lelle and Misra (1961) reported 21 native and naturalized plants, important amongst them were *Agave americana*, *Callistemon citrinus*, *Lagerstroemia speciosa*, *Opuntia dellenii*, *Oenothera nigra*, *Passiflora careulea*, *Sambucus nigra*, *Solanum jasminoides* which were not reported by Collett (1921).

Trivedi *et al.* (1981) recorded 11 species new to Himachal Pradesh, some of which are *Ranunculus lingua*, *Minuartia biflora*, *Juncus leucanthus*, *Nepeta nervosa*. Chawdhery and Wadhwa (1984 a, b) gave an analysis of Flora of Himachal Pradesh covering 180 families and further reported 23 species belonging to the family Poaceae, not reported previously from Himachal Pradesh or North-West Himalayas.

Chauhan (1984) surveyed the wild medicinal and aromatic plants of Pabbar Valley of Himachal Pradesh and collected 761 species belonging to 107 families out of which 649 were dicots, 89 monocots and remaining ferns. Stainton (1988) published a supplementary plant list of subtropical and tropical regions of Western Himalayan exotic plant species, many of them were of American origin thus describing their complete description and area of distribution.

Deshraj (1991) worked on identification and evaluation of landscape plants in Solan, Nauri area and enlisted 255 natives, naturalized and introduced species of landscape plants. Nautiyal *et al.* (1994) listed and collected a total of 61 accessions of 16 fodder legumes and 160 accessions of 63 fodder grasses for conservation and multiplication. Other than these grasses and legumes, 21 other plants species (mainly woody) were also recorded which are extensively used as fodder.

Aswal and Mehrotra (1994) gave descriptive 'Flora of Lahaul Spiti' describing the vegetational wealth of one of the most beautiful but botanically least known areas of the country. The monograph covers 985 taxa belonging to 353 genera, families. Chauhan (1995) described the economically useful plant resources of Himachal Pradesh. He enumerated 87 timber yielding plant resources, 36 plant species yielding fibres and flosses, 172 fuelwood resources, 125 fodder resources, 98 wild fruit bearing plant resources, 187 medicinal and aromatic plants and bee flora. No flora deals exclusively with the plants of this state. However, some of the researchers which have contributed are Maheshwari (1972), Sharma and Nag (1974), Kapoor *et al.* (1976), Sharma (1977), Nair (1977), Kapahi and Sarin (1979), Uniyal and Malhotra (1983), Bhattacharyya and Uniyal (1982), Vij *et al.* (1982), Mangain and Rao (1985), Balodi and Malhotra (1989), Chowdhery and Murti (1989), Singh *et al.* (1993, 1994) and Dhaliwal and Sharma (1994).

2.2 FLORISTIC

The botanical research in a systematical manner started in the last quarter of the 19th century, when Hooker (1872-89) published his 'Flora of British India'. It was a period of active floristic investigations for about half century, but the vegetation was described in general and correlations were attempted with climate, topography and geological formations. Among numerous publications on forest vegetation, the accounts given by Gamble (1915-1936), Brandis (1874, 1882, 1887), Coventry (1901), Burkill (1908) Mehra *et al.* (1971), Paliwal (1984) and Kapur (1985) are noteworthy.

William Moorcroft was the first person to collect plants from Himachal Pradesh. He collected plants from Kangra, Kullu, Lahaul and Spiti in 1821. Countess of Dalhousie collected more than 600 species from Shimla in 1829. Since then, large number of workers have dealt with the floristic studies of the region falling under the erstwhile undivided Punjab or the territories of Himachal Pradesh before its reorganization in 1971. The important among these are Cleghorn (1864), Aitchison

(1868, 1869), Stewart (1868, 1869), Ribbentrop (1873), Brandis (1874, 1879, 1887), Watt (1881) and McDonell (1882, 1883). Collections from Churdhar mountains through out the districts of Sirmour and Shimla were made by Clarke, (1889). Buck (1885), Collet (1902), Coldstream (1880), Bruce (1897), Gamble (1898), Gammie (1898), Coventry (1901), Duthie (1906), Burkill (1908), Bamber (1916), Sahní (1927), Borradaile (1928), Gorrie (1929), Luthra (1937), Parker (1938, 1956) Sabnis (1940-41), Pannel (1943), Ahluwalia (1952), Joshi (1952), Puri (1952), Vrat (1954), Mohan and Puri (1955), Sarin (1955), Mohan (1956), Rau (1950-61), Gupta (1961, 1964), Nair (1977, 1978), Shabnam (1964), Chauhan, (1974, 1979, 1984, 1988, 1989, 1989a, 1992, 1995), Bor, (1973), Jain, (1984), Aswal *et al.* (1994), and Sharma and Singh (1989, 1990, 1994 and 1995).

Misra and Das (1960) studied the distribution patterns of some rainy season annuals in North India. Dansereu (1957) considered floristic composition as one of the major distinguishing characters of the community because each of the species of a community has not only its own ecological amplitude, but also its particular relationship to the environment and its associated species. Thus, the nature of a plant community at a place is determined by the species that grow and develop in such environment (Bliss, 1966) studied the climax vegetation of a monsoon deciduous forest with a high species diversity and stated that clearing the forest rapidly gives rise to savanna, which on regrowth degenerates into grasslands with continuous grazing and further felling. Whitmore (1975) reported that Orchidaceae, Rubiaceae and Euphorbiaceae are the largest families in the Malayan flora as a whole.

Floristic composition of sub-alpine Western Himalayan coniferous forest is dominated by *Abies spectabilis* in the Parbati Range in Himachal Pradesh (Gupta *et al.* 1982). Singh and Verma (1986) studied the distribution of grasses, legumes and ferns in grazed forest communities dominated by *Quercus incana*, *Cedrus deodara* and *Pinus roxburghii* during the rainy, winter and summer season at Shimla. Detailed information regarding scientific, vernacular names, distribution pattern, official parts and uses of 55

medicinal plants used in traditional medicinal systems and collected on commercial scale in Kinnaur region have been given by Singh (1990). Sharma (1991) compared the performance of growth and survival data for 11 provenances/clones of *Populus ciliata*, one of *Populus yunnanensis* and four of *Populus deltoides* in Spiti valley with local provenance of *Populus ciliata* (Tabo) and observed better performance of all the provenances. Most important species of Willow from Spiti valley reported by Nautiyal (1991) are *Salix alba*, *S. angustifolia*, *S. caesia*, *S. daphnoides*, *S. elegans*, *S. flabellaris*, *S. fragilis*, *S. hastata*, *S. oxyacarpa*, *S. sclerophylla* and *S. tetrasperma*.

Solangaarachchi and Perera (1993) reported details of floristic information on eighty one species of important medicinal plants representing 73 genera and 37 families in the understorey of the tropical dry mixed evergreen forest at Hurula reserve of Sri Lanka. About 6 per cent of the species were endemic and 61 per cent were found to be of medicinal importance. Pathak, *et al.* (1993) conducted quantitative analysis of woody vegetation of 12 stands at four aspects of oak forests at an altitudinal range of 3,100-2,700m. in Central Himalayas. It has been also reported that in less biotically disturbed areas upto 220 m altitude, Chirpine (*Pinus roxburghii*) is replaced by ban oak (*Quercus leucotrichophora*) as result of disturbance. Species importance values, basal areas of trees and saplings at different aspects and distribution pattern, species richness, diversity index and concentration of dominance of trees, sapling, seedlings and shrub layers in each stand revealed that *Q. floribunda* dominated in all aspects across all stands. Major associates were reported to be *Rhododendron arboreum*, *Ilex dipyrrens* and *Q. semicarpifolia*. Liu *et al.* (1994) and Nautiyal *et al.* (1994) conducted exploration of fodder grasses and legumes germplasm of cold desert of India viz., Ladakh region of Jammu and Kashmir and Lahaul and Spiti region of Himachal Pradesh. A total of 61 accession of 16 fodder legumes and 160 accession of 63 fodder grasses were documented alongwith 21 woody fodder plant species.

Pettit *et al.* (1995) reported floristic changes in a large group of remnants of native woodland left after agricultural clearing in South-West Australia. Detrended Correspondence Analysis (DCA) indicated that significance of the relationship between grazing effects and DCA floristic axes was greater than edaphic characteristics that normally influence floristic patterns. Floristic characteristics of the sites influencing the position of plots, included proportion of exotic species and proportion of native perennial shrubs and herbs. Species richness and diversity were significantly reduced in remnants and the proportion of exotic species increased. The plant density in different patches of an area are affected by historical changes to landscape heterogeneity. Analysis variations in the number and nature of boundaries between patches in native broad-leaved forests and pine plantations and other patches adjacent to them has attributed these changes to the replacement of the traditional farming systems by more modern intensive uses (Resica *et al.*, 1995).

2.3 ETHNOBOTANY

Humanity has been dependent on plants from time immemorial. The traditional Indian life is based on a subtle and silent relationship with nature. The ancient sages identified humanity as an integral part of nature and stressed the importance of maintaining complete harmony with all the living and non-living components of earth. Their lifestyle evolved as customs and value oriented traditions. These traditions and relationships now form the core of interdisciplinary science known as Ethnobotany.

The plant materials and recipes from herbs used traditionally by various human societies is a challenging field of research in ethnobotanical studies. The use of plants and animals as source of medicine and food is as old as humanity. Health and disease are parameters of the effectiveness with which human groups adapt to their environments. Any idea about the nature of pre-historic medicines, however, must remain only as a guess work. The famous medical papyrus, known as 'Aber's Papyrus', written about 1,500 B.C., shows the existence of many vegetable drugs in use during the Egyptian

civilization. Western Himalayas being an emporium of medicinal plants, holds great reference to ethnobotanical studies. There's a rich wealth of information on the identity and distribution of different plant species of the region in the form of regional floras, reports of botanical expeditions, monographic accounts of families, genera and similar other publications. Few workers who have carried out such studies in Himachal Pradesh are Gupta (1961, 1964, 1987), Shabnam (1964); Uniyal and Chauhan (1971, 1973), Chauhan; 1974, 1984, 1988, 1989 a, b, 1992 and 1995), Chauhan *et al.* (1979); Hemadri (1981); Sahu (1982-83); Uniyal *et al.* (1982) and Tarafdar (1984).

Archaeological or palaeobotanical evidences about collection, use and cultivation of plant products by early man for food and house-buildings etc. and references to herbal medicine in ancient scriptures suggest long history of ethnobotany. Yet the word 'Ethnobotany was applied to such knowledge by Harshberger (1895), a century ago. 'An introduction to Ethnobotany' is the first book on Ethnobotany describing the goods and services obtained from plants and relationship of vegetation with humanity (Faulks, 1958). While 'The Nature and Status of Ethnobotany' is the first book dealing with Indian Ethnobotany (Jain, 1981), it has a compilation of articles on field studies conducted in different phyto-geographical areas of India. The scope, concepts and implications of ethnobotany have been expanding at a very fast rate (Schultes, 1962, 1963; Ford, 1978; Jain, 1967, 1970, 1986, 1987, 1989; Koelz, 1979; Virjee *et al.*, 1984; Alcorn, 1987).

The other important source of ethnobotanical data is the study of archaeological remains and sites for evidences of past relationships of people with plants. Recently an attempt was made by Sitholey (1976) to describe such plants from bas reliefs on the gateways of the Great Stupa at Sanchi and the railing of Bharhut Stupa, belonging to the 1st and 2nd century B.C. respectively. About 40 representatives of plants are included in this work.

One of the excellent source of ethnobotanical research is the large compilation of anti-tumor plants from old texts and local folk medicine from all over the world by Hartwell (1967-71), Sarmah (1969, 1971, 1979) on Vedic literature and the work of Jain and Tarafdar (1970). During the last two decades, nearly 2000 plant species screened in India have revealed various types of pharmacological activities. The prospects of these studies are promising, as only about one per cent of the tropical forest species have been screened for their therapeutic value (Anonymous, 1986; Schultes, 1987; Plotkin, 1988).

Organized ethnobotanical studies in India, have received attention only during the last few decades (Jain, 1963, 1965, 1981 and 1991; Singh and Pandey, 1980; Uniyal and Chauhan, 1972-73; Joshi *et al.*, 1980; Malhotra and Balodi, 1984; Maheshwari *et al.*, 1981, 1984, 1986; Chauhan, 1984, 1988, 1989, 1994, 1996). Ethnobotanical studies have led to the introduction of more or less known potential medicinal herbs and provided materials for the pharmacological and chemical research and new data on the locations and uses of drug (Jain, 1987).

Considerable time and patience are required for ethnobotanical field works. Tribals being very conservative by nature, it is difficult to gather much information in just one or two days field work. The well known ethnobotanists of the world Dr. Richard Evans Schultes of Harvard University had to spend almost 12 years among the tribals of North-West Amazon, before he could publish his valuable ethnobotanical accounts (Schultes, 1962, 1963). Dr. R.J. Roden of Missouri Botanical Garden has botanized for more than 25 years before bringing out his account of the 'Ethnobotany of Kwanyama Ovambos'. Some of the other noted ethnobotanists like Alcorn (1987) also brought into light man-plant inter-relationship.

With the adaptation of wild indigenous germplasm and its improvement, the socio-economic and industrial development of the backward and tribal areas can be achieved without changing their food habits and establishment of their local cottage industries. Dr. E.K. Janaki Ammal (1956) studied subsistence food plants of certain

tribals of South Asia. It is estimated that in India, about 800 species are consumed as food-plants chiefly by the tribal inhabitants (Singh and Arora, 1978). Ethnobotanical studies vis-a-vis crop domestication have been carried out in the recent years as well (Arora, 1987).

In India, some field studies in tribal areas of Madhya Pradesh by Jain and his associates (1964, 1965, 1979), Andaman and Nicobar Island by Bhargava (1981) have been conducted with some positive results. Apart from the field work, herbaria and musea play an important role in ethnobotanical research. The outstanding work of this type is that of Altschul (1968, 1970 a, 1970 b) who scrutinized several hundred thousand herbarium specimens of Harvard University. Very little work has been done on this aspect in India. Jain and Dam (1979) searched a part of about one hundred thousand specimens in Assam for recording ethnobotanical data.

Forest food products are significant components of tribal diet (FAO, 1988). The Kol tribe of Uttar Pradesh, India, uses 130 species of wild plants for foods. There are large number of food items gathered from forests including nuts, leaves, fruits, roots and tubers, gums, fungi, honey and oil, animals including insects, rodents, wild game and fish, collectively, they provide protein, fibre, vitamins and essential minerals to the human diet (FAO, 1988). A recent inventory of PROSEA (i.e. Plant Resources of South-East Asia) region comprising Brunei, Indonesia, Malaysia, Papua New Guinea, Philippines and Singapore shows the occurrence of 1,182 species of medicinal plants (Lemmens et. al., 1989). Jain (1964) reported list of wild plant foods of tribals of Bastar, Madhya Pradesh. Native resources used as famine foods in Rajasthan deserts (Bhandari, 1974). Negi (1988a, 1993) has reported principal wild edible plants of central Himalaya with a special ethnobotanical note on Indian butter tree (*Aesandra butyracea*).

Maheshwari (1990) studied the interaction of tribals with the forests. In this context he emphasized on exploration and survey of plants and animals used by tribals, training of ethnobiologists, creating an ethnobiological data base, development of

ethnobiological herbaria, musea and gardens, and conservation of rare and endangered species with ethnobiological value. Considering the general features of tribal ecosystems, traditional economy, supernatural beliefs and practices. The current threat of ethnobiological research includes not only the identification, documentation and sustainable utilization of numerous species of tropical forests, but also selection of species that can yield raw materials vitally needed in medicine, agriculture and industry (Maheshwari, 1980, 1983, 1987, 1987a, 1988). In India, some field studies in tribal areas of Madhya Pradesh by Jain and his associates (1964, 1965, 1979), Andaman and Nicobar Island by Bhargava (1981) have been conducted with some positive results. Apart from this ethnobotany of certain ethnically distinct primitive otherwise interesting human societies i.e. Mikir of Assam (Jain and Borthakur, 1980); Bhils of Rajasthan (Joshi, 1982); Tharus of Uttar Pradesh (Maheshwari *et al.*, 1981); Bixa tribe of Bijnor and Pauri Garhwal (Maheshwari and Singh, 1984). Ethnobotany of any specific geographical region, which may have one or more distinct ethnic groups e.g. on Central India (Jain, 1963 and 1981); Kumaon (Shah and Joshi, 1971); on Araku valley in Andhra (Banerjee, 1974); on Santhal Pragana (Goel *et al.*, 1984); Bodding (1925); Mirzapur (Maheshwari *et al.*, 1986); northern India (Shah, 1982; Chauhan, 1988, 1989 and 1994; Negi, 1986-88); Coaheulla (Barrows, 1900); Gangwal of Garhwal Himalaya (Negi, 1990; Negi *et al.*, 1993) and others such as Shah *et al.* (1971), Shah (1982), Paul & Mudgal (1985) and Shekhawat (1984).

Singh *et al.* (1994) studied 22 taxa of folk medicinal plants used by many tribal communities in India to limit their family size by birth control methods including abortion at initial stages, preventing conception and making either of the species sterile. They described the use of 34 medicinal plants pertaining to child, adult and old health of different age and ethnic groups based on folk medicine of the respective entities. The survey gives an information on description, distribution, cultivation, authentic methods and constituents of the ethno-medicinal plants. Parabia and Reddy (1994) emphasized the role of tribals, foresters and botanists in building conservation policy for ethnomedicinal taxa.

Vartak and Ghate (1994) look up a case study in Karnala tribal area and gave detailed floristic and ethnobotanical investigation, revealing occurrence of 625 plants and utilization of 155 local resources respectively. Similar studies were carried out by Khanna (1994) in the Gonda District of Uttar Pradesh, Jamir (1994) for Naga tribes in Nagaland, Rajbhandari (1994) in Northern Nepal, Rao (1994) in British Isles, Shukla and Verma (1994) in Vindhyan region and Maheshwari (1994) in Andaman and Nicobar Island. Singh and Pandey (1994) studied 74 species of flowering plants used by different Adivasi communities to cure venereal and gynaecologica complaints. The cause of disease, its symptoms, parts of plants used and method of preparation of household remedies have been highlighted. Mathew, Pushpagadan and Unaithan (1994) presented first hand, ethno-medico-botanical information on four single plant remedies used traditionally by the 'Adian' Tribals of Kerala in the treatment of disease condition showing symptoms of Cancer. Singh *et al.* (1994) highlighted the traditional phytotherapy of 30 indigenous plants for the treatment and control of diabetes among the different Adivasis and rural inhabitants of India.

Simons (1994) used the Kenyan case to demonstrate why re-establishing some effective, and new forms of linkage between rural women and biodiversity is urgent for conservation as well as for economic and social reasons, and presents recommendations on how this might be accomplished. Saberwal (1994) examined the origins and ecological consequences of resource use by Gaddis herders of Himachal Pradesh, North India.

Sushruta Samhita written earlier than 1000 B.C. contains a very comprehensive chapter on therapeutics. Contemporary Charaka Samhita gives remarkable Materia Medica of ancient Hindus (Chopra *et al.*, 1958). Later many Nighantus and Koshas come into existence. In other civilizations of the world, with regard to the history of medicinal herbs, mention may be made of the works of Hippocrates (5th century B.C.), Theophrastus (372-287 B.C.), Pliny (23 A.D.-79 A.D.), Dioscorioides (77 A.D.) famous

for his *Materia Medica*, Galens (131-200 A.D.), Hilarius, Mathhiolus and the Italian physician Clausius best known for his translations of Spanish herbal writings. In brief, the knowledge of medicinal plants in different civilizations like the Indian, Egyptian, Greek, Chinese, Summerian and Babylonian was vast enough.

During the last few decades, a succession of so called "Wonder Drugs" have been discovered from plants with rich ethno-pharmacological histories in aboriginal societies. Surprisingly, the uses of these drugs in North America correspond with those approved in The Dispensatory of the United States of America (Vogel, 1970). Many of the plants familiar to which Doctors really have the healing powers that tradition attaches to them. The age old arts of the herbalist must, therefore, be tapped (Maheshwari, 1980).

Ethnomedicine have now been classified into several more specialized disciplines e.g., papers have appeared under the discipline of ethno-narcotics (Schultes, 1956), ethnopediatrics and ethnogynaecology (Schultes, 1963). Altschul (1970) and Efron (1967) stressed the role of ethnopharmacology in the search of psycho-active drugs.

Apart from the medicine and wild foods, there are few workers who worked out on the arts and crafts, like musical and other sound instruments of South American Indians, personal adornment (Mehra *et al.*, 1975) and musical instruments of Madhya Pradesh (Parmar, 1978). Some of the scientists have published bibliographies and dictionaries on the subject (Sengupta and Parmar, 1967 ; Duke, 1968; and Jain *et al.*, 1984).

The conservation of ethnobotanical resources and wild relatives of crop plants is vital for future breeding programmes. The tribal societies and cultures are themselves disappearing and with them goes their traditional plant lores. Ethnobotany has thus, become increasingly important because the information which is being gathered which otherwise be lost. Some of the workers who have described various conservation

practices of tribals are Vartak (1994); Pal and Mudgil (1985), Arora (1987) and Paroda (1988).

The future of ethnobotany lies in studying the tribal cultures and maintaining them. It takes considerable time and patience to study tribal culture. However, workers have conducted research and spent years living in tribal areas. Some selected tribes are Coahuilla Indians (Duke, 1970), Santals (Bodding, 1925, 1927 and 1940), and Mikirs (Jain and Borthakur, 1980).

METHODOLOGY

TITULOS Y RESUMEN DE LA TESIS

DESCRIPCIÓN GENERAL DEL ÁREA DE ESTUDIO

Introducción

El presente trabajo tiene como objetivo principal investigar el nivel de conocimiento que poseen los habitantes de la zona de estudio sobre el medio ambiente y su conservación. Para ello se realizó una encuesta a 100 personas de diferentes edades y niveles educativos. Los resultados muestran que el 60% de los encuestados tiene un conocimiento básico del medio ambiente, mientras que el 40% restante carece de información suficiente. Se concluye que es necesario implementar programas de educación ambiental en la zona de estudio para mejorar el nivel de conciencia y compromiso de la población con la conservación del medio ambiente.

METODOLOGÍA

El método de investigación utilizado en este trabajo es el método cuantitativo, específicamente el método de encuesta. Se utilizó una muestra aleatoria simple de 100 personas de la zona de estudio. El cuestionario fue diseñado para medir el nivel de conocimiento sobre el medio ambiente y su conservación. Los datos obtenidos fueron analizados estadísticamente para determinar el nivel de conocimiento promedio de la población. Se concluye que el nivel de conocimiento es bajo y que es necesario implementar programas de educación ambiental en la zona de estudio.

METHODOLOGY AND ITINERARY OF DATA COLLECTION

3.1 GENERAL DESCRIPTION OF THE STUDY AREA

3.1.1 Location and Extent

The present Kangra district came into existence on the 1st September, 1972 consequent upon the reorganization of districts by the Government of Himachal Pradesh. The district lies between $31^{\circ}40'$ to $32^{\circ}25'$ longitudes and $75^{\circ}35'$ to $77^{\circ}5'$ latitudes and is bounded on the south-west by Una district, on the north-west by district Gurdaspur of Punjab, on the north by Lahaul and Spiti and Chamba districts, on the east by Kullu and Mandi districts while on the south, it touches Hamirpur district. The elevation generally varies from 500 m to 5,500 m above mean sea level.

3.1.2 Mountain Ranges and Valleys

The district is criss-crossed by mountain ranges enclosing broad to narrow valleys. Dhauladhar which looks like a big giant in a sitting posture, stretches out with fertile valley of Palampur and Kangra in front and is the most important mountain range in the district. Dhauladhar range starts from the right bank of the river Beas and forms boundary of the district with Kullu district at a distant point below Sarui Pass. Thereafter, the range passes through Bhungal area above Kangra and Palampur valley covering Bara Bhungal ridge which is about 6,000 m above mean sea level and thereafter runs parallel to another mountain range known as Hathidhar which forms boundary between Chamba and Kangra district of the state. The Dhauladhar range cuts Bhungal area into two halves. The northern half is called Bara Bhungal and the southern half as Chotta Bhungal. To the east of Bara Bhungal is Kullu; to the north is Lahaul and the Mani-Malesh range of Chamba district is located to the west. When the snows melt, the long bare slopes of the mountains which surround Bara Bhungal on three sides, support

splendid grazing areas and pastures for sheep and goats. General appearance of Chotta Bhargal is wild. The range above Bir is known as Bir Bhargal which is one of the prettiest part of Kangra district.

3.1.3 Geology

Kangra district lies in the Shivalik and the lesser Himalayan zone and its topography is well defined by a series of almost parallel hill ranges which rise in height towards north-east. The altitude generally varies between 400 m to 4,000 m and high reaches of the hill ranges are snow covered during most part of the year. The area between the Beas river which forms the southern boundary of the district and Chakki stream at the south-east is extensively cultivated.

The rocks commonly seen in the district are shale, clay and sand stone of Shivalik group, green shales and fossils rich limestones, gneissic and granatic rocks of Dhauladhar group. The major rock formation can be seen between Bara Bhargal and Kakrani Jot along the pedestrian track. The Saluni formation is exposed at Thamsar pass near Palachak Bridge, at Jalta and in the east of Kakrani Jot. The granitic rocks of Dhauladhar occur in a width of about 5 km. across Dhauladhar ridge.

3.1.4 Climate

The climate in the district unfolds four broad seasons. The winter generally spreads over from December to February. The period from March to June is summer and rainy season generally extends from July to September. October and November exhibit autumn. While the places at high altitudes are covered with deep snow during the winter months the lower areas receive plentiful rains. Temperature during the winter months even in the lower areas is too cold because of the lashing cold winds from the mountain ranges of Dhauladhar and Hathidhar. The places lying at higher altitudes are too wet in the rainy season and Dharamshala, the headquarters of the district, which receives the

plentiful rains of about 350 cm., is the second wettest place in the country next only to Baungi-Gaon. During the summer months in the valleys and southern parts of the district, the days are extremely hot and sultry. During the monsoon period the landscape becomes lush green and the small water channels in the beds of hill streams begin to swell. The springs which dry up during the hot summers are replenished.

3.1.5 General Vegetation

The climatic variations due to the physiography, topography and altitude has greatly influenced the vegetation of the area. Generally, the vegetation of the valley can be broadly divided into three zones:

1. Lower Dhauladhar range (1,300-2,000 m)
2. Upper Dhauladhar range (2,000-3,200 m)
3. Alpine zone (3,200 m upwards)

Above 2,000 m elevation thick forests of *Quercus* spp., *Rhododendrons*, *Conifers* and various other trees are present. Under the shades of these is found the thick growth of herbs like *Hedychium acuminatum*, *Podophyllum hexandrum* and other shade loving plants. Almost at the start of the Alpine zone (4000 m) the trees become absent. The steep sloping meadows and hills are covered with beautiful and attractive flowers of *Aconites*, *Anemones*, *Meconopsis*, *Delphiniums*, *Gentians*, *Potentillas*, *Primulas*, *Saxifragas*, *Sedums* and *Senecios*. On the top of the Thamsar jot (5000 m) woolly *Saussurias* and *Pleurospermum* spp., locally called as Ghuggi-Ban can be seen. Stunted shrubs of *Polygonums*, *Aromatic junipers* and *Rhododendrons* can be seen at certain places on sloppy meadows and rocks.

3.1.6 Cultural Heritage

The study area is chiefly inhabited by the *Gaddi* tribe. The word *Gaddi* means a shepherd. As a nomadic tribe, the *Gaddis* spend half of the year in their villages cultivating their fields and the remaining half is spent in migration searching for grass and fodder for their herd and seeking seasonal employment for themselves.

The *Gaddis* are worshippers of Lord Shiva, but also propitiate their deities and spirits by sacrificing sheep and goats. The tribe follows Hindu tradition, and are served by Brahman priests in a number of social functions. A folklore on Shiva goes:

‘The *Gaddi* was grazing his flock
The *Gaddan* offered incense to Shiva
To the *Gaddi* he gave Sheep
and to the *Gaddan* beauty.’

3.1.6.1 Dialect and Caste system

The dialect of *Gaddis* is called ‘*Gaddi*’ which is written in Devnagri script. Caste system dominates in *Gaddi* community. Brahmins are considered as the top class, who act as priests and purohits of *Gaddies*.

3.1.6.2 Culture

Gaddi life has its own peculiarities. Temples are the centers of activity in the villages. Their culture is reflected in the festivals, folk songs and folk dances. Their dances are directly related to Lord-Shiva. They have kept the folk songs alive by their whole hearted participation. The group dances of men and women present beautiful and fascinating scenes. Maru, Bansuri, Narsingha are some of their musical instruments. The folk ballads of Kunju-Chanchlo and Phoolmu-Ranjha are world famous. There are Dheradies (small temples) of Satis also in the *Gaddi* inhabited belt of Kangra district.

These temples came up where *Gaddi* ladies have performed Sati by sitting on the burning fires in old times. Some of these temples are located at Shidpur, Rakkar, Yol, Sidhbari and Kanihara. *Gaddis* also believe in superstitions. There is a proverb regarding bad omens which reads:

Sap, Soi, Sunar, Widhwa Nar, Khali Ghara, Kadi na Bhali Bar

It means while starting on a journey or any auspicious work, if a person encounters a snake, tailor, goldsmith, widow or empty pitcher, it is considered a bad omen inauspicious and thus would never lead to any good. However, on the contrary sight of monkey, hare and jackal is considered favorable and auspicious.

The marriage traditions in *Gaddis* are not much different from the ones prevalent in the Hindu society in India. The choice of mates is thus regulated by caste, as in other parts of India. Marriage is arranged by the elders in the family. Marriage is performed in several ways. The most respectable form is known as **Shadi** in which a Brahman priest conducts the ceremony and the bride leaves permanently for her future home only after a second ceremony, which is held one year after the first. Two other forms of marriage are also performed. When a man marries into a family or cast considered lower, no Brahmin is employed; but a number of women collect in a temple and tie a red tape in the hair of the bride in the presence of bride groom. In the third form which follows an elopement, the lovers light a fire of brush wood, go around the fire a number of times and then a man ties a red tape in the hair of the girl and the ceremony is over. If a man is unable to secure a bride for himself because of the expenses involved, a marriage by exchange (*bata-sata*) can be arranged between two families. A brother and a sister belonging to one family may be married to a sister and a brother in another. The dowries are written off against one another. One can also gain a wife in exchange of service, when he becomes a son-in-law resident in the house of the wives parents (*Ghar-Jwantri*). Morning break-fast is called *Nuhari*, lunch is known as *Dupari* while dinner is

called Sanja by them and generally all the members of the family take their food together. *Gaddis* being devotees of Shiva, seek blessings of the Lord whenever a new born comes to their family. The women are so sturdy that just after two days of delivering a child, they move on with men folk. The mother and new born are given a bath on eleventh day. They allow breast feeding to newly borns upto three years. The child is named after six months. At the time of the ceremony, a sickle, kadal, kheer and a paper is kept before the child. If he touches kheer, he is considered to be a glutton. If he touches the paper, it indicates he would turn out to be a scholar and if he prefers sickle or kadal, it is thought that he would turn out to be a farmer-a hard working man.

3.1.6.3 Dress and ornaments

The clothing is almost wholly woollen and is made indigenously. Men wear woollen caps or 'Topi', long coats called 'Choga' which is tied round the waist by means of a dark brown rope called 'Dora'. The use of *Dora* is traditionally important among the *Gaddis* for both men as well as women. The use of this probably relates to the hazards of the mountains. Men use ornaments only during festivals. Ear rings (Nanti), finger rings and necklaces are major ones. The *Gaddi* women love jewellery which is considered a sign of prosperity. They wear ornaments like Clip, Chiri, Dhodky, Chaunk, Pherbali, Jhumkas, Bundal, Litkani, Chalik, Kantey or Kanibali, nose ring etc. They wear Chola and Dora garments usually.

3.1.6.4 Agriculture

In the lower reaches, the dependence is more on agriculture than pasturing, but in high reaches, where suitable land is scarce, they earn more through rearing of sheep and goats. Even in agriculture most of produce is for local use than produced for sale. The farming is done on the terraces which are built by the farmer himself with pieces of rock which he may gather from waste land in hill-sides. Ploughing is done with the help of cattle, locally called chungroo (a cross between the yak and plains cattle). The summer

crops is sown in late May and harvested in September, after which winter crops are cultivated on the same land. The most important summer crop is maize. In high tracts, maize is replaced by bhares (millet). Among cereals, barley and buck-wheat are winter crops. Beans, potatoes, cabbage and other vegetables are also grown. A pulse known as mash (*Phaseolus radiatus*) is also extensively grown.

3.1.6.5 Pasturing

For generations, pasturing has been the traditional occupation of the *Gaddis* and their wealth is measured by the number of sheep and goats they possess. The term **Dhan** is used for this wealth. Usually, three or four families collect their animals and make up a number of about 400. Two shepherds are then placed in charge of these. The graziers pay special attention to the animals and divide them into: a) Lambs (Kids), b) Pregnant animals and c) the rest. Each sub group needs separate attention and the divisions are maintained in-tact with the help of sheep dogs, both when the flocks are grazing or are on the move. The dogs are also trained to guide the sheep and goats in a particular direction by the whistle of the Shepherds. If the grazier is hired for a season, food has to be supplied to him by the owner. The principal diet of the shepherd is Chapati (made of the flour of maize); a chutney made of amlu leaves available in hill-sides near the snow line and goat milk. Meat is also eaten; when an animal dies in an accident, or is offered as sacrifice to some deity. Animals are not killed merely for the sake of meat. Wool is shorn from the sheep thrice a year. It is difficult to assess the number of new births in a flock every year. But the *Gaddis* hold that, if a person has 400 sheep, he can sell 40 every year without reducing the size of his flock. In case of the goats the corresponding figure is 70.

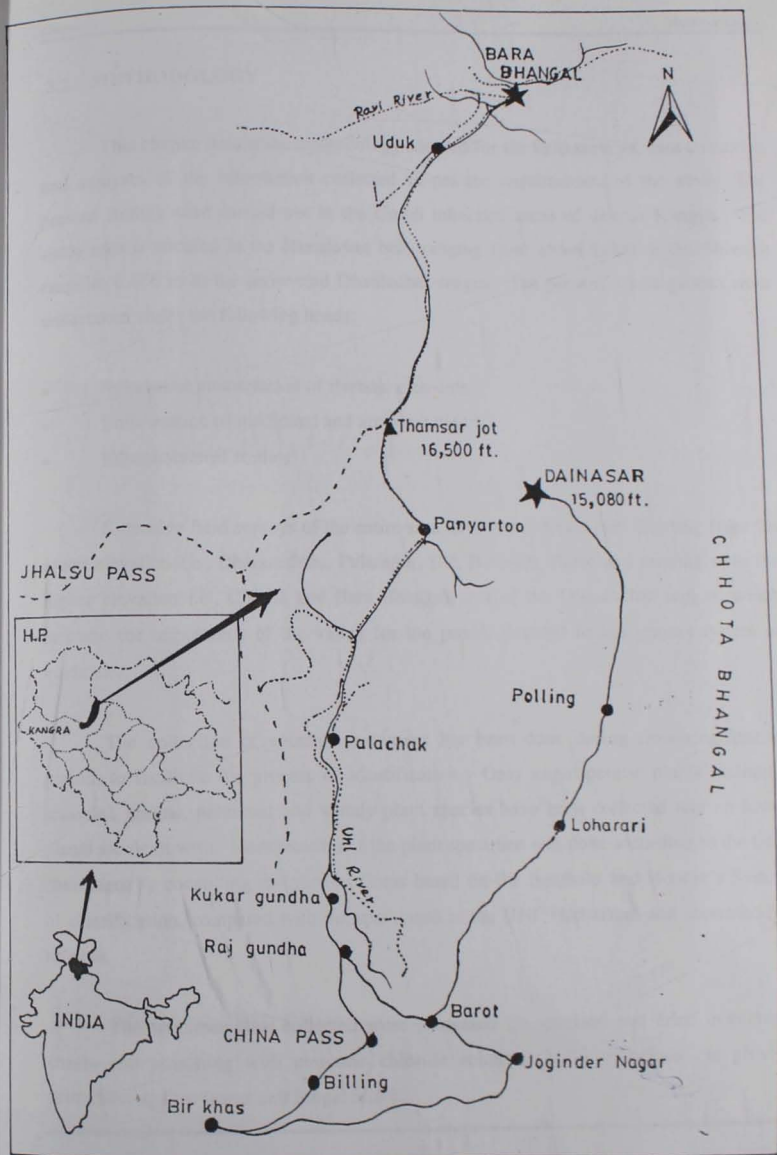


Fig. 1 ITINERARY OF COLLECTION IN THE STUDY AREA

3.2 METHODOLOGY

This chapter details the methodology adopted for the field surveys, data collection and analyses of the information collected as per the requirements of the study. The present studies were carried out in the *Gaddi* inhabited areas of district Kangra. The study area is situated in the Himalayan belt, ranging from about 1,000 m in the Shivalik range to 6,000 m in the snow-clad Dhauladhar ranges. The present investigations were undertaken under the following heads:

- Systematic enumeration of floristic elements
- Enumeration of medicinal and aromatic plants
- Ethnobotanical studies

Extensive field surveys of the entire area have been carried out. Starting from the lower elevation i.e., Dharamshala, Palampur, Bir, Baijnath, Barot and moving upto the higher elevation i.e., Chhota and Bara Bhangal area of the Dhauladhar region, which increase the importance of the valley for the people devoted to indigenous system of medicine.

The collection of voucher specimens has been done during flowering/fruited period, to facilitate the process of identification. Only angiospermic plants including seasonal, annual, perennial and woody plant species have been collected and no lower plants are dealt with. Identification of the plant specimen was done according to the field characters by consulting the various floras based on the Bentham and Hooker's System of classification, compared with the specimens in the UHF Herbarium and deposited for records.

The specimen thus collected were processed i.e., pressed and dried in blotting sheets and poisoning with mercuric chloride solution (2 %) was done to provide protection against insect and fungal attack.

3.2.1 Enumeration of Medicinal and Aromatic Plants

Inventory of entire floristic elements was prepared. The documented information was used to delineate medicinal and aromatic plants. These have been highlighted giving latin names, local/vernacular names, locality and description. Medicinal and Aromatic Plants are also supported by their therapeutic uses (on the basis of their commercial importance).

3.2.2 Ethnobotanical Studies

The information regarding the traditional knowledge, local uses of the plants of the study area, containing the information about the local name of the plant, parts used, purpose for which used, mode of administration and curative properties were recorded through interviews and discussions with elderly people, Herbal Healers, Local Vaid and Rural women and the same have been documented in the results.



Mani-Mahesh peak as seen from the Thamsar



Snow adorning Thamsar top (4650 m.)

Plate-1



Cultivated fields in Chhota Bhangal area. Climatic climax of fir and spruce intersupressed by alpine pastures and temperate pastures are clearly seen in the background



Dainasar at 4,500 m (amsl), held in high esteem as a religious lake and people come to take holly bath on 20th Bhadroan every year. Here, people make offering and it is belived that their prayers and wishes are fulfilled

Plate-2



Terraces fields on both sides of the Uhal river in Rajgunda village
in Chhota Bhangal



Deodar, Taxus, fir and spruce surrounding Bara Gram village in
Chhota Bhangal



Temporary shelter of migratory *Gaddies* at camping sites of sheep and goats

Plate-4



Collection of plant specimens from Dianasar and Panihartu pastures during survey. Melting of glaciers results into revulets and waterfalls.

EXPERIMENTAL RESULTS

EXPERIMENTAL RESULTS

The present study is carried out in *Gaddi* inhabited areas of district Kangra of Himachal Pradesh. After ascertaining the identity, the plants were referred to their respective families and arranged on the basis of Bentham and Hooker's system of classification.

Systematic enumeration of the plant species collected from the study area is as under:

RANUNCULACEAE

Latin name	:	<i>Aconitum heterophyllum</i> Wall.
Local/common name(s)	:	Atis, Patish.
Locality	:	Dainasar (4,500 m) (<i>Sharma, PK 6760</i>)
Description	:	

An erect, leafy herb having biennial, paired, tuberous roots. Stems upto 1 m tall with broad, ovate or orbicular, cordate, lobed and toothed, shortly stalked or sessile, amplexicaule leaves. Lower leaves are long petioled, while the cauline leaves are sessile, amplexicaule. Flowers bright-blue to yellow greenish blue with purple veins in long, many flowered peduncles. Fruits is a 5 celled capsule. Seeds are dark brown.

Latin name	:	<i>Anemone rivularis</i> Buch-Ham
Local/common name(s)	:	Rattan jot
Locality	:	Polling to Dainasar (2,000 m) (<i>Sharma, PK 6769</i>)
Description	:	

Stem 30-90 cm, silky pubescent, radical leaves orbicular, 7.5-15 cm., deeply lobed flowers 3.5 cm diameter. White from lever surface tinged with purple.

Latin name : *Clematis gouriana* Roxb.
 Local/common name(s) : Bel-Kum, Bel-Kungu
 Locality : Barot (900-1,200 m) (Sharma, PK 6473)
 Description :

Glabrous or nearly so, leaves pinnate or 2-pinnate smooth, ovate-lanceolate, cordate, long pointed and entire. Flowers pale yellow, crowded in panicles. Achnes hairy.

Latin name : *Delphinium brunonianum* Royle
 Local/common name(s) : Salyan, Musk Larkspur
 Locality : Thamsar Top (5,000 m) (Sharma, PK 7021)
 Description :

Stems 45-90 cm. Leaves are simple, 15-30 cm, radicle and orbicular. Sepals are dark blue and Petals are dull blue in colour.

Latin name : *Ranunculus diffuses* DC.
 Local/common name(s) : Chambul
 Locality : Palachak to Panihartu (2,700 m) (Sharma, PK 7042)
 Description :

A perennial herb covered with soft spreading hairs. Stem decumbent. Radical leaves long stalked cordate and deeply 3-lobed. Flowers long stalked and bright yellow in colour.

Latin name : *R. laetus* Wall.
 Local/common name(s) : Bodra

Locality : Palachak to Panihartu(2,000 m) (
 Description :

A perennial, erect, hairy herb, with much branched stem, upto 30-60 cm Radical leaves 5-10 cm long, deeply 3-lobed, segments deeply lobed and sharply toothed. Stem leaves are smaller and shortly stalked. Flowers long stalked, bright yellow. Sepals hairy. Fruit is a globose head of smooth, flattened, minutely dotted achenes.

Latin name : *Thallictrum elegans* Wall.

Local/common name(s) : Mamiran

Locality : Palachak to Panihartu(3,000 m), (Sharma, PK 488)

Description :

An alpine species, long stalked achenes and very small 3-lobed leaflets, scarcely 4.0 cm long.

Latin name : *T. foliolosum* DC.

Local/common name(s) : Mamira, Pilihari

Locality : Billing (1,500-2,000 m) (Sharma, PK 7096)

Description :

An erect rigid perennial herb upto 2.5 m tall. Rootstock is fibrous, yellowish-brown, resembling liquorice, but is knotty and extremely bitter and yellow inside. Leaves are pinnately decompound leaflets 4-6 mm, sub-orbicular slightly lobulate flowers are usually pale-green of ten dingy-purple, polygamous, arising in branched terminal panicles. Achenes are 3.75 cm long, sharply ribbed.

Latin name : *T. javanicum* Blume

Local/common name(s) : Gurbiani

Locality: : Polling to Dainasar (2,700 m), (Sharma, PK 6489)

Description :

Stems 60-90 cm, pale coloured, leaves 10-30 cm, pinnules usually with 3 leaflets. Flowers are in clustered.

BERBERIDACEAE

Latin name :

Berberis aristata DC.

Local/common name(s) :

Kashmal, Daru haridra

Locality :

Gundha (1,800-2,400 m) (Sharma, PK 7048)

Description :

Young branched red. Leaves sessile broadly lanceolate; teeth few, distant. Racemes long-stalked, compound, corymbose to umbellate, drooping much longer than leaves. Young fruits are cylindrical, berry, oblong to ovate and red in colour.

Latin name :

B. coriaria Royle

Local/common name(s) :

Amber, Kasmal

Locality :

Polling to Dainasar (2,000 m) (Sharma, PK 7047)

Description :

Bark white, leaves nearly sessile, broadly lanceolate. Racemes shortly stalked simple barely longer than leaves. Berry globose and purple blue in colour.

Latin name :

B. lycium Royle

Local/common name(s) :

Kashmal, Kirmora

Locality :

Kandwari (2,000 m) (Sharma, PK 6701)

Description :

An evergreen shrub of average height. Twigs pale yellowish, bark greyish, rough, rather deeply furrowed; leaves lanceolate or nearly obovate, oblong, entire

flowers, yellow in a simple raceme. Raceme are many flowered, corymbose, shorter than the leaves; pedicles elongated single flowered; berries purplish blue on ripening.

Latin name	:	<i>Podophyllum hexandrum</i> Royle
Local/common name(s)	:	Bankarki
Locality	:	Palachak to Panihartu(2500-4,000 m) (Sharma, PK 7037)
Description	:	

An erect, glabrous, succulent, herb; 35-60 cm tall with creeping, perennial, knotted rhizomes bearing numerous roots. Leaves usually 2; long, stout, stalked, orbicular-reniform, palmate, paltate with lobed segments. Flower-solitary, in the axil of the two leaves, creamy white, cup shaped. Fruits is an oblong, elliptic berry, 2-5 cm, in diameter, red on ripening and containing many seeds embedded in the pulp.

PAPAVARACEAE

Latin name	:	<i>Meconopsis aculeata</i> Royle
Local/common name(s)	:	Kant-Swarnyus
Locality	:	Palachak to Panihartu (3,000-4,000 m) (Sharma, PK 6770)
Description	:	

A bristly haired herb, with stem upto 60cm tall. Leaves are deeply, irregularly pinnately lobed. Lobes rounded, toothed and bristly haired. Flower, few, blue, 5-7 cm in diameter. Capsule ovate to oblong, 1.5 cm, with a beak and is bristly haired.

FUMARACEAE

Latin name	:	<i>Corydalis govaniiana</i> Wall.
Local/common name(s)	:	Bhutkesh, Bhutjata
Locality	:	Palachak to Panihartu(2200 m) (Sharma, PK 6795)

Description :

A short, slender, herb with thick, woody, finely knitted type dark brown rootstock, crowned with withered leaf sheaths. Stem tufted, 30-45cm tall. Radical leaves are long stalked, 2-pinnate, cut to the base and as long as stem. Leaflets-wedge shaped and deeply lobed. Flowers are yellow, crowded, 2.5 cm long arising from 5-10 cm long individual axis. Capsule is 1-1.5 cm long.

CRUCIFERAE

Latin name : *Capsella bursa-pastoris* Medic.
 Local/common name(s) : Shepherd's purse
 Locality : Palachak to Panihartu(3,000 m) (Sharma, PK 6758)
 Description :

An annual herb, more or less covered with forked hairs. Stem erect and branched. Leaves are radical, usually pinnatifid and sometimes lanceolate. Flowers small, white and racemed. Pods nearly flat, triangular and broad.

Latin name : *Nasturtium officinale* R. Br.
 Local/common name(s) : Brahmi-Sag, Chuch
 Locality : Polling to Dainasar (2,200 m) (Sharma, PK 6497)
 Description. :

Stem short, creeping, sometimes much branched. Leaves pinnate, leaflets sessile, ovate, entire or sinuate. Racemes short. Flowers white in colour. Pods are linear.

Latin name : *N. montanum* Wall.
 Local/common name(s) : Lutputian
 Locality : Polling to Dainasar (2,200-2,500 m) (Sharma, PK 7019)

Description :

Stem erect, grooved and branched. Lower leaves stalked, pinnatifid, toothed and the upper ones are almost sessile. Racemes long. Flowers yellow. Pods are oblong.

Latin name : *Sisymbrium wallichii* Hook.f.Thoms.
 Local/common name(s) : Khubkalan, Maktrusa
 Locality : Dainasar (2,700 m) (Sharma, PK 6498)
 Description :

Stem slender and erect. Leaves pinnately lobed, radical and obtuse. Flowers are white which later changes to pale pink. Pods very slender, glabrous; spreading and curved.

VIOLACEAE

Latin name : *Viola serpens* Wall. ex. Ging.
 Local/common name(s) : Banafsha
 Locality : Neugal (Kandi) 2,300 m (Sharma, PK 6715)
 Description :

A small, perennial herb, with short tufted root-stocks. Stem short, but distinct, covered with withered scales, often producing runners. Leaves are ovate-cordate, 2.5-5cm, crenate-serrate. Flowers lilac, blue or sometimes white. Capsule globose, only a few seeded.

CARYOPHYLLACEAE

Latin name : *Arenaria serpyllifolia* Linn.
 Locality : Palachak to Panihartu (4,200m) (Sharma, PK 7055)

Description :

Stem very slender. Leaves ovate-lanceolate and acute. Flowers numerous. Petals obovate. Seeds are rough.

Latin name : *Silene edgeworthii* Bocquet

Locality : Palachak to Panihartu(2,000-3,500 m) (Sharma, PK 6482)

Description :

Flowers usually solitary and pendulous, with distinctive very inflated calyx with dark brown ribs. Leaves elliptic to lanceolate, the lower stalked; stem leafy with swollen nodes.

Latin name : *S. tenuis* Willd.

Locality : Palachak to Panihartu(2,700-4,300 m) (Sharma, PK 6479)

Description :

A slender tufted perennial with several erect branched stems bearing terminal rather crowded elongate clusters of dark purple or brownish purple flowers. Leaves mostly basal, linear to narrow-lanceolate and pointed.

HYPERICACEAE/GUTTIFERAE

Latin name : *Hypericum choisianum* Wallich ex. N. Robson.

Local/common name(s) : Bassant, Balsana

Locality : Polling to Dainasar (2,400-3,600 m)

Description :

A much branched arching often pendent shrub having broad petals which are broadly obovate to rounded. Flowers are yellow in colour. Leaves are shortly stalked, ovate to lanceolate and acute.

MALVACEAE

Latin name	:	<i>Malva verticillata</i> L.
Local/common name(s)	:	Laffa, Khubba
Locality	:	Mayot (2,100-3,300 m) (Shama, PK 6484)
Description	:	

An erect annual or perennial, with whorls or nearly stalk less crowded small pink or mauve flowers borne in the axils of the upper rounded and lobed leaves.

LINACEAE

Latin name	:	<i>Linum usitatissimum</i> L.
Local/common name(s)	:	Alsi, Roghan-Kanta
Locality	:	Kandwari (1,800 m) (Shama, PK 6317)
Description	:	

An annual herb whose stems are slender and erect, branching near the top. Leaves are sessile, oblong and acute. Flowers are in terminal corymbose racemes sky blue in colour.

Latin name	:	<i>Reinwardia indica</i> Dum Syn. <i>R. trigyna</i> Roxb.
Local/common name(s)	:	Basant phool
Locality	:	Kandwari (1600 m) (Shama, PK 6726)
Description	:	

A glabrous shrub, stems 60-90 cm, erect or ascending. Leaves entire, ovate-lanceolate, tip obtuse or acute. Flowers are in axillary, solitary or in small clusters, in a terminal corymbs.

GERANIACEAE

Latin name	:	<i>Geranium robertianum</i> Linn.
Local/common name(s)	:	Lal-jari
Locality	:	Palachak to Panihartu(2,100-2,500 m) (Sharma, PK 7023)
Description	:	

A strong scented, glandular, softly hairy herb, often turning red when mature. Stems erect, 25-50 cm tall. Leaves triangular, 2.5-7.5 cm broad, divided to the base in 3-5 palmately lobed segments, lobes acute. Flowers red-pink, streaked with white.

RUTACEAE

Latin name	:	<i>Boenninghausenia albiflora</i> Reichenb.
Local/common name(s)	:	Pissumarbuti
Locality	:	Bir-Bajjnath (1,500 m) (Sharma, PK 6774)
Description	:	

An erect, perennial, glabrous, branching herb with, stem upto 30-60cm Leaves gland dotted, 2-pinnate. Leaflets ovate, 0.5-1.5 cm, entire. Flowers white, in terminal leafy panicles.

LEGUMINOSAE

Latin name	:	<i>Desmodium tiliaefolium</i> Don.
Local/common name(s)	:	Samber
Locality	:	Palachak to Panihartu(1,500-2,700 m) (Sharma, PK 7098)

Description

A tall, erect shrub; stems tomentose or nearly glabrous. Leaflets broadly ovate, entire or sinuate, obtuse or acute. Racemes numerous. Flowers are pale pink in colour. Pods sessile, pubescent or densely hairy.

Latin name : *Indigofera hebeptala* Benth.

Local/common name(s) : Ganglimethi, Kalaklitka

Locality : Neugal (Palampur) 1,500-3,000 m (Sharma, PK 6486)

Description

A tall shrub whose bracts are differing, boat shaped and encircling the flower buds. Flowers are deep red. Leaves are ovate. Pod is straight and hairless.

Latin name : *Lotus corniculatus* L.

Local/common name(s) : Birds-Foot, Trifol

Locality : Dainasar (1,500-4,000 m) (Sharma, PK 6704)

Description

A perennial herb with usually long-stalked clusters of yellow flowers. Leaves having 5-leaflets. Pods are cylindrical.

Latin name : *Trigonella corniculata* Linn.

Local/common name(s) : Kasturimethi, Champamethi

Locality : Palachak to Panihartu(2,500-4,000.m) (Sharma, PK 7059)

Description

A glabrous herb having robust stem. Flowers racemes. Pod glabrous deflexed, flat, slightly curved and having transversed veined.

Latin name	:	<i>T. emodi</i> Benth.
Local/common name(s)	:	Sainji
Locality	:	Palachak to Panihartu(2,100-4,500 m) (Sharma, PK 7028)
Description	:	

An erect or spreading perennial with trifoliolate leaves and with small yellow flowers in rounded axillary stalked clusters. Leaflets obovate. Finely toothed with hairy beneath. Pods are straight, transversely veined and hairless.

ROSACEAE

Latin name	:	<i>Cotoneaster bacillaris</i> Wall.
Local/common name(s)	:	Ri, Rau, Khariz
Locality	:	Palachak to Panihartu(2,000-3,000 m) (Sharma, PK 6761)
Description	:	

An erect deciduous shrub with branched clusters of many white flowers. Leaves are lanceolate, ovate or obovate. Fruits are reddish black in colour.

Latin name	:	<i>C. microphylla</i> Wall. ex. Lindl.
Local/common name(s)	:	Khariz, Ruins
Locality	:	Palachak to Panihartu(3,000 m)
Description	:	

A dwarf, dense, mat forming evergreen shrub, with much branched stem. Leaves hard, 0.5-1.0 cm, ovate, shining, dark green above, pubescent below and having recurved margins. Flowers white, solitary. Fruit, globose, bright red.

Latin name	:	<i>Filependula vastita</i> (Wall. ex. G.Don.) Maxim
Local/common name(s)	:	Queen-of-the-meadow
Locality	:	Palachak to Panihartu (2,100-3,000 m) (Sharma, PK 7080)
Description	:	

An erect leafy perennial with numerous tiny cream coloured flower on long much branched terminal cluster.

Latin name	:	<i>Fragaria indica</i> Andron
Local/common name(s)	:	Wild-Strawberry, Reun
Locality	:	Kandwari (1,200 m) (Sharma, PK 8723)
Description	:	

Leaflets 1.5 to 3.5 cm.; teeth small and often blunt. Stipules broad and toothed. Flowers yellow in colour.

Latin name	:	<i>Potentilla atrosanguinea</i> Lodd.
Local/common name(s)	:	Larsu
Locality	:	Palachak to Panihartu (2,400-4,500 m) (Sharma, PK 6790)
Description	:	

A variable perennial herb with orange or dark red flowers with trifoliate leaves. Leaflets are elliptic to ovate and sharply toothed. Basal leaves are long stalked.

Latin name	:	<i>P. gelida</i> C. Meyer
Local/common name(s)	:	Spangjha, Merino
Locality	:	Panihartu (3,000-4,500 m) (Sharma, PK 6721)

Description :

A low spreading perennial with lax clusters of small yellow flowers. Leaves are trifoliate with coarsely toothed leaflets.

Latin name : *P. nepalensis* Hook.

Local/common name(s) : Rattanjoj

Locality : Dainasar (2,100-2,700 m)

Description :

An erect herb, with hairy stem, upto 20-90 cm tall. Lower leaves are long stalked, having 5 leaflets, 2.5-8 cm, toothed, oblong-ovate acute and hairy on both sides; upper leaves having 3 narrow elliptic, short stalked leaflets. Flowers crimson borne in branched spreading clusters.

Latin name : *Prinsepia utilis* Royle

Local/common name(s) : Bhekhal

Locality : Palampur (1,200-2,700 m)

Description :

A thorny shrub upto 3.5 m in height. Leaves are lanceolate or elliptic-lanceolate. Flowers yellowish white in axillary racemes. Fruit is drupe-oblique, ellipsoid 1.3 to 1.8 cm x 1.0 cm.; deep purple to almost black; fleshy on ripening.

Latin name : *Rosa moschata* Mill.

Local/common name(s) : Kuja

Locality : Kandwari (1,200-2,000 m) (Sharma, PK 6703)

Description :

An erect or climbing shrub, glabrous usually prickly. Leaves ovate, toothed and acute. Flowers are white in terminal corymbs.

Latin name : *Spiraea conescens* D. Don.

Local/common name(s) : Chaku, Taku

Locality : Gundha (1,500-3,000 m) (Sharma, PK 6789)

Description :

A small stiff deciduous shrub having white flowers born on short side branches forming long terminal clusters.

PARNASSIACEAELatin name : *Parnassia nubicola* Wall. ex. Royle

Locality : Palachak to Panihartu (3,000-4,300 m) (Sharma, PK 6762)

Description :

A glabrous herb; root stock perennial. Leaves are radical, long stalked, ovate or oblong-ovate, cordate, entire and acute. Flower are white in colour born on a slender stem

SAXIFRAGACEAELatin name : *Bergenia ciliata* (Haw.) Sternb. Syn. *B. ligulata*

Local/Common name(s) : Pashanbheda, Pakhanbed

Locality : Polling to Dainasar (1,900-4,300 m) (Sharma, PK 6747)

Description :

A rhizomatic, perennial herb on rocky and shady places. Rootstock thick; stem short, thick and fleshy; leaves stalked and sheathing at the base; ovate or orbicular, cordate; margin fringed with short and stiff hairs. Flowers are white, pink or purplish.

Latin name	:	<i>Chrysosplenium carnosum</i> Hook.f. (Thoms)
Locality	:	Panihartu (3,600-5,000 m) (Sharma, PK 6770)
Description	:	

A delicate perennial with several stems bearing glossy green leaves and a terminal cluster of greenish-yellow to golden flowers encircled by an involucre of leaves.

Latin name	:	<i>Saxifraga brunonis</i> Wall. ex. Seringe
Locality	:	Dainasar (3,000-4,500 m) (Sharma, PK 7034)
Description	:	

An erect perennial herbs with terminal clusters of small yellow flowers. Leaves are linear and lanceolate. Stems often red with few leaves.

Latin name	:	<i>S. diversifolia</i> Wall.
Locality	:	Palachak to Panihartu(2,700-5,000 m) (Sharma, PK 6434)
Description	:	

Stems erect more or less glandular hairy. Lower leaves crowded, long stalked, ovate, entire, stem leaves distinct and sessile. Flowers yellow in termina corymbs.

Latin name	:	<i>S. parnassifolia</i> D.Don.
Locality	:	Palachak (2,000-4,500 m) (Sharma, PK 7035)
Description	:	

An erect perennial herb with terminal clusters of few bright yellow flowers. Lower leaves hairless with elliptic to lanceolate blades, upper leaves rppressively smaller above-glandular-hairy.

CRASSULACEAE

- Latin name : *Rhodiola himalensis* (D. Don.) S.H. Fu.
 Locality : Palachak to Panihartu (3,600-4,800 m) (Sharma, PK 7089)
 Description :

A large showy plant with stout leafy stems; with dense cluster of dark red, pinkish to yellow flowers and with oblanceolate to narrow elliptic fleshy leaves.

- Latin name : *Sedum ewersii* Ledeb.
 Local/common name(s) : Shrolo
 Locality : Palachak to Panihartu (2,700-4,500 m) (Sharma, PK 7054)
 Description :

A small herb, with many stems, upto 8-15 cm. Leaves nearly sessile, 1.3-2.5 cm, ovate, round, having wavy margins. Radical leaves few. Flowers pink, numerous in dense clusters.

ONAGRACEAE

- Latin name : *Epilobium laetum* Wall.
 Local/common name(s) : Fire-Weed
 Locality : Palachak (2,100-4,000 m) (Sharma, PK 7067)
 Description :

Stems erect, slender, angled, usually unbranched, glabrous and shining. Leaves nearly sessile, lanceolate with small and sharp teeth. Racemes short and terminal. Flowers are white or pale-pink in colour.

UMBELLIFERAE/APIACEAE

Latin name	:	<i>Chaerophyllum reflexum</i> Lind.
Local/common name(s)	:	Ghurbini
Locality	:	Neugal (Kandi) (2100-3500 m) (Sharma, PK 6754)
Description	:	

A little branched, hairless or hairy perennial herb with small umbels of white flowers and compound fern like leaves. Fruit long, smooth and shortly beaked.

Latin name	:	<i>C. villosum</i> Wall. ex. DC.
Local/common name(s)	:	Mitha-Patish
Locality	:	Dainasar (2,100-3,600 m) (Sharma, PK 707A)
Description	:	

A slender erect little branched, sharply hairy perennial having distinctive long stiff downward-pointing white hairs on the lower part of stem. Flowers are white or pale pink.

Latin name	:	<i>Heracleum candicans</i> Wall. ex. DC.
Local/common name(s)	:	Padara, Patrala
Locality	:	Palachak to Panihartu (1,800-4,300 m) (Sharma, PK 6745)
Description	:	

An erect herb with stout, odorous rootstock. Stem hollow, densely pubescent, grooved, upto 2m. Leaves 15-45 cm, pinnate or pinnatifid, rarely 2-pinnate, leaflets oblong, 15-30 cm, pinnately lobed, irregularly toothed and having pubescent lower surface. Rays 10-45 about 15 cm long in fruit. Flowers small, white in compound umbels. Fruit pubescent, obovate.

Latin name	:	<i>Pleurospermum brunonis</i> (DC.) C.B. Clarke
Local/common name(s)	:	Nesar
Locality	:	Dainasar and Thamsar top (3,300-4,500 m) (Shasma, PK 6768)
Description	:	

A small plant with one or more stems rising from the base with 2-4 pinnate leaves with lanceolate and deeply toothed lobes. Flowers white, primary umbels with broadly ovate white margin bracts.

Latin name	:	<i>P. govianum</i> (DC.) C.B. Clarke
Local/common name(s)	:	Bann
Locality	:	Dainasar (4,000 m) (Shasma, PK 6777)
Description	:	

A low growing plant which is often stemless but with several long primary raise bearing secondary umbels of white flowers. Leaves are usually shorter than the inflorescence, pinnate with ultimate toothed segments.

Latin name	:	<i>Pimpinella diversifolia</i> DC.
Local/common name(s)	:	Saunf, Shetapuspha
Locality	:	Palachak to Panihartu (1,500-3,000 m) (Shasma, PK 708C)
Description	:	

An erect, hairy or pubescent herb, stem 60-150 cm tall. Leaves- pinnate, leaflets 3-5, rarely 1, variable in shape, lanceolate, 2-5 x 2.5-5 cm, or sometimes in the radical leaves, broadly ovate, toothed, cordate, long pointed. Flowers, white, in umbels. Fruit, roughly pubescent, compressed.

Latin name.	:	<i>Selinum tenuifolium</i> Wall. ex. DC.
Local/common name(s)	:	Bhutkeshi, Mathosal
Locality	:	Dainasar and Panihartu (4,000 m) (Sharma, PK 64672 6743)
Description	:	

A tall hairless perennial, with erect, grooved stem, upto 80-150 cm. Leaves are large, 15-20 cm. Lower long stalked, 4-5 pinnate, upper 3-pinnate. Leaflets pinnatisect, segments linear, acute, entire. Flowers white, in compound hairy umbels. Fruit, ovate with broad lateral wings.

ARALIACEAE

Latin name	:	<i>Trevesia palmata</i> (Roxb.) Vis.
Local/common name(s)	:	Bhotola
Locality	:	Gundha (2,500 m) (Sharma, PK 7060)
Description	:	

A branched shrub covered with reddish hairs and many prickles having large palmately lobed leaves often with prickly leaflets. Flowers are in branched inflorescence.

VALERIANACEAE

Latin name	:	<i>Valeriana hardwickii</i> Wall.
Local/common name(s)	:	Mushakbala
Locality	:	Neugal (Kandi) (4,000 m) (Sharma, PK 6734)
Description	:	

A pubescent annual with descending rootstock. Radical leaves few, stalked, ovate. Stem leaves pinnate, 7.5-17.5 cm, lower ones stalked, crowded, upper sessile.

leaflets 3-7, lanceolate, entire, long-pointed, end one largest. Flowers white, in numerous axillary, stalked, compound corymbs forming a long, terminal panicle.

Latin name	:	<i>V. jatamansi</i> Jones Syn. <i>wallichii</i> DC.
Local/common name(s)	:	Jatamansi, Balcharh, Mansi, Machhi, Spikenard.
Locality	:	Neugal (Kandi) (3,600 m) (Shasna, PK 6703)
Description	:	

It is an aromatic, erect, perennial herb, 10-60 cm high with long, stout, woody rhizomatic rootstock covered with tail like brown fibres left over from the withered leaves. Leaves are radical in nature long, narrow and the flowers are rosy in appearance arising in terminal corymbose.

DIPSACEAE/MORINGACEAE

Latin name	:	<i>Morina longifolia</i> Wall. ex. DC.
Local/common name(s)	:	Bishkantara
Locality	:	Gundha (3,000-4,000 m) (Shasna, PK 7097)
Description	:	

A glabrous or slightly pubescent herb, with stem upto 60-120 cm tall. Leaves whorled, narrowly oblong, sinuately pinnatifid, prickly, upper ones shorter, sessile, united at base, upto 35 cm. Flowers are deep pink, sessile in the axils of the upper leaves forming a terminal, interrupted spike. Achenes are small.

ASTERACEAE/COMPOSITEAE

Latin name	:	<i>Achillea millefolium</i> Linn.
Local/common name(s)	:	Birnjaisif, millfoil, Yarrow.
Locality	:	Dainasar (3,600 m) (Shasna, PK 6494)

Description :

A small, perennial, tufted herb upto 50 cm tall, with a slender cropping rootstock growing numerous roots and stolons with blunt succulent scale at each node. Leaves alternate, oblong-lanceolate, 3-pinnatisect leaves, minutely divided into linear, dentate, small, white in corymbose ovoid heads at the ends of stem and branches fruit.

Latin name : *Ageratum conyzoides* Linn.

Local/common name(s) : Neela phulnu

Locality : Palampur area (1,500-2,000 m) (Sharma, PK 6725)

Description :

An erect softly hairy annual with numerous small pale blue or whitish flowers heads, often in dense domed to flat-topped terminal and axillary clusters. Leaves are opposite, lanceolate to ovate and coarsely rounded toothed.

Latin name : *Anaphalis araneosa* DC.

Local/common name(s) : Dhao-bhujlu

Locality : Neugal (Kandi) (2,000-3,000 m) (Sharma, PK 6744)

Description :

An erect perennial herb with oblanceolate radical leaves. Heads numerous forming a broad terminal corymbs. Involucral bracts are broad, obtuse and erect in flower; spreading in fruit.

Latin name : *A. triplinervis* (Sims) C.B. Clarke

Local/common name(s) : Rui-Ghas

Locality : Palachak to Panihartu (1,800-3,000 m) (Sharma, PK 7049)

Description :

A robust plant with white-woolly elliptic upper leaves which are green above and with dense domed branched clusters of small white flower heads.

Latin name : *Arctium lappa* Linn.

Local/common name(s) : Janglikuth, Thuth

Locality : Neugal (Kandi) (2,700 m) (Sharma, PK 6750)

Description :

An erect, coarse, rough herb, 60-240 cm tall. Radical leaves, alternate, stalked, broadly ovate, 7.5-30 cm, cordate, toothed, having white-cottony lower surface. Heads discoid, angled, finely globose, in terminal clusters. Flowers purple. Achenes large, angled and finely ribbed.

Latin name : *Artemisia gmelinii* Webr. ex. Steckn

Local/common name(s) : Burnak, Chamber

Locality : Polling to Dainasar (2,100-4,200 m) (Sharma, PK 6781)

Description :

It has large nodding flower heads, short stalked green slender spike like clusters.

Latin name : *A. vulgaris* Linn.

Local/common name(s) : Annu, Nagdona

Locality : Neugal (Kandi) & Gundha (1,200-4,200 m) (Sharma, PK 7046)

Description :

An erect, medium to large hairy, aromatic, shrub like herb with much branched leafy stem. Lower leaves 5-10 cm, long stalked, 1-3 pinnately lobed with narrow or broad entire segments, upper surface pubescent or hairy, lower tomentose or densely

hairy, white grey or brown. Heads are clustered in one sided branched woolly. racemes. Flowers purple.

Latin name : *Aster molliusculus* (DC.) C.B.Clarke
 Locality : Palachak to Panihartu (1,800-3,000 m) (Sharma, PK 7053)
 Description :

Flower heads long, stalked, usually solitary with many shorter slender lilac ray florets, which are often recurved and born on slender leafy stem

Latin name : *Cirsium folconeri* (Hook.f.) Petrak
 Locality : Gundha (2700-4300 m) (Sharma, PK 7026)
 Description :

A tall conspicuous perennial, the whole plant covered with whitish spines giving a silvery appearance. Flower heads are globular and cream coloured.

Latin name : *Cremanthodium oblongatum* C.B.Clarke
 Local/common name(s) : Creeping thistle
 Locality : Thamsar top (4,300-5,200 m) (Sharma, PK 6477)
 Description :

A slender plant with a solitary and nodding flower heads with yellow ray florets. Discflorets are often greenish to brownish.

Latin name : *Eupatorium odoratum* Linn.
 Local/common name(s) : Phulnu
 Locality : Bir (1,500 m) (Sharma, PK 6702)

Description :

An erect softly hairy more or less aromatic perennial herb with many spreading branches. Leaves are ovate or ovate-lanceolate and long pointed. Flowers are pale pinkish-mauve, in cylindric heads arranged in branched terminal clusters.

Latin name : *Erigeron bellidioides* (Buch-Hamex.D.Don.)
Benth. ex. C.B. Clarke

Local/common name(s) : Sonsali

Locality : Palachak to Panihartu (1,300-3,600 m) (Sharma, PK 6705)

Description :

An erect herb having solitary or few long stalked flower heads. Ray florets are purple or white. Basal leaves lanceolate, entire and coarsely toothed. Stem leaves are stalkless.

Latin name : *Galinsoga parviflora* Cav.

Local/common name(s) : Pepli-Ghas

Locality : Barot (1,300-2,200 m) (Sharma, PK 6799)

Description :

An erect herb; stem weak, usually smooth towards the base and roughly hairy upwards. Leaves are opposite, stalked, ovate-lanceolate and more or less toothed. Heads are radiate on slender stalks. Flowers are yellow in colour.

Latin name : *Gnaphalium luteo-album* (Wall. ex DC) Hook. f.

Local/common name(s) : Balraksha

Locality : Bir (2,500 m) (Sharma, PK 6719)

Description :

An erect, woolly herb with tufted stem, upto 15-35 cm, simple or branched. Leaves alternate, crowded or distant, sessile, basal lobes spatulate, woolly on both surfaces, upper most leaves lanceolate, acute. Heads discoid, numerous in irregularly globose clusters at the end of the corymbose branches. Flowers bright yellow.

Latin name : *Inula grandiflora* Wild. Syn. *barbata* Wallich. ex. DC.

Local/common name(s) : Pohkarmul

Locality : Palachak & Panihartu (2,000-3,300 m) (Sharma, PK 7043)

Description :

An erect, bristly hairy plant with leafy unbranched stem, upto 45 cm. Leaves 2-3 x 1.5 cm, sessile, oblong, lanceolate, lobed at the base and hairy on the margins. Flower heads yellow, large, solitary, in terminal corymbs. Achenes cylindrical, small and silky.

Latin name : *Jurinea dolomiaea* Boiss
Syn. *macrocephala* C.B. Clarke

Local/common name(s) : Dhoop

Locality : Thamsar top (3,000-4,300 m) (Sharma, PK, 6756)

Description :

A quite prostrate perennial with a dense central domed cluster of large purple flower heads and a rosette of longer spreading lobed leaves often with purple mid-veins. Achenes smooth.

Latin name : *Lactuca lessertiana* (DC.) C.B. Clarke

Local/common name(s) : Lettuce

Locality : Panihartu (2,400-3,600 m) (Sharma, PK 7044)

Description :

A bristly- haired, branched above and with rather numerous erect or inclined bell-shaped blue or mauve flower heads, which are often subtended by rather conspicuous oblong-ovate bracts. Leaves are oblong-ovate and heart-shaped.

Latin name : *Saussurea gossypiphora* D. Don.

Local/common name(s) : Ghuggi-Badshah

Locality : Dainasar (4,300-5,600 m) (Shaama, PK 6780)

Description :

A remarkable- looking plant like a snow-wall, the whole plant is more or less globular and densely covered with long white or grey woolly hairs. Flower heads are deeply embedded in woolly hairs, cylindrical and with many purple florets, densely clustered at the apex of the stout stem and surrounded by woolly linear leaves. Leaves are obscurely or coarsely toothed or lobed embedded in very dense woolly hairs.

Latin name : *S. roylei* (DC.) Sch. Bip.

Local/common name(s) : Kushta

Locality : Palachak to Panihartu (3,000-4,300 m) (Shaama, PK 6474)

Description :

A slender plant with a solitary dark purple. Flower- heads and with long narrow entire leaves conspicuously white woolly beneath and over tapping the flower heads.

Latin name : *Senecio chrysanthemoides* Wall.ex.DC

Local/common name(s) : Ragwort

Locality : Palachak to Panihartu (2,400-4,000 m) (Shaama, PK 6793)

Description :

An erect, pubescent herb with robust, grooved stem, branched above, upto 60-180 cm. Lower leaves pinnately divided into broad, toothed lobes, upper leaves sessile, usually smaller and narrower, lobes more numerous. Leaves purple on the lower surface. Heads many flowered in large spreading terminal corymbs. Flower yellow. Achenes cylindrical, ribbed.

Latin name : *S. nudicaulis* Buch.-Ham

Local/common name(s) : Surjee

Locality : Dainasar (1,800-3,000 m) (Sharma, PK 6727)

Description :

Stems are glabrous and grooved. Leaves nearly smooth on the upper surface and white or purple tomentose on the lower. Leaves are ovate or spatulate, crenate and sharply toothed. Flowers are on the terminal corymbs.

Latin name : *Tanacetum longifolium* Wall. ex DC.

Local/common name(s) : Dhandibuggi, Akarkar

Locality : Palachak to Panihartu (3,300-4,200 m) (Sharma, PK 7025)

Description :

An erect, strong scented hairy herb. Stem 15-30 cm, leafy and densely hairy towards the tips. Leaves 15-20 cm, mostly radical, overlapping the flowers. Heads several, in crowded terminal corymbs. Flowers are bright yellow in colour. Achenes are smooth and 5 ribbed.

Latin name : *Tricholepsis elongata* DC.

Local/common name(s) : Brahmadandi

Locality : Billing (1,300-2,100 m) (Shasma, PK 7054)
 Description :

A rough, perennial herb; stem erect diverging in several long straight branches nearly leafless towards the end. The leaves are alternate, variable in shape and size, lanceolate or oblong and toothed. Flowers are pale yellow in colour.

CAMPANULACEAE

Latin name : *Campanula colorata* Wall.
 Locality : Palachak to Panihartu (3,100 m) (Shasma, PK 7082)
 Description :

A roughly hairy or tomentose herb, whose stem is erect, slender and simple or branched. Leaves broadly or narrowly lanceolate, sessile and crenate or toothed. Flowers numerous and pale lilac in clusters or panicles.

ERICACEAE

Latin name : *Cassiope fastigiata* (Wall.) D. Don.
 Local/common name(s) : Gangachu, Heiunsheli
 Locality : Damani (2,800-4,500 m) (Shasma, PK 6482)
 Description :

A small much branched tufted shrublet with numerous tiny overlapping closely adpressed thick leaves. Flowers are small, axillary, pendent, white and bell-shaped.

Latin name : *Lyonia ovalifolia* Wall.
 Local/common name(s) : Ayar, Angyar
 Locality : Gundha (1,500-3,000 m) (Shasma, PK 6797)

Description :

A small deciduous tree with brown, bark peeling in narrow strips. Leaves are ovate. The flowers are white in colour on long nearly horizontal axillary clusters.

Latin name : *Rhododendron arboreum* Sm

Local/common name(s) : Bras, Buras, Barha-ke-phool

Locality : Palampur (Bandla) (1,500-3,600 m) (Sharma, PK 6733)

Description :

An evergreen, much branched tree, upto 14 m in height and 2.4 m in girth. Bark is reddish-brown, soft, rough, exfoliates in thin flakes. Leaves are lanceolate or oblong, crowded towards the ends of the branches. Flowers are showy, red in dense,

Latin name : *R. campanulatum* D. Don

Local/common name(s) : Kashmiri patha

Locality : Polling to Dainasar (3,000-4,000 m) (Sharma, PK 6430)

Description :

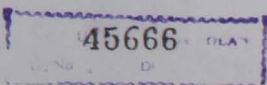
Bark is thin, cinnamon coloured or smooth grey, peeling off in thin papery flakes. Leaves are elliptic or oblong-ovate, leathery, 8-14 cm, having rusty brown tomentum on the under surface. Flowers white, often with purple or pink spot inside the tube. Capsules are cylindrical and slightly curved.

PRIMULACEAE

Latin name : *Anagalis arvensis* Linn.

Local/common name(s) : Khocua

Locality : Palachak to Panihartu (2,100 m) (Sharma, PK 6723)



Description :

A glabrous and gland-delted herb, whose stem is slender and erect or documbent branching from the base. Leaves are opposite, sessile, broadly ovate, entire and acute. Flowers are closing in dull weather, bright blue, solitary, axillary; stalks slender longer than leaves.

Latin name : *Androsace rotundifolia* Hardw.

Local/common name(s) : Nirodhak-Buti

Locality : Palachak to Panihartu (1,500-3,600 m) (Sharma, PK 6707)

Description :

A medium sized herbaceous plant having rounded, deeply lobed and long stalked basal leaves. Flowers are on long stalked lax umbels pink in colour.

ASCLEPIADACEAE

Latin name : *Vincetoxicum hirundinaria* Medicus

Locality : Palachak to Panihartu (2,300-3,600 m) (Sharma, PK 7088)

Description :

An erect herbaceous perennial herb with broadly elliptic to ovate and acute leaves. Flowers are yellowish green on terminal and axillary umbels.

GENTIANACEAE

Latin name : *Swertia chirayita* Karst. Buch.-Ham

Local/common name(s) : Chirayita, Chirata

Locality : Palachak (2,200-3,400 m) (Sharma, PK 6796)

Description :

An erect annual herb whose stem is robust and branching. Leaves are broadly lanceolate and acute. Corolla greenish-yellow tinged with purple colour.

Latin name : *S. cordata* Wall.

Local/common name(s) : Chiretta

Locality : Palachak to Panihartu (1,500-3,000 m) (Sharma, PK 6748)

Description :

An erect annual herb whose stem is usually branched. Leaves are broadly, ovate and acute. Corolla yellow-white. Margins marked with short and pale purple streaks.

Latin name : *S. paniculata* Wall.

Local/common name(s) : Chiretta

Locality : Polling to Dainasar (2,100-2,700 m) (Sharma, PK 6480)

Description :

An annual herb whose branches are spreading. Leaves are oblong or lanceolate. Corolla is white in the upper half with two purple blotches at the base, forming an interrupted ring.

Latin name : *S. speciosa* D. Don.

Local/common name(s) : Chiretta

Locality : Palachak (2,700-4,000 m) (Sharma, PK 6788)

Description :

An erect annual herb whose flowers are lurid grey having elliptic, spreading corolla lobes each with paired long fringed nectaries at its base. Flowers are in a long narrow terminal clusters.

BORAGINACEAE

- Latin name : *Cynoglossum denticulatum* A.DC.
 Local/common name(s) : Kambroo
 Locality : Polling to Dainasar (2,300-3,000 m) (Sharma, PK 7087)
 Description :

An erect hairy or pubescent herb whose leaves are rough, ovate, lanceolate and more or less toothed. Flowers are dark blue in colour.

- Latin name : *C. wallichii* G.Don.
 Local/common name(s) : Kuri
 Locality : Mayot (1,400-2,700 m) (Sharma, PK 7018)
 Description :

An erect herb whose stem and leaves are rough with long white hairs mostly bulbous-based. Leaves are ovate-lanceolate, often more or less toothed and some times narrowed in a short stalked. Flowers are dark blue.

- Latin name : *C. zeylanicum* (Vahl.) Thunb. ex. Lehm
 Local/common name(s) : Kuri
 Locality : Palachak to Panihartu (1,200-4,000 m) (Sharma, PK 7092)
 Description :

It is a more branched plant with larger leaves covered with short, soft adpressed hairs. Inflorescence often widely branched with many little branches. Flowers usually bright-blue. Leaves are oblong-elliptic and long stalked.

SCROPHULARIACEAE

- Latin name : *Euphrasia officinalis* Linn.
 Locality : Panihartu (3,000-4,000 m) (Sharma, PK 6767)

Description :

An erect, pubescent and glandular herb. Leaves are apposite, sessile, ovate, sharply and deeply toothed. Flowers are white or lilac, purple veined usually tinged with yellow in the throat of terminal spikes.

Latin name : *Lindenbergia indica* (L.) Valke
Syn. *L. urticaefolia* Lehm

Local/common name(s) : Patthar- Chatti

Locality : Polling (2,100 m) (Sharma, PK 6724)

Description :

A glandular hairy stem often tufted, erect or ascending. Leaves are broadly ovate. Flowers are in axillary, solitary or in small clusters. Some times forming long leafy racemes.

Latin name : *Pedicularis megalantha* D.Don.

Local/common name(s) : Mishran

Locality : Dainasar Pastures (3,000-4,300 m) (Sharma, PK 6771)

Description :

Flowers large, pink to reddish purple with a very slender corolla tube having a slender curved tail like beak. Inflorescence is usually in a dense terminal head.

Latin name : *P. oederi* Vahl

Local/common name(s) : Mishran

Locality : Bara Bhangal (3,600-4,800 m) (Sharma, PK 7033)

Description :

Flowers are uniformly lemon-yellow or with a purplish or reddish tip to the upper lip, borne in a dense oblong cluster and with broadly linear pinnately cut leaves, which are mostly basal.

Latin name : *P. royleii* Maxim

Local/common name(s) : Mishran

Locality : Palachak to Panihartu (4,000-4,800 m) (Sharma, PK 6782)

Description :

A low plant having many stems and reddish-purple flowers in many whorls forming a broad and short cluster.

Latin name : *Picrorhiza kurroa* Royle. ex. Benth.

Local/Common name(s) : Kutki, Karru

Locality : Thamsar and Dainasar (3,300-4,300 m) (Sharma, PK 7620)

Description :

The plant is trailing herb with joined and zig-zag underground stems, giving off shoots at joints and also rooting at the nodes. Leaves are spatulate and dentate. Flowers are bluish white, showy and are arranged in dense, terminal and spicate racemes.

Latin name : *Scrophularia himalensis* Royle

Local/common name(s) : Shusti

Locality : Palachak to Panihartu (1,500-3,000 m) (Sharma, PK 6796)

Description :

An erect herb whose stem is robust, angular and glabrous towards the base. Leaves are stalked, opposite or the upper alternate, ovate, lanceolate and sharply toothed. Flowers are small and digny green purple in opposite and stalked cymes in terminal panicles.

Latin name	:	<i>Wulfinia amherstiana</i> Benth.
Locality	:	Palachak to Panihartu(2,700 m) (Sharma, PK 708C)
Description	:	

Flowers tubular, blue-purple, many in long one-sided spikes. Leaves are all basal, crowded, blade oblong-obovate, coarsely and irregularly rounded-lobed or toothed and stalked. Flowering stems are leafless and unbranched.

ACANTHACEAE

Latin name	:	<i>Justicia adhatoda</i> Syn: <i>Adhatoda vasica</i> Nees
Local/Common name(s)	:	Başuti, Adusa
Locality	:	Palampur (1,200 m) (Sharma, PK 6734)
Description	:	

An evergreen shrub with yellowish brown bark. Leaves elliptic, acuminate, base narrowed, minutely pubescent, especially when young, lateral nerves, 8-14 pairs. Flowers in dense axillary pedunculate spikes. Bracts and Bracteoles foliaceous green, minutely pubescent calyx lobes equal. Corolla white throughout or with branched pale purple vein on the lower lip inside, pubescent outside.

Latin name	:	<i>Aechmanthera gossypina</i> (Wallich.) Nees
Locality	:	Polling to Dainasar (2,400 m) (Sharma, PK 6766)
Description	:	

A small shrub; with densely white-felted lower branches and with elongated clusters of pale purplish to blue tubular flowers, borne in a lax leafy spike-like inflorescence. Leaves are apposite, elliptic, acute and toothed.

Latin name	:	<i>Dicliptera bupleuroides</i> Nees
Local/common name(s)	:	Bouna, Kirch
Locality	:	Billing (2,300 m) (Sharma, PK 6712)
Description	:	

A hairy, diffuse herb, whose stem is grooved. Leaves are stalked, ovate-lanceolate, entire and long pointed. Flowers are pink, spotted with purple and crowded in axillary cymes clustered towards the end of branches.

Latin name	:	<i>Strobilanthes dalhousianus</i> C.B. Clarke
Local/common name(s)	:	Titana, Khum
Locality	:	Barot (1,200-2,100 m) (Sharma, PK 6709)
Description	:	

An erect shrub, hairy atleast when young leaves hairy on both surfaces; nearly sessile or tapering into a winged stalk, ovate, toothed and long-pointed. Flowers are dark blue in heads or in very short spikes.

VERBENACEAE

Latin name	:	<i>Vitex negundo</i> Linn.
Local/common name(s)	:	Nirgundi, Bana
Locality	:	Palampur (1,700 m) (Sharma, PK 6775)
Description	:	

A shrub, with a thin, grey bark. Branchlets four angled, densely white tomentose. Leaves three to five foliolate, leaflets quite long; lateral smaller and with much shorter petioles. Flowers bluish white to blue in terminal, paniculate racemes.

LABIATAE/LAMIACEAE

Latin name	:	<i>Ajuga bracteosa</i> Wall. ex Benth.
Local/Common name(s)	:	Neelkanthi
Locality	:	Bir-Baijnath (1,000-4,000 m) (Sharma, PK 6722)
Description	:	

A perennial, erect or ascending hairy herb, often prostrate, with oblanceolate or sub-spathulate, obtuse, sinuate toothed leaves; purplish violet tinged from lower surface. Flowers are purplish violet tinged from lower surface. Flowers are purplish in distant axillary whorls in a spike.

Latin name	:	<i>Elsholtzia polystachya</i> Benth.
Local/common name(s)	:	Pothi
Locality	:	Palachak (2,300-3,000 m) (Sharma, PK 6772)
Description	:	

A pubescent shrub whose leaves are nearly sessile, lanceolate, acute and toothed. Spikes are slender and cylindric. Flowers are white or pale yellow in colour.

Latin name	:	<i>E. strobilifera</i> Benth
Local/common name(s)	:	Rangchari
Locality	:	Palachak to Panihartu (1,800-3,000 m) (Sharma, PK 7045)
Description	:	

A herb whose leaves are stalked, ovate and crenate. Spikes are cone like and cylindric. Floral leaves are bract-like, membranous, persistent, united, forming broad, fringed, over lapping involucre nearly concealing the pale purple flowers.

Latin name : *Lamium album* Linn.
 Local/common name(s) : White-thistle
 Locality : Billing (1,500-3,700 m) (Sharma, PK 6732)
 Description :

A hairy, slender perennial with ascending stem, upto 15-45 cm tall. Leaves ovate-heart shaped, 2.5-8 cm, coarsely toothed, lower ones stalked. Flowers white, lilac tinged, 2-2.5 cm in diameter, in distant leafy whorls.

Latin name : *Leucas lanata* Benth.
 Local/common name(s) : Dhurughas
 Locality : Bir-Baijnath (1,000-3,000 m) (Sharma, PK 6718)
 Description :

A softly, densely, woolly-haired, silvery-leaved, perennial with small ovate or oblong leaves and having numerous dense axillary whorls of small white 2-lipped flowers.

Latin name : *Micromeria biflora* Benth.
 Local/common name(s) : Indian wild thyme
 Locality : Barot (2,100 m) (Sharma, PK 6713)
 Description :

A small, hairy, tufted herb, much resembling with the *Thymus serpyllum*, upto 15-30 cm. Leaves 4-6 mm, sessile, gland dotted, elliptic to ovate, acute. Flowers small, pinkish, in axillary whorls.

Latin name : *Nepeta connata* Royle ex. Benth.
 Local/common name(s) : Tukhmmalanga

Locality : Palachak to Panihartu (2,100-3,600 m) (Sharma, PK 678F)
 Description :

Leaves are linear-lanceolate, long pointed, entire and heart-shaped. Flowers are purplish-violet in a dense cylindrical spikes.

Latin name : *N. elliptica* Royle

Local/common name(s) : Catmint

Locality : Palachak to Panihartu (1,800-2,700 m) (Sharma, PK 6478)

Description :

Stems densely hairy and ascending. Leaves are sessile, hairy or pubescent. Flowers are pale blue in colour on the terminal spikes.

Latin name : *N. leucophylla* Benth.

Local/common name(s) : Zufayabis

Locality : Polling to Dainasar (1,800-2,300 m) (Sharma, PK 7033)

Description :

Hoary tomentose; stems erect. leaves are stalked cordate, ovate, crenate and obtuse having lower surface silvery white. Flowers are blue in colour.

Latin name : *N. spicata* Wall. ex. Benth.

Local/common name(s) : Chongmongo

Locality : Palachak to Panihartu (2100-3300 m) (Sharma, PK 7066)

Description :

Flowers are blue-purple, in dense whorls crowded into the long terminal spikes. Leaves are usually stalked, ovate, acute to triangular, lanceolate and coarsely saw-toothed.

Latin name : *Origanum vulgare* Linn.
 Local/common name(s) : Sathra
 Locality : Polling to Dainasar (2,000-3,600 m) (Sharma, PK 7090)
 Description :

It is an aromatic, branched, perennial herb, 30-90 cm high. Leaves are broadly ovate and the flowers are in terminal corymbose cymes. Flowers have pale white colour, yet the plants having flowers with purplish or pinkish tinge are also found. The nutlets are brown in colour.

Latin name : *Phlomis bracteosa* Royle ex. Benth.
 Locality : Palachak to Panihartu (1,200-3,600 m) (Sharma, PK 6792)
 Description :

An erect, hairy plant with heart-shaped toothed leaves and having pink purple flowers crowded into a few large whorls forming an interrupted spikes.

Latin name : *Prunella vulgaris* Linn.
 Local/common name(s) : Ustuskhuddus
 Locality : Dainasar Pastures (1,500-3,600 m) (Sharma, PK 7073)
 Description :

It is an annual herb with many, spreading or ascending stems, 10-30 cm in height. Leaves are opposite, ovate, obtuse and hairy, arising immediately below the bract and spreading beyond the inflorescence. Flowers are bluish, pink, purplish and in terminal spikes.

PLANTAGENACEAE

- Latin name : *Plantago lanceolata* Linn.
 Local/common name(s) : Isabgool
 Locality : Bir (1,800-2,500 m) (Sharma, PK 6714)
 Description :

Leaves are lanceolate, nearly entire tapering upwards in a short stalk.

- Latin name : *P. major* Linn.
 Local/common name(s) : Isbgol, Bartang
 Locality : Neugal (Kandi) (3,300 m) (Sharma, PK, 6735)
 Description :

Leaves are distinctly stalked, broadly ovate or oblong entire or sinuate spikes cylindrical, seldom less than 3.

AMARANTHACEAE

- Latin name : *Cyathula tomentosa* Moq.
 Local/common name(s) : Silath
 Locality : Bir-Billing (2,500 m) (Sharma, PK 7094)
 Description :

A hairy under-shrub, with opposite, short stalked, oval, acuminate, long pointed, leaves, 5-12.5 cm Heads 2.5cm in diameter. Flowers white, shining, in small clusters crowded in globose whorls forming terminal spikes.

CHENOPODIACEAE

- Latin name : *Chenopodium album* Linn.
 Local/common name(s) : Bathu
 Locality : Mayot (1,500-3,600 m) (Sharma, PK 7029)
 Description :

An erect, aromatic, much branched herb, upto 100 cm. tall with purple tinged leaves and stem with tiny green flowers in a rounded clusters, borne in a slender spikes.

PHYTOLACCACEAE

- Latin name : *Phytolacca acinosa* Roxb.
 Local/common name(s) : Jharka
 Locality : Polling (3,000 m) (Sharma, PK 7093)
 Description:

A succulent, robust, glabrous, erect herb, upto 1.5m tall. Leaves are alternate, broadly lanceolate, 15-25 cm, entire, long pointed, narrowed into a short stalk. Flowers pale green, in robust, cylindrical racemes, 5-20 cm long and 2.5 cm to over 5 cm in diameter. Fruit dark purple, succulent, crowded in on erect racemes.

POLYGONACEAE

- Latin name : *Bistorta amplexicaulis* (D.Don) Greene
 Local/common name(s) : Anjwar
 Locality : Dainasar Pastures (2,100-4,800 m) (Sharma, PK 6746)
 Description :

An erect perennial herb with slender, tufted stem, upto 1 m. Rootstock is stout. Leaves few, upper leaves ovate-heart-shaped, clasping the stem, tapering to long point,

lower leaves long stalked, 5-15 cm, minutely toothed. Flowers pink or white, arranged in erect terminal spikes. Nuts are smooth and shining.

Latin name : *Oxyria digyna* (Linn.) Hill.

Local/common name(s) : Amlu

Locality : Palachak to Panihartu (2,400-4,700 m) (Sharma, PK 6487)

Description :

A fleshy herb, with much branched stem, upto 10-80 cm, usually turns reddish. Leaves 2-5 x 5 cm, pale green, rounded to kidney shaped, mostly basal, long stalked, turn reddish. Flowers tiny, greenish tinged with pink, in many whorled long branched spikes.

Latin name : *Polygonum capitatum* Buch.-Ham

Local/common name(s) : Anjwar

Locality : Bir-Billing (1,300-2,000 m) (Sharma, PK 6730)

Description :

Root stock woody. Stems many and leafy. Leaves are in two rows, broadly ovate, acute, more or less downy on both surfaces with fringed margin. Flowers are pink in dense heads.

Latin name : *P. plebezum* R. Br.

Local/common name(s) : Chotti-Niani

Locality : Barot (1,800 m) (Sharma, PK 7027)

Description :

Stems and branches prostrate, leafy, fine grooved, smooth flowering throughout their length. Leaves linear or narrowly obovate. Flowers minute, white or pale pink in axillary clusters.

Latin name	:	<i>Rhuem australe</i> D. Don. Syn. <i>R. emodi</i> Wall. ex. Meissn.
Local/common name(s)	:	Chukri, Rhubarb.
Locality	:	Panihartu (3,200-4,300 m) (<i>Sharma, PK 6794</i>)
Description	:	

A robust perennial herb with thick long roots, 1-15 m tall and grows on rocky lands. Roots are stout and stem is hollow. Lower leaves are 20-50 cm in diameter, orbicular and are broadly ovate. Flowers are small and dark purple in colour. Fruits are purple and angled.

Latin name	:	<i>Rumex acenosa</i> L. Sorrel.
Local/common name(s)	:	Alwar
Locality	:	Palachak to Panihartu(2,100-4,300 m) (<i>Sharma, PK 7022</i>)
Description	:	

Flowers numerous, reddish-green in slender branched terminal and axillary clusters. Leaves are pointed with triangular basal lobes.

Latin name	:	<i>R. hastatus</i> D. Don.
Local/common name(s)	:	Khatti-imli
Locality	:	Kandwari (1,400 m) (<i>Sharma, PK 6724</i>)
Description	:	

Branches numerous, slender and erect. Leaves are stalked, entire broadly triangular and long pointed. Flowers are polygamous in small whorls racemes and forming panicles. Sepals are pink in colour.

Latin name	:	<i>R. nepalensis</i> Spreng.
Local/common name(s)	:	Jangli palak
Locality	:	Gundha (1,400-3,700 m) (Sharma, PK 6752)
Description	:	

An erect herb, with robust stem having spreading branches, upto 120 cm. Leaves, entire, lower ones with oblong-ovate blade and with heart-shaped base, 10-15 cm, upper most stalkless, lanceolate. Flowers in whorls, forming long interrupted leafless spike. Fruits with broad wings, fringed with comb-like hooked teeth.

THYMELAEACEAE

Latin name	:	<i>Daphne papyracea</i> Wall. ex. Stend. Syn. <i>D. canabina</i> Lour. ex. Wall.
Local/common name(s)	:	Satpura
Locality	:	Dhamani (1,500-2,100 m) (Sharma, PK 7085)
Description	:	

A perennial shrub, with leafy stem, upto 60 cm tall. Leaves 3-6 cm, alternate, shortly stalked, lanceolate, entire and long-pointed. Flowers pale yellow in short, erect, axillary racemes. Fruit dark purple.

EUPHORBIACEAE

Latin name	:	<i>Euphorbia cognata</i> (Klotz. & Garcke) Boiss. Syn. <i>E. pilosa</i> L. var. <i>cognata</i> Hook.
Local/common name(s)	:	Saptala
Locality	:	Dainasar (2,100-3,600 m) (Sharma, PK 6493)

Description :

A perennial shrub with leafy stem, upto 60 cm. Leaves 3-6 cm, alternate, shortly stalked, lanceolate, entire, long-pointed. Flowers pale yellow, in short, erect, axillary racemes. Fruit is dark purple in colour.

URTICACEAE

Latin name : *Girardinia diversifolia* Friis
Syn. *G. heterophylla* Decne

Local/common name(s) : Bichhua

Locality : Billing (1,200-3,000 m)

Description :

A robust, nettle like plant with deeply lobed, saw-toothed leaves with bristles and stinging hairs and having axillary and terminal branched spikes of greenish flowers.

CANNABACEAE

Latin name : *Cannabis sativa* Linn.

Local/Common name(s) : Bhang, Ganja,

Locality : Polling (2,500 m)

Description :

An annual, tall herb upto 5 m. Stem is slender, grooved, finely tomentose; leaves are alternate, palmately divided; 5-20 cm long, toothed, rough above, ample downy beneath; leaflets 7-11; flowers dioecious, i.e. born on different plants are yellow-green. Male flowers are clustered in short, drooping panicles. Perianth is of 5 parts. Female flowers are sessile, erect. Perianth is a single, entire, leaf enclosing the ovary. Achene small, rounded, dark grey in colour.

BETULACEAE

Latin name	:	<i>Betula utilis</i> D. Don.
Local/Common name(s)	:	Bhojpatra, Birch
Locality	:	Panihartu (2,700-4,300 m) (Sharma, PK 0741)
Description	:	

A moderate sized, deciduous tree upto 20 m tall or often a more shrub forming the upper most limit of the trees. Bark is smooth, reddish brown, with whitish, linear, horizontal, lenticels. Leaves are stalked 5-10 cm long, ovate, unequally serrate, acute, slightly hairy along the mid ribs, pubescent when young and have a rounded base. Male catkins are few borne at the tips of long shoots; white the female catkins are shot, solitary or in pairs, are erect, terminating the dwarf shoots. Perianth is 4 parted in male flowers and missing in female flowers.

FAGACEAE

Latin name	:	<i>Quercus dilatata</i> Lindley
Local/common name(s)	:	Ban-Oak
Locality	:	Dainasar (1,800-2,700 m) (Sharma, PK 0498)
Description	:	

Leaves are shortly stalked, glabrous, oblong, lanceolate or ovate spinous-toothed or entire acute or obtuse.

SALICACEAE

- Latin name : *Salix karelinii* Turcz.
 Local/common name(s) : Kirka
 Locality : Neugal (Kandi) (2,100-4,500 m) (Sharma, PK 6739)
 Description :

A small shrub upto 120 cm, with elliptic to ovate finely toothed leaves.

PINACEAE

- Latin name : *Abies webbiana* Lindley
 Local/common name(s) : Tosh
 Locality : Palachak (2,100-3,000 m) (Sharma, PK 7100)
 Description :

A common conifer with dark grey, deeply longitudinally grooved bark. Leaves flattened, pale beneath with in-curved margin.

CUPRESSACEAE

- Latin name : *Juniperus communis* Linn.
 Local/common name(s) : Haubera, Shelhu
 Locality : Dainasar (3,600 m) (Sharma, PK 6780)
 Description :

The plant is dense, dwarf, procumbent, bushy, evergreen shrub, or a near bush 60-150 cm high with upright branches, or a small tree reaching upto 9 m high. Bark is chocolate brown, peeling off in papery shreds; leaves are numerous and in whorls of 3, persistent, spreading at right angles and rigid; young twigs are divaricate; fruit is subglobose.

Latin name	:	<i>J. recurva</i> Buch. Ham
Local/common name(s)	:	Thelu, Dhoop
Locality	:	Neugal (Kandi) (4,000 m) (Sharma, PK 6740)
Description	:	

A prostrate or decumbent shrub or a small tree of graceful, drooping habit, often attaining a height of 10-12 m in favourable localities at lower elevation. Stems creep over ground. Leaves ovi shaped, flowers monoecious or dioceious, fruit ovoid and wood is light red in colour.

TAXACEAE

Latin name	:	<i>Taxus wallichiana</i> Zucc. Syn. <i>T. baccata</i> Hook. f.
Local/common name(s)	:	Rakhala
Locality	:	Dainasar (3,400 m) (Sharma, PK 6468)
Description	:	

It is an evergreen usually 6 m or more tall. Bark is reddish brown, thin and scaly. Leaves are disectichous, linear, with recurved margin, shining above, pale-yellowish brown or rusty red below; flowers are usually dioceious and the male strobili are stalked, globose, arising from the axils of the leaves on the underside of the branchlets of the previous year; each consisting of 6-14 stamens with short filaments.

ORCHIDACEAE

Latin name	:	<i>Habenaria pectinata</i> D. Don.
Local/common name(s)	:	Ridhi
Locality	:	Polling to Dainasar (3,000 m) (Sharma, PK 7064)

Description:

A striking terrestrial orchid with green and white flowers with a very distinctive 3 lobed white tip. Flowering are dense with many flowers. Leaves are linear-lanceolate and long pointed.

Latin name : *Malaxis muscifera* Lindley
 Local/common name(s) : Jeevak
 Locality : Thamsar top (3,700 m) (Sharma, PK 7065)
 Description :

Flowers are yellowish green, tiny, numerous in a slender spike. Leaves 2, broad, stalkless, paired unequal, oblong or ovate with lateral sepals curved upwards.

Latin name : *Satyrium nepalense* D. Don.
 Local/common name(s) : Ban-Alu
 Locality : Dainasar (1,500-4,000 m) (Sharma, PK 6800)
 Description :

Flowers are pink, fragrant in a dense terminal spike and with reflexed bracts tinged pink and much longer. Leaves narrow-elliptic with sheathing bases.

Latin name : *Spiranthes sinensis* Lindley
 Locality : Dainasar & Panihartu (4,000 m) (Sharma, PK 6506)
 Description :

Flowers are very small, pink in colour arranged spirally in a slender, but dense spike.

ZINGIBERACEAE

Latin name : *Cautleya spicata* (Smith.) Baker
 Local/common name(s) : Jungli-Adrak
 Locality : Neugal (Kandi) (1,200-2,800 m) (Sharma, PK 6737)
 Description :

Flowers are yellow, few or many crowded into a terminal erect spike with red bracts as long as the calyx. Leaves are narrow, elliptic and broad.

Latin name : *Hedychium acuminatum* Wall.
 Local/common name(s) : Ban-Haldhi, Kapur-Kachri & Shati
 Locality : Neugal (Kandi) (2,800 m) (Sharma, PK 6738)
 Description :

Leaves sessile, broadly lanceolate, ending in a tail-like tip. Flowers fragrant.

Latin name : *Roscoeia capitata* Smith.
 Local/common name(s) : Kakoli
 Locality : Gundha (1,500-2,500 m) (Sharma, PK 6764)
 Description :

Flowers are pink-purple many borne on a slender stem. Leaves are many linear and broad.

Latin name : *R. purpurea* Smith.
 Local/common name(s) : Safed-Mushli
 Locality : Dainasar (2,800 m) (Sharma, PK 6754)

Description :

Flowers are purple, rarely pale lilac or white, few in a terminal spike, borne on leafy stems.

LILIACEAE

Latin name : *Polygonatum verticillatum* (Linn.) All.

Local/common name(s) : Mahameda

Locality : Neugal (Kandi) (3,700 m) (Sharma, PK 6736)

Description :

An erect robust herb, with angled, grooved stem, 60-120 cm. Leaves in whorls of 4-8, 9-20 cm, sessile, lanceolate with acute tips. Flowers white, with green tips, pendulous, in branched clusters. Fruit a bright red berry, becomes purple when fully ripe.

ARACEAE

Latin name : *Acorus calamus* Linn.

Local/common name(s) : Vach, Bare

Locality : Barot (1,600-2,700 m) (Sharma, PK 6487)

Description :

A semi-aquatic or marshy, perennial herb with indefinitely branched rhizome, creeping in mud and having stout joints with large leaf scars. Rhizomes are cylindrical or somewhat compressed, about 1.5 cm in diameter, smooth, pinkish or pale green, white and spongy within. Leaves are few, alternate, forming erect tufts at the extremities of rhizomes. Scale arises from the outer leaves. Rhizomes are aromatic.

Latin name : *Arisaema tortuosum* (Wall.) Schott.
Local/common name(s) : Samp-Ki-Kumb, Snake maize
Locality : Palachak to Panihartu(1,500-3,000 m) (Sharma PK)
Description :

Spathe green, some what glaucous, rarely purple, blade ovate, acute, curved upward. Spadix distinctive with a rather thick up-curved. A tall plant, often usually two pedate leaves, broadly ovate to lanceolate, abruptly pointed leaflets.



Satyrium nepalense



Bistorta amplexicaule



Arisaema tortuosum



Artemisia vulgaris



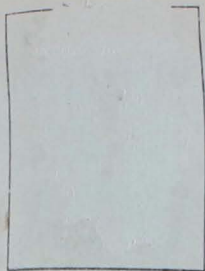
Spiranthes sinensis



Habenaria pectinata



Hedychium acuminatum



Selinum tenuifolium



Leucas lanata



Ajuga bracteosa



Cautleya spicata




Linum istatissimum



Rumex hastatus



Swertia chirayita

Plate 



Aconitum heterophyllum



Angelica glauca



Plantago major



Chaerophyllum reflexum



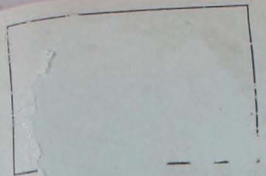
Prinsepia utilis



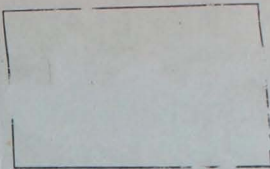
Anaphalis araneosa



Berberis lycium



Podophyllum hexandrum



Juniperus recurva



Valeriana hardwickii



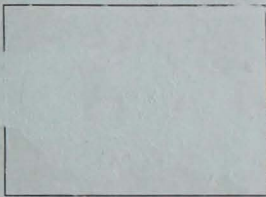
Bergenia ciliata



Meconopsis aculeata



Jurinea dolomaea



Rhododendron arboreum



Arctium lappa



Anaphalis contorta



Polygonum capitatum



Primula poluninii



Polygonatum verticillatum



Ranunculus oedoxifolius



Potentilla eriocarpa



Cannabis sativa



Gerardinia diversifolia



Euphorbia wallichii



Hypericum choisianum



Elsholtzia polystachya



Androsace rotundifolia



Taraxacum officinale



Roscoeia purpurea



Ligularia amplexicaulis

Table I List of Medicinal and Aromatic Plants of commercial importance selected as most important from the study area and their economic uses have been given below:

Name of the species	Official part used	Economic uses (based on their commercial importance)
<i>Abies webbiana</i>	Leaves	Considered carminative used for cough and phthisis, cones yields a violet colour dye. Tree yields a white resin.
<i>Achillea millefolium</i>	Whole herb	Bitterish. Pungent and aromatic aerial parts are used as a flavouring. The herb is also substituted for hops in the preparation of beer. Decoction of leaves carminative native and stimulant. Herb considered astringent, tonic, diaphoretic vulnerary and styptic.
<i>Aconitum heterophyllum</i>	Roots	The alkaloids isolated from the roots include, aconisine, heteratisine, histisine, heterophyllisine, heterophylline, heterophyllidine, atidine, hetidine, benzotheteratisine, F-dihydroatisine and letisinone. The alkaloid content is 0.79%. Roots used for hysteria, throat infections, dyspepsia and vomiting, abdominal pain and diabetes.
<i>Acorus calamus</i>	Rhizomes	Used in epilepsy and other mental ailments, chronic diarrhoea and dysentery. Also used in glandular and abdominal tumours. They are the source of calamus oil.
<i>Adhatoda vasica</i>	Leaves, Flowers and Seeds	Fresh or dried leaves constitute the drug VASAKA, used in bronchial troubles and consumption. Flowers contain an essential oil, seeds yields a fatty oil.
<i>Ageratum conyzoides</i>	Whole herb	Used as a nervine tonic, juice of the herb is useful in prolapsus ani. Decoction or infusion used in diarrhoea, dysentery, colic with flatulence and other gastro intestinal ailments.
<i>Ajuga bracteosa</i>	Whole herb	Herb is astringent febrifuge, apparent, tonic and diuretic. Used in goat, rheumatism, palsy and amenorrhoea.
<i>Anagallis arvensis</i>	Whole herb	Herb accredited with expectorant, stimulant, diaphoretic and vulnerary properties. Used for dropsy, leprosy, hydrophobia, mania and other cerebral affections.
<i>Anemone rivularis</i>	Root stocks	Extract gave positive test for saponin.
<i>Arctium lappa</i>	Roots	Roots diuretic and diaphoretic, used in gout and skin affections. Tincture of seeds used for psoriasis acne and prurigo.
<i>Artemisia vulgaris</i>	Leaves and roots	Infusion of leaves given to asthma, nervous and spasmodic affections. Roots used as a tonic and antiseptic.

<i>Aster mollusculus</i>	Roots	Used for cough and pulmonary affections. Also used in malarial fever and haemorrhage.
<i>Berberis aristata</i>	Roots, Berries and Stem	Dried stems used as a bitter tonic for intermittent fevers. Dried berries are edible. Root-bark contains alkaloid berberine. Roots and stems yield a yellow dye.
<i>B. lycium</i>	Roots	RASAUNT an extract from the root was once considered to have been obtain from this species Umbellatine is the major alkaloid of this species.
<i>Bergenia ciliata</i>	Rhizomes	Rhizomes are astringent, diuretic, antiscorbutic, laxative and lithontriptic, used in diarrhoea, spleen enlargement, renal and pulmonary affections. Rhizomes yield tannin.
<i>Betula utilis</i>	Bark	Bark is papery and ancient manuscripts were written on the sheets of this bark. Infusion of the bark is aromatic antiseptic, used as carminative.
<i>Boenninghausenia albiflora</i>	Whole plant	The crushed leaves of the plant have a strong disagreeable odour, which are used as repellent against the flees.
<i>Bistorta amplexicaulis</i>	Root stocks	Constitute a drug Anjubar used medicinally both in Unani and Ayurvedic systems of medicines. Roots are also contain tannins.
<i>Cannabis sativa</i>	Whole plant	Source of hemp fibre and also of narcotics bhanga, charas and ganja. Dried flowering, tops of female plants used as sedative and gestic and narcotic. Seeds are source of hemp seed oil, used in paints, varnishes and soaps.
<i>Chenopodium album</i>	Whole herb	Used as a pot-herb and accredited in the laxative and anthelmintic properties. Also yields an essential oil.
<i>Cirsium falconeri</i>	Roots	Used in flatulence; externally for ulcers and abscesses. Aromatic seeds and shoots are edible.
<i>Clematis gouriana</i>	Leaves	Leaves are vesicant.
<i>Corydalis govaniiana</i>	Roots	Used as tonic, diuretic, prescribed in syphilitic, scrofulous and cutaneous affections.
<i>Cotoneaster baccillaris</i>	Wood	Suitable for turning, used for walking sticks, umbrella-handles, golf-clubs, tent-pegs and agricultural implements.
<i>C. microphylla</i>	Stolons	Used as an astringent. Twigs used for walking sticks and baskets.
<i>Cynoglossum wallichii</i>	Whole herb	Used for checking vomiting in infants.

<i>Cyathula tomentosa</i>	Roots	Decoction used in dysentery. Also sued for skin complaints.
<i>Daphne papyracea</i>	Bark	Bark used for paper-making, bark also yields a cordage fibre.
<i>Delphinium brunonianum</i>	Leaves	Juice of leaves used to destroy ticks, cardiac and respiratory depressant.
<i>Desmodium titiaefolium</i>	Roots & Leaves	Leaves lopped for fodder. Roots carminative, tonic and diuretic, used in biteous complaints.
<i>Dicliptera bupleuroides</i>	Whole herb	Used as a tonic.
<i>Elsholtzia strobilifera</i>	Leaves	Used for choleric diarrhoea, contains an essential oil.
<i>Epilobium laetum</i>	Leaves	Leaves used as a beverage. Roots are contain tannin and were used as an astringent.
<i>Erigeron bellolioides</i>	Leaves	Used for lumbago and rheumatism.
<i>Eupatorium odoratum</i>	Whole herb	Diuretic, antiscorbutic, cathartic and emetic, used as a deobstruent. Also employed as an emmenagogue and purgative.
<i>Euphorbia cognata</i>	Roots	Juice is acidic and issitant. Roots used for Fistular sores.
<i>Geranium robertianum</i>	Roots	Used for diarrhoea and haemorrhageg, and for gargles; also used in ague, jaundice and gravel.
<i>Habenaria pectinata</i>	Tubers	Tubers are a source of salep.
<i>Hedychium acuminatum</i>	Rhizomes	Aromatic rhizomes employed in the preparation of Abir, a fragrant; coloured powder used during the Holi festival and in the religious ceremonies. They are considered stomach-ache, carminative, stimulant and tonic. Used in dyspepsia. Yields an essential oil used in soaps, hair oils and face powders. Leaves woven into mats.
<i>Heracleum candicans</i>	Roots	Tonic and aphrodisiac. Dry fruits yield an essential oil.
<i>Hypericum choisianum</i>	Flowers	Astringent, expectorant and diuretic, used in diarrhoea, pulmonary and urinary troubles. An oil is prepared by infusing fresh flowers which is used externally for wounds, sores, ulcers, swellings and sometimes against rheumatism and lumbago.
<i>Inula grandiflora</i>	Roots	Aromatic roots employed as an adulterant of kuth.

<i>Juniperus communis</i>	Fruits	Sweet, aromatic fruits are used for flavouring gin, liqueurs and cordials, contain an essential oil fermentable sugars and a fatty oil. Bark used as tannin. Needles rich in vitamin-C. Fruits and roots yield dyes.
<i>J. recurva</i>	Wood, Leaves and Twigs	Wood is locally used as fuel; suitable for pencils. Wood, leaves and twigs are used as incense; smoke from green wood, however is said to be emetic. Fruit yield an essential oil.
<i>Linum usitatissimum</i>	Seeds	Seeds yield a quick-drying oil stalks are the source of flax, oil is extensively used in paint and varnishes.
<i>Lamium album</i>	Roots and flowers	Astringent; decoction used in haemorrhages of uterus and nose. Plant yields an essential oil. Roots resolvent and vulnerary. Flowers mild astringent, haemostatic, hypnotic, depurative and tonic. Leaves edible, a good source of carotene.
<i>Leucas lanata</i>	Tender shoots	Tender shoots used as a vegetable; also given for cough after frying.
<i>Lindenbergia indica</i>	Entire plant	Juice given in chronic bronchitis; also used for skin eruptions.
<i>Lotus corniculatus</i>	Leaves and Flowers	A good soil binder free from pests and diseases. May be used as pasture or fed as silage and hay. Hay is a good source of carotene. Flowers and leaves yields a colouring matter. An important bee plant.
<i>Lyonia ovalifolia</i>	Leaves and Flowers	Infusion of young leaves and buds used for cutaneous troubles; leaves are also insecticidal, contain a toxic substances andromedotozin. Honey from the flowers reported to be poisonous.
<i>Malaxis muscifera</i>	Tuberous roots	Uses as tonic and lactagogue.
<i>Malva verticillata</i>	Leaves and roots	Roots used for whooping cough and ash of dried leaves is used in scabies.
<i>Meconopsis aculeata</i>	Roots	Roots are used as narcotic.
<i>Micromeria biflora</i>	Entire plant	Used for worm infested wounds of cattle.
<i>Morina longifolia</i>	Roots	Used as incense in the preparation of dhoop and agarbatties etc. Yields an essential oil.
<i>Nasturtium officinale</i>	Entire plant	Consumed as salad. Chopped leaves incorporated in fruit and vegetable juice, cocktails, soups and biscuits. Plant also used in asthma and tuberculosis.

<i>Nepeta elliptica</i>	Seeds	Infusion of seeds used in dysentery.
<i>Origanum vulgare</i>	Leaves	Leaves and tops cut prior to blooming used as a flavouring agent, origanum oil is carminative, stomachache, diuretic, diaphoretic and emmenagogue, used as a stimulant and tonic in diarrhoea and colic, also applied in chronic rheumatism toothache and carache. Given in whooping cough and bronchitis because of its spasmolytic action. Also employed in cosmetics and soaps.
<i>Oxyria digna</i>	Leaves	Leaves have sorrel- like pleasantly acidic taste and consumed as a vegetable or used in salads and chutneys. Herb antiscorbutic and refrigerant.
<i>Parnassia rubicola</i>	Entire plant	Decoction of plant used as sedative in nervous palpitation and epileptic convulsions. Flowers yield a dye.
<i>Phytolacca acinosas</i>	Entire plant	Herb has narcotic effect. Fruits occasionally used as a flavouring agent. Seeds yield a fatty oil.
<i>Picrorhiza kurroo</i>	Roots	Constitute the drug picrorhiza, used as a substitute of Indian Gentian (<i>Gentiana kurroo</i>). Contains picrorhizin, kutkin and other compounds.
<i>Pimpinella diversifolia</i>	Entire plant	Carminative.
<i>Plantago lanceolata</i>	Leaves	Leaves and roots are astringent and vulnerary. Used in cough, asthma and other pulmonary diseases.
<i>P. major</i>	Leaves	In homoeopathy it is used in disorders of epidermis headache, earache and toothache. Leaves and roots are also used for dyeing cotton.
<i>Pleurospermum brononis</i>	Whole herb	The dried herb is used as a preserving agent against the attack of moth, silver fish etc. to protect woollen garments. Essential oil is of great value in perfumery industry.
<i>Podophyllum hexandrum</i>	Rhizomes	Constitute a compound called podophyllin which is commonly used as a purgative; podophyllotoxin is the active principle. Podophyllin is an effective vermifuge. Recently it has acquired importance because of its possible use in controlling some forms of cancer. Fruits are edible.
<i>Polygonatum verticillatum</i>	Tubers	Valued as a salep, a strength giving food. Plant diuretic, contains a glucoside of digitalis group.
<i>Rheum australe</i>	Roots	Used as astringent, laxative and also as tonic. The extract made out from the roots known as USHARE-REVAND is used in Unani medicines.

<i>Rhododendron arboreum</i>	Flowers	A sub-acidic jelly or preserve is made from the petals, used in diarrhoea and dysentery.
<i>R. campanulatum</i>	Leaves and Flowers	leaves are used in chronic rheumatism, syphilis and sciatica. Flowers yield an essential oil.
<i>Selinum tenuifolium</i>	Roots	Roots used as a nervine sedative. Also employed as incense; yield an essential oil with hypotensive, sedative and analgesic properties.
<i>Swertia chirayita</i>	Entire plant	Used as a bitter tonic, stomachache, febrifuge and laxative.
<i>Tanacetum longifolium</i>	Roots	Used as incense.
<i>Taxus wallichiana</i>	Entire plant	Leaves are antispasmodic and emmenagogue, used for nervousness, hysteria and as a tithontriptic. Extracts of various parts of the tree is added to hair lotions, beauty and shaving creams and dentifrice's.
<i>Thalictrum foliolosum</i>	Roots	Roots are much valued for ophthalmia used as extract, decoction or powder. Also used as diuretic, purgative and bitter tonic during convalescence and atonic dyspepsia.
<i>T. javanicum</i>	Roots	Used as substitute of those of <i>T. foliolosum</i> .
<i>Valeriana hardwickii</i>	Roots	Same properties and uses at those of <i>V. jatamansi</i> and are therefore a good substitute of the drug valerina.
<i>V. jatamānsii</i>	Roots	Roots are known as Indian valerian, yields an essential oil, used as an adjunct to certain flavours in tobacco, honey etc. also used as a tonic and stimulant.
<i>Viola serpens</i>	Flowers and Roots	Constitute a part of commercial Banafsha and is considered to be posses medicinal properties more of less similar of <i>V. odorata</i> . A decoction of flowers given for improvement in general complexion. Herb is the main ingredient of JOSHANDA, a Unani Medicine used in the form of decoction for cough and colds.
<i>Vitex negundo</i>	Leaves	Leaves are used as tonic and varmifuge, smoked for relief in catarrh and headache. Leaves are also yield an essential oil.

Table 2 Inventory and ethnobotanical uses of plants used by inhabitants of the study area

Botanical name	Common name	Parts used	Local uses
<i>Achillea millefolium</i>	Millfoil, Yarrow	Whole herb	A decoction of whole plant is employed for bleeding piles and is good for kidney diseases. As a bitter tonic, it is given during convalescens from fevers and in atonic dyspepsia to promote appetite.
<i>Aconitum heterophyllum</i>	Atis, Patis	Roots	The roots are used as an antiperiodic to combat weakness after fever, as an aphrodisiac, astringent and in the form of tonic; it is given to cure diarrhoea, dyspepsia and cough. The dry roots are also collected by the local people and sold in market.
<i>A. violaceum</i>	Mitha-Patis	Roots	The roots are eaten as tonic. Small quantity of its roots are collected and sold at various markets.
<i>Acorus calamus</i>	Bach, Bare	Rhizomes	Rhizomes are effective in curing dyspepsia, colic, fever, bronchitis, dysentery, snake bites and is also used as a nerve tonic and insectifuge.
<i>Ainslaea aptera</i>	Karvi-Buti	Roots	The powder of the roots is used as an emergency medicine in acute stomach-ache. A single dose of about to mashas taken with warm water relieves the patients from the pain.
<i>Angelica glauca</i>	Chora	Roots	Used as condiment in cookery. Also used in dyspepsia and stomach-ache. Small quantity is also collected and sold in the market.
<i>Arnebia benthamii</i>	Ratanjot	Roots	Used as an antiseptic and antibiotic in healing of the cuts and wounds when applied as a poultice. Also used for subsiding swelling of the organs.
<i>Artemisia vulgaris</i>	Chhammer	Leaves	The leaves of the plant are crushed and the paste is applied on the cuts and wounds, to check bleeding. The wound is fastened with a cloth and after few minutes, bleeding stops.

<i>Berberis aristata</i>	Kashmal,	Roots	The roots are used as fuel wood while the extract of the root bark, roots and stem called as RASOUNT is used to cure skin diseases, diarrhoea, jaundice, eye diseases, piles and malaria. Berries are eaten as laxative and anti-scorbutic.
<i>Bergenia ciliata</i>	Pashanbled	Roots	The tonics of the root are used in fever, diarrhoea, pulmonary affections, bruised and applied to boils and ophthalmia. Good quantity is also collected and sold in the markets.
<i>Betula utilis</i>	Bhojpatra	Bark	The bark is used as an antiseptic. Bhujera (a fungal formation on the tree) is used for alimentary disorders in animals. Small quantity is also collected and consumed locally.
<i>Bidens pilosa</i>	Chor-Pushi	Whole plant	It is used as a vegetable curri in leprosy and various skin diseases and in healing of the ulcer, the juice of the leaves is applied. Seeds are administered internally as an anthelmintic in cases of animals.
<i>Boehmeria platyphylla</i>	Samrala	Leaves	One matured leaf or two to three small leaves are ground into powder with 2-3 grains of black pepper and then applied on the eczima affected parts of the organs as a paste. It is found as a magic cure for any type of eczima, old or new..
<i>Boenninghausenia albiflora</i>	Pissumar Buti	Whole plant	The entire aerial part is used to repel lice, fleas and other insects. Aerial parts and the shoot is usually spread beneath the bed sheet and allowed to remain for few days.
<i>Calotropis procera</i>	Aak	Leaves	The leaves are ground and the paste is applied to the burnt skin or swellings. The milky juice is used as a purgative. The bark is used to check dysentery.
<i>Cannabis sativa</i>	Bhang, Charas	Whole plant	Paste of fresh leaves is used to resolve tumours. Leaf powder is a useful as dressing for wounds or sores. Seeds are roasted and eaten as culinary by the local people. The resinous exudation commonly known as charas is also taken with tobacco as a sedative.

<i>Camellia thea</i>	Cha, Chai	Leaves	Leaves used as local tea. It is astringent, stimulant, gently excitent and diuretic. Good quantity is also exported.
<i>Cedrus deodara</i>	Devdar, Diar	Oil	The wood of the tree is used to extract the cedarwood oil, by burning it in earthen pit. The oil is used as an effective insect repellent in cattle's, wounds especially in sheep and goats.
<i>Centella asiatica</i>	Brahmi	Leaves	The leaf juice is used as a brain tonic, in skin diseases, leprosy and as a blood purifier.
<i>Corydalis govaniiana</i>	Indrajata,	Whole plant	The decoction of the whole plant is give in chronic fevers and liver complaints.
<i>Cotoneaster microphyllus</i>	Ruinsh	Fruits	The bright red fruits are eaten. The pulp is used to prepare chutney and jams.
<i>Delphinium vestitum</i>	Salyan	Whole plant	Locally the flowers are powdered and mixed with oil and applied to the hairs by the village women to kill the lice. The powder of the roots is applied on the cuts and wounds to kill the bacteria during summer and help heal the wound soon.
<i>Dioscorea deltoidea</i>	Singli-Mingli	Tubers	Locally the tubers are used to kill lice and to poison fish. It is also used for washing the woollen clothes. Cortisone of which Diosogenin is a content is used in the treatment of rheumatic and eye diseases.
<i>Euphorbia pilosa</i>	Saptala, Satla	Whole plant	The plant paste is locally used in curing healing of wounds, weeping eczima and its curative properties are excellent.
<i>Fragaria indica</i>	Wild Strawberry	Fruits	Fruits are eaten by the local people and are also used to make chutney.
<i>Galinsoga parviflora</i>	Pipli-ghas	Leaves	Leaf juice is dropped into the ear to cure earache.

<i>Geranium nepalensis</i>	Laljari	Roots	Generally used in tooth-ache, to check bleeding and in ulcers and jaundice. The powder of the roots when mixed hot ghee is applied to the cuts and wounds and cures them rapidly.
<i>Girardinia diversifolia</i>	Bara Bichhua	Leaves	Leaves are used in headache and swollen joints. Its decoction is given in fever. The bark forms a very good fibre for making ropes and cordage's.
<i>Hedychium acuminatum</i>	Kapur-kachari	Roots	The roots are used in stomach disease as carminative, stimulant, expectorant, useful in vomiting, diarrhoea, pains and inflammations. Also said to be used in snakebites.
<i>Heracleum candicans</i>	Padara	Roots	Roots are considered poisonous. The powder of the plant is given in giddiness. Leaves and shoots are often used as fodder.
<i>Hippophae salicifolia</i>	Amil	Bark	The bark of the plant is used for healing of the wounds and ulcers when applied as a paste.
<i>Juniperus recurva</i>	Pahari Chandan	Twigs	People regard this plant as a repellent of evil spirits. The twigs are used as an incense and commonly used in Havans.
<i>Jurinea dolomiaea</i>	Dhoop	Whole plant	Used in the preparation of Dhoop, which is used to purify the rooms and employed in worships and prayers. Good quantity is also collected and sold at various markets.
<i>Mentha longifolia</i>	Jangli Pudina	Leaves	The leaves are used as a cure for vomiting and headache. Leaves improve digestion and are chewed in case of prolonged indigestion. Locally they are used to make chutney.
<i>Morina longifolia</i>	Bishkandara	Roots	Root powder is applied as a poultice in boils for sucking the puss out of it and facilitate healing of the wounds .
<i>Origanum vulgare</i>	Sathra	Whole plant	The stem and the aerial parts are used an insect repellent, to drive away the fleas and other insects. The leaves are ground and the fine paste is applied on

			boils, wounds and cuts. The paste is very efficacious in healing wounds caused by fire burns.
<i>Oxyria digyna</i>	Chhuchh	Leaves	The leaves are considered as carminative and digestive. Useful in abdominal problems. Leaves are also used as vegetable and for making chutney.
<i>Paeonia emodi</i>	Udsalib	Tuberous Roots	Internally the powder of the roots is given in mental diseases and as a blood purifier. The decoction of the roots is externally applied for healing the cuts, wounds and ulcers.
<i>Phlomis bracteosa</i>		Flowers	Nectar of the flowers is put in the eyes of the person suffering from irritation. It gives cooling effect to eyes.
<i>Picrorhiza kurroa</i>	Karu, Kaur	Roots	The roots are used in abdominal pains and as a purgative too. Fairly good quantity is also collected and exported.
<i>Pleuropermum brunonis</i>	Nesar	Whole plant	The plant is used as spice and flavouring agent. The shoots are dried, powdered and used in cooking.
<i>Podophyllum hexandrum</i>	Bankakri	Roots	The root powder is administered internally for gastric ulcers. It is applied as a paste on cuts and wounds for regeneration of the tissues.
<i>Polygonatum verticillatum</i>	Salam-Misri	Rhizome	The rhizomes being sweet in taste are eaten by the local people. Also used as an aphrodisiac.
<i>Polygonum recumbens</i>	Vishalaya	Whole plant	Powder of the whole plant is applied in abscesses, boils and other skin diseases. The decoction is given internally as a blood purifier.
<i>Prinsepia utilis</i>	Bhekhal	Oil	Oil obtained from the seeds is applied for curing the rheumatic pains and is also sometimes eaten as tonic. It is a good healer for cuts and wounds.
<i>Quercus dilatata</i>	Ban	Seeds and wood	The seeds are used in urinal troubles and the decoction of the wood is used in scabies and other skin diseases.

<i>Rheum australe</i>	Chukri	Roots	Locally the root is dissolved into a paste and applied as an antiseptic and antibiotic. Lotion made of the roots is used in all types of skin diseases, sore eyes and piles. The powder of the root is taken in abdominal pains. It is also used for swellings to subside.
<i>Rhododendron arboreum</i>	Brah, Bras	Flowers	The flowers of this tree are used by the local people for various purposes. Petals are used to prepare jams and local drinks. The juice of the flower is used to cure dysentery and diarrhoea. Petals are dried and stored for the use in the later part of the year, when the fresh flowers are not available. The flowers are ground with sugar and the paste is fed to the person suffering from nose bleeding.
<i>Rumex nepalensis</i>	Jungli Palak	Leaves	The leaves are commonly used to cure constipation. Also used as vegetable.
<i>S. costus</i>	Kuth	Roots	The roots are used as carminative, stimulant and tonic. Also used as antispasmodic in asthma, cough, cholera and in skin diseases.
<i>Saussurea gossypiphora</i>	Ghuggi Badshah	Whole plant	The wool of the herb is applied to the cuts and wounds. The paste is rubbed on the body of the infant kids of sheep and goats enabling their mothers to milk feed them properly.
<i>Selinum tenuifolium</i>	Mathosal	Roots	Roots are used as a catalyst in the preparation of local beverage 'Dheli'. The smoke produced from the roots is used for killing and repelling the insects, for purifying the atmospheric air. Roots are also used as a substitute for 'Bhutkesi' and used as an ingredient in Dhoop preparation.
<i>Strobilanthus auriculatus</i>	Kapuriminjri	Volatile oil	Locally used as a magic cure for eye diseases like cataract, trachoma etc. The oil droplets are mixed with collyrium (Kajal), it is then applied as usual in eyes as a collyrium with the help of a blunt needle. Within 15 days of its application the eyes are cured from the disease.

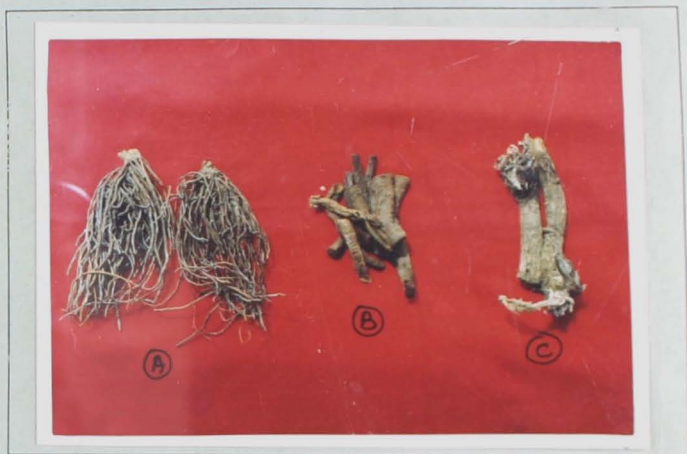
<i>Swertia chirayita</i>	Chirata,	Whole plant	The plant is a bitter tonic, stomachic, febrifuge and laxative. Locally used in fevers. Small quantity is also collected and exported.
<i>Tanacetum longifolium</i>	Akarkar	Flowers	Dried flowers being aromatic and are used as an incense. Flowers are burnt which leaves the homes fragrant for hours together.
<i>Taraxicum officinale</i>	Dugdhphehi	Roots	The root is taken internally as a blood purifier to cure skin diseases. It is internally used in curing of the peptic ulcer.
<i>Thalictrum foliolosum</i>	Pili-Jarhi	Roots	Used internally in abdominal pains and as a blood purifier. The paste of the roots is applied on the eye lids to cure eye diseases. The poultice of the root is applied to cure the boils.
<i>Taxus wallichiana</i>	Talishpatra	Leaves, fruits	Leaves are used as sedatives, antiseptic and emmenagogue; used in asthma, bronchitis, epilepsy and cough etc. Fruit is also sedative, antiseptic and emmenagogue.
<i>Valeriana jatamansii</i>	Mushkbala, Mansi, Jatamansi	Rhizome	Used locally as antispasmodic, carminative and in acute stomach aches. A sizeable quantity of its rhizomes are also collected and exported.
<i>Viola serpens</i>	Banfasha, Banaksha	Leaves, Flowers	Locally the leaves and flowers are used as expectorant and emollient. The poultice of it is used in throat pains, cough and cold. Also exported in sufficiently good quantity.



- A. *Aconitum heterophyllum*, Atis (Roots)
 B. *Heracleum candicans*, Patrala (Roots) and
 C. *Arnebia euchroma*, Ratanjot (Roots),



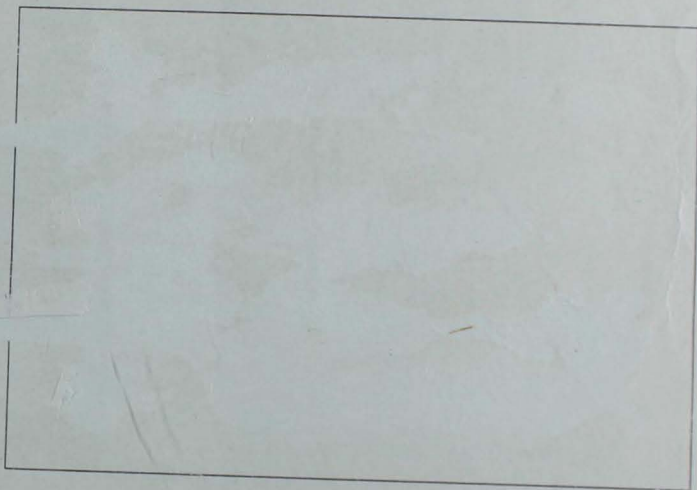
- A. *Polygonatum verticillatum*, Mahameda (Rhizomes)
 B. *Roscoea purpurea*, kakoli (Fasciculated roots)



- A. *Podophyllum hexandrum*, Bankakri (Rootstock with root fibers)
B. *Rheum australe*, Chukri (Roots)
C. *Jurinea dolomiaca*, Dhoop (Roots)



Saussurea gossypiphora, Ghuggi Bndshah (A sacred plant)



Pleurospermum brononis, Nesar

DISCUSSION

DISCUSSION

Himachal Pradesh, situated in the lap of Western Himalayas is considered a repository of medicinal and aromatic plants. Age old practice of plant use as medicines, forms a part and parcel of the culture of this hilly state. Lack of communication means, inadequate modern medical facilities, tribal ways of life, adherence to the primitive myths and legends; custom and beliefs, nearness to the forests and daily encounters with wild plants seems to be the basic reasons for the persisting herbal lores and mores in Himachal Pradesh.

Because of the richness of the Himalaya in vegetal resources, there is need to harness their potential for drug and medicines so that the raw material is available on sustainable basis for the service of mankind. The present investigations were carried out in Gaddi inhabited areas in Kangra district of Himachal Pradesh, which is one of the richest source of Medicinal and Aromatic Plants and where biodiversity is still maintained to a great extent through the cultural heritage of the local inhabitants as well as nomads.

As a result of the preliminary survey of the area, plants were collected during flowering/fruiting period, from May to October during 1997. The collected samples were pressed, mounted, identified, indexed and finally deposited in the herbarium of Dr. YS Parmar University of Horticulture and Forestry, Nauni-Solan 173 230 (HP). For the purpose of classification Bentham and Hooker's system was followed.

During the course of the study, a total number of 161 species belonging to 124 genera and 52 families were collected from different locations. Out of these, 145 species belong to dicots, 11 to monocots and 5 to Gymnosperms. Of the total 52 families, dicots, monocots and gymnosperms were represented by 45, 4 and 3 families respectively. Thus, showing that the dicots dominate the vegetation.

Among the dicots, the dominating families, in the area include Asteraceae (19 genera and 23 spp.), Lamiaceae (9 genera and 13 spp.), Rosaceae (7 genera and 10 spp.), Ranunculaceae (6 genera and 9 spp.) Scrophulariaceae (6 genera and 8 spp.), Polygonaceae (5 genera and 8 spp.), Umbelliferae (5 genera and 7 spp.), Leguminosae (4 genera and 5 spp.) Acanthaceae (4 genera and 4 spp.) Saxifragaceae (3 genera and 5 spp.) and Campanulaceae (3 genera and 4 spp.). Dominating families among the monocots are Orchidaceae (4 genera and 4 spp.), Zingiberaceae (2 genera and 4 spp.), Araceae (2 genera and 2 spp.) followed by Liliaceae (1 genera and 1 sp.). The Gymnosperms, *Cedrus deodara* and *Abies pindrow* are largely represented the area attaining a climatic climax while *Taxus wallichiana* and *Juniperus* spp. have been found in scattered form. (Table No.3).

The least represented families i.e., those having single genera include Papavaraceae, Fumariaceae, Vitaceae, Hypericaceae, Malvaceae, Geraniaceae, Rutaceae, Parnassiaceae, Onagraceae, Araliaceae, Valerianaceae, Dipsacaceae, Campanulaceae, Asclepiadaceae, Gentianaceae, Boraginaceae, Plantagenaceae, Amaranthaceae, Chenopodiaceae, Phytolaccaceae, Thymelaeaceae, Euphorbiaceae, Urticaceae, Cannabaceae, Betulaceae, Fagaceae and Salicaceae, respectively.

All the plant species as collected were further classified as medicinal and aromatic plants (based on their commercial importance). Out of 161 species, 81 species are classified as medicinal and aromatic and are of commercial importance. The important ones are; *Achillea millefolium*, *Aconitum heterophyllum*, *Acorus calamus*, *Artemisia vulgaris*, *Berberis* spp., *Bergenia ciliata*, *Betula utilis*, *Corydalis govaniiana*, *Cotoneaster baccillaris*, *C. microphylla*, *Delphinium brunonianum*, *Geranium* spp., *Hedychium acuminatum*, *Heracleum candicans*, *Inula grandiflora*, *Juniperus* spp., *Malaxis muscifera*, *Picrorhiza kurrooa*, *Plantago* spp., *Pleurospermum* spp., *Polygonatum verticillatum*, *Rheum australe*, *Roscoea purpurea*, *Swertia chirayita*, *Taxus wallichiana*, *Tanacetum longifolium*, *Thalictrum* spp., *Valeriana* spp. and *Viola serpens* (Table No.1).

There is a regular extraction of Dhoop (*Jurinea dolomiaea*), Atis (*Aconitum heterophyllum*), Hauber (*Juniperus* spp.), Karu (*Picrorhiza kurrooa*), Tagar (*Valeriana* spp.) etc., from different parts of this area on unlimited scale by the local inhabitants, which is sold to the middlemen. This excessive and inscientific extraction is leading to decrease in the plant population in many areas.

People in these parts are generally poor, believe in Gods and Dieties, Jantra-mantras and evil spirits. Every village has its own Devta and the oracle rites are performed for getting his blessing in the matter of diseases, calamities and other domestic problems. Residents of the remote villages and tribal areas depend upon the folk medicines and household remedies to a great extend. The prevalent practice of herbal remedies have descended down from generation to generation and includes the cure for simple ailments to the most complicated ones such as asthma, bronchitis, cough, diarrhoea, dysentery, eye diseases, skin diseases, snake bites, rabid dog bites, jaundice, stomach-ache problems, malaria, cholera, fevers, bone fractures, malignant sores and even for effecting the birth control. Plants like *Ainslaea aptera*, *Androsace rotundifolia*, *Aconitum heterophyllum*, *Acorus calamus*, *Angelica glauca*, *Viola serpens*, *Saussurea costus*, *Berberis aristata*, *Geranium nepalense*, *Origanum vulgare*, *Boehmeria platyphylla*, *Dioscorea deltoidea*, *Berginia ciliata*, *Centella asiatica*, *Rheum australe*, *Cassiope fastigiata*, *Saussurea gossypiphora*, *Leucas lanata*, *Polygonum macrophyllum* and *Pleurospermum* spp. etc., are frequently used for various ailments as house hold remedies (Table No.4).

Many phrases are popular about the properties and uses of medicinal herbs in Kangra district and to elicit, few such examples are given here under :-

**“BANA, BASUTI TE BARE; JETHI YE TIN CHIJAN,
TETHI MANU KIAN MARE”**

It is the popular saying in Kangra district, which says where Bana (*Vitex negundo*), Basuti (*Justicia adhatoda*), Bare (*Acorus calamus*) grow a man can not die of diseases (provided one knows its ratio and proportion and respective measures of administrations).

**“HARAD, BAHERA, AMLA BICH PAYI GILOYE;
JITHON YE CHAR CHIJAN, UTHO ADMI KYON MOYE”**

It means where these three myrobalans- Harad (*Terminalia chebula*), Bahera (*T. bellirica*), Amla (*Emblica officinalis*) and Giloye (*Tinospora cordifolia*) are available, the disease can not be the sole cause of death.

GHUGGI-BAN

This is the combination of two herbs i.e. Ghuggi (*Saussurea gossypiflora*) and Ban (*Pleurospermum candolli*) are regarded highly sacred in Bara Bhanganal and Chhota Bhanganal areas of Kangra district. Local inhabitants keep them at home as an omen of prosperity and also used their smoke (Dhuni) in driving away the evil spirits and the ghostly instincts affecting especially small kids.

During the present investigation it was found that the persons practising this art does not easily reveal his knowledge to others. There are instances when the valuable informations has been lost with the dying persons. Informations presented in this manuscript has been gathered from different age groups of people residing in the study area. The practice of ethnobotany is still a matter of cultural heritage of the area. It was only through persistent and constant motivation during the course of survey for medicinal and aromatic plants from the different parts of the district, the present information on ethnobotany could be collected carefully from the practioners and old tribals. Out of 161 species only 67 plant species have been found to be used commonly by the local people. The most commonly used species are *Aconitum heterophyllum*, *A. violaceum*, *Acorus calamus*, *Ainslaea aptera*, *Angelica glauca*, *Arnebia benthamii*, *Artemisia vulgaris*, *Berberis aristata*, *Bergenia ciliata*, *Betula utilis*, *Boehmeria platyphylla*, *Delphinium vestitum*, *Euphorbia pilosa*, *Geranium nepalense*, *Girardinia diversifolia*, *Hedychium acuminatum*, *Heracleum candicans*, *Juniperus recurva*, *Jurinea dolomiaea*, *Morina longifolia*, *Origaum vulgare*, *Oxyria digyna*, *Picrorhiza kurrooa*, *Pleurospermum*

brunonis, *P. govanianum*, *Podophyllum hexandrum*, *Polygonatum verticillatum*, *Rheum australe*, *Rhododendron arboreum*, *Saussurea gossypiphora*, *Selinum tenuifolium*, *Swertia chirayita*, *Tanacetum longifolium*, *Thalictrum foliolosum*, *Taxus wallichiana*, *Valeriana jatamansi* and *Viola serpens*(Table No.2).

Table 3 List of families, genera and species reported from the study area

Sr. No. Dicots	Family	Genera	Species
1.	ASTERACEAE/ COMPOSITAE	<i>Achillea</i> , <i>Ageratum</i> , <i>Anaphalis</i> , <i>Arctium</i> , <i>Artemisia</i> , <i>Aster</i> , <i>Cirsium</i> , <i>Cremanthodium</i> , <i>Eupatorium</i> , <i>Erigeron</i> , <i>Galinsoga</i> , <i>Gnaphalium</i> , <i>Inula</i> , <i>Jurinea</i> , <i>Lactuca</i> , <i>Saussurea</i> , <i>Senecio</i> , <i>Tanacetum</i> and <i>Tricholepis</i> .	<i>Achillea millefolium</i> , <i>Ageratum conyzoides</i> , <i>Anaphalis araneosa</i> , <i>A. triplinervis</i> , <i>Arctium lappa</i> , <i>Artemisia gmelinii</i> , <i>A. vulgaris</i> , <i>Aster mollisculus</i> , <i>Cirsium folconeri</i> , <i>Cremanthodium oblongatum</i> , <i>Eupatorium odoratum</i> , <i>Egiregon bellidioides</i> , <i>Galinosaga parviflora</i> , <i>Gnaphalium luteo-album</i> , <i>Inula grandiflora</i> , <i>Jurinea dolomiaea</i> , <i>Lactuca lessertiana</i> , <i>L. lessertiana</i> , <i>Saussurea gossypiphora</i> , <i>S. roylei</i> , <i>Senecio chrysanthemoides</i> , <i>S. nudicaulis</i> , <i>Tanacetum longifolium</i> and <i>Tricholepis elongata</i> ,
2.	LABIATAE/ LAMIACEAE	<i>Ajuga</i> , <i>Elsholtzia</i> , <i>Lamium</i> , <i>Leucas</i> , <i>Micromeria</i> , <i>Nepeta</i> , <i>Origanum</i> , <i>Phlomis</i> and <i>Prunella</i>	<i>Ajuga bracteosa</i> , <i>Elsholtzia polystachya</i> , <i>E. strobilifera</i> , <i>Lamium album</i> , <i>Leucas lanata</i> , <i>Micromeria biflora</i> , <i>Nepeta connata</i> , <i>N. elliptica</i> N. <i>leucophylla</i> <i>Origanum vulgare</i> , <i>Phlomis bracteosa</i> and <i>Prunella vulgaris</i>
3.	ROSACEAE	<i>Cotoneaster</i> , <i>Filipendula</i> , <i>Fragaria</i> , <i>Potentilla</i> , <i>Prinsepia</i> , <i>Rosa</i> and <i>Spirea</i> ,	<i>Cotoneaster bacillaris</i> <i>C. microphylla</i> , <i>Filipendula vastita</i> , <i>Fragaria indica</i> , <i>Potentilla nepalensis</i> , <i>P. eriocarpa</i> <i>Prinsepia utilis</i> , <i>Rosa moschata</i> and <i>Spirea conescens</i> ,
4.	RANUNCULACEAE	<i>Aconitum</i> , <i>Anemone</i> , <i>Clematis</i> , <i>Delphinium</i> , <i>Ranunculus</i> and <i>Thalictrum</i>	<i>Aconitum heterophyllum</i> , <i>Anemone rivularis</i> , <i>Clematis gouriana</i> , <i>Delphinium brunonianum</i> , <i>Ranunculus diffuses</i> , <i>R. lactus</i> <i>Thalictrum elegans</i> , <i>T. foliolosum</i> and <i>T. javanicum</i>

- | | | | |
|-----|---------------------------|---|---|
| 5. | SCROPHULARIACEAE | <i>Euphrasia</i> ,
<i>Lindenbergia</i> ,
<i>Pedicularis</i> ,

<i>Picrorrhiza</i> ,
<i>Scrophularia</i> and
<i>Wulfinia</i> | <i>Euphrasia officinalis</i> ,
<i>Lindenbergia indica</i> ,
<i>Pedicularis megalantha</i> , <i>P. oederi</i> ,
<i>P. royleii</i> ,
<i>Picrorrhiza kurroa</i> ,
<i>Scrophularia himalensis</i> and
<i>Wulfinia amherstiana</i> |
| 6. | POLYGONACEAE | <i>Bistorta</i> ,
<i>Oxyria</i> ,
<i>Polygonum</i> ,
<i>Rheum</i> and
<i>Rumex</i> | <i>Bistorta amplexicaulis</i> ,
<i>Oxyria digyna</i> ,
<i>Polygonum capitatum</i> , <i>P. plebezum</i> ,
<i>Rheum australe</i> ,
<i>Rumex acetosa</i> , <i>R. hastatus</i> and <i>R. nepalensis</i> |
| 7. | UMBELLIFERAE/
APIACEAE | <i>Chaerophyllum</i> ,
<i>Heracleum</i> ,
<i>Pleurospermum</i> ,
<i>Pimpinella</i> and
<i>Selinum</i> | <i>Chaerophyllum reflexum</i> , <i>C. villosum</i> ,
<i>Heracleum candicans</i> ,
<i>Pleurospermum brunonis</i> , <i>P. govanianum</i> ,
<i>Pimpinella diversifolia</i> and
<i>Selinum tenuifolium</i> |
| 8. | LEGUMINOSAE | <i>Desmodium</i> ,
<i>Indigofera</i> ,
<i>Lotus</i> and
<i>Trigonella</i> | <i>Desmodium tiliaefolium</i> ,
<i>Indigofera hebeptala</i> ,
<i>Lotus corniculatus</i> ,
<i>Trigonella corniculata</i> and <i>T. emodi</i> |
| 9. | ACANTHACEAE | <i>Justicia</i> ,
<i>Aechmanthera</i> ,
<i>Diciliptera</i> and
<i>Strobilanthes</i> | <i>Justicia adhatoda</i> ,
<i>Aechmanthera gossypina</i> ,
<i>Diciliptera bupleuroides</i> and
<i>Strobilanthes dalhousianus</i> |
| 10. | SAXIFRAGACEAE | <i>Bergenia</i> ,
<i>Chrysosplenium</i> and
<i>Saxifraga</i> | <i>Bergenia ciliata</i> ,
<i>Chrysosplenium carnosum</i> ,
<i>Saxifraga brunonis</i> , <i>S. diversifolia</i> and <i>S. parnassifolia</i> |
| 11. | ERICACEAE | <i>Cassiope</i> ,
<i>Lyonia</i> and
<i>Rhododendron</i> | <i>Cassiope fastigiata</i> ,
<i>Lyonia ovalifolia</i> ,
<i>Rhododendron arboreum</i> and <i>R. campanulatum</i> |
| 12. | CRUCIFERAE | <i>Capsella</i> ,
<i>Nasturtium</i> and
<i>Sisymbrium</i> | <i>Capsella bursa-pastoris</i> ,
<i>Nasturtium officinale</i> , <i>N. montanum</i> and
<i>Sisymbrium wallichii</i> |
| 13. | PRIMULACEAE | <i>Anagalis</i> and
<i>Androsace</i> | <i>Anagalis arvensis</i> and
<i>Androsace rotundifolia</i> |
| 14. | BERBERIDACEAE | <i>Berberis</i> and
<i>Podophyllum</i> | <i>Berberis aristata</i> , <i>B. coriaria</i> , <i>B. lycium</i>
and <i>Podophyllum hexandrum</i> |

15.	CARYOPHYLLACEAE	<i>Arenaria and Silene</i>	<i>Arenaria serphyllifolia, Silene edgeworthii and S. tenuis</i>
16.	LINACEAE	<i>Linum and Reinwardia</i>	<i>Linum ustatissimum and Reinwardia indica</i>
17.	CRASSULACEAE	<i>Rhodiola and Sedum</i>	<i>Rhodiola himalensis and Sedum ewersii</i>
18.	GENTIANACEAE	<i>Swertia</i>	<i>Swertia chirayita, S. cordata, S. paniculata</i>
19.	PAPAVARACEAE	<i>Meconopsis</i>	<i>Meconopsis aculeata</i>
20.	FUMARACEAE	<i>Corydalis</i>	<i>Corydalis govaniiana</i>
21.	VIOLACEAE	<i>Viola</i>	<i>Viola serpens</i>
22.	HYPERICACEAE/ GUTTIFERAE	<i>Hypericum</i>	<i>Hypericum choisianum</i>
23.	MALVACEAE	<i>Malva</i>	<i>Malva verticillata</i>
24.	GERANIACEAE	<i>Geranium</i>	<i>Geranium robertianum</i>
25.	RUTACEAE	<i>Boenninghausenia</i>	<i>Boenninghausenia albiflora</i>
26.	PARNASSIACEAE	<i>Parnassia</i>	<i>Parnassia nubicola</i>
27.	ONAGRACEAE	<i>Epilobium</i>	<i>Epilobium laetum</i>
28.	ARALIACEAE	<i>Trevesia</i>	<i>Trevesia palmata</i>
29.	VALERIANACEAE	<i>Valeriana</i>	<i>Valeriana hardwickii and V. jatamansi</i>
30.	DIPSACACEAE/ MORINGACEAE	<i>Morina</i>	<i>Morina longifolia</i>
31.	CAMPUNULACEAE	<i>Campanula</i>	<i>Campanula colorata</i>
32.	ASCLEPIADACEAE	<i>Vincetoxicum</i>	<i>Vincetoxicum hirundinaria</i>
33.	BORAGINACEAE	<i>Cynoglossum</i>	<i>Cynoglossum denticulatum, C. wallichii and C. zeylanicum</i>
34.	VERBENACEAE	<i>Vitex</i>	<i>Vitex negundo</i>
35.	PLANTAGENACEAE	<i>Plantago</i>	<i>Plantago lanceolata and P. major</i>
36.	AMARANTHACEAE	<i>Cyathula</i>	<i>Cyathula tomentosa</i>
37.	CHENOPODIACEAE	<i>Chenopodium</i>	<i>Chenopodium album</i>

38.	PHYTOLACCACEAE	<i>Phytolacca</i>	<i>Phytolacca acinosa</i>
39.	THYMELEACEAE	<i>Daphne</i>	<i>Daphne papyracea</i>
40.	EUPHORBIACEAE	<i>Euphorbia</i>	<i>Euphorbia cognata</i>
41.	URTICACEAE	<i>Girardinia</i>	<i>Girardinia diversifolia</i>
42.	CANNABACEAE	<i>Cannabis</i>	<i>Cannabis sativa</i>
43.	BETULACEAE	<i>Betula</i>	<i>Betula utilis</i>
44.	FAGACEAE	<i>Quercus</i>	<i>Quercus dilatata</i>
45.	SALICACEAE	<i>Salix</i>	<i>Salix karelinii</i>

Monocots

1.	ORCHIDACEAE	<i>Habenaria,</i> <i>Malaxis,</i> <i>Satyrium and</i> <i>Spiranthes</i>	<i>Habenaria pectinata,</i> <i>Malaxis muscifera,</i> <i>Satyrium nepalense and</i> <i>Spiranthes sinensis</i>
2.	ZINGIBERACEAE	<i>Cautleya,</i> <i>Hedychium and</i> <i>Roscoea</i>	<i>Cautleya spicata,</i> <i>Hedychium acuminatum,</i> <i>Roscoea capitata and R. purpurea</i>
3.	ARACEAE	<i>Acorus and</i> <i>Arisaema</i>	<i>Acorus calamus and</i> <i>Arisaema tortuosum</i>
4.	LILIACEAE	<i>Polygonatum</i>	<i>Polygonatum verticillatum</i>

**Gymno-
sperms**

1.	PINACEAE	<i>Abies and</i> <i>Cedrus</i>	<i>Abies pindro, and</i> <i>Cedrus deodara</i>
2.	CUPRESSACEAE	<i>Juniperus</i>	<i>Juniperus communis and J. recurva</i>
3.	TAXACEAE	<i>Taxus</i>	<i>Taxus wallichiana</i>

Table 4 Table showing the list of various diseases and plants used for their cure

Sr. No	Diseases	Plants used to cure various diseases
1.	Asthma, Bronchitis and Cough	<i>Aconitum heterophyllum</i> , <i>Acorus calamus</i> , <i>Saussurea costus</i> , <i>Taxus wallichiana</i> and <i>Viola serpens</i> .
2.	Antiseptic and Antibiotic	<i>Arnebia benthamii</i> , <i>Betula utilis</i> , <i>Oxyria digyna</i> , <i>Polygonatum verticillatum</i> , <i>Rheum australe</i> and <i>Taxus wallichiana</i> .
3.	Boils, Sores, Fire-burns, Cuts and Wounds	<i>Arnebia benthamii</i> , <i>Artemisia vulgaris</i> , <i>Delphinium vestitum</i> , <i>Euphorbia pilosa</i> , <i>Hippophae salicifolia</i> , <i>Morina longifolia</i> , <i>Origanum vulgare</i> , <i>Paeonia emodi</i> , <i>Podophyllum hexandrum</i> , <i>Prinsepia utilis</i> , <i>Saussurea gossypiphora</i> , <i>Bergenia ciliata</i> , <i>Thalictrum foliolosum</i> and <i>Cannabis sativa</i> .
4.	Blood purifier	<i>Centella asiatica</i> , <i>Paeonia emodi</i> and <i>Polygonum recumbens</i> .
5.	Carminative and Aphrodisiac	<i>Oxyria digyna</i> , <i>Rheum australe</i> , <i>Polygonatum verticillatum</i> .
6.	Diarrhoea, Dyspepsia and Dysentery	<i>Achillea millefolium</i> , <i>Aconitum heterophyllum</i> , <i>Acorus calamus</i> , <i>Angelica glauca</i> , <i>Bergenia ciliata</i> , <i>Hedychium acuminatum</i> , <i>Berberis aristata</i> , <i>Calotropis procera</i> and <i>Rhododendron arboreum</i> .
7.	Eczima	<i>Boehmeria platyphylla</i> and <i>Euphorbia pilosa</i> .
8.	Fevers, Malaria and Cholera	<i>Achillea millefolium</i> , <i>Aconitum heterophyllum</i> , <i>Acorus calamus</i> , <i>Berberis aristata</i> , <i>Bergenia ciliata</i> , <i>Corydalis govaniana</i> , <i>Gerardinia diversifolia</i> and <i>Saussurea lappa</i> .
9.	Jaundice	<i>Berberis aristata</i> and <i>Geranium nepalense</i>
10.	Kidney and Liver	<i>Achillea millefolium</i> and <i>Corydalis govaniana</i> .
11.	Leprosy	<i>Bidens pilosa</i> and <i>Centella asiatica</i> .
12.	Pulmonary affections	<i>Bergenia ciliata</i>
13.	Rheumatism	<i>Dioscorea deltoidea</i> and <i>Rheum australe</i>
14.	Scabies	<i>Quercus dilatata</i>
15.	Stomach-ache and abdominal problems	<i>Ainslaea aptea</i> , <i>Angelica glauca</i> , <i>Oxyria digyna</i> , <i>Picrorhiza kurroa</i> , <i>Rheum australe</i> , <i>Rumex nepalensis</i> , <i>Swertia chirayita</i> and <i>Thalictrum foliolosum</i> .
16.	Toothache	<i>Geranium nepalense</i> , <i>Mentha longifolia</i> and <i>Vitex negundo</i> .
17.	Dry piles and Bleeding piles	<i>Achillea millefolium</i> and <i>Rheum australe</i> .
18.	Insecticidal	<i>Boehmeria albiflora</i> , <i>Cedrus deodara</i> , <i>Delphinium vestitum</i> , <i>Origanum vulgare</i> and <i>Selinum tenuifolium</i> .
19.	Ulcers	<i>Bidens pilosa</i> , <i>Geranium nepalense</i> , <i>Hippophae salicifolia</i> , <i>Paeonia emodi</i> , <i>Podophyllum hexandrum</i> and <i>Taraxicum officinale</i> .
20.	Eye diseases	<i>Berberis aristata</i> , <i>Bidens pilosa</i> , <i>Centella asiatica</i> , <i>Polygonum recumbens</i> , <i>Quercus dilatata</i> , <i>Rheum australe</i> , <i>Saussurea costus</i> , <i>Sirobilanthus auriculatus</i> and <i>Taraxicum officinale</i> .
21.	Skin diseases	<i>Berberis aristata</i> , <i>B. lycium</i> , <i>Phlomis bracteosa</i> , <i>Rheum austral</i> and <i>Thalictrum foliolosum</i> .

SUMMARY

SUMMARY

The present investigation entitled, "Ethnobotanical study of Gaddies- A tribal community in district Kangra, Himachal Pradesh" was undertaken for conducting preliminary survey of the medicinal and aromatic wealth of this area. The district is situated between 31°40' to 32°25' longitudes and 75°35' to 77°5' latitudes represent four main seasons i.e., winter, summer, rainy season or monsoon and autumn.

A total of 161 species belonging to 52 families and 124 genera were collected from the different parts and locations of the study area. Out of these 145 species belonged to dicots, 11 to monocots and 5 to gymnosperms. Predominantly woody elements included *Pinus wallichiana*, *Picea smithiana*, *Abies pindrow*, *Rhododendron arboreum*, *Betula utilis*, species of *Acer*, *Prunus*, *Salix*, *Populus*, and *Quercus* etc. The shrubby and herbaceous components included *Clematis gouriana*, *Boenninghansenia albiflora*, *Cotoneaster bacillaris*, *C. microphylla*, *Valeriana jatamansi*, *V. hardwickii*, *Viola serpens*, *Senecio* spp., *Swertia chirayita*, *S. paniculata*, *S. speciosa*, *Taraxacum officinale*, *Morina longifolia*, *Achillea millefolium*, *Thalictrum foliolosum*, *Tanacetum longifolium*, *Elsholtzia polystachya*, *E. strobilifera*, *Cannabis sativa*, *Phlomis bracteosa*, *Wulfinia amhertiana*, *Chaerophyllum reflexum*, *C. villosum*, *Corydalis govaniana* and *Phytolacca acinosa*.

Most dominating families are Asteraceae, Lamiaceae and Rosaceae occupying first, second and third place in the study area. Whereas Ranunculaceae, Scrophulariaceae, Polygonaceae, Umbelliferae and Leguminosae occupy, Fourth, fifth, sixth, seventh and eighth places, respectively. The least represented families are Papaveraceae, Fumariaceae, Violaceae, Malvaceae, Parnassiaceae, Moringaceae, Araliaceae, Campanulaceae, Amaranthaceae, Phytolaccaceae, Thymelaeaceae, Urticaceae, Betulaceae, Fagaceae, salicaceae, Araceae, Liliaceae and Cupressaceae.

Out of 161 species 81 species were further classified as medicinal and aromatic plants (based on their commercial importance in the drug industry). Among these the

most common species are *Achillea millefolium*, *Aconitum heterophyllum*, *Acorus calamus*, *Berberis aristata*, *Bergenia ciliata*, *Betula utilis*, *Corydalis govaniiana*, *Delphinium brunonianum*, *Geranium* spp., *Hedychium acuminatum*, *Heracleum candicans*, *Inula grandiflora*, *Juniperus recurva*, *Malaxis muscifera*, *Picrorrhiza kurrooa*, *Polygonatum verticillatum*, *Rheum australe*, *Roscoea purpurea*, *Swertia chirayita*, *Taxus wallichiana*, *Tanacetum longifolium*, *Thalictrum* spp., *Valeriana* spp. and *Viola serpens*.

The information on the traditional uses were collected to highlight the local use of plants, which includes 67 plant species. The most commonly used species are *Aconitum heterophyllum*, *A. violaceum*, *Acorus calamus*, *Ainslaea aptera*, *Angelica glauca*, *Arnebia benthamii*, *Artemisia vulgaris*, *Berberis aristata*, *Bergenia ciliata*, *Betula utilis*, *Boehmeria platyphylla*, *Delphinium vestitum*, *Euphorbia pilosa*, *Geranium nepalense*, *Girardinia diversifolia*, *Hedychium spicatum*, *Heracleum candicans*, *Juniperus recurva*, *Jurinea dolomiaea*, *Morina longifolia*, *Origauum vulgare*, *Oxyria digyna*, *Picrorrhiza kurroa*, *Pleurospermum brunonis*, *Podophyllum hexandrum*, *Rheum australe*, *Rhododendron arboreum*, *Saussurea gossypiphora*, *Selinum tenuifolium*, *Swertia chirayita*, *Tanacetum longifolium*, *Thalictrum foliolosum*, *Taxus wallichiana*, *Valeriana jatamansi* and *Viola serpens*. Many of these plants exhibit high medicinal and aromatic properties and need to be extensively screened for clinical use. Only after proper elucidation and authentication such claims can be accepted for the welfare of the humanity.

The area still possesses rich representation of herbal wealth. This attempt is only an initiation and further extensive and intensive exploratory studies are needed for better utilization of these resources on sustainable basis for generation to come. The documentation and inventorization of these resources, knowing the status of individual species; taking remedial measures for their conservation and above all documenting the traditional usages for the benefit of the society, both for the present as well as the posterity are needed to highlight the newer resources of drugs required for the treatment of incurable and dreadful diseases, the world is fighting against.

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ABSTRACT

Himachal Pradesh, a hilly state situated in the North-West Himalayan region, has been rightly regarded as the cornucopia of plant genetic resources especially for the Medicinal and Aromatic Plants since ancient times. Ethnobotany specifically deals with direction relationship of plants with man. The study of inter-relationship between living organism and human culture, including studies among tribals for documenting their knowledge of the uses of biological materials which is often kept secret and was passed on orally to the selected ones to the next generation is gaining worldwide significance. The present course of study was undertaken for making the preliminary survey of the Medicinal and Aromatic Plants wealth of the Gaddi inhabited areas of the district Kangra and their uses to cure various ailments. The study revealed 161 species belonging to 124 genera and 52 families. Of the total 145 species belongs to dicots, 11 to monocots and 5 to gymnosperm. Out of 161 species only 67 plant species have been found to be used commonly by the local people. 81 species are reported as medicinal and aromatic based on their commercial importance. The area still possesses rich representation of herbal wealth. This attempt is only an initiation and further extensive exploratory studies are needed for better utilisation of these resources on sustainable basis for generation to come. The documentation and inventorisation of these resources, knowing the status of individual species; taking remedial measures for their conservation and above all documenting the traditional usages for the benefit of the society, both for the present as well as the posterity are needed to highlight the newer resources of drugs required for the treatment of incurable and dreadful diseases, the world is fighting against.

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