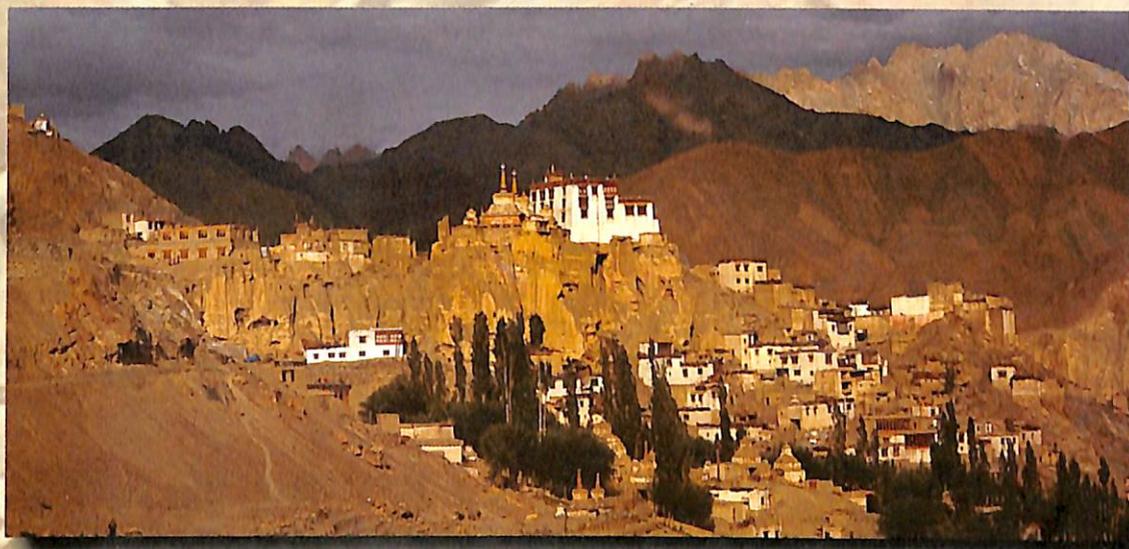


# Medicinal Plants of Indian Trans-Himalaya

*(Focus on Tibetan Use of Medicinal Resources)*



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*C.P. Kala*



# Medicinal Plants of Indian Trans-Himalaya

(Focus on Tibetan Use of Medicinal Resources)



C.P. Kala



**BISHEN SINGH MAHENDRA PAL SINGH**

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Medicinal Plants of Indian Trans-Himalaya  
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## **Souvenir of Kargil Martyrs at Drass**



This book is dedicated  
To my revered father  
Late S.M. Kala  
and  
The Martyrs of Kargil

## PREFACE

In the long struggle to understand and achieve mastery over the powerful forces of nature man has always turned to plants for help- for food, shelter, clothing, weapons, and of course for healing. Plants, people and medicine design the fascinating story of mankind's relationship to plants from prehistoric times to the present. No wonder then that from the most primitive societies to the most advanced, plants have been investigated and empowered with multipurpose uses. The present form of herbal medicine is the outcome of several years of hard work and trials carried forward by various indigenous communities. In the remote region, such as trans-Himalaya the indigenous community of *amchis* is credited to develop the Tibetan Medical System (TMS) and over the years of experiments made them diligent students of the local flora and medicinal plants.

*Amchis*, the local herbal practitioners, have their own name for each medicinal plant, which sometime varies with localities. Moreover, the same plant has more than one local name and also one common name for two or more species. Therefore, field visits with the local *amchis* are very essential for identifying the plants at the very spot. This book is the outcome of medicinal plants survey with *amchis* for 4 years in the trans-Himalayan region of India, particularly in Ladakh, Lahaul-Spiti and Malari. A total of 337 species of medicinal plants were found and documented to Indian trans-Himalayan region of which 45 species are placed in different threat categories. Different localities, habitat types and altitudes were surveyed during the growing season (May-October) for locating the medicinal plants in Indian trans-Himalaya.

While surveying the medicinal plants in trans-Himalaya I came across with many individuals and organizations those helped me in various ways. I acknowledge here few of them but I am indebted to all of them. I feel a tremendous pleasure to express deep sense of gratitude to all the *amchis* of Ladakh and Lahaul-Spiti, without their co-operation this study was not possible. I am highly inspired with their simplicity and straight forwardness in life. I spent 3 years with them (fourth year with Bhotiya's of Malari region) during which they guided, taught, informed, and overloaded me with unforgettable hospitality. I thank all 83 *amchis* whom I met for gathering information, especially, Dr. Tsering Phunchok (Chief *amchi*),

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I am grateful to Dr. Nima Manjrekar with whom I first visited this desolate world for medicinal plants survey and she introduced me with the culture and traditions of Spiti. I thank Shri Vinay Tandon, Chief Conservator of Forest (Research) and his wildlife staff of Lahaul-Spiti for providing logistic support in Spiti. In Ladakh, I am thankful to Shri Rinchen Wangchuk 'Stakrey', Shri R.K. Tiwari, DFO Leh, Shri Rauf Zarger, Wildlife Warden Leh, Shri Balouria, Director Minor Forest Product Dept. Leh, Dr. O.P. Chaurasia, Field Research Laboratory Leh, and Shri K.V.S. Panwar, SSB Unit In-charge Diskit, for helping in various ways. I thank Dr. Charudutt Mishra for superb company at Kibber and everlasting discussions on the various facets of trans-Himalayan flora and fauna. Ms. Neema Chhodan, Yeshe Dolkar, Yang Chen, Dorje, Nawang and Illiyas are thanked for supporting during fieldwork.

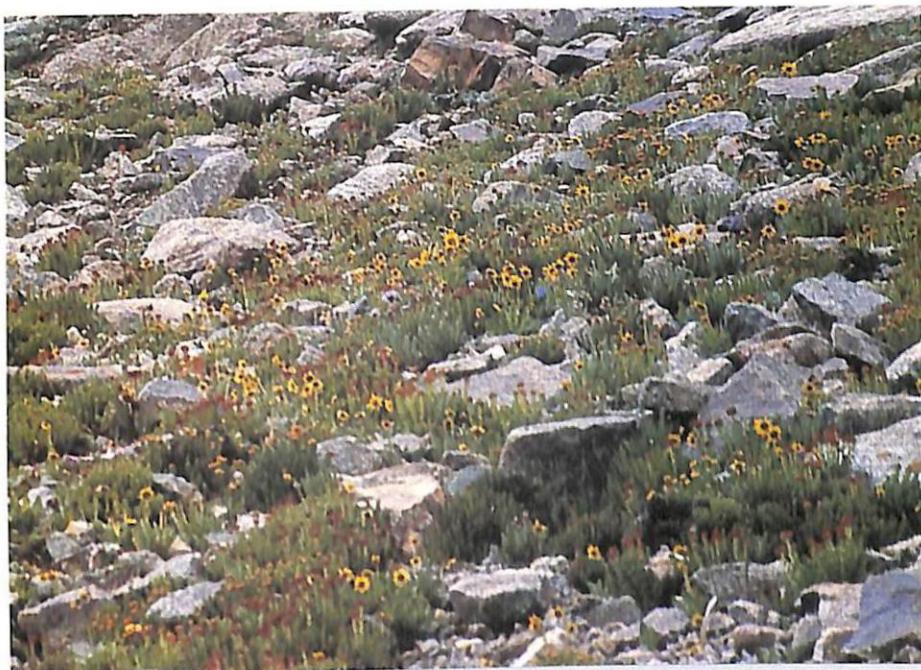
I extend my thanks to Director and scientists of Wildlife Institute of India especially Drs. V.B. Mathur, Qamar Qureshi, V.P. Uniyal, Y.V. Bhatnagar, B.C. Chaudhary, Anul Hussain, Ruchi Badola and Librarian Shri M.S. Rana and fine bird watcher Rajah Jayapal for helping in various ways. Thanks are also due to Prof. A.N. Purohit, Vice Chancellor, Garhwal University, Prof. R.D. Gaur, Head, Department of Botany, H.N.B. Garhwal University, Dr. Subhash Nautiyal, Forest Research Institute, Dehradun, Dr. S.S. Negi, IFS H.P. Cadre, Shri V.K. Uniyal, CF Kerala Cadre, and Dr. K.S. Negi, National Bureau of Plant Genetic Resources, Bhowali for continuous support and guidance.

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Words fail to express sense of indebtedness to my parents Late Sunder Mani Kala and my mother Smt. Kamla Devi Kala who imbibed in my

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Rock garden with *Cremanthodium ellissi* at 5,200 m near Khardung la



*Chrysanthemum pyrethroides* (Kar. & Kir.) B. Fed.



*Saxifraga flagellaris* Willd. ex Stemb.



*Waldheimia stoliczkae* and *Saussurea gnaphalodes* community at 5,400 m altitude



*Ranunculus brotherusii* Freyn.



*Saussurea obvallata* (DC.) Edgew.



*Primula macrophylla* D. Don



*Oxyria digyna* (L.) Hill



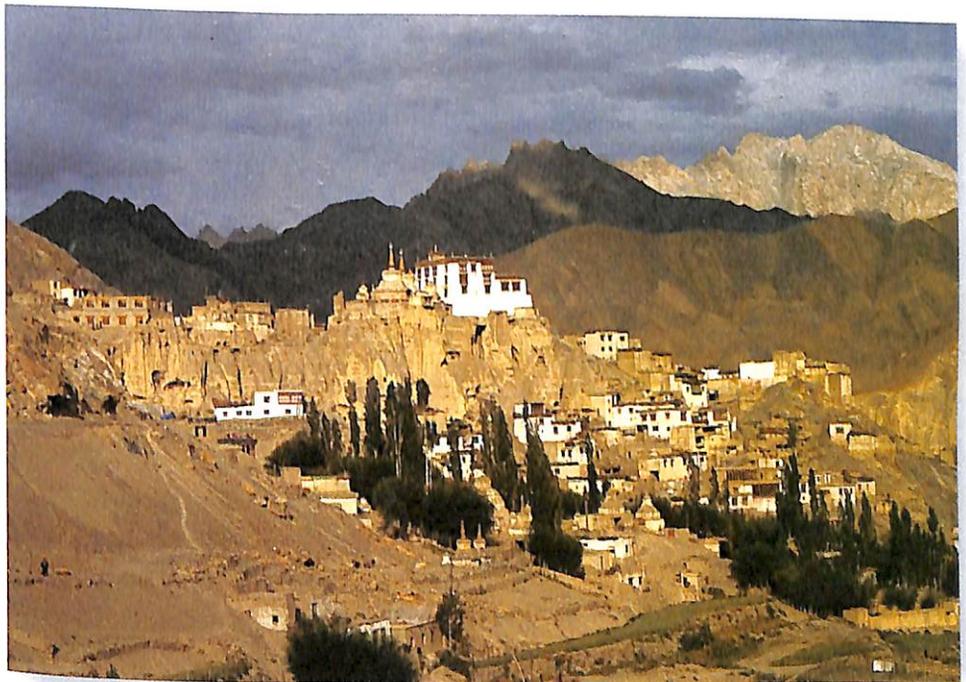
*Aster flaccidus* Bunge



A rare medicinal plant with a rare butterfly



*Saussurea bracteata* Dence



The Lamayuru monastery



An *amchi* at Panamik



*Nepeta longibracteata* Benth.

## 1.0 INTRODUCTION

Since the dawn of human civilization, plants have been used by the human societies in a variety of ways ranging from their sustenance to the development of their art, culture and literature. Food and medicines are obviously the best examples in this regard, however, a great deal of knowledge occupied through the centuries of experiments in this direction have been lost over a period of time. Due to the development of education, communication and interaction systems, a realization has emerged regarding the importance of glorious knowledge that had utilized the available vegetation for their complete requirements including medicines. The Himalayan and trans-Himalayan flora is well known for its medicinal properties, and has been in use by the *Ayurvedic*, *Unani*, *Siddha*, Tibetan and a number of non-formal traditional systems of medication, and the Indian trans-Himalaya that stretches in Ladakh, Lahaul-Spiti, parts of Sikkim and Uttaranchal is the repository of such plants and knowledge systems.

For centuries, the trans-Himalayan area has remained isolated and politically closed due to a number of reasons including poor accessibility. The availability of a number of aromatic and rare plants, and the physical, geographical, cultural and political isolation has thus resulted into the development of such health care systems. The achievements of ancient Buddhist and non Buddhist philosophy, metaphysics, art, and culture is well known globally and has attracted the scholars and students from all over the world. Earlier, not much was known about the traditional medicine of this region that is also known as 'Tibetan Medical System (TMS)' or 'Amchi Medical System' (Namgyal and Phuntsog, 1990); *Amchi* is the practitioner of this system of medicine. In due course of time, *Ayurveda* influenced the TMS due to the movement of monks and traders across the region (Das, 1976). After the advent of Buddhism in Ladakh, around 2<sup>nd</sup> century A.D., many *Ayurvedic* works along with religious scriptures were translated into the Tibetan languages under the patronage of local kings and priests that brought a revolution in the Tibetan medical knowledge systems, and thus, led to the development of formal medical system (Jina, 1996; Das, 1994).

Plant material is the major ingredient in the Tibetan medicine, besides animal products, some minerals and salts which is mostly collected from their own region i.e., trans-Himalaya, apart from some material is purchased from lower altitudes by the local traders and few *amchis*. Most of the rare

and endangered plants and animals of trans-Himalayan region, which is used as ingredients in the Tibetan medicine, are placed in the Red Data Book of Indian plants (Nayar and Sastry, 1987) and schedules of Wildlife Protection Act, 1972 of Government of India. The use of many rare and some lesser known plants and wild animals of trans-Himalayan region have restricted the growth of this system of knowledge to that region mostly. Due to the influence of *Ayurveda* in TMS, *amchis* have also started to use such other rare plants not found in the trans-Himalayan region.

The fragile and rugged nature of the trans-Himalayan ecosystem does not show much vegetal cover, and hence the region appears to be very poor in terms of its biodiversity. The short growing season due to extreme cold conditions (which remains under snow from November to April) which is around four and half months, further restricts the growth of vegetation in the region. Earlier, only the local people including the *amchis* used these plants and animal resources for their own consumption, but now the users have grown very large due to the increase in population and various pharmaceutical companies have also found them useful in their system of medicines. As a result, the pressure on the resource base has increased tremendously which needs immediate attention by government. The World Health Organization has estimated that some 80% of the developing world relied on their traditional medicines and that, of these, 85% use plants or their extracts as the active substance (Sheldon *et al.*, 1998). This means that close to 3 billion people rely on such plants for medicine. One of the prime reason for the over exploitation of medicinal plants is the dependence of such a large number of human population on these valuable and limited resource base in nature. Hence, most plausible scenarios today suggest that nearly 25% of the estimated 2,50,000 species of vascular plants in the world may become extinct within the next 50 years (Raven, 1987; Schemske *et al.*, 1994). If the estimates are to be believed then it is a matter of grave concern for the global society, which is so heavily dependent on the natural vegetation.

Today, the trans-Himalayan society is not cut off from the rest of the urban and other Indian societies, and hence the social and cultural transformation has affected this region also. As a result, there is a change in the attitude of the people towards material world, and the aspiration for more financial income and to lead a more luxurious life has certainly made them to care more for money which not the case earlier (Norberg-Hodge, 1999). Most of them do not have resources and vision to cope up with the changed scenario. Moreover, lack of opportunities for employment, better

education and proper rural development schemes have forced the local people towards over-exploitation of surrounding natural resources leading to severe environmental degradation. As per one estimate there are some 50,000 pharmaceutical companies within India and the raw materials used in preparing medicines in these companies are gathered mostly from wild resource base. Therefore, there is a tremendous pressure on these medicinal plants and hence many of them have become rare and endangered. All these are resulting in the change in our traditional values, ethno-biological knowledge and respect for the nature and natural resources, and needs to be protected from further degradation. The natural availability of herbs has decreased and some important herbs have disappeared, at least in some regions, which has made the collection of medicinal plants more difficult and alarming for those who keep interest in the subject. Considering these facts attempts were made to survey and documents the medicinal plants found in Indian trans-Himalaya and also used in TMS.

## 2.0 THE INDIAN TRANS-HIMALAYA

The Indian trans-Himalaya, which is in the rain shadow zone lying above the natural treeline zone, is usually described as a high altitude cold desert. In India, it spans over 1,86,000 km<sup>2</sup> (Fig. 1), and is known for its sparsely distributed vegetation and relatively low species diversity. Nevertheless, the area harbors many rare and endangered plant and animal species.

The first existing literature on flora and useful plant species of Indian trans-Himalaya dates back to 1841, when W. Moorcroft and G. Trebeck jointly published their expedition travelogue titled '*Travels in the Himalayan provinces of Hindustan*'. However, they conducted the surveys much earlier during 1819-1825 in Lahaul, Zaskar, Nubra and Drass valleys. A year later, in 1842 G.T. Vigne reported 90 plant species to Ladakh, which he collected in 1835. However, Stewart (1916) pointed out that during that period the best collection from Spiti to Karakoram ranges was made by T. Thomson during 1847-1848. Afterwards, many botanists surveyed the Indian trans-Himalaya notably Richard Strachey and J.E. Winterbottom in 1848, William Hay in 1862, J.L. Stewart in 1868, G. Henderson and A.O. Hume in 1873, G. Watt in 1881, J.F. Duthie in 1893, A. Meebold in 1905, R.R. Stewart in 1912 and A.C. Joshi in 1953.

Later on, few researchers started working exclusively on the medicinal plants of Ladakh and Lahaul-Spiti. Some of the prominent among them



Fig. 1: Location map of the study area

are Singh (1950), Rau (1961), Sarin *et al.* (1963), Uniyal *et al.* (1973), Arora *et al.* (1980), Aswal and Mehrotra (1987), Kaul (1997), Kala and Manjrekar (1999), Chaurasia *et al.* (1999) and Kala (2000). The Flora of Ladakh (Kachroo *et al.*, 1977), Flora of Lahaul-Spiti (Aswal and Mehrotra, 1994) and The Cold Desert Plants (Chaurasia and Singh, 1996) are the best-known contributions on the floral account of Indian trans-Himalayan region. More than 800 species of vascular plants have been reported so far for the cold desert of India.

Apart from this, the Indian trans-Himalaya is the home of endangered snow leopard (*Uncia uncia*), Ladakh urial (*Ovis vignei vignei*), Tibetan argali (*Ovis ammon hodgsoni*), Tibetan gazelle (*Procapra picticaudata*),

wild yak (*Bos grunniens*), Himalayan brown bear (*Ursus arctos*), dhole or wild dog (*Cuon alpinus*), Pallas's cat (*Otocolobus manul*), Tibetan wild ass or kiang (*Equus kiang*), blue sheep (*Pseudois nayaur*), Asiatic ibex (*Capra ibex sibirica*), wolf (*Canis lupus*), red fox (*Vulpes vulpes*) and lynx (*Lynx lynx*). Common smaller mammals include marten (*Martes* spp.), otter (*Lutra lutra*), weasel (*Mustela altaica*), hare (*Lepus oiostolus*), marmots (*Marmota* spp.) and several species of mouse hare or pika (*Ocotona* spp) (Fox *et al.*, 1994). A total of 225 avian species have been reported from the entire Ladakh region that distributed over 34 families (Pfister, 1997; Kala and Jayapal, 1999).

Notwithstanding, the high potential instability and inherent vulnerability of mountain ecosystems (Skeldon, 1985) renders the trans-Himalaya one of the most ecologically fragile bio-geographic zones in India (Rodgers & Panwar, 1988). Demographic, economic and social changes, therefore, have important consequences on conservation of trans-Himalayan natural resources (Fox *et al.*, 1994). It occurs above 3,000 m that is characterized by high solar intensity, high aridity, low temperature, lack of adequate soil and short growing season resulting into low plant productivity.

In India, the trans-Himalaya stretches in four states, Jammu and Kashmir, Himachal Pradesh, Sikkim and Uttaranchal. According to biogeographic classification of Rodgers and Panwar (1988) the trans-Himalayan zone in India is classified into 3 biotic provinces: (i) Mountainous terrain of Ladakh and Lahaul-Spiti, (ii) Tibetan plateau of eastern Ladakh including Malari region of Uttaranchal, and (iii) north of Sikkim, the Sikkim plateau. The present study is widely focused on the mountains, valleys and Tibetan plateaus of Ladakh (Suru, Zanskar, Indus, Nubra, Shyok, Hemis, Markha, Changthang), along with mountains and valleys of Lahaul Spiti (Pin, Satluj, Lahaul, Kibber) of Himachal Pradesh. A part of Malari region in Uttaranchal was also surveyed.

### 2.1.1 Ladakh:

Ladakh, which literally means "the land of high-rising passes" in the local Ladakhi language which is of Tibetan origin, is located in the northernmost state of Jammu and Kashmir in India between 32°15' to 36° N and 75°15' to 80° 15' E. It is bounded in the north by the eastern range of Karakoram Mountains, to the south by the western extreme of the main

1977). The region is virtually treeless, except for poplar and willow species planted along the major river courses. *Hippophae rhamnoides*, a rare medicinal plant is the dominant shrub along the Indus, Shyok and Nubra river valleys followed by *Myricaria*. Apparently juniper and birch have disappeared from many areas within historical times and only a few relict stands still survive in some of the more remote river gorges (Fox *et al.*, 1994).

There are many large brackish water lakes (Tsomoriri, Tsokar, Pongong-tso etc.), which form the breeding grounds for many endangered and migratory birds such as black-necked crane and bar headed geese. A nest of black-necked crane with two eggs was spotted at the Tsomoriri during the survey in July 2000. Though Ladakh boasts of distinct assemblage of high altitude flora and fauna, it still occupies the least protected ecosystem with only one national park, viz., Hemis National Park covering Rumbak and Markha valleys. To protect the biodiversity of Ladakh, three protected areas viz., Hemis National Park (4,100 km<sup>2</sup>), Karakoram Wildlife Sanctuary (5,000 km<sup>2</sup>) and Changthang Wildlife Sanctuary (4,000 km<sup>2</sup>), have been notified so far. There are also five wildlife reserves (Randum, Sabu-Chakur, Rizong Basgo, Gya-Miru and Kangri) and three game reserves (Boodh Karbu, Tongri and Lung lang) in Ladakh (Rodgers *et al.*, 1998).

Administratively, Ladakh is divided into two districts, Leh and Kargil. The area is extremely cold during winter when temperature goes down at places to minus 30° to 40° C. Annual precipitation decreases to the north and east, ranging from 500-1,000 mm in valleys just north of the main Himalaya to approximately 100 mm in the central trans-Himalayan valleys such as the upper Indus near Leh (Fox *et al.*, 1994).

### 2.1.2 Lahaul-Spiti:

Lahaul-Spiti lies in the state of Himachal Pradesh between 31°44'-32°59' N latitudes and 76°46'-78°41' E longitudes. It is bounded by Tibet (China) on the northeast and by Great Himalayan ranges on the south. It occupies an area of c. 12,210 sq. km. Administrative boundaries of Lahaul-Spiti include Kinnaur in the southeast, Kullu in the west and Ladakh in the north with average elevation of 4,270 m. The district Lahaul-Spiti comprises two sub-divisions Lahaul and Spiti. Rohtang pass (3,955 m) is the gateway to this district that connects Lahaul to Kullu. The highest mountain peak exceeds to 6,400 m (Mulkilla), whereas the lowest point is 2,400 m, an exit of the Chenab in Chamba. There are three prominent

lakes such as Chadra tal, Suraj tal and Sissu tal in Lahaul valley along with many glaciers. Andrew Wilson denoted this valley as a 'Valley of Glaciers' (Aswal and Mehrotra, 1994).

The Spiti valley situated beyond Kunzum-la is famous for many ancient monasteries such as Tabo, and Kye. The mountain ranges in Spiti are pierced in the southeast by the narrow gorge of the river Spiti before it meets the Satluj at Khab. Lahaul-Spiti is divided into 4 ecological units namely Sham (the lower region), Pin (lies by the Pin river), Bhar (the middle tract) and Tud (the high territories). The entire terrain is dry with an annual rainfall of about 17 cm (Bajpai, 1987; Kapadia, 1996).

The typical cold desert of Lahaul-Spiti encompasses the rich trans-Himalayan fauna and flora. More than 800 vascular plant species have been recorded from this area (Aswal and Mehrotra, 1994), of which many plant species are used in medicine. To conserve the biodiversity of this area two Protected Areas (PAs) viz., Pin Valley National Park (675 km<sup>2</sup>) and Kibber Wildlife Sanctuary (1,400 km<sup>2</sup>), have been set aside by the State Government. A total of 378 plant species have been recorded within Pin Valley National Park (Manjrekar, 1997), of which 8 are threatened, 3 are rare, and 11 are endemic to the western Himalaya (Aswal and Mehrotra, 1994). The human population according to 1991 census was 9,591 (Mishra, 1997) largely belonging to Buddhism, who also has been using plants for health care since time immemorial. Majority of its inhabitants are still dependent on the TMS for curing diseases due to the strong faith in the system and also due to remoteness of the area to some extent.

The geology of Indian trans-Himalaya (including Tibetan plateau) indicates that it consists of more than 20,000 feet of sediments, almost entirely of marine origin and represented by such rocks as slate, sandstone, conglomerate and limestone. Along its southern border it is in contact with the Himalayan granite, which throws out branches ramifying and metamorphosing the sediments (Stewart, 1916). In Cambrian times it is believed that Tibet and North America were joined, as fossils are similar while they differ from those of Europe (Burrard and Hayden, 1907). At the close of the Cambrian the Tethys of Suess linked up with the Palaeozoic Sea of Europe (Burrard and Hayden, 1907). There is a general agreement in the views among geologist regarding the elevation of the trans-Himalaya and Himalaya, and is regarded as a very recent phenomena in terms of geologic time scale, therefore the flora cannot be considered

to be very old accordingly. Nevertheless, the Russian botanist, C.J. Maximowicz who worked with Prejevalsky holds the view that the flora of trans-Himalaya and Himalaya is extremely ancient (Stewart, 1916).

The soils of Indian trans-Himalaya have been classified as grey, light, arid, sandy clay, loam or loamy clay and are characterized by low fertility (Kachroo *et al.*, 1977; Singh and Gupta, 1990). In the cold arid zone of Ladakh and Lahaul-Spiti the soils in general are very poor in organic matter. Aswal and Mehrotra (1994) have termed the soil of Lahaul-Spiti as alpine sward due to the filling of upper stratum of earth and vegetable mould with incomplete decomposed roots of grasses and other herbaceous plants.

The people of Lahaul-Spiti, central (Leh) and eastern Ladakh (Changthang), and Sikkim are predominantly Buddhist while the population of western Ladakh (Kargil) has a high proportion of Muslim faith. In the Malari region of Garhwal (Uttaranchal), the people belong to the Bhotiya tribe and are basically Hindus. Buddhist speaks Tibetan dialects while the Muslims of Drass and Kargil speak a form of dialect called Dard. Buddhists have their own culture and social customs where there are various functions ranging from childbirth till death, similar to the Tibetans. In the Buddhist dominated areas the treatment through TMS is very popular, while in the Muslim dominated regions the *Unani* form of medical treatment prevails. A large sections of Buddhists still dependent totally on the *amchi* medicine due to the remoteness, high prices of allopathic medicine and unavailability of modern medical facilities.

### 3.0 HISTORY AND EVOLUTION OF TMS

In India, the history of medicinal plants can be traced back to the Vedic period (4500 B.C. to 1500 B.C.). The Rigveda mentions the identity of several plants used in various medicines in the ancient times, while the Atharveda, contains detailed information on approximately 2,000 medicinal plants and their uses. The works of Charak (Charak Samhita) and Susruta (Susruta Samhita) deals with 700 drugs of daily and specific use. The 16<sup>th</sup> and 17<sup>th</sup> century period is quite remarkable as it witnessed the development of medical botany, and apparently most of the world's famous medicinal drugs were found during this period. Therefore, this period is also called as 'The Age of Herbal Medicines' (Sharma and Mir, 2000).

The earlier inhabitants of Tibet and Ladakh probably practiced shamanism, which was prevalent in whole of the northern Asia in the name of 'Ban' (Das, 1976). Several forms of medical practice existed in the trans-Himalayan region during the pre-Buddhist era like the *Ihaba* (Shaman) and *Onpo* (astrologer) in Ladakh. The *amchis* under the influence of the Buddhism probably overshadowed these forms of medical treatments, as the entire region got converted to Buddhism. Since the *amchis* were also the religious people, hence they are accorded with more respect and faith compared to the others in the land of Buddhism. King Strongsten Gampo, the founder of Lhasa city, is known to introduce Buddhism in Tibet around 639 A.D. whereas in Ladakh, Buddhism was introduced much earlier during 2<sup>nd</sup> century A.D. (Jina, 1996). King Strongsten Gampo was also the person who probably introduced the Tibetan script, which was adopted from the Sanskrit Devanagari characters (Das, 1976).

However, as the tradition has it, that along with the sermons of Lord Buddha, '*Bauddha Bhiksus*' (monks) introduced the knowledge of *Ayurveda*, and propagated it among their disciples in Ladakh, Lahaul-Spiti, Tibet and where ever they preached. Over a period of time, the term 'Buddha' was established to refer the medical practice being done by the *amchis* as medicine Buddha (Men-la). Besides India, China, Mongolia, Persia, and Nepal have contributed in the evolution of the Tibetan medicine. In fact, the science of 'Ser-khab' or golden needle healing, which is practiced even today, is the discovery of the *amchis* (Dommer, 1988). The tradition of Buddhist medicine though continued to flourish over the period, however, the contributions of Kumarafiva, Acharya Nagarjuna, Ashva Gosh, and Chandranandan is worth mentioning in this regard. In the 8<sup>th</sup> century A.D., a galaxy of Indian and Tibetan scholars was engaged in translation of Buddhist texts from Sanskrit to Tibetan, in order to popularize these difficult texts in Tibet, and Yuthog of Tibet wrote the comprehensive commentaries on these ancient texts in Tibetan (Namgyal and Phuntsog, 1990).

About 900 years ago, during the reign of king Lhablama Ye-shes-od, the learning of Buddhist medicine was introduced in the province of Kuge and neighboring areas in the western Himalayas. In that period the Mthogling monastery played an important role in translating the later Buddhist medical texts from Sanskrit into Tibetan under the supervision of great translator Rinchen Bzanpo (Namgyal and Phuntsog, 1990). The 5th Dalai Lama (1617-1687) established first school of Tibetan medicine at Garden

Monastery in Lhasa. Later a medical college and hospital was also built near Lhasa at Chagpori. In 1916, the 13<sup>th</sup> Dalai Lama established a new college of Astrology and Medicine at Lhasa. In 1961, the 14<sup>th</sup> Dalai Lama in exile established the Men-Tsee-Khang (Tibetan Medical and Astrology Institute - TMAI) at Dharamsala in Himachal Pradesh in Northern India. Approximately half of the students in this organization are women.

The Chogpori Tibetan Medical Center established by Lama Trogawa Rinpoche in Darjeeling, India, may be regarded as traditionalists, with strong links with the monastic tradition of education, where only men are accepted as students. In 1989, Ladakh School of Tibetan Medicine was established in Leh, Ladakh that is affiliated to the Tibetan Medical and Astrology Institute, Dharamsala. The Tibetan Medical School, Central Institute of Higher Tibetan Studies, in Sarnath, Varanasi, India also runs a seven-year recognized course. Besides the Tibetan Medical Course, Sanskrit and the Tibetan language are taught at graduate level to facilitate research work at the institute.

#### 4.0 FUTURE OF TMS

The system of Tibetan medicine is gradually declining in Indian trans-Himalayan region, as the new generation is hardly coming forward to adopt *amchi* as a profession. The old *amchis* have good knowledge on the medicinal plants and are able to identify these plants in the field. Whereas many new *amchis* (some of them are trained in Dharamsala) do not make these medicines themselves nor do they get chance to visit field for identification of certain medicinal plants, hence are not able to identify the plant species. Accordingly, they are more dependent on the available Tibetan medicines prepared in various pharmaceuticals and they prescribe them or sell them directly. It is praiseworthy that state Governments, few NGOs and many *amchis* are doing their best to keep the tradition alive. They are building up new associations and *amchi* schools are in progress within and outside of Ladakh and Lahaul-Spiti. Gradually the TMS has gained a considerable momentum in the western countries due to the growing awareness about the side effects of the Allopathic medicines. The Tibetan herbal products of China and India are well known to the world for their results and healing power.

At present, there are two ways to become a Tibetan doctor (*amchi*), one through the formal certified training, and second through the traditional method. Formal qualifications have been introduced, primarily in the main

teaching schools offering seven-year formal training courses. The formal training for Tibetan Doctors is provided in the established medical schools. The courses for students include memorization of medical texts, medical theory, practice of pharmacy, use of herbals and minerals, collection and recognition, Tibetan grammar, debate on Tibetan medicine, medical astrology and astronomy. During the last stage of training, emphasis is given to practical work in which students spend 2 years in a clinic with a senior doctor before they are fully qualified to practice alone.

To inculcate the pride in their tradition, sense of belongings and to propagate the Tibetan medical knowledge globally His Holiness the 14<sup>th</sup> Dalai Lama in exile has established the Men-Tsee-Khang (Tibetan Medical and Astrology Institute - TMAI) at Dharamsala in Northern India. The Men-Tsee-Khang in Lhasa, Tibet, continues to provide education and training in Tibetan medicine. The Ladakh School of Tibetan Medicine in Ladakh runs on the same basis as the Men-Tsee-Khang and is closely affiliated to the TMAI of Dharamsala. Apart from this, there is a Tibetan Medical Center in Darjeeling, India. Established in 1993 the Tibetan Medical School, Central Institute of Higher Tibetan Studies, in Sarnath, Varanasi, India also runs a seven-year recognized course. Besides the Tibetan medical course, Sanskrit and the Tibetan language are taught at graduate level to facilitate research work at the institute. Recently at Tungri in Zanskar valley an Amchi Institute has been set up in which half of the students are females.

Creation of *Amchi* associations recently in 1999 such as Traditional Medico-Cultural Association and Yuthog Foundation are dealing with the preservation and promotion of TMS. The aims of these associations are to provide health care facilities for the poor and rural section of the societies. NOMAD, an NGO at Leh is also dealing in popularizing the TMS. In general, attempts are being made by different sections of the societies to gear up this age-old tradition, and carve a niche in the areas of different healing systems prevalent the worldwide.

## 5.0 MEDICINE BUDDHA

There are many incarnations of Buddha such as Buddha Maitreya (Sangye Jampa), Buddha Dipamkar (Sangya marmey zey), Buddha Amitabha (sang gyy voe pak mey) Buddha Sakyamuni (sang gye shakya thubpa), etc. who have directly appeared on the earth as human beings.

Whereas some Buddha emanations are in the form of a statue, or speech, mind, attributes and activities, for instance, the Tibetan Medicine Buddha. The original teachings of ancient TMS are generally attributed to the Buddha who is believed to have taught the roots of this tradition of the Medicine Buddha.

The right hand of Medicine Buddha holds an arura (*Terminalia chebula*) and left hand holds a begging bowl. His right hand is extended, palm outward, over his right knee in the gesture called supreme generosity. Arura is considered the best medicine in TMS. The position of his right hand and the arura, which he holds, represent the eradication of suffering, especially the suffering of sickness, using the means of relative truth. The name of the Medicine Buddha is believed to have the power to free one from the pattern of negative thoughts and emotions. Just by speaking, hearing or concentrating on His name healing can be accomplished. Apart from this, Tibetan Buddhist tools for awakening also promote healing and relaxation. In traditional Tibetan culture, practicing meditation and working (or playing) with prayer wheels, incense, chants, and prayer flags all are used together with Tibetan medicine. *Amchi* focuses his attention on spiritual factors even in the treatment of the simplest illnesses. Every *amchi* vows to 'regard medicine as an offering to the Medicine Buddha and all other medicine deities' and considers his 'medical instruments as holy objects'. Even in the Tibetan pharmaceuticals the medicines, which are mixtures of vegetable, animal and mineral compounds, are prepared with meticulous attention to religious ritual.

## 6.0 ASSESSMENT OF INDIGENOUS KNOWLEDGE AMONG *AMCHIS*

In order to assess the traditional knowledge, particularly on TMS and use of medicinal plants among various age groups of *amchis*, they have been categorized into 4 age classes i.e. <25 (new generation or students of Tibetan medicine), 26-35 (young practitioners), 36-45 (adult practitioners) and >46 (old or veterans). The transfer of this knowledge system from one generation to the other, two methods i.e., formal education through institution and informal continuation through assistant or disciple form are prevalent in this society. This was further verified by the number of students an *amchi* had as a disciple. Further, the TMS being practiced by the *amchis* in different valleys of Ladakh, and Lahaul-Spiti has also been studied and analyzed.

### 6.1.1. Profile of *amchis* in Ladakh and Lahaul-Spiti:

*Amchis* enjoy high respect and social status in the trans-Himalayan Buddhist communities. The meaning of *amchi* is self explanatory in Buddhist language; it means 'superior of all'. The *amchis* do not merely follow the theoretical texts but also have practical knowledge in the making of medicines of their prescription. This is handed over to them by generation to generation apart from their own experiences in this regard. Traditionally, the *amchis* were primarily farmers, and medical practice was their secondary occupation. They offered their services free of charges, however, in exchange one member of every household helped him during the planting and harvesting period. Gradually the concept of money economy reached this region also, and people slowly became conscious of money and like all economy driven practices in the society, *amchis* also began the selling their knowledge and medicines.

In Ladakh, for instance the *amchis* are now looking after 60% of public health whereas in Lahaul-Spiti this figure is still quite high up to 80% primarily due to the poor infrastructure of modern health care system. In Ladakh the highest number of concentration of *amchis* (55%) was found along the Indus valley, which is the most populated area within Ladakh. Many *amchis* from side valleys also come to practice in Leh especially during summer season. Out of 43 *amchis* interviewed in Ladakh, 24 (55%) were from Indus valley, 8 (19%) from Changthang plateau, 5 (12%) from Nubra valley and 6 (14%) were from Kargil district. In Lahaul-Spiti each village has one or two *amchis* and few of the *amchis* from side valleys also come to practice either at Kaza or Kelung, headquarters for Spiti and Lahaul regions respectively.

It is interesting to note that the practicing *amchis* are apprehensive of their traditional practice, and fear that it might get phased out due to the market forces, which is making all modern facilities available even in the remotest corners. In order to continue their medical knowledge and practices, the *amchis* have earnest desire to teach anyone whoever likes to learn this tradition. But, unfortunately, this tradition is not much popular in younger generation as it does not provide enough income, and the younger generation like any other place wants more money and glamour, which the *amchi* system cannot provide. In spite of the willingness of *amchis* to transfer their knowledge system to the younger generation, at present most of the *amchis* in that region (64%) do not have any disciple or student, which indicates that traditional *amchi* system of medicine in

Indian trans-Himalaya is on the verge of decline. Only 36% of the total *amchis* surveyed reported that they had disciple primarily their own sons and daughters except few others (Fig. 2).

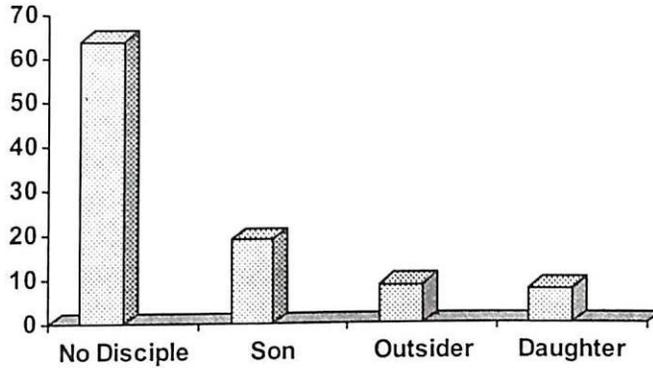


Fig. 2: Disciples of *amchi* system in Ladakh and Lahaul-Spiti

In Ladakh, unlike its adjacent district Lahaul-Spiti, the TMS is well organized in terms of its social institutions spread across the region. The *amchis* have their own committees and social groups that help them in sharing of medicinal plants, medical knowledge and medicine spread across the different valleys. Like the *amchis* of Changthang plateau have an association based at Nyoma, where almost all *amchis* of this region meet together every year during 1<sup>st</sup> to 15<sup>th</sup> September and share their knowledge and experience along with the raw materials (medicinal plants and other products). Apart from this, the State Govt. of Jammu and Kashmir has an *amchi* association, known as the 'State Govt. Amchi Sabha', which is presided by a Chief Amchi. All the *amchis* of Ladakh are the member of this association, which provides some kind of subsidy to about 40 selected *amchis* at a given time, and provided with some financial help for purchasing and preparing medicines, and for enhancing their own knowledge base. Similarly, there are two NGOs in the district headquarters at Leh working for the welfare of *amchis* and TMS.

In Ladakh and Lahaul-Spiti, *amchi* as an institution is a family tradition, where majority of the knowledge base is transmitted on a family basis, like in Ladakh, where 84% of *amchis* adopted this tradition through their ancestors. Where as, there were only few *amchis* around (16%) who got the traditional knowledge outside their respective families. *Amchi*'s profession is mostly male dominated yet there are few female *amchis*. The male female ratio in *amchis* was 10:1. The quality and quantity of

knowledge in *amchis* depends upon the respective *amchi*'s skill and the teacher from whom they learned this indigenous knowledge. The establishment of Amchis Training Centers in Dharamsala, Darjeeling, Ladakh and Manali many *amchis* (35%) in Ladakh had gone through the proper training courses conducted in these centers. Out of total *amchis* studied 33% had clinics in Ladakh, of which most clinics are in Leh town.

In the studied area the highest numbers of *amchis* (46%) were more than 45 years old, 32% were adult (36-45 age group) and only 20% were below 35 years age (Fig. 3). The trend is quite indicative that there is a decrease in the young generation in the selection of *amchi* as a profession; however, the established Amchi Training Centers at various places further strengthens the argument that there is a need to provide boost to this system of medical care.

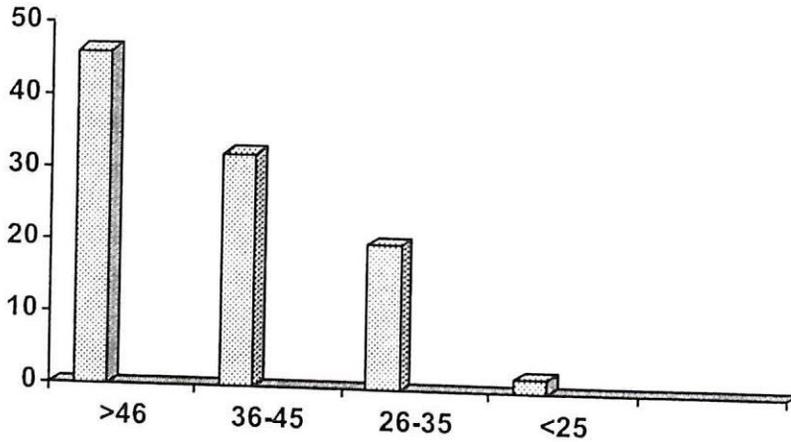


Fig. 3. Age wise classification of *amchis* in Ladakh and Lahaul-Spiti

Regarding the trade of medicinal plants and import from different regions, only few of the 83 *amchis* admitted that there is a trade in medicinal plants from their region. The procurement of medicinal plants was done either through barter exchange, or from the market in Delhi and Amritsar. Some *amchis* admitted that they share the raw material (medicinal plants, animal parts, minerals, and stones) with the other *amchis* of adjacent valleys. There was consensus among all *amchis* on the question of use of plants but 2% expressed their ignorance on the use of minerals and 18% on the use of animal parts. The average money spent in the purchase of the raw materials varied greatly among *amchis*, and it ranged from Rs. 1,000-60,000 annually.

### 6.1.2. Examination and pulse reading by *amchis*:

There are three different methods of examination of a patient viz., inspection, palpitation, and interrogation. Among all the methods, examination by interrogation is considered the most important. However, before attempting a patient for treatment, it is necessary for an *amchi* to accurately examine the condition of pulse with reference to etiology signs, symptoms and useful and harmful regimes (Khangkar, 1990). The number of pulse beats during one respiratory cycle tells the *amchi* whether the patient has healthy or unhealthy pulse. To know precisely that a person is healthy his/her pulse rate should be 5 beats per respiratory cycle. More or less than the normal five beats per respiratory cycle indicates disorders (Khangkar, 1985). Any irregular beat of the pulse whether strong, declining, quick, slow, violent or weak indicates that the person is unhealthy. Khangkar (1985) has further pointed out that when a child is born he or she has three natural emotions, such as, passion, aggression and desire and the domination of any one of them brings about the different temperamental and constitutional composition in each individual. Therefore, even unhealthy persons or organisms, the beat and movement of the pulse may differ.

Few *amchis* believe that for the Tibetan doctors a clear understanding of the constitutional pulse in all its dimension is important, not because of its mysteries, but because of potential confusion in future pulse readings where it could be mistaken for an internal disorder, giving rise to a wrong diagnosis. The art of pulse diagnosis is overwhelmingly difficult to understand and master.

### 6.1.3. Treatment by moxibustion and puncturing of veins:

Mostly for the treatment of headache, paralysis, inflammation of the joints and arthritis the practice of moxibustion is used (Goyal *et al.*, undated). In moxibustion the flower heads of woolly plant species such as *Anaphalis* or *Gnaphalium* along with animal horns, iron, gold, and silver needle are burnt or heated and placed at certain parts of the body. The use of materials depends on the seriousness of the diseases. *Amchi* allow the blood to ooze out for certain time by puncturing of veins through needles. Usually this therapy is employed for blood and skin disorders.



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