Medicinal Plants of Dolpo
Amchis’ Knowledge and Conservation

Yeshi Choden Lama
Suresh K. Ghimire
Yildiz Aumeeruddy-Thomas

in collaboration with the Amchis of Dolpo
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People and Plants Initiative
WWF Nepal Program
Kathmandu, Nepal
"Every plant has a medicinal value once its taste and potency are known."

Gyushi.
**Amchi Resource Persons from Dolpo**

Karma Lhundup (Komang)
Karma (Dho)
Lama Namgyal (Dho)
Pema Lama (Dho)
Sherab Nyima (Pungmo)
Sherab Tenzin (Bijer)
Tengyal Zangpo (Punikha)
Yungdrung Thargye (Bijer)

**WWF Nepal Program/People and Plants Project Team (1997-2001)**

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Gyatso Bista (1997-2001)
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Choephel Lama, Park Game Scout (2000)
Damber B. Kathayat, Park Game Scout (1997-1998)
Karsang Gurung, Khaliban (2000)
Laxmi Bahadur Thapa, Park Game Scout (1999)
Palden Lama, Park Game Scout (1997)
Ram Babu Khanal, Park Game Scout (1999)
Rup Lal Thapa, Kaigaon (2000)
Sherab Tenzin, Bijer (1997)
Sherab Nyima, Pungmo (1997)
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Foreword

The ecological diversity of the Himalaya makes the area the habitat of a wide range of medicinal and aromatic plants (MAPs). This is well evidenced by this study of an innovative program in Dolpa. Of the 7, 939 km² area of Dolpo, 7, 0047 km² or 88.8 percent lies above 3,500 metres in elevation. The district, therefore, is a storehouse of sub-alpine and alpine plants including medicinal ones. Surveys under the People and Plants Initiative there confirm the occurrence of 407 medicinal plant species of 222 genera and 80 families. According to the records of the District Forest Office, the total volume of 13 varieties of MAPs traded from Dolpo in 1997/98 was 37,834 kg. This seems highly underestimated. Gorkha district has 1,548 km² area above 3,500 metres, about a quarter of Dolpo’s. For the period of September 1994-August 1995, MAPs traded from Gorkha was 222,000 kg with a value of Rs. 8.3 million.¹

The theme of this study is not the economics of medicinal plants but their conservation, through nurturing of indigenous knowledge. Folk medicines obtained from natural resources are most used in remote areas that have no modern health facilities. Dolpo is one of the remotest areas in Nepal, and people have to rely on indigenous medicine. It is also partly remoteness that has kept alive the tradition of the amchis. It is commendable that this study has attempted to unravel the wisdom of some such local medical practitioners. Their knowledge and classification of ecosystem, plants, and medicine are well described. The development approach is two-pronged: use of amchi knowledge for conservation and public health. Conservation here encompasses botanical resource as well as cultural heritage (Tibetan medical system).

People and Plants Initiative (PPI) in its first phase in Dolpo has carried out ecological surveys to ascertain harvesting levels of plants in the wild. There has been only a modest venture in cultivation of medicinal plants. The second phase of the PPI needs to emphasize this aspect. Experience in Nanda Devi National Park has established that economic returns from medicinal herbs are much higher than from other cash crops.² Another area of intervention could be the marketing aspect whereby the local collectors and cultivators receive a fair price so that medicinal plants not only cure illnesses but also improve livelihoods.

This publication is the outcome of collaboration between scientists and local experts. It is an exercise in local participation in knowledge sharing for development in a district burdened by much economic deprivation, but endowed with rich natural and cultural resources.

Harka Gurung, PhD
December 2001

Preface

Walking up-valley from the Phoksundo Lake and across Churang-La Pass to Shey Monastery in August 2000 for a festival that attracts pilgrims from all over the region to the sacred mountain of Shey once every twelve years, I was breath-taken by the diversity and beauty of our country’s nature and culture. There, in the wind-wept valleys and passes of Dolpo, hundreds of flowers boldly display their majestic colors braving the extremes of nature. There, snow leopard and blue sheep are intricately linked in the cycle of life and death, and eagles circle the sky in search of prey. There, human culture has withstood the vagaries of time and the environment through distinct niches and skillful practices tried and perfected over time. There at Shey Monastery, the multitude of pilgrims participating in the ceremonies and circumambulating the sacred mountain in the torrential downpour illustrated the deep-rooted ties between cultures and their landscapes, formed and reinforced through a belief system that attaches great importance to the relationships and interrelationships of life. Few places and even fewer cultures on earth can surpass the beauty and the resilience of this land of Dolpo and its people.

I am pleased that this book attempts to document some of the medicinal plants important to local lives and livelihoods and highlight the role of the traditional doctors or amchis and their unsung yet indispensable contributions to local health. This book is also useful as it discusses the specificity and the complexity of the conservation and management issues related to medicinal plants and the need for appropriate guidelines for management and sustainable use. I am positive that this ethnobotanical work by the WWF Nepal Program/People and Plants, in cooperation with the Department of National Parks and Wildlife Conservation, will contribute towards promoting effective management and sustainable use of medicinal plants for improving local health and livelihoods.

Having had the opportunity to visit the land and interact with its people in a brief tour last year, I came away feeling that we are working where it matters, and in ways that matter. This gives my team at WWF Nepal Program and myself much encouragement and much hope for contributing towards ensuring a living and vibrant natural and cultural heritage in Nepal, even in its remotest areas.

Chandra P. Gurung, PhD
Country Representative
WWF Nepal Program
Kathmandu
December 2001
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This book is an attempt to document aspects of amchis’ knowledge which relate to medical science as well as resource management. It is also an attempt to show the linkages between traditional health care and conservation, and the issues and complexities of the trade of medicinal plants in the Nepal Himalaya.

Located in north-west Nepal, at the border of the Tibet Autonomous Region of China, Dolpo is one of the remotest areas of Nepal (See Map). It is currently considered as one of the last and most intact sanctuaries of medicinal plants in Western Nepal. Covered in part by the Shey Phoksumdo National Park (SPNP), the largest national park of the country with an area of 3555 km², Dolpo represents a variety of vegetation types, ranging from lower temperate to montane, sub-alpine, alpine and trans-Himalayan. The area hosts a diversity of plants, including many rare and vulnerable medicinal plants, as well as endangered animals such as the snow leopard. Some 3000 inhabitants who follow the culture and religions of Tibet including Bon and Buddhism live in SPNP. Indeed, Dolpo and Upper Kali Gandaki including Lo are known to have been colonized in the seventh and eighth century by people from the ancient kingdom of Zhang-zhung, a region located in Western Tibet (Snellgrove 1992, Kind 1999). This region fell under the Gorkha regime in 1796 and was included in the Kingdom of Nepal in the 18th century (Kind 1999). Some 10 000 inhabitants live in the periphery (buffer zone) of the park. The majority of the people outside the southern boundary of the park are Hindu, some having been in this area prior to the Gorkha period and others who migrated into the area more recently from the lower plains of Nepal.

WWF Nepal Program, in collaboration with the Department of National Parks and Wildlife Conservation (DNPWC) of His Majesty’s Government of Nepal, started the Northern Mountains Conservation Project (NMCP) at SPNP in 1997, an integrated conservation and development project funded by USAID. Within the context of this project, the People and Plants Initiative (PPI), a joint programme of UNESCO and WWF, has worked with WWF Nepal Program to develop a project focusing on medicinal plants conservation and management with a strong community-based approach. This sub-project is funded by the European Union (EU) and the Department for International Development (DFID, UK). Though it was initially planned for four years (1997 - 2000), the project will continue another four more years to allow an appropriate period for phasing out. During the second phase (2001-2004), ecological monitoring experiments started during the first phase will be continued. A model of medicinal plants management developed until now only in Phoksumdo Village Development Committee (VDC) located inside the park will be replicated in the southern buffer zone of the park. The Traditional Health Care Centre located in Phoksumdo will be replicated in Dho VDC in upper Dolpo.
A planning meeting based on a needs-oriented approach held in June 1997 at Ringmo, SPNP - at which all stakeholders of the resource were present – showed that two major groups living inside the park, the amchis and women, have a keen interest in the conservation and management of medicinal plants. The amchis are the main health care providers in remote, mountainous areas such as Dolpo. They have a practical interest in the conservation of medicinal plants as the bulk of their materia medica is derived from plants. Women’s interest in medicinal plants stems from their need to learn to use remedies for common childhood ailments as they are mainly responsible for childcare. Child mortality is very high in this area due to poor hygiene and sanitation and lack of access to adequate health care services. The formal health sector, with its infrastructure of health posts and hospitals, has serious difficulties in operating in this area.

Work conducted during the first year of the project and during preliminary phases show that the amchis’ knowledge and profession are declining (Gurung et al. 1996, Shrestha et al. 1998). Many amchis have not received full training due to lack of access to proper medical materials, capacity to follow formal studies or money to purchase medicines and materials from the lowlands. The ethics of their profession based on Buddhist and Bonpo concepts of universal compassion do not allow the amchis to charge their patients fees for their services. Yet in the present monetary context, they need to purchase plants and other products from the lowlands which in the past they exchanged for other products from the highlands. Dolpo amchis have underlined at many occasions, including at the planning meeting in June 1997, their interest to meet and exchange knowledge to promote their profession, and to document existing knowledge for use by the future generations.

Medicinal plants are crucial to local livelihoods. The major threat to the sustainability of medicinal plants collection in Dolpo is not the small amount used by the amchis, but the very large and growing interest in the trade of some 20 species of plants which are collected in large volumes from the district. Signs of over-harvesting of these species are very distinct at the periphery of the park and encroachment for commercial collection inside the park is ongoing. This project aims to develop local capacity to manage resources sustainably by working with the amchis, women and other user groups. Since 1999, the project has been working with commercial collectors who mostly live in the southern buffer zone of the park. The knowledge of the amchis of Dolpo related to the use and management of medicinal plants, combined with the results of the ecological studies on medicinal plants will contribute towards devising appropriate systems for sustainable harvesting which may ultimately be transferred to commercial collectors who tend to over-exploit the resource. Networking between these different user groups and facilitating the exchange of experiences and information is a major objective of this project.
A major thrust of the strengthening of capacity of amchis and women lies in bringing together fragments of knowledge held by all the amchis of Dolpo as well as in understanding women's role in primary health care. To do so, different mechanisms have been set up including: (1) organization of a meeting in June 1998 that brought together almost all the amchis of Dolpo to discuss their knowledge, gaps to be filled and problems encountered by their profession and; (2) building of a Traditional Health Care Centre in Phoksumdo to promote the exchange of knowledge between amchis, enhance conservation of medicinal plants through guidelines provided by the Centre for the collection of medicinal plants by amchis for local use; (3) production of a training manual for women in primary health care based on advice from the amchis; (4) and, finally, production of this book which brings together aspects of amchis' knowledge to promote the exchange of knowledge between the amchis of the Himalayan region, as well as with other resource stakeholders.

The transfer of this knowledge to the global community does not pose any ethical problem to the amchis, except regarding specific compounds that have not been fully tested and therefore cannot be used by non-specialists. It is also to be noted that in the context of Buddhism and Bon, the amchis see this knowledge as an asset to be used for the good of all sentient beings, i.e., human welfare. However, this project has taken care not to reveal knowledge that amchis perceive should be kept secret. The detailed composition of the medicine prepared by the amchis are not included in this book as it is beyond its scope, but some indications of the extent of diseases treated by the amchis of Dolpo are noted. The precise geographical location of the plants have not been revealed as it is important both for the amchis and for the sake of conservation that this book should not lead to an increased pressure on the plants from harvesting. All profits made through the sale of this book will be returned to the amchis through the local amchi associations.

The benefits for local communities in a more global sense derives from: (1) building of local capacity to manage and use medicinal plants in a sustainable way; (2) improving local health care through the building of a Traditional Health Care Centres in Lower Dolpo (1997-2000) and in Upper Dolpo (2001-2004).

The book has three parts: Part I describes the medical and ethno-ecological knowledge and practices of the amchis; Part II discusses the relationship between conservation, health care and the trade of medicinal plants; and Part III contains descriptions of selected medicinal plants that are most important in terms of their use by the amchis, their conservation significance and economic value. The descriptions of the plants in Part III have been translated into Tibetan to aid the amchis in the correct identification of these plants. Short biographies of selected amchis have also been included in this book. For the purposes of this book, we have not used the academic (Wylie) system of transcribing Tibetan terms, but have used the phonetic system so that the terms are accessible to the general reader.
Part I

Traditional Knowledge of Amchis
Historical origins and development
The amchis of Dolpo seldom fail to mention that the most important characteristic of their healing tradition Sowarigpa is that unlike allopathic medicine, theirs is closely linked with the religious belief systems of the area (i.e. Bon and Buddhism). Spiritual development and physical healing are seen as closely linked as exemplified by the Mendrub ceremony held across Dolpo, which elucidates how a special medicine (jinlab) is collectively produced in the context of a community ritual for alleviating physical as well as mental ailments. Much of the medical knowledge of the amchis is based upon the study of a fundamental medical treatise, the Gyushi or Four Tantras, the origins of which have been debated by scholars of Bon and Buddhism (Karmay 1998).

The amchis adhering to the Bonpo faith in Dolpo trace the origins of this tradition of healing to Tonpa Shenrab who is said to have taught Bumshi to his son Chebu Trishe in the sacred land of Olmolungring in Tazik (Persia) prior to the time of the historical Buddha Tonpa Shakyamuni. Bonpo amchis maintain that the Gyushi is essentially the Bumshi concealed during the decline of Bon in Tibet and rediscovered and transmitted in the eighth century to Yuthok Yonten Gonpo to whom the compilation of the Gyushi is attributed. Geshe Yungdung Thargye of Samling Monastery in Bijer states:

"Tonpa Shenrab Mibo taught the Bumshi at Yungdung Gutsek Hill in the sacred realm of Olmolungring to his son and medical lineage holder Chebu Trishe. The Bumshi was translated into the languages of Tazik, Zhang-zhung, Dusha, Khache, Trom, Orgyen, Thogar, Gyakar, Gyanak and Bhoie 1800 years after the demise of Tonba Shenrab. It was translated from Zhang-Zhung into Tibetan during the time of Nyatri Tsenpo in the fourth century. During the disintegration of Bon in Tibet, seven Bonpos concealed the Bumshi in Chema Yungdung in the region of Tsang. Tsangpa Shenpo Butsho Sipe Gyalpo recovered the texts and transmitted the teachings to the learned Mauu Palchen. In the eleventh century, three Buddhists recovered the Menbum Karpo and three other medical texts from Samye Monastery. These were transmitted to Yuthok Yonten Gonpo and widely propagated until this day."

On the other hand, the amchis of the Buddhist faith trace this tradition of healing to the historical Buddha Tonpa Shakyamuni who is said to have assumed the form of Dangsong Rigpe Yeshe and taught the Gyushi to Dangsong Yilakye and many other disciples. Renowned amchis in Dolpo attribute the authorship of the Gyushi to Yuthok Yonten Gonpo the Elder who is said to have incorporated the medical traditions of neighbouring regions into the indigenous tradition of Tibet and compiled the Gyushi in the eighth century. In the eleventh century, his descendant Yuthok Yonten Gonpo the Younger is said to have revised the text to its present form. Kungawa of Dolpo, a contemporary of Yuthok Yonten Gonpo the Elder and a court
The religious and medical traditions prevalent in Tibet and the neighbouring regions of Dolpo and Mustang prior to the spread of Buddhism in the sixth to the eighth century are said to have originated in Zhangzhung, a region in western Tibet (Tsedon 1996). According to historical sources and modern experts, the medical practices of Dolpo such as bloodletting and moxibustion were important developments in the Sowarigpa tradition. In the eighth century, the learned physician Kholmarutse of Dolpo, also known as Kungawa, was invited to the court of King Trisong Detsen and asked to translate into Tibetan a text on surgery called Mijikpa Gyekyi Tsoncha (Rechung 2000). He was also known for his expertise in bloodletting and moxibustion. Upon his return to Dolpo, he widely propagated the medical tradition.

During the time of Kunkhyen Sangye Rinpoche of Dolpo more recently, painting, astrology, woodcarving, blacksmithy progressed a great deal, and in particular, the medical tradition. A number of medical texts, commentaries and pharmacopoeia have been written by the Dolpo amchis over the centuries. The most famous is the Jorpe Detsen Shipa written by Drungtsho Pema Choephel of Tiling, also known as Amchi Garchoe, whose great-grandson Amchi Karma Gejor continues to uphold and practice this tradition. This text contains formulas for preparation of remedies based upon local experimentation with the tastes and potencies of the medicinal plants and other ingredients.

There are thus various accounts on the origins of the medical tradition of the amchis of Dolpo: from being solely Tibetan or Indian in origin to being an amalgamation of the medical traditions of ancient Tibet, India, Kashmir, Nepal, Dolpo, China, Zhangzhung, Persia, and Mongolia. The historical origins of the tradition are perhaps of less importance to the amchis of Dolpo than its theories and practices and its relevance to modern health care. Despite the scholastic debate on the origins of the Gyushi, the medical theories and practices that it propounds are widely accepted and practiced throughout the Himalaya, albeit with varying degrees of modification and innovation.

Much work remains for the amchis of Dolpo in exploring new medicinal substances or reviving local practices to meet specific local health care needs as well as to promote this tradition in the context of nature and culture conservation. As the trans-Himalaya is rich in minerals, eminent amchis propose the investigation of minerals as substitute for animal parts that are used in the preparation of medicine and highlight the role of Dolpo amchis in this endeavour.

The amchis rightly claim that local health care needs in Dolpo are largely met through the traditional medical system, whereas modern allopathic medicine with its formal infrastructure has brought few benefits. While the amchis are disheartened by the lack of formal recognition and support for their profession, many acknowledge the merits of allopathic medicine and the relevance of practices such as immunization in strategies to improve health care. Although in the past the amchis have received little...
or no support for their profession, there has been more recently a better understanding of the value of this healing tradition, and, consequently, increased support for the amchis. The Remote Area Development Committee of the Ministry of Local Development has been providing training on sustainable harvesting practices and supporting the formation of amchi associations in remote districts. Through the WWF/People and Plants project, the first ever district level workshop of more than 50 amchis was organized in Dho in 1998, and a traditional health care centre established in Lower Dolpo. A second traditional health care centre is being supported in Upper Dolpo with plans to train amchis and provide medical reference texts and medicinal ingredients from the lowlands. These traditional health care centres will play a key role in strengthening the link between local health care development and medicinal plants conservation, and thereby in raising the profile of the amchis both nationally and internationally. The amchi organizations of Dolpo, such as the Gangchen Menkhang Service Centre and Naychen Buddha Ribo Dolpo Lama Amchi Association, have developed contacts with the Kathmandu-based Himalayan Amchi Association to further the objectives of promoting amchis' knowledge and practices for improving the health care status of these remote regions. At the first national workshop of amchis organized by the Himalayan Amchi Association in January 2001, 47 amchis of Dolpo were present, of which 11 took part in a month-long refresher course in medical theory and practice. The Himalayan Amchi Association and the district level associations are now working towards attaining national and international recognition and support for their medical tradition, and hence towards promoting appropriate health care in the remote regions of the Himalaya.

Transmission of knowledge

Medical texts are often studied alongside religious texts, and both systems of learning are intricately linked. While the amchis provide freedom from the suffering of illness, the spiritual guidance provided by the lama is said to lead the way to 'ultimate freedom' or 'enlightenment.' In addition to the Gyushi, a variety of texts and commentaries on the identification of medicinal materials, disease and therapies such as Trungpe Drimey Shelgi Melong, Menjong Lekdik, Baidurya Ngonpo, Men Ngak Lhenthab, Jamgon Zinthik and Khyungtul Menjong Tongtsa are studied by the amchis. In remote Himalayan villages where there are no medical schools, knowledge is transmitted from father to son or from teacher to disciple. If an amchi is also a lama, as is often the case in Dolpo, medical knowledge may also be taught in the monastery as part of the religious training. In the absence of an appropriate teacher, it is also not unusual for students to travel to distant villages to study with knowledgeable amchis.

Amchis usually begin their studies when they are in their early teens. They learn to identify the medicinal plants of the highlands in the summer and of the lowlands in the winter. They begin to treat patients after four to five years of study and practice.

In addition to the knowledge attained from the study of texts, amchis' knowledge is also derived from an in-depth understanding of the local environment, medicinal resources locally available, diseases prevalent, and therapeutic measures that are most appropriate. The area of locally specific knowledge has yet to be explored in detail, although the use of substitutes by the amchis demonstrates a process of innovative experimentation with the tastes and properties of medicinal plants and other ingredients.

In the modern world, people choose the medical profession for a variety of reasons, ranging from the motivation to serve others to that of gaining fame and prestige. The most important motivating factor for an amchi should be the desire to benefit other beings and to relieve them from the suffering of disease. The amchis-in-training are constantly reminded of the six qualities (gyu duk) of intelligence, kindness,
trustworthiness, practical experience, diligence and social awareness that they are expected to possess.

Despite these prerequisites for becoming an amchi, given the local reality and the urgency for health care services in remote areas such as Dolpo, both experienced as well as amchis with less experience treat patients, with varying degrees of efficacy. This, of course, has various implications for the amchi tradition that the amchis are well aware of and are seeking to address in their strategy to promote their profession.

**Causes of disease**
The amchis identify a close link between the elements of nature and the human body such that earth (sa), water (chhu), fire (me) and wind (lung) form our flesh, blood, body heat and breath. The element of space (namkha) enables the development of all of the above.

Passion, anger and ignorance are believed to be the primordial causes for disrupting the balance of the three psycho-physiological conditions or ‘humours’ (nyepa sum) translated as ‘wind’ (lung), ‘bile’ (tripa) and ‘phlegm’ (beken) resulting in disease. Each of these humours is classified into five types. Wind is classified as life-sustaining (sogzin), ascending (gengyu), pervading (khyabje), equalizing (menyam) and downwards-voiding (thursel). Bile is classified as digestive (zhuje), colour-transforming (dogsel), accomplishing (dubje), sight-giving (thongje), complexion-transforming (danggyur). Phlegm is classified as supporting (tenje), decomposing (nyakje), experiencing (nyongje), satisfying (tsimje) and connecting (jorje) (Burang 1983; Men-Tsee-Khang, 1995; Donden 1986; Clark 1995; Donden and Wallace 2000). Thus wind, bile and phlegm have more subtle aspects than their common and literal meanings.

Diseases may be caused by a single humoural imbalance (kyangpe ne), dual humoural imbalances (denpe ne) or multiple humoural imbalances (dupne ne).

In all, amchis recognize a total of 404 diseases directly caused by past and present actions related to diet, behaviour, seasonal change, and evil spirits leading to an imbalance of the three humours. An individual’s body is naturally dominant in one or two of the humours, which also affects one’s susceptibility to specific diseases during specific seasons. Diseases are categorized as ‘hot’ and ‘cold.’ Bile disorders are categorized as ‘hot’ and wind and phlegm disorders as ‘cold.’ The amchis also recognize ten bodily constituents (flesh, blood, nutriment, fat, bone, bone marrow, regenerative substances, urine, excrement and sweat), which may affect the balance of the humours and cause disease.

**Diagnostic and therapeutic measures**
The most important diagnosis is to identify whether the nature of a disease is ‘hot’ (tsa) or ‘cold’ (dang) because an amchi may do more harm than good if he cannot differentiate between the two. When examining patients, the amchis of Dolpo employ the techniques of seeing, touching and questioning to diagnose an illness. Seeing involves examining the tongue, eyes, complexion, and urine. Touching involves feeling the pulse and areas where pain is felt by the patient. Questioning involves asking the patient the causes and nature of the illness. By skillfully utilizing these three techniques, an amchi is usually able to diagnose an illness without sophisticated equipment. But as amchis have repeatedly pointed out, in the absence of a skillful integration of the three techniques, an illness can also be misdiagnosed if one merely “fingers the pulse and stirs the urine.”

Various forms of treatment such as medicine, medicinal baths, bloodletting, moxibustion, massage and surgery may be used depending upon the nature and severity of the illness. Medicine is administered in the form of a concoction, powder, pills, medicinal butter, and concentrates. Although the amchi clinics in Kathmandu and other urban areas administer medicine mostly in the form of pills, the amchis of
Dolpo prefer the powder form as the local people consider it to be more effective than pills. Bloodletting is a specialized form of treatment that requires great knowledge, experience and skill on the part of the amchi. It is a healing technique through which impure blood is drawn from specific points of the body. But on the other hand, if improperly handled, life-sustaining blood may be drawn, thereby causing more harm than good. If skillfully handled, bloodletting is useful in the treatment of various diseases. It is especially effective for danglung gyenlok (indigestion and stomach ache), tripe gonapa (headache from bile), dewadampa (constriction of the throat), trak khyilpa (internal bleeding from injury), bam/dumbu (rheumatism). Medicinal baths are usually prescribed for skin diseases and fluid retention. Moxibustion is used for treating chuser (infectious fluid retention), lung (wind disease), kheldam (kidney disease), dangnik chusang (fluid retention) and ruchak (fracture) without having to treat with medicines first. However, it should not be applied to a patient who has fever or is suffering from a 'hot' disease. When a person has fever or a 'hot' disease, tsenden gyukme using white sandalwood can be applied. For patients suffering from wind disease, there are five moxibustion points: one at the crown, one at the back of the head, two at the temples and one above the forehead. Moxibustion is said to seal the gap through which illness-causing wind is said to enter the body. In the case of kheldam, it cures the pain caused by over exertion of the body. In the case of fracture, moxibustion is applied to heal the bone. Similarly, for water retention, moxibustion is applied to various points on the spine after administering medicines. According to the amchis, both bloodletting and moxibustion are most effective when used in conjunction with medicine.

**Classification of medicines**

Amchis classify medicinal plants according to explicit qualities related to their morphological features, which is discussed in the following chapter. In addition, medicines and medicinal plants are also classified according to implicit qualities such as taste and potency. All medicinal plants and materials for making medicine are said to have six tastes: sweet (ngar), sour (kyur), salty (lentsa), acrid (tsa), bitter (kha) and astringent (ka). In addition to the six tastes, medicines have eight potencies: heavy (chi), oily (num), cool (sil), neutral (nyom), light (yang), coarse (tsub), warm (dro) and sharp (no). Part III has detailed descriptions of a hundred medicinal plants of Dolpo.

Examples of medicinal plants that have a sweet taste are:
- **Nyeshing** (Asparagus racemosus Wild.),
- **Ranye** (Polygonatum cirrhifolium (Wall.) Royle),
- **Gundum** (Vitis vinifera L.),
- **Shingngar** (Cinnamomum tamala (Buch.-H am.) Nees & Eberm.);
- **Busuhang** (Trigonella emodi Benth.),
- **Wolmose** (Podophyllum hexandrum Royle),
- **Pangram** (Bistorta affinis cd D on Greene),
- **Tsenden** (Fragaria nubicola zinal ex lacaita),
- **Upal serpo** (Meconopsis paniculata prain),
- **Lhashuk** (Juniperus indica Bertol.).

Medicinal plants with a sour taste are:
- **Sendu** (Punica granatum L.),
- **Tarbu** (Hippophae salicifolia D. Don),
- **Chumtsa** (Rheum australe D. Don),
- **Chuntsi** (Oxyria digyna (L.) Hill),
- **Kyerwa** (Berberis aristata D.C.),
- **Datrik** (Rhus javanica L.),
- **Kurut** (Phyllanthus emblica L.), etc.

Medicinal plants with a salty taste include:
- **Kharutsa** (black salt).

Medicinal plants with an acrid taste include:
- **Chetsa** (Ranunculus brotherusii Freyn),
- **Imong karpo** (Clematis montana Buch.-H am. ex D.C.),
- **Yershing** (Artemisia sp.),
- **Daryaken** (Lepidium apetalum Wild),
- **Phowarilbu** (Piper nigrum L.),
- **Gakya** (wild ginger),
- **Pipiling** (Piper longum L.),
- **Shingkun** (Ferula asafoetida L.),
- **Subka** (Anemone rivularis Buch.-H am. ex D.C.),
- **Gokpa** (Allium spp.), etc.

Medicinal plants with a bitter taste are:
- **Tikta** (Swertia chirayita (Roxb. ex Fleming) Karsten),
- **Tongzil** (Corydalis megacalyx Ludlow),
- **Honglen** (Neopicrorhiza scrophulariiflora (Pennell) H ong),
- **Dakpoe** (Nardostachys grandiflora)**.
D.C.), dhum bashaka (Corydalis impatiens (Pall.) Fisch),
taksha (Astragalus sp.), khenkya (Artemisia sp.), etc.  
Medicinal plants with an astringent taste are: upal
ngonpo (Meconopsis grandis prain), ligadur (Geranium
pratense L.), wonbu (Myricaria rosea W.W. Sm.),
japhotsitsi (Salvia spp), aru (Terminalia chebula Retz.),
baru (Terminalia bellirica (Gaertn.) Roxb.), tsenden
(Santalum album L.), etc.

The sweet taste nourishes the body, cures lung
infection, heals wound, stimulates the appetite, cold,
bleeding and impure blood. The sour taste stimulates
appetite, aids digestion, heals the stomach, and cures
fever of the phlegm and blood. The salty taste cures
phlegm diseases, indigestion, and blood tumors. The
acrid taste treats phlegm and other stomach related
ailments. The bitter taste cures bile, fever, cold, and
infections are treated with bitter medicinal plants and
ingredients. Astringent taste treats blood disorders.
Generally, medicinal plants and ingredients with
sweet, sour, salty, and acrid tastes cure wind disorders.
Bitter, sweet, and astringent tastes cure bile disorders
whereas acrid, sour and salty tastes cure phlegm
disorders. The amchis need to be especially attentive
when providing treatment. For example, when
treating wind disorders, bile disorders can arise, and
when treating bile disorders, wind and phlegm
disorders can arise.

In preparing and prescribing medicine, an amchi has
to understand the taste, potencies, and the post
digestive taste (shuje) of the medicine. Unlike the
amchis trained at formal medical schools, the amchis
of Dolpo prepare most of their medicine themselves.
In the amchi schools in India for example, a separate
specialized unit prepares the medicine. The amchis of
Dolpo prepare a number of medicines using rinpoche
rik (precious metals), domen (stone medicines), samen
(earth medicines), shingmen (tree medicines), tsmen
(resins), ngo men (plants) and sokchag (animal parts).
The medicines locally prepared are administered as
decoctions (thang), powder (chhema), pills (rilbu),
paste (degu) and concentrate (khenda). Depending
upon the nature and severity of the disease, amchis
may use a variety of therapeutic techniques starting
from a gentle therapy and then moving on to a
stronger one. Amchi Sherab Tenzin of Bijer usually
administers a thang to identify the illness, and then
provides the necessary remedy. He also resorts to
bloodletting and moxibustion to prevent the illness
from recurring.

Some amchis rely more upon certain techniques for
curing illnesses through their successful practical
experiences. For example, Amchi Karma of Takkyu
has cured several patients of painful joints in the
Tichurong area in Lower Dolpo with Dudtsi Ngalom,
a medicinal bath constituted mostly of plants. Dudtsi
Ngalom (medicinal bath), tarka metsa (bloodletting
and moxibustion), lapchang (medicinal wine), ngabru
(horn for drawing blood), tsukshel (ointment for
drawing lymph fluid) kunye (massage), men ngak
(mantas) are also some specialized techniques used
by the amchis of Dolpo.

The knowledge of the amchis of Dolpo is therefore
multi-faceted, as it includes a thorough understanding
not only of medical theory and practices, but also of
the ecology and the biology of the medicinal plants
and other materials used in the preparation of
medicine. This knowledge has great value for the
conservation and sustainable use of wild resources,
especially medicinal plants.

A matter of concern, however, is that many of these
knowledgeable amchis are aging. Amchis such as
Karma Lhundup of Komang, Khending Rinpoche
and Thondup of Namgong, Dakri Ngodup, Pema,
Sheri Rinpoche and Kunga of Barong, Ngodup of
Tsharkha, Gelong Yungdung of Bijer, and Tsewang
Ngodup of Karang are well above fifty years of age.
The knowledge that they hold represents the essence
of the medical texts and their vast experience. A major
challenge for the amchis of Dolpo and the Nepal
Himalaya is to ensure that this knowledge continues
to flourish and to serve the local communities.
Local botanical knowledge is interrelated with perceptions of many aspects of natural environment such as soil, climate, vegetation type, stages of ecological succession, and land use (Martin 1993, 1995). An integrated local knowledge system is classified according to specific codes understood by all members of the society. Ethnobotanical or vernacular classification is one form of encoding knowledge (Aumeeruddy 1998). The local people and the amchis have a rich knowledge of environmental components, resources and their conservation and management. The scale of their knowledge is reflected by more than 400 species of medicinal and aromatic plants recorded and used in Dolpo. This knowledge has its base in a strong cultural heritage and a sense of respect for natural environment formed and reinforced by local religious beliefs.

The amchis have broadly identified six major types of landuse units or ecosystems, viz, nakri (forest land), pangri or penhri (grassland/pastureland/meadows), drakri (rocky mountains or cliffs), gangri (snowy mountain); sing/sim (marshy place or wetlands) and lung (agricultural land). Forests are further classified as shingnak (forest in a flat land), shingdhong (forest with large trees), bednak, dhama or tsalip (shrubberies), naksep or naktren (scrubland or forest with small trees or bushes). Other minor habitat categories are kepa (soil with gravel); tsangdam (moist habitat), dza (snow melting zone), ya (alpine grasslands), thakh-rot (rock with little soil in moist forest); ya tsangdam (moist places in high himal), etc.

The mountains, pastures, forests, and scrublands bear specific local names and cultural significance. Within the territory of one community or village, amchis have delimited and named over 61 forests, 2 major winter pastures, 11 different sub-pastures, and over 110 grazing sub-units. These vegetation components are categorized and named based on component species, cultural significance, morphological characteristics, etc. Limits to different perceived components may be either natural topographic boundaries but may also be man-made constructions built at specific strategic points of the landscape, such as gomba (monastery) and chorten (stupa) and other religious landmarks (laptsai and mani or mendong).

Forests and pastures are categorized and named based on the dominant species of plants, morphological characteristics of the place, the name of dominant wildlife, and name of deities or spirits that dwell therein. For example, Damari in Pungmo refers to the forest in the cheek of a larger mountainous relief. Forests named as Lhaptsen, Lombo and Simutong represent the names of spirits that reside therein. Aikotong in the same village refers to a forest, which looks like a chin. Penhri-jongba-tong, a sub-unit of the pasture in Pungphu, refers to the flat area, which has flat topography and is square in shape. Penhri-sopa in the same area refers to a meadow, which is shaped as a human shoulder. Talgera, a sub-pasture in Kunasa refers to a place having ladder-like terraces. Kyunga-thang, another sub-pasture in the same place has a flat meadow (thang) where a bird locally known as kyunga (with a red spot in the head and legs) is commonly found. Similarly, Laretong represents a forest in Pungmo where thousands of musk deer are found. Forest such as Takpa-dosa, Shukpa-dosa, Buk-konga, etc are named after the component species.
The amchis classify the whole of the plant world (kingdom) as tsishing ngodhum (herbaceous and woody plants). It contains all higher plants and also includes fungi, lichens, hepatics, mosses and ferns. Below the kingdom there are two life form ranks (Table 1). In life form 1, plants are grouped into two distinct categories based on plant habit as ngodhum (herbaceous) and shing (woody). In life form 2, shing (woody plants) are further classified into four specific habit categories, viz. shing dhong (large trees), nakthong (small tree or large shrubs), thrilshing (climbers) and dama or challip (shrubs). Ngodhum (herbaceous plants) are further classified into ngodhum (herbs) and tsa (grass).

Below life form ranks, there are two intermediate ranks based on flower and fruiting characters. In intermediate 1, all the shingdhong (which contains various species of trees) are further grouped into two categories based on whether they flower or not: metok chen gi shing dhong (with flower) and metog mepe shing dhong (without any distinct flower). Similarly in intermediate 1, all the ngodhum (herbs and grass) are directly classified into seven categories based on the morphology of fruits, roots and flower. These seven categories of ngodhum are gangpochen (plants with bean-like fruits), debuchen (plants with ovoid fruits), tsug (plants with mustard-like fruits), tsawa chungwa (plants with small roots), tsawa chewa (plants with large roots), metok chen (plants with distinct flower) and metok mepa (plants without flower or with indistinct flower). All the lower plants (fungi, lichens, hepatics, mosses and ferns) are grouped in ngodhum under metok mepa. In intermediate 2, all the trees which flower (metok chen gi shing dhong) are further grouped into two on the basis of presence or absence of thorn. Thus, the thorny trees are grouped into tserma chen gi shing (tserma - thorn) and non-thorny trees are grouped into tserma mepe shing. Below the two intermediates, there is another rank locally referred to as rik. However, rik is used only in some cases and is not actually used to design a group of plants. It is a theoretical concept that amchis use when

| Table 1. Ethnobotanical rank and approximate number of categories in Amchi botanical classification. |
|-------------------------|-------------------------|-------------------------|
| Ethnobotanical rank     | Type of name            | Number of categories    |
| Kingdom                 | Secondary               | Unitary                 |
| Habit or Life form (1)  | Primary                 | 2                       |
| Habit or Life form (2)  | Primary                 | 6                       |
| Intermediates (1)       | Secondary               | 9                       |
| Intermediates (2)       |                         | 2                       |
| Intermediates (3)- Rik  | Primary                 | 48                      |
| Generic*                | Primary                 | 297                     |
| Specific*               | Secondary               | 382                     |
| Varietal                | Secondary               | 5                       |

*Numbers are based on amchi names. These represent the total number of names assigned for a taxon. Each taxon may have more than one local term.
asked to comment in relation to the integration of different groups of plants into a higher level of hierarchy. It represents a small grouping of several plant groups bearing a similar generic term (generics) that are considered to be similar in either habit, plant morphology, use or property.

Folk generics represent a group of plants which are similar in one or more than one characteristics in terms of habit, morphology of flower, use, property, habitat specificity, etc. Many plants are identified only by the generic terms i.e. for one plant there are only generic terms. But, many folk generics are further differentiated into specific categories, i.e. corresponding to the level of scientific species termed here as folk specifics. These folk specifics are further distinguished by the use of specific terms or determinants which often correspond to the colour of the flower, size of the plant, habitat where the plant grows, etc (See Box-1).

Besides these categories, there are certain plants, which are scientifically distinct species but bear similar folk generics and specifics. However, sometimes amchis use another term that delimits different local specifics. These terms are also derived based on habitat and morphology of plant parts, and by comparing the plant parts with the human body and other objects.

There is some relationship between scientific and folk botanical classification. However, the relationship is more evident at a lower rank. At a higher rank, amchis also define the whole plant world in single term of kingdom, referred to as tsishing ngodhum. They have also included lower groups of plant together with higher groups.

At life form and intermediate levels, the correspondence between folk rank and scientific taxa is not sharp. Life form categories such as tsa (grass) and ngodhum (herb) may correspond with herbaceous monocots (or scientific family - Gramineae and Cyperaceae) and herbaceous dicots respectively. However, in folk classification of amchis, other monocotyledons, which are not grass-like are grouped into ngodhum. Some relationship exists at intermediate level 1, where amchis distinguished two categories of trees (shingdhong) based on whether the plant flowers or not. Thus metok chen gi shing dhong (plant which flowers) corresponds to the botanical angiosperm group whereas metog mepe shing dhong (plant which does not produce any distinct flower) corresponds to the gymnosperm group. However, gymnosperms are not always trees and also include small bushy plants like Ephedra, and this is not expressed in the folk botanical classification.

At a lower rank, rik shows some relationship with a botanical family. However, a botanical family is a category comprising one or more genera or tribes of common phylogenetic origin - therefore plants which have common ancestors and which have evolved into different species along an evolutionary process, whereas rik is a family level which regroups plants which are not linked by phylogeny.

**System of naming plant parts**

Amchis very precisely define and name the parts, biology and life cycle stages of a plant. They use the term dhongpo for a single plant and pong for a group of plants arising from the same rootstock (genet). As many as 15 different parts of a plant are identified: tsawa (root), barak (root/rhizome), barak ngama or tsatren (root hair/ adventitious root), khalo (thick rhizome), loma (leaf ), pakpa (scales at the basis of a main stem/ scaly leaf ), dhongpo (main stem, flower peduncle), langiya (stem branch), utum (floral bud), metok (flower) and debu (fruit). They also identified floral parts as damma fikoh (sepal), damma (petal), simdu (androecium), and debu (gynoecium).

**Perception of resource harvesting**

The knowledge of the amchis includes the ecology, distributions, and use of several medicinal plant species found in their territories. In addition, they also possess precise knowledge regarding habitat specificity,
i) **Nomenclature following plant habit:**

In many cases, plant names refer to life form categories like tree (shing) or grass or grasslike (tsa). For example, **theshing** (Pinus wallichiana A.B. Jacks.), **sershing** (Syringa emodi Wall. ex Royle), **shingatrong** (Buddleja crispa Benth.), **zomoshing** (Caragana gerardiana Royle), **tatsa** (Gerbera nivea (D.C.) Sch. Bip.), etc. Similarly, thorny or spiny plants are named as tser. For example, **chang tser** (Morina nepalensis D. Don, Morina polyphylla Wall. ex D.C.), **shuk tser** or **poma tser** (Juniperus squamata Buch.-Ham. ex D.), etc. The name of the fungus **yartsa-gunbu** (Cordyceps sinensis (Berk.) Sacc.) is given on the basis of the nature of the plant and its growth period. It is a fungus parasitising a caterpillar. However, the amchis identify the fungal part as a grass (tsa) and the caterpillar as an insect (bu). During the winter (gun), the fungal spore which happens to fall on the caterpillar germinates, grows steadily and matures during the summer (yar). Thus the locals named the plant - **yartsa-gunbu** - summer (yar) grass (tsa), winter (gun) insect (bu) - “summer grass, winter insect”.

ii) **Nomenclature following plant morphology:**

It is based on plant and flower morphology, colour of the flower or leaves, appearance of particular parts, etc. Some species of the genus Pedicularis are locally termed as lugru (sheep horn) because the flower has a coiled beak resembling the horn of a sheep. In the same genus, there are a group of species in which the flower has an entire slender beak and is therefore named lang na (elephant trunk). Several species of the genus Aster are called **lug mik** (sheep’s eye) in which the flower resembles the eyes of a sheep. These are further differentiated through the assignment of a second descriptive term which may generally refer to the colour of the flower. Species with yellow flowers are called serpo: e.g. **lugru-serpo** (Pedicularis klotzschii H.urus.), langna serpo (P. longiflora Rudolph); red coloured species are called marpo: e.g. **lugru-marpo** (Pedicularis siphonantha D. Don), etc. **Shangdril-nakpo** is a primrose (Primula macrophylla D. Don) which has drooping blue flower clusters which resemble a bell. Thus, the local name stands for a plant having blue (dark) flower (nakpo) in a drooping bell-shaped (shangdril) inflorescence. **Balu** is a generic term assigned to some species of Rhododendron. **Balu karpo** (white) refers to Rhododendron anthopogon D. Don, which bears white flowers, whereas **balu mar po** (red) refers to R. lepidotum Wall. ex G. Don. Some species are given sacred names of gods and goddess. For example **khandui kyalpsa** (Cassiope fastigiata (Wall.) D. Don), in which the arrangement of leaves has given a distinctive appearance of locks of hair or plaits (chulthi or kyalpsa) of a woman, and thus the local name khandui kyalpsa stands for goddess (khandui) plaits (kyalpsa). Many legumes are termed as sema or semar or semug, meaning fruits like those of pea; such as Thermopsis barbata (**huse sema**), Gueldenstaedtia himalaica (**se mug**), etc.
iii) **Nomenclature following use:** Plant names have a connection with use. For example, *rike gok pa* (Allium carolinianum DC.), meaning wild (rike) garlic (gok pa), is used as spice. Several plants are grouped together based on use categories. For example, aromatic plants used in incense are termed as poe; those used in medicine are termed as men; and poisonous plants are termed as dhuk. Most of the aromatic plants are used medicinally. Examples are *drakpoe* (Nardostachys grandiflora DC.), *pangpoe* (Saussurea sp.), *nakpoe* (Valeriana jatamansi Jones), *gangpoe* (Aster sp.), *silapoe* (Jurinea dolomiae Boiss.), *tsenduk* (Aconitum spicatum), etc. Accordingly, several species of grasses are grouped together as mentsa (medicinal grass), dhuktsa (poisonous grass), etc.

iv) **Nomenclature following habitat:** Plants are also named according to their habitat specificity such as: pang (meadows), drak (rocky mountains or cliff), nak (forest), gang (snowy mountain), etc. Generally, the names referring to a plant’s habitat occurs in connection with information concerning its use. For example, based on the habitat, the incense plants (poe), also used medicinally, are named as *drakpoe* (N. grandiflora), *pangpoe* (Saussurea sp.), *nakpoe* (V. jatamansi) and *gangpoe* (Aster sp.) which are found in steep mountains, flat meadows, forests and in snowy mountains respectively. A number of grasses are named together according to habitat, for example, *ramtsa* (grasses found in the agricultural land), *pangtsa* (found in the pasture), *tholtsa* (found in the pasture of lowland marshy habitat), etc. Based on habitat specificity, foliose and crustose type of lichens are grouped into three categories: *shingdrak* (lichens found on tree trunk), *chudrak* (found in water or marshy habitat) and *dhodrak* (found on rock). *Atrong karpo* is a specific term for both hay/thread like fungi (Xylaria spp.) and fruticose type of lichens (Cladonia spp.), which are white or brown in colour (karpo = white) and they are differentiated into *gang atrong* (those growing very high near the snow), *pang atrong* (those growing on meadows), *nakatrong* (those growing on forest floor).

v) **Nomenclature following properties:** Plants are also named according to their properties. For example medicinal plants bitter in taste are grouped together as tik or tig. For example, *bhotig* (Swertia sp.), *chaktig* (H alenia elliptica D. Don), Gentianopsis paludosa (M unro ex Hook. f.) M a), *gyatig* (Swertia ciliata (D. Don ex G. Don) B.L. Burtt), *gatik* (Androsace strigillosa Franchet), *kyurtig* (Saxifraga sp.), *ngultig* (Swertia angustifolia Buch.-Ham. ex D. Don), *sumchutig* (Saxifraga umbellulata Hook. F. & Thomson), *zin tik* (Ajuga spp.) etc. Species with an acrid (tsa) taste are *chetsa* (Ranunculus spp.).
The harvesting stage of medicinal plants depends upon the nature of the disease for which the plant is used, nature of the plant parts used, and type of herbal preparations. The amchis broadly define six stages of plant life cycle: dhongbokeyete (juvenile)- stage for harvesting very young leaves; utumchhadu (young with floral bud)- stage for harvesting mature leaves; medokbarduk (flowering)- stage for harvesting flowers; depuminduk (seeding) and chhoiduk (ripening)- stages for harvesting fruits and seeds; and kamduk or thudaichonduk (dry)- stage for harvesting roots, rhizomes and bulbs. Kamduk or thudaichonduk stage is the optimum period for harvesting plants whose underground parts are used. At this stage, the aboveground part of the plant is said to ripen and slowly dry, and the nutrients are transported to the underground parts, making them more potent and effective for medicinal use. The most useful and commercially important medicinal plants fall in this category.

Amchis believe that for better medicinal efficacy, specific parts of specific medicinal plants should be collected during specific seasons defined according to the Tibetan calendar. The period chosen is when the different parts (flowers, fruits, seeds or leaves) are best developed for medicinal use. Chidasum (spring) is said to be the best season for collecting bark of trees or shrubs and juvenile leaves of herbaceous plants. Flowers, leaves and small amount of whole plants are collected during yardasum (summer) for higher potency. Rhizomes, fruits and seeds are collected during tongdasum (autumn), whereas rhizomes are collected during gundasum (winter). Amchis harvest the medicinal and aromatic plants selectively, and encourage the local people to do the same. Selective harvesting of underground parts of plants involves uprooting only mature and robust plants and leaving younger bulbs, rhizomes, and vegetative shoots to mature until they set seeds. Limited amounts of leaves, flowers, or other parts of the plants are collected so as not to affect their regeneration.

Although harvesting periods of medicinal plants differ with species, amchis generally follow specific cultural or religious processes prior to harvesting. An auspicious period for harvesting pasture resources, in general, is determined in advance by the head lama of the area based upon the Tibetan calendar and medical texts. Amchis usually propitiate the menlha or medicine deity prior to collecting the plants. Moreover, fodder grass as well as medicinal plants from the pasture, particularly whose underground parts are used, are harvested during a specific auspicious period known as dangsong rikhi. It is a period of seven days determined by the head lama according to the Tibetan calendar when most of the perennial herbs complete their life cycle during September/October. During this period, ‘nutritional showers’ are said to occur which enriches medicinal plants including grasses, and thus increases their medicinal efficacy.
these two categories, for other uses, the herbs are dried both in sunlight as well as in shade. The herbs are stored in leather or cloth bags and wooden boxes.

Poisonous plants such as tsenduk (Aconitum spicatum (Brühl) Stapf), atik (Delphinium himalayai Munz), jagopoe (Delphinium brunonianum Royle), jangma (Rhododendron campanulatum D. Don), (Stellera chamaejasme L.), dhurji (Euphorbia spp.), etc. are detoxified before their use in medicine. There are various techniques for detoxification: one process involves boiling the rhizome with the extract of aru (Terminalia chebula). Depending upon the toxicity, the boiling processes (periods) differ with species. Plants with high levels of toxicity are boiled for prolonged periods.

The knowledge of the amchis related to medicinal plants and their use has immense implications not only for the conservation and sustainable use of medicinal plants but also for local health care. Although this knowledge has been rapidly declining due to the changing socio-economic circumstances of the region, there has recently been a renewal and a revitalization of this ancient and time-tested tradition of healing. In order to sustain this momentum in the long term, the national and local amchi associations have an indispensable part to play.
Part II

Conservation of Medicinal Plants, Trade, and Health Care
Background

Dolpo, and particularly Shey Phoksumdo National Park, encompasses a large variety of ecological zones ranging from an altitude of 2000 m in the Suligad Valley to 6883 m at the peak of Mount Kanjiroba. Moreover, due to intricate climatic and landscape variation of mountains ecosystems, a large number of habitats and microhabitats within each ecological zone host a very high biodiversity, both of plants and animals. Endemism is high in Dolpo with 50 species of flowering plants representing 46% of the total endemics of West Nepal (Ghimire 2000, Shrestha and Joshi 1996). The interaction between nature and culture in Dolpo, as elsewhere in the Himalaya, has also created man-made landscapes over time, such as the high pastures where livestock grazing has brought about much transformation of the natural meadows. This has in some cases destroyed existing habitats and has, in other cases, created new habitats such as the nitrogen-rich areas located near summer settlements, where plants such as Aconitum spicatum (Brühl) Stapf, which are quite rare elsewhere, grow abundantly. Cultural adaptations to the harsh environment have also resulted in new diversity through the cross-breeding of yak (nak, dzo, etc.) and selection of cereals such as barley (Hordeum vulgare L.), buckwheat (Fagopyrum tartaricum (L.) Gaertn.) and varieties of millet including Eleusine species. This long interaction between human beings, animal husbandry, agriculture and natural resources has proved sustainable over many generations mainly due to low population density (about 3 inhabitants per square kilometer in Dolpo) and the low levels of extraction of resources. Moreover, Buddhist and Bonpo belief in the interdependence of all phenomena and the respect for nature in all its forms of life continue to play a major role in conserving elements of biodiversity in Dolpo. The amchis use a few kilograms of each species of medicinal plants each year, and as shown in this book, have a thorough knowledge of their growth pattern and management. The use of plants for health care does not seem to have affected the resource (see below results of the Rapid Vulnerability Assessment). However, the situation is changing rapidly. Some 40 to 80 tons of raw dry medicinal plants are exported each year from Dolpo to feed the vast Ayurvedic industry in India and the growing natural product market in the West. Collection of medicinal plants and other non-timber forest products is a very important component of the economy in Nepal (Edwards 1996, Bhattarai 1997, Olsen 1997). People need money to make a living, responding to the requirements of modern life. Human and livestock population is growing, putting more pressure on many vulnerable resources. Within this context, what can be done to ensure that medicinal plants will still be available for health care and for trade for the coming generations?

In Nepal, the guidelines relating to the conservation status of plants are found in the book on Rare, Endemic and Endangered Plants of Nepal by Shrestha and Joshi (1996). HMG Nepal also has set out policies under the Forest Act 1993 and Forest Regulation 1995 which regulate the collection and trade of medicinal plants in Nepal. Nepal is a member of Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES) since 1973. Other international conventions related to the conservation of biodiversity to which Nepal is a party are the Ramsar Convention (1971) and the United Nations Convention on Biological Diversity (1992). The Nepalese government ratified the Ramsar
Convention on December 17, 1987 and Convention on Biological Diversity on September 15, 1993. More recently in January 2001, a Conservation Assessment Management Plan (CAMP) workshop was held in Nepal by the Medicinal and Aromatic Plants Program in Asia (MAPPA), a joint programme of the International Development Research Centre (IDRC), the Ford Foundation, and the Ministry of Forest & Soil Conservation of HMG Nepal. This workshop mainly aimed at assessing the conservation status of medicinal plants of Nepal with a particular focus on Western Nepal (workshop report is forthcoming).

The following is a highlight of some approaches, results and lessons learnt for conservation at this stage from WWF's People and Plants project in Nepal. The overall strategy is the major input of the project towards contributing to the conservation of medicinal plants in Dolpo, and which may also be useful for high-altitude medicinal plants conservation elsewhere in the Himalaya.

**Ethnobotanical surveys**

Project staff conducted ethnobotanical surveys with different social groups in 10 VDCs (out of 23) in Dolpo District in 1997, and in great depth in Phoksumdo VDC since 1998. Household questionnaires, indoor semi-structured interviews, and to a great extent in situ open individual and group interviews during outdoor field surveys were conducted. The 1997 survey was conducted on a wide scale at the household level (therefore including men, women, children, lay people, specialists etc). From 1998 on, surveys focused on key stakeholders i.e. amchis, women, park staff and commercial collectors. These surveys show that amchis, dhamis and jhankris (traditional healers) have the highest level of knowledge about plants, both in terms of identification and use as well as management.

Among 407 medicinal species, 397 higher/vascular plants (including 3 Pteridophytes and 2 parasites), 5 mushrooms and 5 lichens were found to be used, most of which by amchis (Ghimire et al. 2001). These are distributed in 222 genera and 80 families. Out of the 397 higher medicinal plant species, 330 were found to grow above 3000 m in sub-alpine and alpine zones. Some of these species also grow under 3000 m. This result gives a new picture of the diversity of high altitude medicinal plants as only 140 were known to grow in subalpine and 45 in alpine zones (Malla and Shakya 1999). This indicates that not much work has been done in high altitude areas in Nepal. Moreover, very little is still known about the use pattern, ecology, growth rate and even less about the conservation status of high altitude medicinal plants.

Results of field studies show that a majority of medicinal plants are herbs and that the parts used are mostly whole plants (Fig 2, 3). From the point of view of conservation, uprooting of the whole plant is a destructive method. However, this has also to be considered in the light of the biology, growth pattern as well as the harvest timing.

Herbs may be annuals, biennials, monocarpic and perennials. If an annual herb is uprooted after it has shed seeds, this may have no negative impact on the regeneration of this species. However if a perennial herb is uprooted, the impact upon its population is important as such plants take many years to mature, and may be very old. Being a perennial, it also contributes to the species' strategy for survival through shedding seeds or reproducing vegetatively from one year to another and its uprooting also has an impact on the overall population dynamics of the species. Collection of fruits or flowers may also be detrimental to the survival of species depending upon its life form and growth pattern. Collection of flowers, fruits and seeds are less destructive with perennials than with annuals.

The distribution of herbs within the four categories of annuals, biennials, monocarpic and perennials is not yet known, although this is a major criterion to
consider from a conservation perspective. Some information could be found in the description of these species in various reports, monographs and books dealing with local and regional flora of Nepal, but field data is still needed to have a better view of the growth pattern of these plants. Harvesting of whole plants, roots and bark is very destructive for shrubs and trees, although the percentage of roots and bark used may be sustainable depending on each species' capacity to recover from such damage through coppicing, bark re-growth, etc (Cunningham 2001). Ethnobotanical surveys yield a large amount of information, including multiplicity of uses, amounts used, geographical locations of resources, harvesting practices, which if used adequately, may guide and help design appropriate conservation programmes.

Local botanical knowledge
A major approach of this project has been to investigate the depth of knowledge of amchis and local people as well as women. Aspects of amchis' knowledge which have been investigated, as shown in previous chapters of this book are: their knowledge of plant's life cycle (its evolution from seed to death), biology and ecology including distribution, size and vigour of populations; and the harvesting practices and rationale behind choice of different practices.

Results regarding amchis' knowledge are given in Part I of this book. Reasons for exploring local knowledge of specialists such as amchis in the case of Dolpo, and relevance to conservation are as follows: (1) exploring knowledge of user groups with the highest level of knowledge is most likely to yield substantial results as how best to manage the resource; (2) this knowledge should be used in a participatory way with knowledge holders themselves to design improved management systems building on scientific knowledge; (3) understanding the rationale of folk vernacular classification is crucial to compare local perception of biodiversity to scientific classifications and enable people speaking different languages (scientific, park managers - often from different ethnic
groups - and local people) to exchange information; and (4) it is also necessary to understand local perceptions and rationale to set up monitoring systems for local communities, using local indicators which may be used on the long run, beyond the lifetime of the project.

Although this knowledge is very profound, it is only held by a very small group of people. It is, therefore, crucial to find ways to transfer part of this knowledge to other sections of the population, such as women or young people.

**Trade in medicinal plants**

Trade surveys undertaken since 1997 have consisted in: (1) recording volume of plants exported at the District Forest Office level; (2) interviewing different types of traders from the production areas up to the roadhead, in this case the airport of Juphal; (3) interviewing commercial collectors and (4) checking the areas given by traders and collectors to look at the status of the resource.

Amounts of raw dry products coming from localities close to SPNP were of five tons in 1992/1993, nine to twelve tons in 1995/96 and twelve tons in 1996/97 based on figures obtained from the DFO records. In 1997/98, a total of 37.834 tons was recorded by the DFO (Table 2). Surveys conducted under this project (Shrestha et al. 1998) show that some 40 tons were exported in 1996/1997. A survey by ANSAB in 1997 estimated that about 80 tons were exported in 1996/1997 (AN SAB 1997). These figures show that there is a need to collect trade data at the field level. Cross-checking information obtained from the collectors in the field has shown that areas named as collection areas were already exhausted of the resource, thus showing that the species collected have been over-harvested.

In addition to the data provided by the DFO, field surveys showed that other species traded in very large amounts from Dolpo were Acorus calamus L., Cordyceps sinensis (Berk.) Sacc. and Jurinea dolomiae Boiss. Species traded in smaller amounts include Aconitum spicatum (Brühl) Stapf, Dactylorhiza

<table>
<thead>
<tr>
<th>TradeName</th>
<th>Scientific name</th>
<th>Amount (kg)</th>
</tr>
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<tbody>
<tr>
<td>Atis</td>
<td>Delphinium himalayai Munz</td>
<td>2065</td>
</tr>
<tr>
<td>Bhutkesh</td>
<td>-</td>
<td>12435</td>
</tr>
<tr>
<td>Chau</td>
<td>Morchella esculenta Pers. ex Fr.</td>
<td>450</td>
</tr>
<tr>
<td>Chirayita</td>
<td>Swertia spp.</td>
<td>700</td>
</tr>
<tr>
<td>Jatamansi</td>
<td>Nardostachys grandiflora D.C.</td>
<td>10890</td>
</tr>
<tr>
<td>Kakarsinghi</td>
<td>Pistacia chinensis subsp. integerrima (J.L. Stewart) Rech. f.</td>
<td>429</td>
</tr>
<tr>
<td>Kutki</td>
<td>Neopicrorhiza scrophulariiflora (Pennell) Hong</td>
<td>3850</td>
</tr>
<tr>
<td>Padamchak</td>
<td>Rheum australe D. Don.</td>
<td>2615</td>
</tr>
<tr>
<td>Kaladana</td>
<td>-</td>
<td>100</td>
</tr>
<tr>
<td>Salla simta</td>
<td>Pinus wallichiana A.B. Jacks.</td>
<td>1000</td>
</tr>
<tr>
<td>Satwari</td>
<td>Asparagus spp.</td>
<td>2450</td>
</tr>
<tr>
<td>Sugandhbal</td>
<td>Valeriana jatamansi Jones</td>
<td>550</td>
</tr>
<tr>
<td>Titepati</td>
<td>Artemisia spp.</td>
<td>300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>37834</strong></td>
</tr>
</tbody>
</table>

Sources: H M G (1999), DFO, Dunai (Ghimire et al. 2001).
hatagirea (D. Don) Soó, Hippophae salicifolia D. Don, Juniperus indica Bertol., Paris polyphylla Sm. and Taraxacum spp (Ghimire et al. 2001).

Amounts traded are very important indicators of the trend of trade and therefore of the level of threat for each species. This indicator linked to the biology, part collected, and habitat specificity of the plants is important to filter species which require the highest level of attention. While work until now has concentrated on ecological monitoring and defining sustainable levels of harvesting for a few species, future activities will also concentrate on the ecological and social strategies of commercial collectors.

**Simulation of harvesting levels**

Species chosen for indepth ecological studies and simulation of different harvesting levels were Nardostachys grandiflora and Neopicrorhiza scrophulariiflora, both perennial herbs whose rhizomes are collected for trade and well as for local religious rites and health care. They are both known to have a vulnerable conservation status at the global level. Nardostachys grandiflora is included in the CITES Appendix II, and Neopicrorhiza scrophulariiflora is a species close to Picrorhiza kurrooa which is also included in CITES appendix II. Both species are known indistinctly as kutkutkikutkikutkikutki in trade circuits.

Since 1999, the project has been engaged in the long-term ecological monitoring of Jurinea dolomiae because it is a perennial species that does not reproduce vegetatively and grows in a highly specific habitat. It was found that the amount of this species traded from Dolpo in 1997/98 makes up the total amount traded from the whole of the Karnali region, indicating possibly that the populations have been over-exploited elsewhere. Other species being monitored are Delphinium himalayai, an endemic of Nepal, Rheum australe and Dactylorhiza hatagirea.

Details of ecological surveys and simulation of different levels of harvesting are not given here, as these are ongoing experiments. A very general result is that Nardostachys grandiflora is more vulnerable to harvesting practices than Neopicrorhiza scrophulariiflora. This is probably due to its different growth pattern and morphology, higher vulnerability to disturbances, and very low reproductive success through seed or vegetative means. This subject is described in detail in the technical reports of the project (Ghimire et al. 1999, 2000 and 2001).

Although both Nardostachys grandiflora and Neopicrorhiza scrophulariiflora reproduce vegetatively, a precise study of their morphology and growth pattern was undertaken to better understand the impact of harvesting on both these species. The study shows that both species reproduce vegetatively through the reproduction of a basic module. Nardostachys grandiflora grows into a dense clump with new shoots attached to the mother plant. These may separate accidentally through decay of the old rhizome and segregation of the new shoot from the old rhizome, therefore leading to a form of vegetative reproduction. Neopicrorhiza scrophulariiflora on the other hand develops long stolons from the base of old rosettes, carrying away from the mother plant new shoots with a greater chance of segregating from the mother plant. This system of reproduction could even react positively to a certain level of trampling as it has been noted that densities of N. scrophulariiflora tend to augment under low levels of disturbance. Harvesting parts of N. scrophulariiflora without affecting the whole clone is easy whereas for N. grandiflora it is difficult to collect parts of the dense clump without affecting the whole plant. Morphological studies especially relating to the growth patterns are essential to develop sound guidelines for the harvesting of such medicinal plants.

**Sociological and institutional surveys**

Sociological and institutional surveys were conducted through open-ended interviews with specialists and groups of people in the pastures. Highlights of results show that medicinal plants are not an open access
resource but a community resource traditionally controlled by two institutions, Dratsang and Yuldigothe. Dratsang is a religious hierarchic institution of lamas while Yuldigothe is the village administrative customary institution led by the Mukhiya. Although the Mukhiyas established by the old Talukduri system of land management of Nepal do not have any formal authority today (Devkota 1992), they were generally chosen among the customary chiefs of the villages and often still play a major role today in community affairs. In the context of the national park, local institutions such as Dratsang and Yuldigothe are no more empowered to exercise control over resources. It is crucial to identify such institutions if they exist, as new institutions may be designed which build on the rationale and functioning of older systems. This project has made an attempt to do so through the establishment of Medicinal Plants Management Committees (See below).

Linking health care to conservation

Linking health care with conservation of medicinal plants resources is based on the following assumptions: (1) people living in remote areas in the absence of modern health care services are highly dependant on medicinal plants and hence have a major incentive to conserve this resource; (2) traditional health care providers such as the amchis are specialist users with a thorough understanding of the use and management of medicinal plants derived from a time-tested medical system; (3) although medicinal plants are also important for trade and contribute to the economy of households, access to good health care services has been given much consideration by the project since it is a basic need; (4) the joint management of medicinal plant resources by park managers and local communities is necessary to ensure long-term conservation of the resources for consolidating the health-care/conservation and the trade/conservation linkages.

The decision to explore this avenue in this project was made at the planning meeting of this project (June 1997), during which amchis expressed their strong interest to collaborate with the project for conserving medicinal plants.

The strategy of this project is two-fold:
- To include local amchis in the research team working on the ecological monitoring of medicinal plants so as to build upon amchis’ knowledge to design appropriate experiments. In return, amchis would gain from knowledge through scientific monitoring. Park staff associated with this team benefited from both types of knowledge.
- To promote the knowledge and build the capacity of the amchis in order to ensure the continuation of a medical system conducive to the conservation of nature in all its forms of life. To do so, the following activities were developed: (i) bringing together amchis for exchange of knowledge, identifying gaps, needs and ways of promoting their profession; (ii) favouring exchange of knowledge between amchis and women through training in small groups; (iii) setting up a Traditional Health Care Centre (THCC) in Phoksumdo VDC; distribution of Tibetan medical texts to all Dolpo amchis and providing raw plant materials purchased in Kathmandu for the running of the THCC during the first year and (iv) providing guidelines for the sustainable use of medicinal plants at the THCC and monitoring use through working in close collaboration with Medicinal Plants Management Committees (MPMC) of each village of Phoksumdo VDC. Cultivation trials were launched both in-situ in the high pastures by amchis as well as in the yard of the THCC.

A high level of awareness has been raised through the inclusion of amchis in the ecological monitoring of medicinal plants, discussing the issue of the sustainable collection of medicinal plants for the
The THCC, and conducting a Rapid Vulnerability Assessment of the species most necessary for the THCC.

The THCC is a new institution registered as an independent NGO under the framework of the Buffer Zone User Committee. The amchis who previously lacked visibility and recognition as a group are now a constituted group who can officially engage in negotiations with the Park and who can be considered as a partner for joint management of resources. The link with Medicinal Plants Management Committees is crucial as the latter constitute an intermediate body between a small group of specialists and the bulk of lay people in villages. Ensuring the transfer of knowledge by the amchis to the members of MPMCs is also a way of preserving knowledge.

**Setting up of Medicinal Plants Management Committees (MPMCs)**

Medicinal Plants Management Committees (Fig 4) are new institutions based at the village level constituted of different stakeholders including amchis, women, customary village representatives, VDC representatives and park staff. Knowledge regarding medicinal plants status is transferred to MPMCs by amchis and the project staff though field training. Their role is to gain insight of amounts and harvesting techniques used both by amchis and lay people and conduct field surveys in order to inform both the THCC and the Park on the status of conservation of the resource.

In addition to building the capacity of amchis, it appears that there is a need for transferring knowledge from the amchis as well as from the experience gained by the project to a body that has the capacity to monitor resources on the long run. They should in turn give feedback both to the THCC and to the Park relating to the practical issues of what to harvest, when and where. To date this project has formed only one MPMC in the pilot village of Pungmo in Phoksumdo VDC. MPMCs should be formed and trained by the project and the THCCs in the different areas of the project (i.e. Dho VDC where a second THCC has been planned and Kaigaon and Pahada VDCs located in the southern buffer zone area of the park). The sustainability of operation of MPMCs will lie in the capacity of the THCCs to raise funds not only to run the THCCs but also to provide economic incentive for MPMC members to continue their work. Ensuring the sustainability of the THCCs will require much attention during the second phase of this project.

**Rapid vulnerability assessment**

Assessment of the vulnerability to harvesting of medicinal plants used by the THCC was conducted by adapting the method of ‘Rapid Vulnerability Approach’ developed for Uganda by Cunningham (1996, 2001). This approach aims to identify plants that are vulnerable to over-exploitation through a relatively rapid ‘filtering’ system based on some indicators (often approximations) of the plants’ ecology, parts used, local and trade demand and geographical distribution in published sources as well as using the knowledge of local resource users. A number of useful predictors of resilience or vulnerability to harvesting exist. Those finally chosen for this study were:

![Figure 4](image-url)

Medicinal plant management committee (MPMC) and its relation with other institutions.
rarity of a species, which is determined by combinations of geographic distribution, habitat specificity and local population size (Rabinowitz et al. 1986); life form (e.g., tree or annual); user group (specialist users vs. large scale trade); single vs. multiple uses; and parts used (e.g., whole plant vs. leaves), amongst others.

Susanne Schmitt and Giri Tripathi who conducted this survey focused their work on the local knowledge of the amchis about the use, distribution, rarity and amount used of MAPs. This knowledge was further tested through cross-checking of the information with the project botanist and by using different exercises and questions. This contributed, in particular, to short-listing the potentially vulnerable species. Field test and surveys (belt transect and productivity surveys) were then conducted for those species found to be most vulnerable.

This survey generally points out that the very small amounts used by the amchis and by the THCC should not pose any major problem of sustainability. However, it is important that species found potentially vulnerable are constantly monitored as they may be

<table>
<thead>
<tr>
<th>Botanical names</th>
<th>Amchi names</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dactylorhiza hatagirea (D. Don) Soó</td>
<td>Wanglak</td>
<td>22</td>
</tr>
<tr>
<td>Arnebia benthamii (Wall. ex G. Don) I.M. Johnst.</td>
<td>Dimok</td>
<td>21</td>
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<tr>
<td>Dracocephalum aff tanguticum Maxim.</td>
<td>Tiyangku</td>
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</tr>
<tr>
<td>Nardostachys grandiflora DC</td>
<td>Pangpoe</td>
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</tr>
<tr>
<td>Incarvillea mairei (H. Lev.) Grierson</td>
<td>Ukchoe marpo</td>
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<tr>
<td>Corydalis megacalyx Ludlow</td>
<td>Tongzil serpo</td>
<td>18</td>
</tr>
<tr>
<td>Corydalis cashmeriana Royle</td>
<td>Tongrizilba</td>
<td>17</td>
</tr>
<tr>
<td>Delphinium brunonianum Royle</td>
<td>Jagopoe</td>
<td>17</td>
</tr>
<tr>
<td>Neopicrorhiza scrophulariiflora (Pennell) H ong</td>
<td>Honglen</td>
<td>17</td>
</tr>
<tr>
<td>Rheum austral D. Don</td>
<td>Chutsa</td>
<td>17</td>
</tr>
<tr>
<td>Soroseris hookeriana (C. B. Clarke) Stebb.</td>
<td>Solgongpa</td>
<td>17</td>
</tr>
<tr>
<td>Mecanopsis horridula Hook. f. &amp; Thoms.</td>
<td>Ajak tserngon</td>
<td>16</td>
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<tr>
<td>Aconitum spicatum (Brühl) Stapf</td>
<td>Bonga nakpo</td>
<td>15</td>
</tr>
<tr>
<td>Corallodiscus lanuginosus (Wall.exD.C.) Burtt</td>
<td>Dakyhawo</td>
<td>15</td>
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<tr>
<td>Fritillaria cirrhosa D. Don</td>
<td>Gha</td>
<td>15</td>
</tr>
<tr>
<td>Gentiana robusta King ex Hook f.</td>
<td>Kyiche karpoo</td>
<td>15</td>
</tr>
<tr>
<td>Lagotis kunawurensis (Royle ex Benth.) R upr.</td>
<td>Bashaka</td>
<td>15</td>
</tr>
<tr>
<td>Podophyllum hexandrum Royle</td>
<td>Wolmose</td>
<td>15</td>
</tr>
<tr>
<td>Megacarpaea polyantra Benth.</td>
<td>Bagan</td>
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</tr>
<tr>
<td>Mecanopsis grandis Prain</td>
<td>Upal ngonpo</td>
<td>13</td>
</tr>
<tr>
<td>Primula buryana Balf. f.</td>
<td>Shangdril karpoo</td>
<td>13</td>
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<tr>
<td>Delphinium caeruleum Jacquem. ex Cambess.</td>
<td>Metog jakang</td>
<td>12</td>
</tr>
<tr>
<td>H alenia elliptica D. Don</td>
<td>Chak tig</td>
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</tr>
<tr>
<td>Gentianopsis paludosa var. paludosa (Wall.) M ez.</td>
<td>Upal</td>
<td>11</td>
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</tbody>
</table>
sensitive to trends of collection due to factors as yet unknown.

Out of 136 species absolutely needed by the clinic, 24 species were found to be potentially vulnerable. The result of the scoring shows that there are varying levels of vulnerability ranging from a score of 22 for Dactylorhiza hatagirea to that of 11 for Gentianopsis paludosa var. paludosa (Table 3). This system of scoring is very important as it will serve as a major guide for establishing priorities for monitoring plants used by the THCC.

It is important to note that although this work considers the amount used by the amchis as well as parts used and life form, the precise harvesting patterns needs to be further understood for each species in order to establish sustainable harvesting practices. Optimal amounts that may be harvested will also depend on regeneration pattern and growth rate which are little known to date. Long term monitoring by MPMCs should concentrate on these two particular aspects.

Guidelines for sustainable use

- Improved harvesting patterns need to consider a very large number of criteria. However, a few rules of the thumb have been formulated, especially relating to biological characteristics and technical harvesting practices. Some guidelines to the sustainable use of medicinal plants in Dolpo are as follows:
  - In the absence of thorough knowledge on all plant species, the principle of precaution should be adopted i.e. amounts harvested and parts harvested should be the least detrimental to the plants capacity to reproduce.
  - Sustainable amounts may be determined on the basis of the size of the plant's population, its population dynamics and reproductive biology.
  - Some plants may be rare in some areas and abundant in others. Care should be taken not to collect in areas where the plant is rare.
  - Use of substitutes for vulnerable species should be promoted if they are known to be safe and have a good level of activity.
  - It is not sustainable to harvest all the plants of a same population. Small amounts of different populations should be harvested.
  - For perennial herbs, collection of whole plants, roots or rhizomes are destructive unless a very small proportion is collected from one sub-population. This proportion should be estimated on the basis of the growth rate and age of plants collected, population dynamics and size of the plant population. Care should be taken to collect only some parts of the roots or rhizome in order to allow the plant to recover. A good knowledge of the plant's morphology is thus needed to decide which parts may be collected without affecting the plant's ability to regenerate.
  - For monocarpic species, care should be taken not to collect flowers before the plant has set seeds and to collect only a small proportion of flowers. A good alternative is the collection of leaves as it delays the production of flowers but does not kill the plant. Collection of roots is highly destructive and the proportion of plants that may be uprooted will depend on the size of the population.
  - For annual herbs, it is more sustainable to collect whole plants once the plants have set seeds. However if very abundant, not endemic nor growing in highly specific environment, relatively large amounts may be collected. Collection of fruits and seeds should leave a large proportion of seeds to allow the population to recover. This relates to the reproductive biology of the plant, which needs to be known to some extent before engaging in any large scale collection.
  - For trees, shrubs and perennial climbers, collection of large amounts of roots and bark is unsustainable. Collection of some proportion of leaves, flowers and seeds may be sustainable if care is taken to leave 'material' for the plant to reproduce.
Part III

Medicinal Plants of Dolpo:
Some Highly Potential Species
Introduction

Among the 407 species recorded so far from SPNP and its buffer zone, a total of 100 medicinal plants have been selected for detailed description in this book. The medicinal plants described here have been selected from a list provided by the amchis of Dolpo. These plants comprise a major part of the materia medica of the amchis. Although the list of locally available plants important to the amchis exceeded a hundred, we have selected only a hundred to reduce the size and cost of this publication. Cultivated plants regardless of their importance and exotic and invasive species have been omitted. Cordyceps sinensis and Lycoperdon cf. perlatum, although fungi, have been included because they are locally considered as medicinal plants. The list also includes endemic species and species that are important from a conservation perspective.

The plant species are arranged alphabetically according to their scientific names. Vernacular names are given as amchi (Am), Kham (Km), Nepali (Np) and Dolpal Nepali (Dn) – local dialect of Nepali used in Lower Dolpo. Besides these, the Sanskrit (Sn) name is also given as far as possible. The aspects on geographical distribution and diagnostic characters are based on Grierson and Long (1983, 1984, 1987, 1991), Iwatsuki (1988), Sharma et al. (1993), Noltie (1994), Polunin and Stainton (1984), Shrestha and Joshi (1996), Stainton (1988), Zheng-Yi and Raven (1999) and Press et al. (2000). Information on chief constituents is mainly based on CSIR (1948-1976, 1985, 1986, 1988, 2000).

Occurrence of medicinal plants is described under three categories based on local perception of habitat specificity/rarity: rare (nyung), common (ding) and abundant (yongzok). Aspects on parts used, taste, potency, use, toxicity, mode of use and harvesting for each species are mainly based on information given by amchis. Selected categories have been translated into Tibetan for the benefit of amchis. The taste and potency refers to the classification of medicine according to the Tibetan medical system. The translation of diseases into English attempts to indicate the types of diseases that are recognized and treated by the amchis, and are not to be equated with bio-medical definitions. All uses relate to the use of the plant by amchis as part of a mixture with other herbs and medical substances. One should therefore not expect this plant to cure the diseases highlighted here, unless mixed with other substances and prepared according to the formulas used by the amchis.

National status of a particular species represents either endemics or official conservation or threat designations assigned under CITES Appendices, IUCN threat categories and HMG Nepali protection (Forest Act 1993). Regarding local conservation status, plants are termed as highly vulnerable, vulnerable or not vulnerable. Vulnerability is defined in relation to the species' biological characteristics such as distribution, population size, as well as socio-economic characteristics such as amounts used, parts collected etc., following a concept developed by Cunningham (2001). Vulnerability of plants used by amchis in Lower Dolpo has been assessed within the context of the project by Tripathi and Schmitt (Ghimire et al. 2001). The section entitled major documentation relate to major texts/references in English or Tibetan where the same plant species or a related species is cited either in relation to medicinal use, chief chemical constituents or to conservation.
**Aconitum naviculare** (Brühl) Stapf
*Aconitum ferox* Wall. ex Ser. var. *navicularis* Brühl

**Family**: Ranunculaceae

**Vernacular names**: Bongkar, Bongnga karpo (Am).

**Habitat & distribution**: Rocky slopes, Juniper scrub; 4200-4900 m, WC Nepal. Distributed in the Himalaya (Nepal to Bhutan). Locally found in Dho, Tsharkha and Saldang areas.

**Diagnostic characters**: Small perennial herb, with tuberous roots. Leaves mostly basal, rounded-kidney-shaped, palmately divided into 3-5 segments. Flowers 1-4, in slender pedicels, reddish blue, with darker veins, spur globose. Follicles hairy surrounded by persistent sepals.

**Occurrence**: Rare.

**Flowering & fruiting**: Jul.-Oct.

**Parts used**: Root tubers, leaves, stems and flowers.

**Taste/Potency**: Bitter (*kha*)/Cool (*sil*).

**Use**: Poisoning, fever due to poisoning, bile fever and infections.

**Toxicity**: Slightly poisonous; detoxified before use.

**Mode of use**: Used with other herbs.

**Harvesting**: Tubers are harvested during Sep.-Oct.; and leaves, stems and flowers are harvested during Jul.-Aug.

**National status**: Threat not known.

**Local status**: Vulnerable. Threat is due to its rare occurrence with restricted distribution and harvesting of whole plant for medicine.

Aconitum spicatum (Brühl) Stapf
Aconitum ferox Wall. ex Ser. var. spicata Brühl

Family: Ranunculaceae
Vernacular names: Bongnga nagpo, Bongnak (Am); Tsendug, Dug (Km); Bikh (Dn, Np).
Common name: Nepal aconite.

Habitat & distribution: Open and damp places, forests, scrubland, meadows; 3300-4300 m, WCE Nepal. Distributed in the Himalaya (Nepal to Bhutan), China. Locally found in Jagdulla, Kagmara, Dokpa, Ringmo, Pungmo areas.

Diagnostic characters: Perennial herb, with paired tuberous roots and erect stems to 2 m. Leaves deeply lobed; lobes ovate, further cut into toothed or pointed segments. Flowers dark blue, violet or white, tinged with purple, in a dense terminal spike; spur recurved. Follicles hairy.

Occurrence: Common.
Parts used: Root tubers.
Taste/Potency: Sweet (ngar)/Warm (dro).
Use: Cough, bile fever, lung and intestine infection, headache, cuts and wounds.
Toxicity: Tubers are highly poisonous. It is detoxified by boiling with the extract of aru (Terminalia chebula Retz.).

Mode of use: Used with other herbs.

Chief constituents: Tubers contain alkaloids such as pseudoaconitine and bikhaconitine.

Harvesting: Tubers are harvested during Sep.-Oct.

National status: Commercially threatened (IUCN). Tubers are exported as crude drug.

Local status: Vulnerable. Threat is due to harvesting for trade.

**Family** : Labiatae  

**Vernacular names** : Zintig (Am), Khangsu metog (Km).  

**Common name** : Bugleweed.  

**Habitat & distribution** : Open slopes; 2200-4500 m, WC Nepal. Distributed in Nepal, NE India, China. Locally found in Jagdulla, Pungmo, Ringmo, Dokpa and Dho areas.  

**Diagnostic characters** : Erect or spreading, hairy perennial herb. Leaves ob lanceolate to obovate, toothed, hairy. Flowers white, 2-lipped, in whorls forming dense, spike-like clusters, with ovate to elliptic, toothed, densely over-lapping pale yellow or blue bracts spreading much beyond the flowers.  

**Occurrence** : Abundant.  

**Flowering & fruiting** : Jun.-Aug. (fl).  

**Parts used** : Leaves, flowers & seeds.  

**Taste/Potency** : Bitter (kha)/Cool (sil).  

**Use** : Skin problems, fever, sinusitis, menstrual disorders, epilepsy, swelling and infection.  

**Toxicity** : Non-toxic.  

**Mode of use** : Used with other herbs.  

**Harvesting** : Plant parts are harvested during Jul.-Aug.  

**National status** : Threat not known.  

**Local status** : Not vulnerable. Abundantly found and collected only by amchis.  

**Major documentation** : Chophel (1993).
**Family** : Amaryllidaceae

**Vernacular names** : Lunggok (Am), Rungmar, Gokpa, Dangsong gokpa, Rukpa, Jimril (Km); Jangalilasun, Kagelasun, Lasune sag (Dn).

**Habitat & distribution** : Stony slopes; 3300-5100 m, WC Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Nepal), C. Asia. Locally found in Pungmo, Ringmo, Dokpa, Bijer, Saldang areas.

**Diagnostic characters** : Stout, bulbous onion like herb. Bulbs large, oblong-cylindric, covered with conspicuous leathery scales. Leaves several, broad, flat, blunt, glaucous. Flowers pink, cylindrical, in dense globular umbel, borne on stout stem; petals shorter than stamens.

**Occurrence** : Common.

**Flowering & fruiting** : Jul.-Aug. (fl).

**Parts used** : Bulbs & leaves.

**Taste/Potency** : Sweet (ngar) & acrid (tsa)/Warm (dro).

**Use** : Digestive, stimulant and tonic; used in wind diseases, toothache, earache and headache. Plant is also eaten as vegetable or as spice.

**Toxicity** : Non-toxic.

**Mode of use** : Used with other herbs.

**Harvesting** : Leaves are harvested during Jul.-Aug. and bulbs during Oct.-Nov.

**National status** : Threat not known.

**Local status** : Vulnerable. Threat is due to over harvesting for local use as spice.

Family: Compositae
Vernacular names: Tayung (Am); Pang tsampaka, Suka tayung, Ngo pangtsi dho wo, Champa metog (Km); Ruk jhulo (Dn); Buki phul (Np).

Habitat & distribution: Open slopes, rocky areas; 3400-5500 m, WCE Nepal. Distributed in the Himalaya, S China, Taiwan. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo and Dho areas.

Diagnostic characters: Dwarf usually tufted, woolly-haired perennial herb. Leaves narrow-lanceolate, white-woolly. Flowers in heads; heads solitary or few, borne on an erect stem; involucral bracts white, acute, spreading; disk-florets yellow.

Occurrence: Abundant.
Flowering & fruiting: Jun.-Sep.
Parts used: Flowers, leaves & stems.
Taste/Potency: Bitter (kha)/Neutral (nyom).
Use: Fever, chest pain and inner bleeding. Also used in heat therapy, moxibustion. Plant is also offered during religious ceremonies.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Plant parts are harvested during Aug.-Sep.
National status: Threat not known.
Local status: Not vulnerable. Abundantly found and collected only by amchis.
Androsace strigillosa Franch.

**Family** : Primulaceae

**Vernacular names** : Gatiknakpo, Gatik chungwa (Am), Metok jaikang (Km).

**Habitat & distribution** : Forest edge, shrub-beries, open slopes; 2400-4700 m, WC Nepal. Distributed in the Himalaya (Nepal to Bhutan). Locally found in Tshepka, Pungmo, Ringmo, Dokpa, Dho areas.

**Diagnostic characters** : Erect, tufted herb with branched rootstock. Leaves elliptic, stalked, in whorls, size variable. Flowers white or pink, in a lax umbel borne on elongated, slender stalks.

**Occurrence** : Abundant.

**Flowering & fruiting** : May-Jul. (fl).

**Parts used** : Flowers & leaves.

**Taste/Potency** : Bitter (*kha*)/Cool (*sil*).

**Use** : Fever, lymph fluid disorders and body swellings.

**Toxicity** : Non-toxic.

**Mode of use** : Used with other herbs.

**Harvesting** : Flowers and leaves are harvested during Aug.-Sep.

**National status** : Threat not known.

**Local status** : Not vulnerable. Abundantly found and collected only by amchis.

**Anemone rivularis** Buch.-Ham. ex DC.  

**Family**: Ranunculaceae  
**Vernacular names**: Subka (Am), Subka karpo, Dumbu metok Km); Kangrate, Kangresjhar (Np).

**Habitat & distribution**: Streamsides, cultivated fields, shrubberies, meadows; 1600-4000 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Nepal), China, Myanmar, Sri Lanka. Locally found throughout the Suligad, Jagdulla and Thuli Bheri valleys.

**Diagnostic characters**: Perennial herb, with woody rootstock. Leaves ternate; leaflets broadly elliptic or rhombic, further cut and toothed, silky-haired. Involucre segments narrowly linear. Flowers white, long stalked, borne terminally. Achenes elliptic, hairless; styles hooked.

**Occurrence**: Abundant.

**Flowering & fruiting**: May-Aug. (fl), Jul.-Sep. (fr).

**Parts used**: Fruits & seeds.

**Taste/Potency**: Bitter (kha) & acrid (tsa)/Warm (dro).

**Use**: Liver and bile disorders, indigestion, cough, cold and fever; generates digestive heat and dries lymph fluid.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Chief constituents**: Plant contains betulinic acid, saponins (rivularinin and anemonin).

**Harvesting**: Fruits and seeds are harvested during Sep.-Oct.

**National status**: Threat not known.

**Local status**: Not vulnerable. Abundantly found and collected only by amchis.

**Arctium lappa L.**

**Family**: Compositae

**Vernacular names**: Jisung (Am); Shiking naro, Km); Kurro, Tine (Dn, Np).

**Common names**: Common or Great burdock.

**Habitat & distribution**: Shrubberies, open slopes, forest clearings; 2000-4000 m, WC Nepal. Distributed throughout Eurasia. Locally found in Mukroman, Jagdulla, Phoksundo areas.

**Diagnostic characters**: Erect biennial herb, to 1.2 m high. Leaves ovate-cordate, margins undulate, cottony beneath. Flower-heads globose, in terminal clusters, involucral bracts with rigid awl-like barbed tips. Corolla and stamens purple-pink.

**Occurrence**: Common.

**Flowering & fruiting**: Jun.-Aug. (fl).

**Parts used**: Whole plant.

**Taste/Potency**: Hot (tsa) & astringent (ka)/ Warm (dro).

**Use**: Channel disorders and wind fever. Plant paste is used for blisters, burns, ulcers, pimples, etc. Seeds are digestive and used for gall and kidney stones.

**Mode of use**: Used with other herbs.

**Chief constituents**: Roots contain inulin, tannins, volatile oil. Fruits contain arctiin, arctigenin.

**Harvesting**: Fruits and seeds are harvested during Sep.-Oct.

**National status**: Threat not known.

**Local status**: Not vulnerable.

Commonly found and collected only by amchis.

**Family**
Araceae

**Vernacular names**
Dhawa, Dhayung, Dhawa dhabma dhunchen (Am); Dhowa, Dhagot, Tangso, Talo (Km); Chara banko (Dn), Bir banko, Sarpako makai, Tinchu (Np).

**Common name**
Arisaema.

**Habitat & distribution**
Open places, rocky slopes, cultivated land; 1800-4500 m, WCE Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Bhutan), W China. Locally found in Pungmo, Ringmo, Jagdulla, Mukroman, Kaigaon, Pahada areas.

**Diagnostic characters**
Monoecious tuberous herb. Leaves 1-2, pedate, with 5-11 oblong-lanceolate, pointed leaflets. Flowers in very short, ellipsoid, greenish or yellowish spadix; spathe very small, yellowish.

**Occurrence**
Abundant.

**Flowering & fruiting**

**Parts used**
Root tubers & flowers.

**Taste/Potency**
Hot (tsa)/Warm (dro).

**Use**
Tubers are used in worm infestation, stomach pain, scabies, swelling, and bone disease. Flowers are used in disorders of the uterus and menstrual disorders. Tubers are eaten as vegetable.

**Toxicity**
Slightly toxic; used after detoxification.

**Mode of use**
Used with other herbs.

**Chief constituents**
Tubers contain starch, crystals of calcium oxalate.

**Harvesting**
Tubers are harvested during Sep.- Oct.

**National status**
Threat not known.

**Local status**
Not vulnerable. Abundantly found. Low threat.

**Major documentation**
Arisaema jacquemontii Blume

Family : Araceae
Vernacular names : Dhawa, Dhowa (Am, Km); Dolo (Km); Male banko (Dn), Banko (Np).

Habitat & distribution : Open places, forest clearing; 2700-4000 m, WCE Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Bhutan), NE India, China. Locally found in Pungmo, Ringmo, Pahada, Kaigaon, Dokpa, Jagdulla areas.

Diagnostic characters : Dioecious, tuberous herb. Leaves digitate, with 5-9 narrow-elliptic to ovate long-pointed leaflets. Spathe green, sometimes white-striped, with a long up-curved, tail-like tip; spadix short, projected forwards only a short distance from the mouth.

Occurrence : Abundant.


Parts used : Root tubers.

Taste/Potency : Hot (tsa)/Warm (dro).

Use : Worm infestation, chest infection, stomach pain, toothache, rheumatism, and menstrual disorders. Tubers are eaten as vegetable.

Toxicity : Slightly toxic; used after detoxification.

Mode of use : Used with other herbs.

Chief constituents : Tubers contain starch, crystals of calcium oxalate. Plant also contains ariseminone.

Harvesting : Tubers are harvested during Sep.-Oct.

National status : Threat not known.

Local status : Not vulnerable. Abundantly found and eaten as vegetable.

**Arnebia benthamii** (Wall. ex G. Don) I.M. Johnst.

*Echium benthamii* Wall. ex G. Don, *Macrotomia benthamii* (Wall.) A. DC.

**Family**
- Boraginaceae

**Vernacular names**
- Dimok (Am); Koma, Muktsi (Km); Maharangi (Dn, Np).

**Habitat & distribution**
- Dry open slopes; 2800-4300 m, W Nepal. Distributed in the Himalaya (Kashmir to Nepal). Locally found in Jagdulla, Dokpa and Phoksundo areas.

**Diagnostic characters**
- Hairy perennial herb with stout rootstock covered with bases of old leaves. Leaves linear to narrow-lanceolate, bristly hairy. Flowers red-purple in a dense hairy cylindrical spike, with much longer, linear, grey, hairy drooping bracts, borne on stout leafy stem.

**Occurrence**
- Rare.

**Flowering & fruiting**
- May-Jul. (fl).

**Parts used**
- Rootstocks.

**Taste/Potency**
- Sweet (*ngar*) & bitter (*kha*)/ Cool (*sil*).

**Use**
- Blood disorders, high blood pressure, fever, lung diseases, cough, bodyache and earache. Extract of rootstocks is applied mixed with hair oil to cure dandruff. Rootstocks yield purple dye for colouring wool.

**Toxicity**
- Non-toxic.

**Mode of use**
- Used singly or with other herbs.

**Chief constituents**
- Plant contains essential oil and root yields a purple dye.

**Harvesting**
- Rootstocks are harvested during Nov.-Dec.

**National status**
- Threat not known.

**Local status**
- Highly vulnerable. Very rare with restricted distribution. Threat is high due to overharvesting for local use as dye.

**Major documentation**
Family: Liliaceae

Vernacular names: Nye shing (Am); Gaja tugtug, Rapuk (Km); Ban kurilo, Satawari (Dn, Np).

Common name: Wild asparagus.

Habitat & distribution: Forests, shrubberies; 2100-3000 m, WC Nepal. Distributed in the Himalaya (Kashmir to Arunachal Pradesh), NE India, Myanmar, China, Indo-China, Thailand. Locally found in Suligad and Jagdulla valley (2200-3400m).

Diagnostic characters: Erect perennial, or twiner without spines and with tuberous roots. Cladodes flat, curved in clusters of 2-6. Flowers white or greenish to reddish-green, solitary or paired, on slender stalks in axils of cladode whorls. Berry black, globose.

Occurrence: Common.


Parts used: Root tubers.

Taste/Potency: Sweet (ngar) & bitter (kha). Warm (dro).

Use: Lactation, weakness, excessive menstrual bleeding, nasal bleeding, diarrhoea, dysentery, and skin diseases. Also used as diuretic, tonic, and detergent to wash hair and wounds.

Toxicity: Non-toxic.

Mode of use: Used singly or with other herbs.

Chief constituents: Tubers contain mucilage and furostanosides (filicinoside-A & B).

Harvesting: Tubers are harvested selectively from mature plants during Oct.-Nov.

National status: Threat not known.

Local status: Not vulnerable. Commonly found and collected mostly by amchis.

Family: Compositae
Vernacular names: Metog lugmig (Am); Ming-chen serpo (Km); Kheldar (Dn), Ankhe phul (Np).

Habitat & distribution: Open slopes, meadows; 3200-4900 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), W China. Locally found in Jagdulla, Kagmara, Pungmo, Ringmo, Dho areas.

Diagnostic characters: Robust shaggy-haired perennial herb. Leaves oblanceolate to linear-lanceolate, entire, narrowed to the base. Flower-heads large, solitary; ray florets bluish to lilac, spreading or reflexed, obscurely 3-toothed; disk-florets at first blackish then orange; involucral bracts leafy, lanceolate.

Occurrence: Common.
Flowering & fruiting: Jul.-Sep.
Parts used: Leaves, stems & flowers.
Taste/Potency: Bitter (kha)/Cool (sil).
Use: Back pain, chest pain, paralysis, poisoning, fever, wounds and sores. Plant is also used to join nerves.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Plant parts are harvested selectively from mature plant during Aug.-Sep.
National status: Threat not known.
Local status: Not vulnerable. Commonly found and collected only by amchis.

Aster diplostephioides (DC.) C.B. Clarke
Heterochaeta diplostephioides DC.
Family: Compositae

Vernacular names: Metog lug-mig, Metog lugmig dol ñgon tongkhor (Am); Metog lugmig (Km).

Habitat & distribution: Rocks, open slopes; 2900-4700 m, WCE Nepal. Distributed in the Himalaya (Kulu to Bhutan). Locally found in Pungmo, Kagmara and Jagdulla areas.

Diagnostic characters: Dwarf perennial herb with creeping stems. Leaves mostly basal, obovate-spathulate, toothed. Flower-heads lilac, solitary borne on almost leafless flowering stems.

Occurrence: Common.

Flowering & fruiting: Jul.-Sep.

Parts used: Leaves & flowers.

Taste/Potency: Bitter (kha)/Cool (sil).

Use: Used in wounds, poisoning, contagious fever and headache.

Toxicity: Non-toxic.

Mode of use: Used with other herbs.

Harvesting: Plant parts are harvested selectively from mature plant during Aug.-Sep.

National status: Threat not known.

Local status: Not vulnerable. Commonly found and collected only by amchis.
Family: Berberidaceae
Vernacular names: Kyewa (Am); Duktser (Km); Chotto (Dn); Chutro (Np); Daru-haridra (Sn).
Common names: Berberry, Nepal berberry.

Habitat & distribution: Shrubberies, rocky slopes; 1800-3500 m, WCE Nepal. Distributed in the Himalaya (Himachal Pradesh to Bhutan). Locally found in Suligad and Jagdulla valleys (2500-3800 m).

Diagnostic characters: Shrub, 1-3 m tall, with or without spines. Leaves sub-sessile, ovate to elliptic, clustered, entire or toothed near apex. Flowers yellow, in drooping racemes. Fruits ovoid, blue-purple or red.

Occurrence: Common.
Parts used: Leaves, flowers, fruits & bark.
Taste/Potency: Sour (kyur) & bitter (kha)/Cool (sil) & coarse (tsub).
Use: Eye disease, bile disorders, lymph disorder, swelling and dysentery. Flowers and fruits are eaten raw. Fruits are substituted for kyuru (Phyllanthus emblica L.).
Toxicity: Non-toxic to slightly toxic.
Mode of use: Used singly (in eye diseases) or mixed with other herbs.

Chief constituents: Root bark contains alkaloid, berberine.

Harvesting: Plant parts are harvested from the mature plant during May-Sep.

National status: Threat not known. It is traded from the country. It is one of the chief sources of the drug (rasaut) sold in the Indian market.

Local status: Not vulnerable.

**Family** : Saxifragaceae  
**Vernacular names** : Gadhur (Am); Gatik mukpo (Km); Simtadi, Salipat (Dn); Pakhanved (Np); Pashanaveda (Sn).  
**Common name** : Rockfoil.  

**Habitat & distribution** : Moist rock ledges, shady place; 900-3600 m, WC Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Bhutan), China, NE India. Locally found in Jagdulla, Suligod and Thuli Bheri Valleys from 2000-3200m.  

**Diagnostic characters** : Perennial herb with thick, stout, creeping rootstocks or rhizomes. Leaves rosetted, short-petioled, orbicular or obovate, with bristle margin. Flowers white, pink or purple, borne in a spreading or dense terminal clusters. Capsules round.  

**Occurrence** : Common.  
**Flowering & fruiting** : Mar.-Jun. (fl).  
**Parts used** : Whole plant & rootstocks.  
**Taste/Potency** : Acrid (tsa) & Astringent (ka)/Cool (sii).  
**Use** : Vomiting, diarrhoea and dysentery, indigestion, bile and liver disorders.  
**Toxicity** : Non-toxic.  
**Mode of use** : Used with other herbs.  

**Chief constituents** : Rootstocks contain wax, gallic acid, tannin, bergenin and mucilage.  
**Harvesting** : Rootstocks are harvested selectively from mature plant during Oct.-Nov.  
**National status** : Commercially threatened (IUCN).  
**Local status** : Not vulnerable. Commonly found, occasionally traded and mostly used by amchis.  
**Bistorta affinis** (D. Don) Greene  
*Polygonum affine* D. Don

**Family**: Polygonaceae  
**Vernacular names**: Pangram, Rambu (Am); Rambu (Km); Myakuri (Dn).

**Habitat & distribution**: Open slopes, rocks, screes; 3000-4800 m, WCE Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Nepal), China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo, Saldang, Dho areas.

**Diagnostic characters**: Tufted mat forming perennial herb, with prostrate woody rootstock; flowering stem erect. Leaves mostly basal, elliptic-lanceolate, entire or finely toothed, glaucous beneath. Flowers bright red, in a dense raceme.

**Occurrence**: Abundant.

**Flowering & fruiting**: Jun.-Sep.

**Parts used**: Roots, leaves, flowers & fruits.

**Taste/Potency**: Sweet (*ngar*) & astringent (*ka*)/Warm (*dro*).

**Use**: Diarrhoea and dysentery; and for increasing blood. Roots edible raw. Flowers are offered in monasteries during religious functions.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Plant parts are collected during Sep.-Oct.

**National status**: Threat not known.

**Local status**: Not vulnerable. Abundantly found and collected mostly by amchis.

**Major documentation**: Chophel (1993).

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**Family**: Polygonaceae  
**Vernacular names**: Pangram, Rambu (Am); Rambu (Km); Myakuri (Dn).

**Habitat & distribution**: Open slopes, rocks, screes; 3000-4800 m, WCE Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Nepal), China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo, Saldang, Dho areas.

**Diagnostic characters**: Tufted mat forming perennial herb, with prostrate woody rootstock; flowering stem erect. Leaves mostly basal, elliptic-lanceolate, entire or finely toothed, glaucous beneath. Flowers bright red, in a dense raceme.

**Occurrence**: Abundant.

**Flowering & fruiting**: Jun.-Sep.

**Parts used**: Roots, leaves, flowers & fruits.

**Taste/Potency**: Sweet (*ngar*) & astringent (*ka*)/Warm (*dro*).

**Use**: Diarrhoea and dysentery; and for increasing blood. Roots edible raw. Flowers are offered in monasteries during religious functions.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Plant parts are collected during Sep.-Oct.

**National status**: Threat not known.

**Local status**: Not vulnerable. Abundantly found and collected mostly by amchis.

**Major documentation**: Chophel (1993).
**Bistorta macrophylla** (D. Don) Sojak

*Polygonum macrophyllum* D. Don

**Family**
- Polygonaceae

**Vernacular names**
- Monbu, Lakang (Am);
- Monluk lakang (Km);
- Myakuri (Dn).

**Habitat & distribution**
- Meadows; 2700-4500 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan), NE India, W & C China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo, Dho, Bijer areas.

**Diagnostic characters**
- Small, perennial herb, with thick fibrous rootstocks. Lower leaves ovate-lanceolate or linear, long-stalked; upper leaves lanceolate or linear, sessile. Flowers pink or red grouped in rounded or oval terminal raceme, borne on a slender erect, nearly leafless stem.

**Occurrence**
- Abundant.

**Flowering & fruiting**
- May-Sep.

**Parts used**
- Roots & fruits.

**Taste/Potency**
- Sweet (ngar) & astringent (ka)/Neutral (nyom).

**Use**
- Roots are used for wind, lung and intestinal disorders; diarrhoea, dysentery and to increase blood. Fruits are also used for diarrhoea and to increase blood. Roots are eaten.

**Toxicity**
- Non-toxic.

**Mode of use**
- Used with other herbs.

**Harvesting**
- Roots and fruits are harvested during Sep.-Oct.

**National status**
- Threat not known.

**Local status**
- Not vulnerable.

**Major documentation**
**Family** : Leguminosae

**Vernacular names** : Zomoshing, Ji tser (Am); Thaling (Km).

**Habitat & distribution** : Open dry slopes; 3000-4200 m, WC Nepal. Distributed in the Himalaya (Uttar Pradesh, Nepal). Locally found in Pungmo, Ringmo, Dho, Saldang, Bijer, Shey, Tsharkha areas.

**Diagnostic characters** : Densely branched, very spiny shrub to 1.5 m. Leaves pinnate; leaflets 8-12, downy, oblanceolate; stipules not spiny; spines 1-4 cm, formed from the rachis of old leaves. Flowers solitary, yellow, stalkless; calyx hairy. Pods with dense grey hairs.

**Occurrence** : Abundant.

**Flowering & fruiting** : May-Jul. (fl).

**Parts used** : Stem.

**Taste/Potency** : Astringent (ka)/Cool (sil).

**Use** : Skin diseases, cough, blood disorders, high blood pressure, heart pain, and eye disease. It is substituted for **tsenden karpo** (*Santalum album* L.). Flowers are eaten raw. It is also used as firewood.

**Toxicity** : Non-toxic.

**Mode of use** : Used with other herbs.

**Harvesting** : It is harvested during Oct.

**National status** : Threat not known.

**Local status** : Vulnerable. Threat is high, particularly in inner treeless areas (upper Dolpo) due to its harvesting for firewood. It is less threatened in lower Dolpo where it is collected mostly by amchis for medicine.

Family : Compositae
Vernacular names : Tsatri chok (Am); Metok ngon-po Gyakhur ngombo (Km); Doilu phul (Dn).

Habitat & distribution : Open slopes, rocks; 1300-4500 m, WCE Nepal. Distributed in N. Pakistan, Himalaya (Kashmir to Bhutan), Myanmar, China. Locally found in Pahada, Kaigaon, Jagdulla, Dokpa, Pungmo, Ringmo areas.

Diagnostic characters : Perennial herb, with woody rootstocks and branched prostrate or pendulous stems. Leaves pinnately lobed, lobes rounded, terminal lobe largest; lower leaves with a winged or smooth leaf-stalk. Flowers in heads, mauve to blue; heads often drooping.

Occurrence : Common.
Flowering & fruiting : Jul.-Sep.
Parts used : Leaves & flowers.
Taste/Potency : Bitter (kha) & sweet (ngar)/Cool (sil).
Use : Liver and bile disorder, fever due to poisoning.
Toxicity : Non-toxic.
Mode of use : Used with other herbs.

Harvesting : Plant parts are collected during Jul.-Sep.
National status : Threat not known.
Local status : Not vulnerable. Commonly found and collected only by amchis.

Cicerbita macrorhiza (Royle) Beauv.
Lactuca macrorhiza (Royle) Hook. f.
Family: Ranunculaceae
Vernacular name: Imong nag po (Am).

Habitat & distribution: Edge of fields, riversides, shrubberies; 1700-4000 m, WC Nepal. Distributed in the Himalaya (Uttar Pradesh, Nepal), China (Xizang). Locally found along the edge of Suligad and Bheri river, Khanigaon, Saldang, Dho areas.

Diagnostic characters: Large climbing shrub. Leaves pinnate, with 5-7 ovate to narrow-lanceolate, entire or deeply 2-5-fid leaflets. Flowers yellow to yellowish-green, flushed or spotted with rusty-brown outside, bell-shaped, axillary, solitary or 2-3 together; pedicels long.

Occurrence: Common.
Flowering & fruiting: Jul.-Sep.
Parts used: Leaves, stems & flowers.
Taste/Potency: Acrid (tsa) to slightly sweet (ngar)/Warm (dro).
Use: Cold tumours, cough and cold, indigestion, and joint pain.
Toxicity: Non-toxic.
Mode of use: Used singly or with other herbs.

Harvesting: Plant parts are collected during Aug.-Sep.
National status: Threat not known.
Local status: Not vulnerable. Commonly found and collected only by amchis.
Family: Campanulaceae
Vernacular names: Nyi ba (Am), Trikyi metok, Puldon-yen (Km).

Habitat & distribution: Agriculture fields, shrubberies; 2200-4200 m, WCE Nepal. Distributed in the Himalaya (Nepal to Bhutan), NE India, Myanmar, W. China. Locally found in Riyanchi, Pungmo, Ringmo, Jagdulla, Kaigaon and Pahada areas.

Diagnostic characters: Perennial twinning herb. Leaves ovate to broadly lanceolate, entire or toothed. Flowers large, blue, bell-shaped with reddish ring within. Capsule top-shaped with persistent calyx.

Occurrence: Abundant.
Parts used: Fruits & roots.
Taste/Potency: Sweet (ngar) & astringent (ka)/Neutral (nyom).

Use: Fruits are used to cure poisoning and fever. Roots are used for cough and cold, fever of the windpipe, diseases of the stomach, spleen, bones and loss of energy.

Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Plant parts are harvested during Sep.-Oct.
National status: Threat not known.
Local status: Not vulnerable. Abundantly found and collected by amchis.

Corallodiscus lanuginosus (Wall. ex DC.) Burtt
Didissandra lanuginosa (DC.) C. B. Clarke, Didymocarpus lanuginosus Wall. ex DC.

Family: Gesneriaceae
Vernacular name: Dakya habo (Am, Km).

Habitat & distribution: Rocks; 1000-3400 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan), NE India. Locally found in Suligad, Lower part of Phoksundo and Pahada areas.

Diagnostic characters: Small herb. Leaves basal, in rosette with ovate blade and toothed or entire margin. Flowers pale purple or white, tubular 2-lipped, long stalked, few in lax terminal cluster. Capsule cylindrical with persistent style.

Occurrence: Common.
Flowering & fruiting: Jul.- Sep.
Parts used: Whole plant.
Taste/Potency: Bitter (kha) & astringent (ka)/Cool (sil).

Use: Poisoning, diarrhoea, kidney problems, and wounds.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: It is harvested during Sep.-Oct.
National status: Threat not known.
Local status: Vulnerable. Threat is due to low availability and harvesting of whole plant for medicine.

Family: Clavicipitaceae.
Vernacular names: Yar tsa gun bu (Am); Bu (Km); Buti (Dn); Yarsagumba, Jivanbuti (Np).
Common names: Caterpillar fungus.

Habitat & distribution: Alpine meadows; 4500-5200 m, WCE Nepal. Distributed in the Himalaya, China. Locally found throughout the high alpine areas such as Dokpa, Jagdulla, Kagmara, Pungmo, Ringmo, Majhpal, Numlia, Bagala, Dho, Bijer, Saldang.

Diagnostic characters: Club-shaped parasitic fungus; later becomes saprophytic on insect larva after its death. It comes out of the anterior end of the larva of the caterpillar (swiftmoth) during the monsoon. Fructification dark-brown and stalk yellowish-white, 5-8 cm long.

Occurrence: Common.
Season of fructification: May-Jun.
Parts used: Fungus & insect larva.
Taste/Potency: Sweet (ngar)/Oily (num) & warm (dro).
Use: Tonic and aphrodisiac. Also used as tonic for yak and sheep.
Toxicity: Non-toxic.
Mode of use: Taken orally in combination with Dactylorhiza hatagirea (D. Don) Soó, honey and cow’s milk as tonic and aphrodisiac. It is also used singly.

Chief constituents: Plant contains cordycepic acid, cordycepin and adenosine.
Harvesting: Harvested during May-Jul.
National status: HMG Nepal protection 2 (banned for export in unprocessed form).
Local status: Not vulnerable. Locally collected for trade. Less threatened due to common occurrence.

Cordyceps sinensis (Berk.) Sacc.
Sphaeria sinensis Berk.
Corydalis cashmeriana Royle

Family: Papaveraceae
Vernacular names: Tongri zilpa, Tongzil (Am); Rekon ngonpo, Ye khi (Km).

Habitat & distribution: Alpine screes, open slopes; 2800-5500 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), China (Xizang). Locally found in Jagdulla, Dokpa, Mukroman, Kagmara, Pungmo areas.

Diagnostic characters: Slender perennial herb, with many unbranched stems, arising from a cluster of tuberous roots. Basal leaves ternate; leaflets 3-lobed; stem leaves one or two, smaller with narrow lobes. Flowers sky-blue, in a terminal cluster; spur slightly down curved.

Occurrence: Rare.
Flowering & fruiting: May-Aug. (fl).
Parts used: Whole plant.
Taste/Potency: Bitter (kha)/Cool (sil).
Use: Chronic fever, bile fever and burns. It is substituted for kapur (Cinnamomum camphora (L.) J.S. Presl.) in medicine.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Plant is harvested during Jul.-Aug.
National status: Threat not known.
Local status: Vulnerable. Threat is due to its rare occurrence and harvesting of whole plant for medicine. The plant is very small and a large number of individuals are needed in medicine.
Family: Papaveraceae

Vernacular names: Tongri-zilpa serpo, Tongzil serpo, Gudue serpo (Am); Gudue, Rekon, Jafo tsitsi, Pegen, Tsikya (Km).

Habitat & distribution: Open slopes, screes; 3600-5500 m, WCE Nepal. It is endemic to the Nepal. Locally found in Kagmara and Jagdulla areas.

Diagnostic characters: Small perennial herb, with long rootstock. Leaves pinnate; leaflets lobed or pinnately cut into minute, linear segments. Flowers yellow, striped with dark brown, in dense cluster; spur cylindric, straight.

Occurrence: Rare.

Flowering & fruiting: May-Jul. (fl).

Parts used: Leaves, flowers & whole plant.

Taste/Potency: Bitter (kha)/Cool (sil).

Use: Chronic fever, liver disease, jaundice, bile fever, wounds, cold, ulcer, and blood disorders.

Toxicity: Non-toxic.

Mode of use: Used with other herbs. It is also used as substitute for Corydalis cashmeriana.

Harvesting: Leaves and flowers of mature plants are harvested during Jun-Jul., and the whole plant during Aug.-Sept from dominant stock.

National status: Endemic. Threat not known.

Local status: Highly Vulnerable. Threat is high due to its rare occurrence with restricted distribution and harvesting of whole plant for medicine.
Cyananthus lobatus Wall. ex Benth.

Family : Campanulaceae
Vernacular name : Ngonbu (Am).

Habitat & distribution : Meadows, shrubberies; 3300-4700 m, WCE Nepal. Distributed in the Himalaya (Punjab to Bhutan), NE India, W China. Locally found in Jagdulla, Dokpa, Pungmo, Bijer, Saldang, Dho areas.

Diagnostic characters : Low spreading perennial herb. Leaves obovate to wedge-shaped, deeply lobed. Flowers bright blue-purple; calyx conspicuous covered with short blackish hairs; corolla-tube hairy in the throat.

Occurrence : Common.
Flowering & fruiting : Jul.-Sep.
Parts used : Whole plant.
Taste/Potency : Bitter (kha)/Warm (dro).
Use : Lymph disorders. Flowers are mildly rubbed in case of chapped lips. Also offered during religious ceremonies.
Toxicity : Non-toxic.
Mode of use : Used with other herbs.

Harvesting : It is collected during Aug.-Nov.
National status : Threat not known.
Local status : Not vulnerable. Commonly found, and collected mostly by amchis.
Family: Asclepiadaceae
Vernacular names: Ngo dhugmo nyung (Am, Km); Gaiama dudh (Dn).

Habitat & distribution: Forests, open slopes, wasteland; 2300-3600 m, WC Nepal. Distributed in SW Asia, Pakistan, Afghanistan, Himalaya (Kashmir, Nepal, Bhutan), India, China, Russia. Locally found in Pungmo, Ringmo, Bijer, Nyisal, Langkar areas.

Diagnostic characters: Erect perennial herb. Leaves opposite, short stalked, broadly elliptic to ovate, acute. Flowers small, yellowish green in terminal and axillary umbels. Fruits cylindrical, broader at base and tapering gradually to apex.

Occurrence: Common.
Parts used: Fruits.
Taste/Potency: Bitter (kha)/Cool (sil).
Use: Intestinal parasites, bile fever, cough, stomachache, diarrhoea, dysentery, and earache. Roots edible.
Toxicity: Poisonous.
Mode of use: Used with other herbs.

Harvesting: Fruits are collected during Sep.-Oct.
National status: Threat not known.
Local status: Not vulnerable. Commonly found and mostly used by amchis.
Family : Boraginaceae
Vernacular name : Nema jarma (Am).

Habitat & distribution : Cultivated areas, grazing grounds, wasteland; 1200-4100 m, WCE Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Bhutan), India, Sri Lanka, east to China & Japan, Malaysia. Locally found in Jagdulla, Pungmo, Rigmo, Bijer, Saldang, Dho areas.

Diagnostic characters : Erect, branched herb. Leaves bristly hairy; oblong-elliptic, long-stalked; upper oblong-lanceolate, stalkless. Flowers bright blue, borne in widely branched inflorescence. Nutlets covered with hooked bristles.

Occurrence : Abundant.
Flowering & fruiting : May.-Aug. (fl).
Parts used : Leaves, stems, flowers & fruits.
Taste/Potency : Sweet (ngar), bitter (kha) & Cool (sil) & rough (tsub).
Use : Sores, fresh wounds, swellings, cough and fractured bone. It dissolves uterus tumours and draws out lymph fluids.
Toxicity : Non-toxic.
Mode of use : Used with other herbs.

Harvesting : Plant parts are collected selectively from mature plants during Aug.-Sep.
National status : Threat not known.
Local status : Not vulnerable. Abundantly found and collected only by amchis.
**Family**: Orchidaceae  
**Vernacular name**: Khu juk pa (Am, Km).  
**Common name**: Lady’s-slipper orchid.

**Habitat & distribution**: Open slopes, shrubberies; 3000-4800 m, WCE Nepal. Distributed in the Himalaya (Nepal to Bhutan), China (Xizang). Locally found in Jagdulla, Kagmara, Dokpa areas.

**Diagnostic characters**: Erect terrestrial orchid, stems with several sheaths at base. Leaves 3-4, elliptic to lanceolate. Flowers with a broadly ovoid pendent bag-like lip with a wavy to crenate mouth, streaked with purple; petals and sepals green with red veins; upper sepal broadly ovate; bracts leafy, larger than the flower.

**Occurrence**: Rare.

**Flowering & fruiting**: Jun.-Jul. (fl).

**Parts used**: Whole plant.

**Taste/Potency**: Sweet (ngar)/Cool (sil).

**Use**: Blocked channels, urine retention and stone diseases. Also used in heart disease, chest disorders and cough.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Plant is selectively collected during Aug.-Sep.

**National status**: CITES Appendix II.

**Local status**: Vulnerable. Threat is due to its rare occurrence with restricted distribution and harvesting of whole plant for medicine.

**Major documentation**: Chophel (1993).
Dactylorhiza hatagirea (D. Don) Soó
Orchis hatagirea D. Don, O. latifolia var. indica Lindl.

Family : Orchidaceae
Vernacular names : Wangpo lagpa, Wang lag (Am, Km); Hethejara (Dn); Panch-aunle, (Np); Munjataka (Sn).
Common names : Orchis, Marsh orchid, Salep.

Habitat & distribution : Damp places, open slopes; 2800-4000 m, WCE Nepal. Distributed in Himalaya (Kashmir to Bhutan), China. Locally found in Pungmo, Ringmo, Kaigaon, Jagdulla areas.

Diagnostic characters : Erect, terrestrial orchid with palmately divided, fleshy tubers. Leaves, oblong-lanceolate or elliptic. Flowers rosy-purple, spotted, in a many-flowered dense cylindrical terminal spike, borne on a robust leafy stem; spur stout, cylindrical; bracts leaf-like.

Occurrence : Rare.
Parts used : Root tubers.
Taste/Potency : Sweet (ngar)/Warm (dro).
Use : Increases regenerative fluid, vitality and strength and heals wounds, cuts and burns. The roots with five or more tuberous divisions are superior than those with fewer divisions.
Toxicity : Non-toxic.
Mode of use : Used singly or with other herbs.

Chief constituents : Tubers contain a glucoside, starch, mucilage, albumen, volatile oil, etc.
Harvesting : Tubers are collected selectively during Oct. leaving young buds.
National status : CITES Appendix II, HMG Nepal protection 1 (banned for collection, use, sale, distribution, transportation and export).
Local status : Highly vulnerable. Threat is due to its rare occurrence and harvesting of whole plant for medicine and trade.
Delphinium brunonianum Royle
*Delphinium moschatum* Munro ex Hook. f. & Thoms.

Family : Ranunculaceae
Vernacular names : Jagopoe (Am); Siksike, Mangro mulo (Dn); Bishadi ghans (Np).

**Habitat & distribution** : Stony slope, screes, shrubberies; 3500-6000 m, WC Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Nepal), China (SE Xizang). Locally found in Kagmara and Pungmo areas.

**Diagnostic characters** : Hairy perennial herb, with a musky odour when fresh, and with slender rootstock and glandular pubescent, erect, leafy stems. Leaves 5-fid or deeply partite; lobes folded, dentate; hairy beneath; long stalked. Flowers large, blue to purple, woolly-haired, veined, borne in a few-flowered raceme; spurs broad, straight and blunt.

**Occurrence** : Rare.

**Flowering & fruiting** : Jul.-Sep.

**Parts used** : Leaves, stems & flowers.

**Taste/Potency** : Bitter (*kha*)/Cool (*sil*).

**Use** : Fever, appetite loss, headache, dysentery, body swelling and wounds. Also used in dysentery and ticks in cattle. Plant is substituted for musk.

**Toxicity** : Poisonous. It is detoxified by slightly boiling the plants in the extract of *aru* (*Terminalia chebula* Retz).

**Mode of use** : Used singly or with others.

**Chief constituents** : Plant contains brunonin, delbrunine, delbruline, delbrusine, lappaconitine, N-deacetyl lappaconitine, etc.

**Harvesting** : Plant parts are collected selectively from the matured plants during Aug.-Sep.

**National status** : Threat not known.

**Local status** : Vulnerable. Threat is due to its rare occurrence and possible commercial exploitation.

**Family**  
Ranunculaceae

**Vernacular names**  
Jakang, Metok jakang, Timusa (Am, Km).

**Habitat & distribution**  
Grassy and rocky slopes; 3000-5800 m, WC Nepal. It is distributed in Pakistan, Himalaya (Kunawa to Bhutan), China (Xizang). Locally distributed in Bheri valley, Khanigaon and Dho areas.

**Diagnostic characters**  
Much branched perennial herb. Lower leaves large, long petioled, gradually reduced upwards with much shorter petioles; lamina sub-orbicular, deeply cut into much narrower, linear, acute or sub-acute segments. Flowers blue or violet, borne in racemes; bracts and bracteoles linear; spur straight or slightly curved at tip.

**Occurrence**  
Rare.

**Flowering & fruiting**  
Jul.-Oct.

**Parts used**  
Leaves & flowers.

**Taste/Potency**  
Bitter (kha) & astringent (ka)/Cool (sil).

**Use**  
Diarrhoea, intestinal fever and wounds. It dries up lymph fluid, pus and blood. It is also used to kill lice.

**Toxicity**  
Slightly poisonous. It is detoxified before use.

**Mode of use**  
Used with other herbs.

**Harvesting**  
Plant parts are collected selectively from matured plants during Jul-Sep.

**National status**  
Threat not known.

**Local status**  
Vulnerable. Threat is due to its low availability and possible commercial exploitation.

**Major documentation**  
Dracocephalum heterophyllum Benth.

**Family**
: Labiatae

**Vernacular names**
: Jibkar (Am); Atunmetok (Km).

**Habitat & distribution**
: Open slopes, shrubberies; 3400-5500 m, WC Nepal. Distributed in Turkestan, Himalaya (Kashmir to Sikkim), China (Xizang). Locally found in Bijer, Saldang, Dho areas.

**Diagnostic characters**
: Aromatic perennial herb. Leaves leathery, oblong-ovate. Flowers white, or tinged mauve or pink, hoary, in dense leafy spikes; corolla-tube inflated; calyx broad, hairless, tips bristle-like.

**Occurrence**
: Common.

**Flowering & fruiting**
: Jun.-Aug. (fl).

**Parts used**
: Whole plant.

**Taste/Potency**
: Sweet (*ngar*) & bitter (*kha*)/Cool (*sil*).

**Use**
: Liver disease, fever, oral sores, and toothache.

**Toxicity**
: Non-toxic.

**Mode of use**
: Used singly or with other herbs.

**Harvesting**
: Plant is harvested selectively from the matured stocks during Sep.-Oct.

**National status**
: Threat not known.

**Local status**
: Not vulnerable. Commonly found and collected only by amchis.

**Major documentation**
Drynaria propinqua (Wall. ex Mett.) J. Sm.
Polypodium propinquum Wall. ex Mett.

Family : Polypodiaceae

Vernacular names : Bejang reral (Am); Gyalpo reral (Km); Hatpusaro, Hatpaharo (Dn).

Common name : Oak leaf fern.

Habitat & distribution : Epiphyte on trees, mossy rocks on forests; 800-3500 m, WCE Nepal. Distributed in the Himalaya, N India, Myanmar, China, Malay Peninsula and Thailand. Locally found Jagdulla, Sulligad and throughout the Thuli Bheri valleys.

Diagnostic characters : Epiphytic fern with creeping rhizome, clothed with brown scales. Sterile fronds small, sessile, becoming brown on aging, fertile fronds large, long stalked, pinnately lobed, with a network of areoles. Sori brown, single row on either side of main vein.

Occurrence : Common.

Parts used : Rhizomes.

Taste/Potency : Bitter (kha)/Cool (sil).

Use : Food and meat poisoning and fever due to poisoning; also used in massage to cure pain due to wounds.

Toxicity : Non-toxic.

Mode of use : Used singly or with other herbs.

Harvesting : Rhizomes are harvested selectively from the matured stocks during Aug.-Sep.

National status : Threat not known.

Local status : Not vulnerable. Commonly found, and collected mostly by amchis.

Elsholtzia eriostachya (Benth.) Benth.  
*Aphanochilus eriostachyus* Benth., *Elsholtzia pusilla* Benth., *E. eriostachya* var. *eriostachya* (Benth.) Benth.

**Family** | Labiatae
---|---
**Vernacular names** | Jirug serpo (Am); Khun juk (Km); Bhotepati (Np)

**Habitat & distribution** | Open slopes, alpine meadows, damp places; 3000-4800 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), India, SW China. Locally found in Jagdulla, Kagmara, Pungmo, Dho areas.

**Diagnostic characters** | Erect, aromatic, annual herb with 4-angled stems. Leaves oblong to lanceolate, toothed, softly hairy, or sometimes wooly beneath, shortly stalked. Flowers very tiny, yellow, numerous, in terminal stout cylindrical shaggy-haired spikes.

**Occurrence** | Abundant.
**Flowering & fruiting** | Jul.-Aug. (fl).
**Parts used** | Whole plant.
**Taste/Potency** | Acrid (*tsa*) & astringent (*ka*)/Warm (*dro*).
**Use** | Intestinal parasites and all kinds of bacterial infections.
**Toxicity** | Non-toxic.
**Mode of use** | Used singly or with other herbs.
**Harvesting** | It is harvested during Sep.-Oct.
**National status** | Threat not known.
**Local status** | Not vulnerable. Abundantly found and collected only by amchis.
**Family**  : Ephedraceae  
**Vernacular names**  : Tshe, Tshedum; Tshe (Km); Kag-chhalo, Kagcharo, Sallejari (Dn); Somlata (Np); Soma (Sn).

**Habitat & distribution**  : Open stony slopes, gravel terraces; 2400-5200 m, WCE Nepal. Distributed from Afghanistan to Himalaya (Kashmir to Bhutan). Locally found throughout the Thuli Bheri, Suligad and Jagdulla valleys.

**Diagnostic characters**  : Tufted shrub, with densely clustered, erect, joined branches. Leaves scale-like, ovate, uniting to form a sheath around node. Male cones ovate, 2-3, each with 4-8 flowers; female flowers in opposite, sessile pairs at each node, with 2 ovules enveloped by red, succulent bracts.

**Occurrence**  : Abundant.
**Parts used**  : Stems & fruits.
**Taste/Potency**  : Sweet (ngar) & bitter (kha)/ Cool (sil).
**Use**  : Liver fever, fever due to common cold, bleeding, blood pressure, and cuts. Fruits are digestive. Smoke from the plant is used for eye problems. Fruits are substituted for *kakola* (Amomum subulatum Roxb.) by amchis.

**Chief constituents**  : Plant contains ephedrine, pseudoephedrine, tannins, catechins, saponin and an essential oil.

**Harvesting**  : Plant parts are harvested during Sep.-Oct.

**National status**  : Threat not known.
**Local status**  : Not vulnerable. Abundantly found and collected mostly by amchis.

**Euphorbia longifolia** D. Don

*Tithymalus longifolius* (D. Don) Hurus. & Ya. Tanaka

**Family**
- Euphorbiaceae

**Vernacular names**
- Dhurji (Am); Dhurtsi (Km).

**Habitat & distribution**
- Wastelands, cultivated areas, grazed slopes, shady banks; 1700-2900 m; WCE Nepal. Distributed in the Himalaya (Nepal, Bhutan). Locally found in Kaigaon, and Jagdulla areas.

**Diagnostic characters**
- Tall, nearly hairless, perennial herb. Leaves leathery, linear-oblong or linear-lanceolate. Flower heads yellow, few in branched, flat-topped clusters, each flower-head with 3-4 rounded or broadly ovate pointed bracts. Involucre with bell-shaped glands, hairy within, with rounded lobes. Fruits with conical swellings.

**Occurrence**
- Rare.

**Flowering & fruiting**

**Parts used**
- Roots.

**Taste/Potency**
- Bitter (*kha*)/Warm (*dro*).

**Use**
- Constipation, hot and cold diseases, skin diseases, and bacterial infections.

**Toxicity**
- Toxic. It is detoxified before use.

**Mode of use**
- Used with other herbs.

**Harvesting**
- Roots are harvested selectively from the matured plant during Nov.-Dec.

**National status**
- Threat not known.

**Local status**
- Vulnerable. Threat is due to its low availability and habitat encroachment.
Family: Rosaceae

Vernacular names: Ditha sazin, Sazin (Am, Km); Bhuin kafal, Lahare kafal, Bhuin ainselu (Dn, Np).

Common name: Strawberry.

Habitat & distribution: Open, moist places at forest margins, shrubberies; 1600-4000 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), N Myanmar, W China. Locally found in Pahada, Dokpa, Mukroman areas.

Diagnostic characters: Small, softly silky-haired, prostrate perennial herb, with long runners rooting at nodes. Leaves trifoliate, long-stalked, arising from the rootstock; leaflets obovate or elliptic, toothed. Flowers white, on 1-3-flowered scapes. Fruits globose, red when ripe.

Occurrence: Common.


Parts used: Leaves, flowers & fruits.

Taste/Potency: Sweet (ngar)/Cool (sil).

Use: Used to check excessive bleeding during menstruation; and in cough and cold. It is beneficial for inflammation of the nerves and draws out the impure fluid from the lungs. It is also used in foot and mouth disease of cattle. Fruits are edible.

Toxicity: Non-toxic.

Mode of use: Used with other herbs.

Harvesting: Plant parts are harvested selectively from the matured plant during Apr.-Jul.

National status: Threat not known.

Local status: Not vulnerable. Commonly found, and collected mostly by amchis.


Fragaria nubicola Lindl. ex Lacaita
Fragaria vesca L. var. nubicola Hook. f.
**Gentiana nubigena** Edgew.

*Gentiana algida* Pall. var. *nubigena* (Edgew.) Kusn.

**Family**
- Gentianaceae

**Vernacular names**
- Pangyen thrabo,
- Pangyen ngonpo (Am).

**Habitat & distribution**
- Open slopes, meadows; 4000-5600 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), NW India, China. Locally found in Pungmo, Bijer, Dho areas.

**Diagnostic characters**
- Perennial herb. Basal leaves spathulate to linear-oblong blunt, thick and fleshy; stem leaves lanceolate, shorter. Flowers yellowish-white spotted with blue, and blue-ribbed outside, in terminal and axillary stalked clusters; corolla funnel-shaped; calyx tubular.

**Occurrence**
- Common.

**Flowering & fruiting**

**Parts used**
- Leaves & flowers.

**Taste/Potency**
- Bitter (*kha*)/Cool (*sil*).

**Use**
- Throat disease, lung fever, chest pain, poor eyesight and blood disorders.

**Toxicity**
- Non-toxic.

**Mode of use**
- Used with other herbs.

**Harvesting**
- Plant parts are harvested from matured plant during Aug.-Oct.

**National status**
- Threat not known.

**Local status**
- Not vulnerable. Commonly found and collected only by amchis.

**Major documentation**
**Gentiana robusta** King ex Hook. f.

**Family**: Gentianaceae  
**Vernacular names**: Kyiche, Kyiche karpo (Am); God tito (Dn).

**Habitat & distribution**: Open slopes, shrubberies; 3500-4000 m, WC Nepal. Distributed in the Himalaya (Nepal, Sikkim). Locally found in Pungmo and Ringmo areas.

**Diagnostic characters**: Perennial herb, with robust, ascending stem. Leaves narrow-lanceolate, acute; basal leaves large, leathery, fused at base in a tubular sheath; uppermost leaves shorter and broader at base, forming crowded involucre subtending the flowers. Flowers creamy or greenish-white, axillary or in dense terminal heads.

**Occurrence**: Rare.  
**Flowering & fruiting**: Aug.-Sep.  
**Parts used**: Stems, leaves & flowers.  
**Taste/Potency**: Bitter (*kha*)/Cool (*sil*).  
**Use**: Bile disorder, bile fever, liver fever, stomach and intestinal disorders, inflammation due to wound, food poisoning, swelling and joint pain.  
**Toxicity**: Non-toxic.  
**Mode of use**: Used with other herbs.

**Harvesting**: Plant parts are harvested selectively from the matured plant during Jul.-Sep.  
**National status**: Threat not known.  
**Local status**: Vulnerable. Threat is due to its low availability and harvesting for medicine.  
**Geranium donianum** *Sweet*

*Geranium multifidum* D. Don

<table>
<thead>
<tr>
<th><strong>Family</strong></th>
<th>Geraniaceae</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vernacular names</strong></td>
<td>Ligadur (Am); Ratoasne (Dn).</td>
</tr>
</tbody>
</table>

**Habitat & distribution**: Open slopes, meadows; 3200-4800 m, WCE Nepal. Distributed in the Himalaya (Nepal to Bhutan), China. Locally found in Dokpa, Jagdulla, Pungmo, Ringmo, Dho areas.

**Diagnostic characters**: Perennial herb, with slender stem. Leaves rounded, deeply 5-9-lobed; lobes deeply incised into linear or lanceolate, acute segments. Flowers paired, pinkish-purple; sepals with whitish hairs.

**Occurrence**: Common.

**Flowering & fruiting**: Jun.-Aug. (fl).

**Parts used**: Roots.

**Taste/Potency**: Acrid (tsa) & sweet (ngar)/ Cool (sil).

**Use**: Fever, bile disorders, cough, intestinal disorders, and joint pain. It is also used as anthelmintic.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Roots are harvested selectively from the matured plants during Oct.-Nov.

**National status**: Threat not known.

**Local status**: Not vulnerable. Commonly found and collected only by amchis for medicine.

Family : Geraniaceae

Vernacular names : Ligadur, Ligadur ngonpo (Am); Pallo (Dn).

Common name : Meadow cranesbill.

Habitat & distribution : Open slopes, shrubberies; 3000-4500 m, WC Nepal. Distributed in Europe, C Asia and Himalaya (Kashmir to Nepal). Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo, Dho areas.

Diagnostic characters : Perennial herb. Stems with spreading hairs. Leaves divided into 5-7-ovate lobes; lobes further cut into oblong acute toothed segments. Flowers in pairs, bluish-purple. Fruits beaked.

Occurrence : Abundant.

Flowering & fruiting : Jun.-Aug. (fl).

Parts used : Whole plant.

Taste/Potency : Bitter (kha), sweet (ngar) & astringent (ka)/Cool (sil)

Use : Cough and cold, lung disease, eye disease, fever, lymph fluid disorder, backache, joint pain, swelling of limbs, bile disease, and stomach disease.

Toxicity : Non-toxic.

Mode of use : Used with other herbs.

Chief constituents : Rhizomes possess jeranin.

Harvesting : Rhizomes are harvested selectively during Sep.-Oct. Above ground parts are harvested during Jul.-Aug.

National status : Threat not known.

Local status : Not vulnerable. Abundantly found and collected only by amchis.

**Family**: Gentianaceae

**Vernacular names**: Chak tig (Am); Cheh tig, Tikta (Km); Tite (Dn, Np).

**Habitat & distribution**: Edges of forests, open slopes, damp places; 2000-4500 m, WCE Nepal. Distributed in W Asia, Himalaya (Uttar Pradesh to Bhutan), NE India, Myanmar, N & W China. Locally found in lower parts of Phoksundo.

**Diagnostic characters**: Erect, hairless, annual herb, with 4-angled stems. Leaves sessile, opposite, narrow-elliptic or ovate. Flowers small, mauve, blue or white, in axillary and terminal branched clusters, with 4 short blue spurs projecting backwards and outwards beyond the calyx. Capsules ovoid.

**Occurrence**: Rare.

**Flowering & fruiting**: Jul.-Oct.

**Parts used**: Leaves & stems.

**Taste/Potency**: Bitter (*kha*)/Cool (*sil*).

**Use**: Liver and bile disease, fever, headache, cough and cold.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Plant is harvested during Aug.-Sep.

**National status**: Threat not known.

**Local status**: Vulnerable. Threat is due to rare occurrence and harvesting for medicine.

Family: Umbelliferae
Vernacular names: Tukar (Am); Sukar (Km); Chhetaro (Dn).

Habitat & distribution: Open slopes, near fields; 1800-4300 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo, Dho areas.

Diagnostic characters: Robust perennial herb. Leaves large, pinnately lobed with white-felted undersides; upper leaves with large boat-shaped sheaths. Flowers white, in umbel; outer petals of the outer flower larger, bi-lobed. Fruits flattened with broad lateral wings.

Occurrence: Abundant.
Flowering & fruiting: Jun.-Jul. (fl).
Parts used: Roots & fruits.
Taste/Potency: Bitter (kha) & acrid (tsa)/Neutral (nyom).

Use: Phlegm and wind disorders, earache, stomach disorders, infection, bleeding, leprosy, fever due to wounds, and blood pressure. Root paste is applied to relieve from joint pain. Fruits are used in intestinal parasites.

Toxicity: Slightly toxic.
Mode of use: Used singly or with other herbs.

Harvesting: Plant parts are harvested during Sep.-Oct.
National status: Threat not known.
Local status: Not vulnerable. Abundantly found and collected mostly by amchis.

**Herpetospermum pedunculosum (Ser.) Baill.**

*Bryonia pedunculosa Ser.*

<table>
<thead>
<tr>
<th>Family</th>
<th>Cucurbitaceae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vernacular names</td>
<td>Serkyi metog (Am); Ban karela, Kurkure kakro (Np).</td>
</tr>
</tbody>
</table>

**Habitat & distribution**: Near fields, riverbanks, shrubberies; 1500-3600 m, WCE Nepal. Distributed in the Himalaya (Kulu to Bhutan), NE India, China. Locally found in Pungmo and Kaigaon areas; generally grown by amchis in Pungmo areas.

**Diagnostic characters**: Herbaceous climber with tendrils. Leaves ovate-heart-shaped, acute or long pointed, rough hairy. Male flowers clustered; female flower solitary, large, yellow. Fruits ellipsoid, finely hairy.

**Occurrence**: Rare.

**Flowering & fruiting**: Jul.-Oct.

**Parts used**: Leaves, flowers & fruits.

**Taste/Potency**: Bitter (*kha*)/Cool (*sil*).

**Use**: Bile disease, jaundice, bile fever, stomach fevers, headache and cough.

**Toxicity**: Slightly toxic.

**Mode of use**: Used singly or with other herbs.

**Harvesting**: Leaves and flowers are harvested during Jul.-Aug. and fruits in Sep.

**National status**: Threat not known.

**Local status**: Vulnerable. Natural population is threatened due to encroachment.

Family: Elaeagnaceae

Vernacular names: Tarbu, Tarbu Namtar (Am); Dale Chuk (Dn, Np); Ashuka (Sn).

Common name: Seabuckthorn

Habitat & distribution: Along riversides, alluvial gravel; 2200-3500 m, WC Nepal. Distributed in the Himalaya (Punjab to Bhutan), China. Locally found in Tripurakot, Pahada, Kaigaon, Suligad and Pungmo areas.

Diagnostic characters: Thorny deciduous shrub or small tree. Leaves oblong-lanceolate, white-downy beneath. Male flowers yellowish-brown in small catkins that appear before leaves; female in small racemes appearing with the leaves. Fruits globular, orange or red berry.

Occurrence: Common.


Parts used: Fruits.

Taste/Potency: Sour (kyur)/Neutral (nyom), sharp (no) & light (yang).

Use: Toothache, joint pain, liver, lung and phlegm diseases, menstrual disorders, dysentery, gum infection, blood disorders, diabetes and intestinal parasites. Fruits are edible raw, also used extensively for the preparation of concentrate (chuk).

Mode of use: Used singly or with other herbs.

Chief constituents: Fruits are rich in vitamins and minerals.

Harvesting: Fruits are collected during Nov.-Dec.

National status: Threat not known.

Local status: Vulnerable. Threat is due to encroachment and felling for firewood.


Hippophae salicifolia D. Don

Hippophae rhamnoides L. subsp. salicifolia (D. Don) Servett.
Family: Elaeagnaceae
Vernacular names: Tarbu, Tarbu satar (Am); Chichi sin, Tarbu, Taru, Tirtsuk (Km).

Habitat & distribution: Stony places, river-sides; 3300-4500 m, WCE Nepal. Distributed in the Himalaya (Punjab to Bhutan), N & W China. Locally found in Ringmo, Bijer, Saldang areas.

Diagnostic characters: Much branched shrub or shrublet with long, stout terminal spines formed from the branch tips. Leaves narrow-elliptic or linear-oblong, covered with rusty scales. Flowers stalkless, yellowish, in clusters appearing on leafless stems. Fruits orange-red when ripe.

Occurrence: Common.
Parts used: Fruits.
Taste/Potency: Sour (kyur)/Neutral (nyom), sharp (no) & light (yang).
Use: Cough and cold, blood disorders. Also used as appetite stimulant, diuretic, anthelmintic and tonic. Fruits are edible raw.

Toxicity: Non-toxic.
Mode of use: Used with other herbs. Herbal tea prepared from fruits is taken for cough and cold.

Chief constituents: Fruits are rich in vitamins and minerals.
Harvesting: Fruits are collected during Nov.-Dec.
National status: Threat not known.
Local status: Not vulnerable. Commonly found and is collected mostly by amchis.

Major documentation: Chophel (1993).

Hippophae tibetana Schlecht.
Hippophae rhamnoides L. subsp. tibetana (Schlecht.) Servett.
**Family**
Bignoniaceae

**Vernacular names**
Ukchoe marpo (Am).

**Habitat & distribution**
Open stony slopes; 3000-4700 m, WC Nepal. Distributed in the Himalaya (Nepal, Bhutan), W China. Locally found in Ringmo areas.

**Diagnostic characters**
Small perennial herb. Leaves basal, pinnate; leaflets ovate, toothed; terminal larger. Flowers large, tubular-funnel-shaped, crimson outside, yellow, grey or white within, with 5 rounded lobes, borne on leafless stem. Capsule nearly straight.

**Occurrence**
Rare.

**Flowering & fruiting**

**Parts used**
Whole plant.

**Taste/Potency**
Bitter (kha)/Cool (sil) & light (yang).

**Use**
Flowers are used for headache and lymph fluid disease; fruits and roots for ear infection and deafness; roots for flatulence, headache and cough.

**Toxicity**
Non-toxic.

**Mode of use**
Used with other herbs.

**Chief constituents**
Argutone is reported in the allied species *I. arguta* (Royle) Royle.

**Harvesting**
Leaves and flowers are collected during Jun.-Jul., fruits in Aug. and roots during Sep.-Oct.

**National status**
Threat not known.

**Local status**
Highly vulnerable. It is very rare and confined to some specific habitats. Threat is high due to livestock grazing and harvesting.

**Major documentation**
Chophel (1993).
**Iris goniocarpa** Baker

**Family**  
Iridaceae

**Vernacular names**  
Drema, Maning drema, Ko tha (Am); Jarok gokpa (Km); Piperi (Dn).

**Habitat & distribution**  
Scrubland, open hillsides; 3600-4400 m, WC Nepal. Distributed in the Himalaya (Nepal to Bhutan), W & N China. Locally found in Jagdulla, Mukroman, Kagmara, Pungmo, Ringmo, Dho areas.

**Diagnostic characters**  
Slender rhizomatous herb. Leaves few, narrow, grass-like. Flowers lilac with bluish tinge, solitary; falls obovate blunt, with yellow hairs; standard spreading. Spathe papery. Fruits narrow-elliptic, with a slender beak.

**Occurrence**  
Abundant.

**Flowering & fruiting**  

**Parts used**  
Whole plant.

**Taste/Potency**  
Sweet (ngar) & acrid (tsa)/ Cool (sil) & coarse (tsub).

**Use**  
Intestinal parasites and poisoning. Also used as appetite stimulant. It is beneficial to remove poisoning. Seeds are used in sinusitis.

**Toxicity**  
Non-toxic.

**Mode of use**  
Used with other herbs.

**Chief constituents**  
Rhizome contains essential oil.

**Harvesting**  
Plant is harvested during Aug.-Sep.

**National status**  
Threat not known.

**Local status**  
Not vulnerable.

**Major documentation**  

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Family: Iridaceae  
Vernacular names: Drema, Maning drema, Ko tha (Am); Jarok gokpa (Km); Piperi (Dn).

Habitat & distribution: Scrubland, open hillsides; 3600-4400 m, WC Nepal. Distributed in the Himalaya (Nepal to Bhutan), W & N China. Locally found in Jagdulla, Mukroman, Kagmara, Pungmo, Ringmo, Dho areas.

Diagnostic characters: Slender rhizomatous herb. Leaves few, narrow, grass-like. Flowers lilac with bluish tinge, solitary; falls obovate blunt, with yellow hairs; standard spreading. Spathe papery. Fruits narrow-elliptic, with a slender beak.

Occurrence: Abundant.


Parts used: Whole plant.

Taste/Potency: Sweet (ngar) & acrid (tsa)/ Cool (sil) & coarse (tsub).

Use: Intestinal parasites and poisoning. Also used as appetite stimulant. It is beneficial to remove poisoning. Seeds are used in sinusitis.

Toxicity: Non-toxic.

Mode of use: Used with other herbs.

Chief constituents: Rhizome contains essential oil.

Harvesting: Plant is harvested during Aug.-Sep.

National status: Threat not known.

Local status: Not vulnerable.

Family: Juglandaceae
Vernacular names: Tar ka (Am); Okhar, Hade okhar (Dn, Np); Akshotak (Sn).
Common name: Himalayan walnut.

Habitat & distribution: River side, forests; 1200-3000 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), NE India, China. Locally found in Jagdulla, Sulligad and Thuli Bheri Valleys.

Diagnostic characters: Large deciduous tree. Leaves pinnate; leaflets 5-13, elliptic to ovate, pointed. Male catkins pendulous, green; female small, in a short spike. Fruits large drupe containing wrinkled nuts.

Occurrence: Common.
Flowering & fruiting: Feb.-Apr. (fl); May-Oct. (fr).
Parts used: Bark, fleshy wall of fruits, nuts.
Taste/Potency: Sweet (ṅgar)/neutral (nyom).
Use: Beneficial for wind diseases, shrunken limbs. Bark and fleshy wall of the fruit are used as hair dye to make hair black and promote hair growth; and also used in mouth sores.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.
Chief constituents: Plant contains juglone, berberine. Nuts contain juglansin.

Harvesting: Bark is harvested throughout the year and nuts during Sep.-Oct.
National status: HMG Nepal protection 1 (banned for collection, use, sale, distribution, transportation and export of the bark) and 3 (whole plant is banned for transportation, export and felling).
Local status: Vulnerable. It is threatened due to habitat encroachment and deforestation. Generally the fruits are collected and sold.

**Family**: Cupressaceae

**Vernacular names**: Shuk pa, Lha shuk (Am); De shuk (Km); Dhupi (Np).

**Common name**: Black juniper.

**Habitat & distribution**: Open slopes, forest, shrubberies; 3700-4500 m, WCE Nepal. Distributed from Karakoram, Himalaya (Kashmir to Nepal) to W China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo, Dho areas.

**Diagnostic characters**: Shrub or small tree to 20 m. Leaves on lower branches awl-shaped, spreading; those on terminal branches scale-like, adpressed, overlapping in 4-ranks. Male cones ovoid; female cones fleshy, berry-like, black, 1-seeded.

**Occurrence**: Abundant.

**Flowering & fruiting**: May-Aug.

**Parts used**: Leaves & fruits.

**Taste/Potency**: Sweet (ngar) & bitter (kha) / Cool (sil).

**Use**: Kidney disorders, skin and lymph disease, fever, cough and cold, sores, wounds, and paralysis of limbs. Leaves and branches are used for incense.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Chief constituents**: Plant yields an aromatic essential oil.

**Harvesting**: Leaves are harvested throughout the year; and fruits during Jul.-Aug.

**National status**: Traded. Threat not known.

**Local status**: Vulnerable. Threat is due to harvesting for firewood and incense.

**Major documentation**: CSIR (1959), IUCN (2000), Mikage et al. (1988).
Family: Compositae
Vernacular names: Ruta, Khamkyi ruta (Am); Silapoe (Km); Dhupjadi (Dn, Np).

Habitat & distribution: Open slopes; 3200-4300 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Nepal). Locally found in Dokpa, Kagmara, Pungmo, Ringmo areas.

Diagnostic characters: Stemless perennial herb, with long, stout, aromatic taproot. Leaves radical, rosetted, long spreading, pinnately lobed, white-woolly beneath. Flower-heads purple, sessile or short-stalked in a central domed cluster.

Occurrence: Common.
Flowering & fruiting: Jul.-Sep.
Parts used: Whole plant.
Taste/Potency: Bitter (kha)/Cool (sil) & coarse (tsub).
Use: Stomachache and diarrhoea. Roots are used for incense.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Jurinea dolomiae Boiss.
Jurinea macrocephala (Royle) C. B. Clarke

Harvesting: Plant is harvested selectively during Sep.-Oct.
National status: Traded. Threat not known.
Local status: Vulnerable. Threat is high due to unsustainable harvesting of root for trade.
Family: Scrophulariaceae
Vernacular name: Ba sha ka (Am).

Habitat & distribution: Open slopes, damp places; 3900-5600 m, WCE Nepal. Distributed in the Himalaya (Baltistan to Bhutan). Locally found in Jagdulla, Kagmara, Pungmo, Ringmo, Dho areas.

Diagnostic characters: Perennial herb. Leaves fleshy, mostly basal, narrow-elliptic to obovate, stalked; stem leaves bract like, stalkless, progressively smaller above. Flowers white, pale mauve to blue, in a dense spike, borne on short stems arising from the rootstock.

Occurrence: Common.
Parts used: Leaves, flowers & rootstocks.

Taste/Potency: Bitter (kha)/Cool (sil).
Use: High blood pressure, vomiting of blood, fever, cuts and wounds.
Toxicity: Slightly toxic.
Mode of use: Used with other herbs.

Harvesting: Rootstocks are harvested from the mature plant during Sep.-Oct.; and leaves and flowers during Jul.-Aug.

National status: Threat not known.
Local status: Not vulnerable.

Commonly found and collected mostly by amchis.
Lamiophlomis rotata (Benth. ex Hook.f.) Kudô

Phlomis rotata Benth. ex Hook.f.

Family: Labiatae
Vernacular names: Ta pag (Am); Tak bag (Km).

Habitat & distribution: Open slopes, meadows, near fields; 4100-5200 m, WCE Nepal. Distributed the Himalaya (Nepal, Bhutan), India, C China. Locally found in Dho, Saldang, Bhijer, Baga-la, Num-a-la and Samling areas.

Diagnostic characters: Perennial herb, almost stemless. Leaves rounded to kidney-shaped, leathery, wrinkled with deeply impressed veins above, toothed, rosetted and placed flat to the ground; leaf-stalk broad, wooly. Flowers mauve in a dense stemed or stemless cluster, borne from the centre of leaf rosette.

Occurrence: Common.
Flowering & fruiting: Jun.-Aug. (fl).
Parts used: Leaves & flowers.
Taste/Potency: Sweet (ngar) & bitter (kha)/ Neutral (nyom).
Use: Bone fractures, lymph fluid and channel disorders. Also used in case of pains in the tendons and ligaments, indigestion, sinus and bacterial infections.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Leaves and flowers are harvested during Jul.-Aug.
National status: Threat not known.
Local status: Not vulnerable.
Commonly found and collected mostly by amchis.

Family : Scrophulariaceae
Vernacular names : Payak tsa, Payak tsa ba, Payakpa (Am, Km).

Habitat & distribution : Meadows, grazing grounds, damp places; 3300-4400 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), W China. Locally found in Jagdulla, Kagmara, Pungmo, Ringmo areas.

Diagnostic characters : Stemless glabrous herb. Leaves rosetted, oblong-ovate to spatulate, entire. Flowers in fascicles of 3-5 or in a raceme, dark blue to purple, 2-lipped. Fruits red to purple, ovoid, included in persistent calyx.

Occurrence : Common.
Flowering & fruiting : May-Aug. (fl).
Parts used : Leaves, fruits & roots.
Taste/Potency : Sweet (ngar) & bitter (kha)/Cool (sil).
Use : Fruits are used for heart disease; roots for cough, lung infection and fever; and leaves for cuts and wounds.
Toxicity : Non-toxic.
Mode of use : Used with other herbs.

Lancea tibetica Hook.f. & Thoms.

Harvesting : Leaves are harvested from the mature plant during Jul.-Aug., fruits during Sep.-Nov. and roots during Dec.-Jan.
National status : Threat not known.
Local status : Not vulnerable. Commonly found and collected only by amchis.
**Leontopodium jacotianum** Beauverd

**Family**: Compositae

**Vernacular names**: Tawa thokar (Am); Bhuke phul, Jhulo (Dn, Np).

**Habitat & distribution**: Open slopes; 2700-4900 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), Myanmar, China. Locally found in Dokpa, Jagdulla, Kagmara, Pungmo, Ringmo, Dho, Bijer areas.

**Diagnostic characters**: Tufted, woolly-haired perennial herb. Leaves linear to narrow-elliptic, grey-woolly. Flowers in globular heads in terminal flat-topped clusters surrounded by an involucre of spreading white-woolly leaves.

**Occurrence**: Abundant.

**Flowering & fruiting**: Jul.-Sep.

**Parts used**: Leaves & flowers.

**Taste/Potency**: Bitter (kha)/Neutral (nyom).

**Use**: Heat therapy (moxibustion). Also used as incense.

**Toxicity**: Non-toxic.

**Mode of use**: Used alone or with other herbs.

**Harvesting**: Plant is harvested during Sep.-Oct.

**National status**: Threat not known.

**Local status**: Not vulnerable. Abundantly found and collected mostly by amchis.

**Family** : Lycoperdaceae

**Vernacular names** : Phabang goti, Phaba gogo, (Am); Phagogo, Fago (Km).

**Common name** : Common puffball.

**Habitat & distribution** : Open slopes, shrubberies, meadows. Locally found in Pungmo, Ringmo, Dho, Bijer areas from 3500-4000 m.

**Diagnostic characters** : Terrestrial puffball. Fruiting body clubshaped with a stem-like base; upper part rounded, whitish at first, finally pale brown, enclosed by two peridial layers, opening by a small pore at the top. Outer surface with short, conical spines. Inner portion of the fruiting body powdery. Spores small, light coloured.

**Occurrence** : Common.

**Season of fructification** : Jun.-Sep.

**Parts used** : Spores.

**Taste/Potency** : Slightly sweet (ngar), bitter (kha) & acrid (tsa)/Neutral (nyom).

**Use** : Bleeding, wounds, burns, infections, etc. Young plant is eaten as vegetable.

**Toxicity** : Non-toxic.

**Mode of use** : Used with other herbs.

**Harvesting** : Plant is collected during Aug.-Sep.

**National status** : Threat not known.

**Local status** : Not vulnerable. Commonly found and collected mostly by amchis. Local people harvest young plant for food.

**Major documentation** : Chophel (1993).
**Meconopsis grandis** Prain

**Family**: Papaveraceae  
**Vernacular name**: Upal ngon po (Am).

**Habitat & distribution**: Shrubberies, grazing grounds, open slopes; 3000-5200 m, WCE Nepal. Distributed in the Himalaya (Nepal to Bhutan), Myanmar, China. Locally found in Jagdulla, Dokpa, Mukroman, Kagmara areas.

**Diagnostic characters**: Monocarpic herb. Basal leaves in rosette, blade oblanceolate to oblong-elliptic coarsely toothed, covered with bristles; stem leaves becoming small and whorled at top of stem. Flowers 1-4 per stem, blue or tinged purple, borne on long stalks. Capsule ellipsoid-oblong.

**Occurrence**: Rare.


**Parts used**: Leaves & flowers.

**Taste/Potency**: Sweet (ngar) & astringent (ka)/ Cool (sil).

**Use**: Lung and liver fever. Seeds are edible, also used to make pickle.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Flowers and leaves are collected selectively from matured plant during Jun-Aug.

**National status**: Threat not known.

**Local status**: Vulnerable. Threat is due to its rare occurrence, grazing and harvesting.

**Family**: Papaveraceae

**Vernacular names**: Tsher ngon, Ajak tsher ngon (Am); Tiki, Zerjom (Km).

**Habitat & distribution**: Rocks, stony slopes, screes; 3000-5800 m, WCE Nepal. Distributed in the Himalaya (Nepal to Bhutan), N Myanmar, W China. Locally found in Jagdulla, Kagmara, Pungmo, Ringmo, Dho areas.

**Diagnostic characters**: Monocarpic prickly herb, with long slender tap root. Leaves mostly basal in rosette, elliptic to linear-oblong or oblanceolate, covered with bristly spines. Flowers light blue, in spike-like clusters, often borne on leafless stems arising directly from the rootstocks. Capsules ellipsoid to globular, covered with bristly spines.

**Occurrence**: Rare.


**Parts used**: Whole plant.

**Taste/Potency**: Bitter (*kha*)/Cool (*sil*).

**Use**: Bone fractures, bone fever, upper back pain, lung and skin diseases, sinusitis, bile disease, and wounds.

**Toxicity**: Toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Whole plant is uprooted from a matured stock during Aug.-Sep.

**National status**: Threat not known.

**Local status**: Vulnerable. Threat is due to harvesting of whole plant for medicine.

**Family** : Papaveraceae  
**Vernacular names** : Upal serpo (Am); Nge bu metog (Km).

**Habitat & distribution** : Grazing grounds, open slopes, meadows; 3000-4400 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Arunachal Pradesh), NE India. Locally found in Jagdulla, Pahada, Kagmara, Pungmo, Ringmo areas.

**Diagnostic characters** : Monocarpic herb, 1-2.5 m high, with stems covered by long bristly, yellowish or golden, stellate hairs. Basal leaves in a dense rosette, elliptic to lanceolate, pinnately-lobed; lobes ovate or oblong, golden-bristly-haired. Flowers large yellow, in long cylindrical terminal clusters. Fruits ellipsoid-oblong, densely bristly-haired.

**Occurrence** : Common.


**Parts used** : Flowers & leaves.

**Taste/Potency** : Sweet (ngar) & astringent (ka)/ Cool (sil).

**Use** : Lung and liver fever, bile disease, swelling of limbs, and sores.

**Toxicity** : Non-toxic.

**Mode of use** : Used with other herbs.

**Harvesting** : Flowers and leaves are collected selectively from matured plant during Jun.-Sep.

**National status** : Threat not known.

**Local status** : Not vulnerable. Commonly found and collected mostly by amchis.

Morina polyphylla Wall. ex DC.

Family : Dipsacaceae
Vernacular names : Changtser karpo, Changtser goepa (Am); Dheunkaama (Km); Chilleti (Dn).

Habitat & distribution : Open slopes, grazing grounds; 3000-4300 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan). Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo, Bijer, Saldang, Dho areas.

Diagnostic characters : Spinous herb; roots with unpleasant smell. Leaves in whorls, linear acute, fused in a sheath at base, pinnately lobed, with stiff marginal spines. Flowers small reddish or white in a dense spike; bracts large, linear-lanceolate spreading, fused at base.

Occurrence : Abundant.
Flowering & fruiting : Jun.-Aug. (fl).
Parts used : Roots.
Taste/Potency : Sweet (ngar) & Astringent (ka)/Warm (dro).
Use : Swellings, gastritis and painful joints. Root paste prepared with other herbs (Stellera chamaejasme L., Aconitum spicatum (Brühl) Stapf, and Terminalia bellirica (Gaertn.) Roxb.) is applied to painful joints.

Toxicity : Non-toxic.
Mode of use : Used with other herbs.
Harvesting : Roots are collected during Sep.-Oct.
National status : Threat not known.
Local status : Not vulnerable.
Abundantly found and collected mostly by amchis.
**Myricaria rosea** W.W. Sm.41

*Myricaria germanica* var. *prostrata* Dyer, *M. prostrata* Hook. f. & Thomson ex Benth. & Hook. f

**Family**: Tamaricaceae

**Vernacular names**: Wonbu (Am), Thrishing (Km).

**Habitat & distribution**: Riverside gravel; 3000-4400 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan). Locally found in Pungmo, Ringmo, Bijer, Saldang, Dho areas.

**Diagnostic characters**: Much branched prostrate shrub, with spreading branches. Leaves small, lanceolate to linear, gland dotted. Flowers pink, fragrant in dense terminal spikes. Capsules narrowly ovoid, spindle-shaped, glaucous.

**Occurrence**: Common.

**Flowering & fruiting**: May-Jun. (fl).

**Parts used**: Leaves & flowers.

**Taste/Potency**: Sweet (ngar) & astringent (ka)/Cool (sil).

**Use**: Fever, headache, stomachache and uterine bleeding. Also used as herbal bath and as antidote to food and meat poisoning. Flowers are substituted for *aru* (*Terminalia chebula* Retz.).

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Flowers and leaves are selectively collected during Jun.-Jul.

**National status**: Threat not known.

**Local status**: Not vulnerable.

Commonly found and collected mostly by amchis.

**Family** : Valerianaceae

**Vernacular names** : Pang poe, Dak poe (Am, Km); Bhulte, Bhutle (Dn); Jatamansi (Np, Sn).

**Common names** : Spikenard, Musk root.

**Habitat & distribution** : Rocks, open slopes, scrubs, forests; 3200-5300 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan), W China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Majphal areas.

**Diagnostic characters** : Perennial herb with thick aromatic rhizome covered by reddish brown fibres. Leaves basal, elliptic-lanceolate to spatulate, sessile. Flowers rosy, pale pink or white, in dense terminal cymes. Fruits obovate, 1-seeded.

**Occurrence** : Common.


**Parts used** : Rhizomes & leaves.

**Taste/Potency** : Sweet (*ngar*) & bitter (*kha*); Cool (*sil*).

**Use** : Rhizomes are used for wounds, cough, cold, chronic fever, fever due to poisoning, spleen disease, intestinal parasites, high blood pressure, tumours, stomach diseases and swellings. Leaves are used for high altitude sickness, headache, fever and wounds. Rhizomes are highly used for incense.

**Toxicity** : Non-toxic.

**Mode of use** : Used with other herbs.

**Chief constituents** : Rhizome yields volatile oil, containing jatamansone, seychellene, norseychelanne, jatamansic acid, nardostachone, etc.

**Harvesting** : Leaves are collected during Jul.-Aug. and rhizomes during Sep.-Oct.

**National status** : Vulnerable (IUCN), CITES Appendix II, HMG Nepal protection 2 (banned for export outside the country in unprocessed form).

**Local status** : Highly vulnerable. Threat is due to unsustainable harvesting for trade.

Family: Scrophulariaceae
Vernacular names: Hong len (Am); Tikta (Km); Katuko, Katuki (Dn); Kutki (Np); Katuka (Sn).

Habitat & distribution: Rocky slopes, scree, gravelly areas; 3500-4800 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan), China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo areas.

Diagnostic characters: Perennial herb with woody, creeping rhizome. Leaves sub-radical, rosetted, spatulate to ovate, serrate. Flowers dark blue-purple, in a dense terminal raceme, borne on aerial stem arising from rosette. Capsule ovoid.

Occurrence: Common.
Flowering & fruiting: Jul.-Sep.
Parts used: Rhizomes & roots.
Taste/Potency: Bitter (kha)/Cool (sil).
Use: Bile disease, intestinal pain, blood and lung fever, high blood pressure, sore throat, eye disease, gastritis, cough and cold.

Mode of use: Used singly or with other herbs. For cough and cold, rhizomes are soaked in water over night and the water is given to the patient.

Chief constituents: Rhizomes contain kuttin, kurrin, kurkin, kutkisterol, picrorhizin, picroliv, etc.

Harvesting: Rhizomes are harvested selectively from matured plants during Oct.-Nov.

National status: Vulnerable (IUCN). HMG Nepal protection 1 (banned for collection, use, sale, distribution, transportation and export).

Local status: Highly vulnerable. Threat is high due to harvesting of rhizome for trade.

Oxyria digyna (L.) Hill
Rumex digynus L.

Family: Polygonaceae

Vernacular names: Chuma tsi (Am); Nyalowa nyalu, Kyurmu, Wueen (Km); Boke, Bojo (Dn, Np).

Common name: Mountain sorrel.

Habitat & distribution: Open slopes, moist places; 2400-5000 m, WCE Nepal. It is distributed in Europe, W & C Asia, Himalaya (Kashmir to Bhutan), Siberia, W China, Japan, N America, Greenland. Locally found in Jagdulla, Kagmara, Pungmo, Ringmo areas.

Diagnostic characters: Glabrous succulent herb. Leaves mostly basal, long stalked, fleshy, pale green often turning reddish; blade rounded to kidney-shaped. Flowers greenish or reddish, borne in long slender, sparsely branched spikes. Fruits orbicular, notched, red, with membranous wing.

Occurrence: Abundant.

Flowing & fruiting: May-Aug. (fl).

Parts used: Leaves & flowers.

Taste/Potency: Sweet (ngar) & sour (kyur) / Cool (sil) & heavy (chi).

Use: Lymphs disorders and urine retention. Leaves are edible raw or cooked.

Toxicity: Non-toxic.

Mode of use: Used with other herbs.

Harvesting: Plant parts are harvested during Jul.-Aug.

National status: Threat not known.

Local status: Not vulnerable. Abundantly found and collected mostly by amchis.


*Isopyrum microphyllum Royle*

**Family**: Ranunculaceae

**Vernacular names**: Yumo deu jin (Am); Yumoma dheujin (Km).

**Habitat & distribution**: Rock crevices; 3400-4900 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), China, Mongolia, S Siberia. Locally found in Jagdulla, Mukroman, Kagmara, Pungmo, Ringmo, Dho areas.

**Diagnostic characters**: Densely tufted perennial herb, with rootstocks surrounded by persistent petioles. Leaves basal, long stalked, ternate; leaflets divided into deeply lobed segments. Flowers solitary, somewhat pendulous, cup-shaped, white, blue or lilac, borne on slender leafless stems. Follicles oblong, shortly stalked.

**Occurrence**: Common.


**Parts use**: Stem, leaves & flowers.

**Taste/Potency**: Bitter (*kha*) & astringent (*ka*)/Cool (*sil*).

**Use**: Gynaecological diseases, uterine tumours, and blood disorder (*thrag tshab*). Also expels placenta retained after delivery and removes foreign objects (bullets, nails) from the body.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Plant parts are harvested during Jul.-Aug.

**National status**: Threat not known.

**Local status**: Not vulnerable. Commonly found and is collected mostly by amchis.

**Pedicularis hoffmeisteri** Klotzsch

**Family**: Scrophulariaceae  
**Vernacular names**: Lugru, Lugru serpo (Am, Km).

**Habitat & distribution**: Shrubberies, open slopes; 2300-4500 m, WCE Nepal. Distributed in the Himalaya (Himachal Pradesh to Nepal). Locally found in Jagdulla, Mukroman, Kagmara, Pungmo, Ringmo, Dho areas.

**Diagnostic characters**: Erect herb. Leaves narrow-elliptic, deeply lobed, coarsely toothed; upper leaves sessile, lower leaves stalked. Flowers pale yellow or cream, in terminal clusters; corolla-tubes very long, upper and lower lip rounded, encircling the long slender beak, which is curved in a circle.

**Occurrence**: Common.

**Flowering & fruiting**: Jun.-Aug. (fl).

**Parts used**: Leaves & flowers.

**Taste/Potency**: Bitter (*kha*) & astringent (*ka*)/Cool (*sil*).

**Use**: Circulatory system disorders, liver fever, bile disorders, poisoning, lymph fluid disorder, and wounds.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Plant parts are harvested during Jul.-Aug.

**National status**: Threat not known.

**Local status**: Not vulnerable. Commonly found and collected by amchis.

Pedicularis longiflora Rudolph var. tubiformis (Klotzsch) P.C. Tsoong

Pedicularis tubiformis Klotzsch, *P. longiflora* subsp. *tubiformis* (Klotzsch) Pennell

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**Habitat & distribution**: Grassy slopes, damp places, river banks; 3300-5000 m, WCE Nepal. Distributed in the Himalaya (Baltistan to Bhutan), W China. Locally found in Kagmara, Pungmo and Dho areas.

**Diagnostic characters**: Erect or spreading annual herb. Leaves alternate, with oblong, toothed lobes. Flowers golden yellow, with dark brown or red markings, in terminal clusters; corolla-tubes long, upper lip curved into long beak, lower lip broader, 3-lobed.

**Occurrence**: Rare.

**Flowering & fruiting**: May-Oct.

**Parts used**: Flowers or whole plant.

**Taste/Potency**: Bitter (*kha*) & astringent (*ka*)/Cool (*sil*).

**Use**: Water retention, food poisoning, liver and stomach disorders, lymph fluid disorder, asthma, wounds, and headache from bile disease. It is substituted for bezoar or giwang (found in the liver of elephant/yak).

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Plant parts are harvested during Jul.-Aug.

**National status**: Threat not known.

**Local status**: Vulnerable. Threat is due to its low availability with restricted distribution and harvesting of whole plant for medicine.

Pedicularis siphonantha D. Don

Family: Scrophulariaceae
Vernacular names: Lug ru mar po, Lug ru mug po (Am, Km).

Habitat & distribution: Open slopes, meadows, swampy place; 3000-4500 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan), China (Xizang). Locally found in Pungmo, Dokpa and Dho areas.

Diagnostic characters: Erect perennial herb. Leaves with oblong, toothed lobes. Flowers bright red or purplish-pink, with white throats, in terminal clusters; corolla-tubes very long; upper lip curved into bifid beak, lower lip broader, 3-lobed, lateral lobes broad rounded and mid-lobe notched.

Occurrence: Rare (nyung).
Flowering & fruiting: Jun.-Aug. (fl).
Parts used: Leaves, flowers, or whole plant.
Taste/Potency: Bitter (kha) & astringent (ka)/Cool (sil).
Use: Used as antidote to poisoning, and in liver disorders, fever and headache. It is also used to dry lymph fluid and heal wounds.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Plant parts are harvested during Jul.-Aug.
National status: Threat not known.
Local status: Vulnerable. Threat is due to its low availability with restricted distribution and harvesting of whole plant for medicine.
Family: Berberidaceae.

Vernacular names: Wolmose (Am), Balugu (Km); Meme gudruk (Dn); Laghu patra (Np).

Common name: Himalayan may apple.

Habitat & distribution: Open and shady places, shrubberies; 2400-4500 m, WCE Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Arunachal Pradesh), W China. Locally found in Kagmara, Pungmo, Ringmo areas.

Diagnostic characters: Perennial rhizomatous herb, with erect unbranched stem. Leaves 2, large, long-petioled, borne at the stem apex, palmately lobed into 3 elliptic or obovate segments. Flowers solitary, cup-shaped, white or pink, borne on petiole of upper leaf. Berry large, fleshy, red.

Occurrence: Common.


Parts used: Fruits.

Taste/Potency: Sweet (ngar) & astringent (ka)/Neutral (nyom).

Use: Gynaecological diseases, menstrual disorders, kidney disease, skin disease, cough, fever due to channel disorders and bleeding. It assists childbirth and expulsion of placenta. Fruits are eaten raw.

Toxicity: Slightly-toxic.

Mode of use: Used with other herbs.

Chief constituents: Plant contains podophyllin.

Harvesting: Fruits are collected selectively during Aug.-Sep.

National status: Vulnerable (IUCN), CITES Appendix II. Threat is due to harvesting for trade.

Local status: Not vulnerable. It is commonly found and only the fruits are collected for medicine.

**Polygonatum cirrhifolium** (Wall.) Royle

Convallaria cirrhifolia Wall.

**Family**
Liliaceae

**Vernacular names**
Ramnye (Am); Ranya (Km); Khiraunle (Dn, Np); Mahameda (Sn).

**Common name**
Solomon’s seal

**Habitat & distribution**
Forests, shrubberies, open slopes; 1700-4600 m, WCE Nepal. Distributed in the Himalaya (Punjab to Bhutan), NE India, W. China. Locally found in Mukroman, Pungmo, Ringmo areas.

**Diagnostic characters**
Erect perennial herb, with stout creeping rhizome. Leaves in whorls of 3-6, linear to narrow-lanceolate, with coiled tendril-like tips. Flowers tubular, white, tinged purple or green, 2-3 in short-stalked clusters, arising from the axils of leaves.

**Occurrence**
Abundant.

**Flowering & fruiting**
May-Jul. (fl).

**Parts used**
Roots.

**Taste/Potency**
Sweet (ngar), & astringent (ka)/Warm (dro).

**Use**
Used as tonic to restore vitality, increase regenerative fluids; also beneficial for cold wind disorders; bile and generate stomach heat. Also used as fixer in painting canvas/walls. Roots are edible raw.

**Toxicity**
Non-toxic.

**Mode of use**
Used singly (as tonic) or mixed with other herbs.

**Harvesting**
Roots are collected during Oct.

**National status**
Threat not known.

**Local status**
Not vulnerable. Commonly found and collected mostly by amchis.
Potentilla fruticosa L.

- **Family**: Rosaceae
- **Vernacular names**: Penak, Pemma nakpo (Am); Pema (Km); Jhwan (Dn); Bhairang pate (Np).
- **Common name**: Bush cinquefoil.

**Habitat & distribution**: Open slopes, shrubberies; WCE Nepal, 2400-5500 m. Distributed in the Himalaya (Kashmir to Bhutan), China. Locally found in Jagdulla, Dokpa, Mukroman, Kagmara, Pungmo, Ringmo, Saldang, Bijer, Dho areas.

**Diagnostic characters**: Low-spreading, much branched shrub, forming thickets. Leaves pinnate, with 3-7 small, silvery-haired, ovate-lanceolate leaflets. Flowers large, bright yellow, solitary, terminal.

**Occurrence**: Abundant.

**Flowering & fruiting**: Jun.-Sep.

**Parts used**: Stem, leaves & flowers.

**Taste/Potency**: Sweet (ngar) & bitter (kha) / Cool (sil).

**Use**: Breast disease, stomach and lung disorders, and indigestion. Plant is also used as incense.

**Toxicity**: Non-toxic.

**Mode of use**: Used singly or with other herbs. Herbal tea is taken to cure different diseases.

**Harvesting**: Stems, leaves and flowers are selectively harvested from the matured stock during Jul.-Sep.

**National status**: Threat not known.

**Local status**: Not vulnerable. Abundantly found and collected mostly by amchis.

Family: Primulaceae
Vernacular names: Shang dril nagpo, Shang dril ngonpo (Am); Dum ra metog (Km).

Habitat & distribution: Meadows, open slopes, damp places; 3300-5600 m, WCE Nepal. Distributed in Pakistan, Himalaya (Kashmir to Bhutan), China. Locally found in Jagdulla, Dokpa, Mukroman, Kagmara, Pungmo, Ringmo, Dho areas.

Diagnostic characters: Robust perennial herb. Leaves narrow lanceolate or strap-shaped, with white farina beneath. Flowers purple, violet or lilac, with a darker eye, in a dense head. Capsule cylindrical.

Occurrence: Common.
Flowering & fruiting: Jun.-Aug. (fl).
Parts used: Whole plant.
Taste/Potency: Bitter (kha) & sweet (ngar)/Cool (sil).
Use: Plant is used as antidote to food poisoning. Flowers are used in fever, indigestion, dysentery and ulcer.

Toxicity: Non-toxic.
Mode of use: Used with other herbs.
Harvesting: Plant parts are selectively collected during Jul.-Sep.

National status: Threat not known.
Local status: Not vulnerable. Commonly found and collected mostly by amchis.
Primula sikkimensis Hook. f.

Family: Primulaceae
Vernacular names: Shang dril serpo (Am); Syaule phul (Dn).

Habitat & distribution: Open slopes, damp places, along the streams; 2900-4800 m, WCE Nepal. Distributed in the Himalaya (Nepal to Bhutan), NE India, Myanmar, W China. Locally found in Dokpa areas.

Diagnostic characters: Robust perennial herb. Leaves mostly basal, with blades tapering to the shortly winged leaf-stalk. Flowers yellow, creamy-white, scented, pendulous, numerous in umbel like inflorescence.

Occurrence: Common.
Flowering & fruiting: May-Aug. (fl).
Parts used: Flowers.
Taste/Potency: Bitter (kha) & sweet (ngar)/Cool (sil).

Use: Used in case of fevers of the lung and blood, channel disorders and diarrhoea.

Toxicity: Non-toxic.
Mode of use: Used with other herbs.
Harvesting: Flowers are selectively collected during May-Jul.

National status: Threat not known.
Local status: Not vulnerable. Commonly found and collected mostly by amchis.

Major documentation: Chophel (1993).
**Pterocephalus hookeri** (C.B. Clarke) Diels  
*Scabiosa hookeri* C. B. Clarke

**Family**  
Dipsacaceae

**Vernacular names**  
Pangtsi dobo (Am); Takullya (Km).

**Habitat & distribution**  
Open slopes, meadows; 3000-4500 m, WC Nepal. Distributed in the Himalaya (Nepal to Bhutan), SW & W China. Locally found in Jagdulla, Dokpa, Mukroman, Pungmo, Dho areas.

**Diagnostic characters**  
Small perennial herb, with woody rootstock. Leaves basal, linear-spathulate, entire or lobed. Flowers lilac or cream-coloured in globular heads, borne on hairy leafless stem. Fruits with papery limb and calyx bristles.

**Occurrence**  
Abundant.

**Flowering & fruiting**  
Jul.-Sep.

**Parts used**  
Leaves, flowers & fruits.

**Taste/Potency**  
Bitter (*kha*)/Cool (*sil*).

**Use**  
Cough, cold, fever due to poisoning, contagious fever, infection, bile disorder, jaundice, diarrhoea and dysentery, gout, arthritis, blood disorders, and intestinal pain.

**Toxicity**  
Slightly poisonous.

**Mode of use**  
Used singly or with other herbs. Flowers and leaves are dried and brewed as a tea to alleviate colds.

**Harvesting**  
Plant parts are collected during Jul.-Sep.

**National status**  
Threat not known.

**Local status**  
Not vulnerable. Abundantly found and collected mostly by amchis.

**Major documentation**  
Family : Punicaceae
Vernacular names : Sendu (Am, Km); Anar, Darim (Dn, Np); Dadima (Sn).
Common name : Pomegranate.
Habitat & distribution : Open and dry slopes; 700-2700 m, WC Nepal. Distributed in C & W Asia, Himalaya; cultivated. Locally found in wild state in Thuli Bheri and Suligad valleys from 2000-2300 m.
Diagnostic characters : Shrub or a small tree, 2-3 m high; branchlets often spine-tipped. Leaves entire, lanceolate to oblanceolate, opposite. Flowers scarlet, axillary; calyx tubular, with 5-7 triangular fleshy lobes. Fruits globular, crowned by persistent calyx.
Occurrence : Common.
Flowering & fruiting : Apr.-Sep.
Parts used : Bark, Flowers & fruits.
Taste/Potency : Sour (kyur) & sweet (ngar)/ Warm (dro).
Use : Indigestion, loss of appetite, cold diseases, diarrhoea, dysentery and for promoting digestive heat. Outer layers of fruit, calyx and flower parts are used in cough. Bark is used as anthelmintic.
Toxicity : Non-toxic.
Mode of use : Used singly or with other herbs.
Chief constituents : Plant contains tannin and pyridine alkaloids.

Harvesting : Flowers are collected during Jun.-Aug. and fruits during Sep.-Oct.
National status : Threat not known.
Local status : Vulnerable. Fruits are collected in large amount for the preparation of concentrated juice (chuk). Natural population is threatened mainly due to habitat encroachment and use for firewood.

Punica granatum L.
Family: Ranunculaceae
Vernacular names: Chetsa, Chu rugpa (Am).

Habitat & distribution: Damp places in meadows, scrubs, forests; 3000-5000 m, WCE Nepal. Distributed in C Asia, Himalaya (Kashmir to Arunachal Pradesh), China. Locally found in Jagdulla, Pahada, Kagmara, Pungmo, Dho areas.


Occurrence: Abundant.
Parts used: Leaves, flowers & stems.
Taste/Potency: Acrid (tsa)/Warm (dro).
Use: Indigestion, cold tumours and weak digestive heat.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Plant parts are collected during Jun.-Aug.
National status: Threat not known.
Local status: Not vulnerable. Abundantly found and collected mostly by amchis.
Family : Polygonaceae

Vernacular names : Chutsa (Am), Tarbu bartar (Km); Padamchal, Chulthi amilo, Mirechuk (Dn, Np); Amlaparni, Pitamulika (Sn).

Common name : Himalayan rhubarb.

Habitat & distribution : Open slopes; 3200-4200 m, WCE Nepal. Distributed in the Himalaya (Himachal Pradesh to Bhutan), China (Xizang). Locally found in Dokpa, Mukroman, Pungmo areas.

Diagnostic characters : Robust perennial herb, with hollow stem and stout rootstocks. Leaves orbicular, with heart-shaped base, long petioled; upper leaves smaller. Flowers small, dark reddish-purple, in terminal panicles. Fruit purple, winged.

Occurrence : Common.


Parts used : Rootstocks & petioles.

Taste/Potency : Sour (kyur) & bitter (kha)/ Neutral (nyom).

Use : Rootstocks in fracture, sprain, indigestion, bloated stomach, sores, menstrual and blood disorders, and bile fever. Also used for colouring wool and as fixative. Petioles are used as anthelmintic, and in gastritis and swellings. Also used as pickle.

Toxicity : Non-toxic.

Mode of use : Used singly or with other herbs. Petioles are chewed raw to kill intestinal worms. Also dried and stored for later consumption.

Chief constituents : Emodin, glucoside rhapontien, chrysophanol, alueemodin, tannin and catechin.

Harvesting : Rootstocks are harvested during Sep.-Oct. and petioles during Jun.-Jul.

National status : Threat not known.

Local status : Highly vulnerable. Threat is high due to unsustainable harvesting for trade.

**Rhodiola himalensis** (D. Don) S.H. Fu
*Sedum himalense* D. Don, *S. quadrifidum* var. *himalense* (D. Don) Frod.

**Family**: Crassulaceae

**Vernacular names**: Tsen chungba, Solo mukpo (Am).

**Habitat & distribution**: Shrubberies, screes, rocky slopes; 3600-4600 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), SW China. Locally found in Jagdulla, Dokpa, Mukroman, Kagmara, Pungmo, Ringmo, Dho, Saldang areas.

**Diagnostic characters**: Perennial herb with many glandular pubescent, stout, 10 cm long flowering stems, arising from elongate, sub-erect rhizomes. Leaves fleshy, oblanceolate to narrow elliptic. Flowers dark red, pinkish to yellow in dense terminal subumbellately arranged cymes.

**Occurrence**: Common.

**Flowering & fruiting**: Jun.-Aug. (fl).

**Parts used**: Whole plant.

**Taste/Potency**: Astringent (*ka*) & bitter (*kha*)/Cool (*sil*).

**Use**: Kidney disease, urinary disorders, asthma, lung infection, lymph fluid disorders, poisoning, arthritis and fever. Also used for skin diseases and oral infection.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Rootstocks are harvested during Aug.-Sep.

**National status**: Threat not known.

**Local status**: Not vulnerable. Commonly found and collected only by amchis.

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**Family**  
Crassulaceae

**Vernacular names**  
Tsen chungba, Solo mukpo (Am).

**Habitat & distribution**  
Shrubberies, screes, rocky slopes; 3600-4600 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), SW China. Locally found in Jagdulla, Dokpa, Mukroman, Kagmara, Pungmo, Ringmo, Dho, Saldang areas.

**Diagnostic characters**  
Perennial herb with many glandular pubescent, stout, 10 cm long flowering stems, arising from elongate, sub-erect rhizomes. Leaves fleshy, oblanceolate to narrow elliptic. Flowers dark red, pinkish to yellow in dense terminal subumbellately arranged cymes.

**Occurrence**  
Common.

**Flowering & fruiting**  
Jun.-Aug. (fl).

**Parts used**  
Whole plant.

**Taste/Potency**  
Astringent (*ka*) & bitter (*kha*)/Cool (*sil*).

**Use**  
Kidney disease, urinary disorders, asthma, lung infection, lymph fluid disorders, poisoning, arthritis and fever. Also used for skin diseases and oral infection.

**Toxicity**  
Non-toxic.

**Mode of use**  
Used with other herbs.

**Harvesting**  
Rootstocks are harvested during Aug.-Sep.

**National status**  
Threat not known.

**Local status**  
Not vulnerable. Commonly found and collected only by amchis.
**Family** : Ericaceae

**Vernacular names** : Balu karpo (Am); Surkar, Dhali karpo, Da li, Balu (Km); Pehlu, Sunpate (Dn); Sunpate, Sunpati (Np).

**Habitat & distribution** : Open slopes, shrubberies; 3300-5100 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), China. Locally found in Dokpa, Jagdulla, Kagmara, Mukroman, Pungmo, Ringmo, Dho areas.

**Diagnostic characters** : Evergreen, aromatic shrublet. Leaves oval to obovate, densely scaly beneath. Flowers white, pink or yellow, in compact clusters; capsule enclosed in the persistent calyx.

**Occurrence** : Abundant.

**Flowering & fruiting** : May-Jul. (fl).

**Parts used** : Leaves & flowers.

**Taste/Potency** : Astringent (ka)/Warm (dro).

**Use** : Stomach, liver and lung disorders, indigestion, sore throat, and phlegm disease. Also used as appetizer, diuretic, in allergy from eating potato, and in vomiting. Leaves and flowers are used for incense.

**Toxicity** : Non-toxic.

**Mode of use** : Used with other herbs. Tea brewed from fresh flowers is used for liver disorders, allergy and vomiting.

**Chief constituents** : Plants yield essential oil.

**Harvesting** : Plant parts are collected during Aug.-Sep.

**National status** : Threat not known.

**Local status** : Not vulnerable. Abundantly found and collected only for local use.


**Rhododendron anthopogon** D. Don
Rhododendron lepidotum Wall. ex G. Don

Family: Ericaceae
Vernacular names: Balu nagnpo, Dhali nagnpo (Am); Sumak, Sulo, Balu (Km); Pehlu (Dn); Bhale sunpate (Np).

Habitat & distribution: Forests, shrubberies, open slopes; 2100-4700 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Arunachal Pradesh), NE India, N Myanmar, China. Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo areas.

Diagnostic characters: Small evergreen, resinous, matforming shrublet. Leaves small, obovate, narrow-oblancoelectate or elliptic, scaly above and beneath. Flowers pink on dull purple in terminal clusters. Capsule densely scaly.

Occurrence: Abundant.
Flowering & fruiting: Jun.-Sep.
Parts used: Leaves & flowers.
Taste/Potency: Acrid (tsa) & bitter (kha)/Warm (dro).
Use: Promotes digestive heat and stimulates appetite. Used for bile and lung disease, headache from bile, back pain, cold and blood disorders and bone disease. Leaves are used for incense.
Toxicity: Non-toxic.

Mode of use: Used with other herbs. Herbal tea of flowers is given in pain, cold, bile and blood disorders and herbal bath in bone disease.
Chief constituents: Leaves yield essential oil.
Harvesting: Plant parts are harvested during Jul.-Sep.
National status: Threat not known.
Local status: Not vulnerable. Abundantly found and mostly used by amchis.
Rhus javanica L.
*Rhus chinensis* Mill., *R. semialata* Murray

**Family**: Anacardiaceae

**Vernacular names**: Da trig (Am); Bhaki amilo, Bhakimlo, Dudhe bhalayo (Dn, Np).

**Habitat & distribution**: Forests, shrubberies, along the river; 1200-2400 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), India, Sri Lanka, Myanmar, E to China, Korea, Japan. Locally found in Suligad valley from 2000-2500 m.

**Diagnostic characters**: Small deciduous tree, with hairy young parts. Leaves pinnate, with 5-13 leaflets; leaflets lanceolate to ovate, long-pointed, coarsely toothed. Flowers pale yellowish-green, in branched clusters. Fruits woolly, reddish-brown.

**Occurrence**: Common.

**Flowering & fruiting**: Aug.-Sep. (fl), Sep.-Mar. (fr).

**Parts used**: Fruits.

**Taste/Potency**: Sour (*kyur*), acrid (*tsa*) & astringent (*ka*)/ Neutral (*nyom*).

**Use**: Colic, diarrhoea, dysentery, breathing disorders, vomiting and loss of appetite.

**Toxicity**: Non-toxic.

**Mode of use**: Used singly or with other herbs. Dried fruits ground and boiled in water and decoction is taken in dysentery and stomach complaints.

**Chief constituents**: Fruits contain tannin, gallic acid and potassium acid salts.

**Harvesting**: Fruits are harvested during Oct.

**National status**: Threat not known.

**Local status**: Not vulnerable.

**Commonly found and mostly used for local health care**.

**Family**  
Rosaceae

**Vernacular names**  
Segoe fo, Segoe (Am); Amdoga, Bella (Km); Kesar (Dn); Jangali gulaf (Dn, Np).

**Habitat & distribution**  
Forests, shrubberies; 2100-3800 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan). Locally found in Jagdulla, Mukroman, Pungmo, Ringmo areas.

**Diagnostic characters**  
Erect shrub, stems sometimes with paired straight prickles below leaves. Leaves with 7-11, ovate-elliptic, finely serrate leaflets. Flowers pink, 1-2, terminal on short lateral shoots. Fruits very large, red, flask-shaped, with persistent calyx.

**Occurrence**  
Common.

**Flowering & fruiting**  

**Parts used**  
Fruits.

**Taste/Potency**  
Sour (kyur) & sweet (ngar)/Neutral (nyom).

**Use**  
Fever, diarrhoea, and bile disorders. Fruits are edible raw and also used for making local wine.

**Toxicity**  
Non-toxic.

**Mode of use**  
Used with other herbs.

**Chief constituents**  
Fruits are rich in vitamin C.

**Harvesting**  
Fruits are harvested during Sep.-Oct.

**National status**  
Threat not known.

**Local status**  
Not vulnerable.

**Major documentation**  
Family: Rosaceae
Vernacular names: Sewa (Am); Seroga, Se (Km), Jangali gulaf (Dn, Np).

Habitat & distribution: Open hill slopes; forests, shrubberies, 2100-4600 m, WCE Nepal. Distributed in the Himalaya (Chamba to Bhutan), NE India, N Myanmar, W China. Locally found in Jagdulla, Mukroman, Kagramara, Pungmo, Ringmo, Dho, Saldang areas.

Diagnostic characters: Stiff erect shrub, 1-4 m high. Stems naked or bearing straight paired or scattered slender or broad prickles. Leaves pinnate; leaflets 5-11, elliptic to oblong, margins serrate at apex, terminal leaflet larger. Flowers white or cream, solitary axillary with persistent calyx. Fruits bright red, globular to pear-shaped.

Occurrence: Abundant.
Parts used: Flowers, fruits & bark.
Taste/Potency: Fruits: Sour (kyur) & sweet (ngar)/Neutral (nyom).
Use: Flowers and ripe fruits are used in liver, bile, wind and lung diseases and menstrual disorders. Bark is used in cases of poisoning and lymph fluid disorders. Ripe fruits are edible raw.

Toxicity: Non-toxic.
Mode of use: Used singly or with other herbs.
Harvesting: Flowers and bark are harvested during May-Jul. and fruits during Sep.-Oct.
National status: Threat not known.
Local status: Not vulnerable.
Abundantly found and mostly used by amchis.
**Family**: Rosaceae  
**Vernacular names**: Kanda ka ri (Am), Gata (Km); Ainselu (Np).

**Habitat & distribution**: Forests, shrubberies; 2100-3600 m, WC Nepal. Distributed in the Himalaya (Himachal Pradesh to Nepal), NE India, China. Locally found in Jagdulla, Pungmo, Ringmo areas.

**Diagnostic characters**: Scrambling shrub with prickly stems. Leaves pinnate; leaflets 3-7, sub-sessile, rounded or elliptic-pointed, finely serrated. Flowers pink in branched axillary clusters. Fruits small, pink or white, hairy.

**Occurrence**: Abundant.
**Parts used**: Stem pith.
**Taste/Potency**: Sweet (ŋgar) & astringent (ka)/Neutral (nyom).

**Use**: Lung disease, cough and cold, and wind fever. Ripe fruits are edible raw.
**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: It is harvested during Jul.-Sep.

**National status**: Threat not known.

**Local status**: Not vulnerable.

**Abundantly found and mostly used by amchis.**

**Family** : Polygonaceae  
**Vernacular names** : Lung sho (Am); Shoma (Km); Hale (Dn); Halhale, Halhale sag (Np).  
**Common name** : Common field sorrel.

**Habitat & distribution** : Cultivated areas, grazed grounds; 1200-4200 m, WCE Nepal. Distributed in SW Europe, W Asia, Himalaya, India, China. Locally found throughout the Suligad, Jagdulla and Thuli Bheri valleys.

**Diagnostic characters** : Perennial herb, with stout rootstock. Leaves entire; lower leaves oblong-ovate, petioled; upper ones smaller, lanceolate, sessile. Flowers bisexual, in whorls, forming long leafless spikes. Fruits with broad wings fringed with comb-like teeth.

**Occurrence** : Abundant.  
**Flowering & fruiting** : Apr.-Oct.  
**Parts used** : Seeds, roots & stems.  
**Taste/Potency** : Sweet (ngar) & bitter (kha)/Cool (sil).  
**Use** : Seeds are used for mouth disorders. Roots are used for joint pain and wounds. Stems are used for lung and liver diseases, constipation, sores, and skin disease. Leaves are eaten as vegetable.

**Toxicity** : Non-toxic.

**Mode of use** : Used singly (in sores and skin diseases) or mixed with other herbs.

**Chief constituents** : Roots contain nepodin, tannin and chrysophanic acid.

**Harvesting** : Plant is harvested during Oct.

**National status** : Threat not known.

**Local status** : Not vulnerable. Abundantly found and mostly used by amchis.

**Family**
Compositae

**Vernacular names**
Gangla metok (Am); Lukshuk, Noppa sumgang (Km); Bhutkesh (Np).

**Habitat & distribution**
Open rocky slopes, screes; 3500-5700 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Bhutan), SW China. Locally found in high alpine areas of Pungmo, Kagmara and Dho.

**Diagnostic characters**
Perennial herb, densely covered with white- or grey-woolly hairs. Leaves toothed or lobed, sessile, imbedded in dense woolly hairs. Flower-heads with purple florets, clustered at the apex of the stem imbedded in woolly hairs.

**Occurrence**
Rare.

**Flowering & fruiting**
Jul.-Oct.

**Parts used**
Whole plant.

**Taste/Potency**
Bitter (*kha*).

**Use**
Gynaecological disorders, menstrual disorders, and hysteria. Plant is used to guard against evil spirits.

**Toxicity**
Non-toxic.

**Mode of use**
Used with other herbs.

**Harvesting**
Plant is harvested during Aug.-Sep.

**National status**
Threat not known.

**Local status**
Vulnerable. Threat is due to its low availability, restricted distribution and harvesting of whole plant for medicine.

**Major documentation**
Family : Umbelliferae
Vernacular names : Tunak (Am); Sunaga (Km); Bhattauri (Dn); Bhutkesh (Dn, Np); Kanthaparna (Sn).

Common name : Ragwort.

Habitat & distribution : Shrubberies, open slopes, edges of fields; 2700-4800 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Bhutan), NE India, China (Xizang). Locally found in Jagdulla, Mukroman, Pungmo, Ringmo areas.

Diagnostic characters : Tall perennial herb. Leaves 3-5 times divided into numerous elliptic segments. Lower leaves long-stalked, sheathing at base, upper smaller, the uppermost reduced to a sheath. Flowers white, in compound umbels. Fruits with broad lateral wings.

Occurrence : Common.
Parts used : Roots & fruits.
Taste/Potency : Bitter (kha) & acrid (tsa).
Use : Roots are used for cuts and wounds as antiseptic and to check bleeding. Roots and fruits are used for colic, gastritis and intestinal pain.
Toxicity : Slightly-toxic.
Mode of use : Used with other herbs.

Chief constituents : Roots contain heraclenin, bergapten, imperatorin, heraclenol, etc.

Harvesting : It is harvested during Aug.-Sep.

National status : Traded. Threat not known.
Local status : Not vulnerable. Commonly found and mostly used by amchis.

Family
Vernacular names
Habitat & distribution
Diagnostic characters
Occurrence
Flowering & fruiting
Parts used
Taste/Potency
Use
Toxicity
Mode of use
Harvesting
National status
Local status
Major documentation

Family

Compositae

Vernacular names

Solgong serpo (Am);
Solgong pa (Km).

Habitat & distribution

Stony slopes, screes;
4100-5500 m, WCE Nepal. Distributed in the
Himalaya (Himachal Pradesh to Bhutan), China
(Xizang). Locally found in Dokpa, Kagmara, Pungmo
and Dho areas.

Diagnostic characters

Small herb. Leaves
narrow, oblong and shallowly lobed or toothed, to
lanceolate entire, stalked, rosetted. Flower-heads
yellow, many, in a compact almost stemless
inflorescence; ray-florets 4, oblong; involucral bracts
linear blunt. Fruits cylindrical, with long grey pappus.

Occurrence

Rare.

Flowering & fruiting


Parts used

Flowers.

Taste/Potency

Bitter (kha)/Cool (sil).

Use

Used in fever from
poisoning, broken skull
and as a purgative.

Toxicity

Non-toxic.

Mode of use

Used with other herbs.

Harvesting

Flowers are harvested
during Sep.-Oct.

National status

Threat not known.

Local status

Vulnerable. Threat is due
to its low availability with restricted distribution and
harvesting for medicine.

Major documentation

Arya (1998), Chophel
**Family**: Thymelaeaceae

**Vernacular names**: Re jak, Re jak pa (Am); Go nara, Go dan ga (Km); Mege phul, Jharan (Dn).

**Habitat & distribution**: Meadows, stony slopes; 2700-4200 m; WC Nepal. Distributed in C Asia, Himalaya (Uttar Pradesh to Bhutan), Mongolia, E Siberia, China. Locally found in Dokpa, Kagmara, Pungmo, Ringmo, Bagala, Numala, Dho areas.

**Diagnostic characters**: Perennial, clump-forming herb, with many stems arising from woody rootstock. Leaves overlapping, elliptic-lanceolate, long pointed, sessile; upper leaves forming involucre round the flower-heads. Flowers sweet-scented, white with pinkish tubes, in rounded terminal heads. Fruits ovoid.

**Occurrence**: Abundant.

**Flowering & fruiting**: May-Jul. (fl).

**Parts used**: Rootstocks.

**Taste/Potency**: Acrid (tsa)/Warm (dro).

**Use**: Used in cases of infectious diseases and pain from swellings. Used as antiseptic for open wounds, poultice for swellings and fractured bone, and for massage.

**Toxicity**: Slightly poisonous. Smell of the flower can cause headache.

**Mode of use**: Used with other herbs.

**Harvesting**: Rootstocks are harvested during Oct.-Nov.

**National status**: Threat not known.

**Local status**: Not vulnerable.

**Abundantly found and mostly used by amchis.**

Family: Gentianaceae

Vernacular names: Tikta, Chak tik (Am).

Habitat & distribution: Meadows, open slopes; 3600-5000 m, WCE Nepal. Distributed in the Himalaya (Uttar Pradesh to Sikkim), NE India, China (Xizang). Locally found in Jagdulla, Dokpa, Kagmara, Pungmo, Ringmo areas.

Diagnostic characters: Erect perennial herb. Leaves spatulate; lower long stalked, the upper nearly stalkless. Flowers lurid blue, long stalked; corolla lobes 5, narrow-elliptic, with 2 linear basal nectaries surrounded by long hairs, or hairless. Capsules narrowly oblong.

Occurrence: Common.


Parts used: Whole plant.

Taste/Potency: Bitter (kha)/Cool (sil).

Use: Bile disease, liver disease, cough, cold, fever, wind fever, bone fever and headache.

Toxicity: Non-toxic.

Mode of use: Used with other herbs.

Harvesting: It is collected in Nov.-Dec.

National status: Threat not known.

Local status: Not vulnerable. Commonly found and mostly used by amchis.

Family: Compositae
Vernacular names: Khur mang (Am); Wakhur, Dangsong metog (Km); Nigale sag (Dn).

Habitat & distribution: Meadows, shrubberies; 3500-4300 m, WC Nepal. Distributed in the Himalaya (Nepal to Bhutan), W China. Locally found in Jagdulla, Dokpa, Pungmo, Ringmo, Dho areas.

Diagnostic characters: A small perennial herb, with milky sap. Leaves basal, lobed. Flower-heads yellow, borne in a long stalk arising from the rosette of leaves.

Occurrence: Common.
Flowering & fruiting: Jun.-Sep.
Parts used: Leaves & flowers.
Taste/Potency: Bitter (kha)/Cool (sil).
Use: Ulcer, brown phlegm (bad kan mug po), chronic fever, poisoning, eye infection, bile and stomach disorders. Also used as galactagogue. Milky sap cures poisoning from precious stones and metals. Also used as vegetable and fodder.
Toxicity: Non-toxic.
Mode of use: Used with other herbs.

Harvesting: Leaves and flowers are collected during Jul.-Aug.
National status: Threat not known.
Local status: Not vulnerable. Commonly found and mostly used by amchis.

Taraxacum tibetanum Hand.-Mazz.
Thalictrum foliolosum DC.

**Family** : Ranunculaceae  
**Vernacular names** : Ngo tin chag kyu, Chag kyu (Am); Noghag kyu (Km); Bansuli, Dampate, Mamira (Np); Trayamana, Pitaranga (Sn).  
**Common name** : Meadow rue.

**Habitat & distribution** : Moist places, forests, shrubberies; 1300-3400 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Arunachal Pradesh), N Myanmar, China. Locally found in Jagdulla, Pungmo, Ringmo areas.

**Diagnostic characters** : Tall, glabrous herb, 1-2 m high. Leaves many times divided into oblong-ovate, rounded-toothed, 3-lobed leaflets. Flowers white to dull greenish-purple in branched cluster; petals inconspicuous; stamens much longer. Achenes ellipsoid, ribbed, beak curved.

**Occurrence** : Common.  
**Flowering & fruiting** : Jul.-Aug. (fl), Sep.-Nov. (fr).  
**Parts used** : Root, leaf & flowers.  
**Taste/Potency** : Bitter (kha)/Cool (sil).  
**Use** : Contagious fever, poisoning, wounds and infection.  
**Toxicity** : Non-toxic.  
**Mode of use** : Used with other herbs.

**Champion constituents** : Roots contain berberine, thalictrine, palmatine, jatrorrhizine, etc.

**Harvesting** : Leaves and flowers are collected during Jul.-Aug. and roots during Sep.-Oct.

**National status** : Threat not known.

**Local status** : Not vulnerable. Commonly found and mostly used by amchis.

**Thymus linearis** Benth.

**Thymus himalayicus** Ronn.

**Family** : Labiatae  
**Vernacular names** : Maktok, Maktokpa (Am); Ghoda-macha, Ghodamarcha (Km, Dn).

**Habitat & distribution** : Open places, stony slopes; 1500-4500 m, WCE Nepal. Distributed in Afghanistan, Pakistan, Himalaya (Kashmir to Nepal), India, China, Japan. Locally found in the Suligad, Jagdulla and Thuli Bheri valleys from 2500 to 4200 m.

**Diagnostic characters** : Small, spreading, aromatic shrublet. Leaves small, elliptic-oblong, nearly stalkless, gland-dotted. Flowers purple, crowded into short dense terminal clusters; calyx 2-lipped with ciliate lobes.

**Occurrence** : Abundant.  
**Flowering & fruiting** : Apr.-Nov.  
**Parts used** : Leaves & flowers.  
**Taste/Potency** : Hot (tsa)/Warm (dro).  
**Use** : Used as appetite stimulant, blood purifier and digestive. Also used in case of gum and tooth problems. Leaves are used as spice.

**Toxicity** : Non-toxic.  
**Mode of use** : Used with other herbs. It is taken as herbal tea.

**Harvesting** : Leaves and flowers are collected during Jul.-Aug. and roots during Oct.-Nov.

**National status** : Threat not known.  
**Local status** : Not vulnerable. Abundantly found and mostly used by amchis.

**Major documentation** : Pohle (1990), Rajbhandari (2001).
**Usnea longissima** Ach.

**Family**
Usneaceae (Ascolichen)

**Vernacular names**
- Shingbal, Ser kue (Am)
- Thangbu balto (Km);
- Jhyau (Np).

**Common names**
Lichen, Old-man’s beard.

**Habitat & distribution**
Corticolous, grows on twigs of oak, rhododendron, fir, birch, etc; 2500-3500 m, WCE Nepal. Distributed in Himalayas, India, China. Locally it is found in Balengra, Kaigaon, Jagdulla, Pungmo areas.

**Diagnostic characters**
Pendulous, thread-like, fruticose lichen; thallus upto 45 cm long, pale yellow to yellowish-green, with solid axis, basal disc not found, much branched, covered by whitish green soredia.

**Occurrence**
Common.

**Season of fructification**
Jun.-Sep.

**Parts used**
Whole thallus.

**Taste/Potency**
Bitter (kha) & astringent (ka)/Cool (sil).

**Use**
Wounds, lung, liver and channel fever and fever from poisoning. Also used as incense.

**Toxicity**
Non-toxic.

**Mode of use**
Used with other herbs.

**Chief constituents**
Plant contains usnic and barbatic acids.

**Harvesting**
Thallus is collected during Aug.-Sep.

**National status**
HMG Nepal protection 2 (banned for export in unprocessed form).

**Local status**
Not vulnerable. It is commonly found and is not collected for trade.

**Major documentation**
**Family** : Valerianaceae  
**Vernacular names** : Na poe (Am, Km); Sugandhwal, Samayo (Dn, Np).  
**Common name** : Indian valerian.  

**Habitat & distribution** : Open slopes, moist places in forest; 1500-3600 m, WCE Nepal. Distributed in Afghanistan, Himalaya (Kashmir to Bhutan), NE India, Myanmar, China. Locally found in Juphal, Pahada, Tripurakot, Majphal areas.  

**Diagnostic characters** : Perennial herb, with tufted stem and long fibrous roots descending from fragrant rhizome. Basal leaves ovate-heart-shaped, long stalked, toothed or wavy; stem leaves few, small, entire or lobed. Flowers small white, or pink-tinged, in terminal cluster.  

**Occurrence** : Common.  
**Parts used** : Rhizomes & roots.  
**Taste/Potency** : Sweet (*ngar*) & bitter (*kha*); Cool (*sik*).  
**Use** : Headache, eye trouble, sore throat, indigestion and wounds. Also used as incense with other herbs.  
**Toxicity** : Non-toxic.  
**Mode of use** : Used with other herbs.  

**Chief constituents** : Rhizome yields essential oil, containing valeranone, isovaleric acid, etc.  
**Harvesting** : Rhizomes are collected during Sep.-Nov.  
**National status** : HMG Nepal protection 2 (banned for export in unprocessed form).  
**Local status** : Highly vulnerable. Threat is due to harvesting of rhizome for trade.  
**Verbascum thapsus L.**

**Family** : Scrophulariaceae

**Vernacular names** : Yugushing, Ngo serje (Am); Singi serchhe, Nope peka, Deber (Km); Gunu puchhu, Guna lankuri (Dn).

**Common names** : Cow's lungwort, Mullein.

**Habitat & distribution** : Shrubberies, stony slopes; 1800-4000 m, WCE Nepal. Distributed from Afghanistan, Himalaya (Kashmir to Bhutan) to SW China. Locally found throughout the Suligad and Bheri valleys from 2000-3600 m.

**Diagnostic characters** : Erect biennial herb with unbranched stem covered with grayish yellow stellate hairs. Leaves oblanceolate, woolly; upper leaves sessile; basal leaves stalked. Flowers yellow in a slender woolly spike; bracts woolly, longer than flowers.

**Occurrence** : Common.

**Flowering & fruiting** : May.-Sep. (fl).

**Parts used** : Leaves, stems & flowers.

**Taste/Potency** : Bitter (kha)/Cool (sil).

**Use** : Used as diuretic and blood purifier and for blood disorders, sores, infections, bleeding wounds and cuts.

**Toxicity** : Non-toxic.

**Mode of use** : Used singly (in sores) or mixed with other herbs.

**Chief constituents** : Plant yields an essential oil. Leaves contain saponins. Roots contain verbascose, aucubin, and flowers contain crocetin.

**Harvesting** : Leaves, stems and flowers are collected during Jul.-Aug.

**National status** : Threat not known.

**Local status** : Not vulnerable. Commonly found and mostly used by amchis.

**Veronica ciliata** Fischer subsp. **cephalooides** (Pennell) Hong

*Veronica cephalooides* Pennell, *V. nana* Pennell

**Family**: Scrophulariaceae  
**Vernacular names**: Dhum nag dhom tri (Am); Dhum ba sha ka (Km).

**Habitat & distribution**: Alpine meadows; 3300-4500 m, WCE Nepal. Distributed in Pakistan, Himalaya (Kashmir to Sikkim), NW India, China (Xizang). Locally found in Mukroman, Dokpa, Kagmara, Pungmo, Ringmo, Dho areas.

**Diagnostic characters**: Erect, grey-white hairy perennial herb; stems often 1. Leaves sessile, opposite, oblong to ovate-lanceolate, pubescent, margin incised-dentate or entire. Flowers blue in terminal and axillary clusters from uppermost leaves.

**Occurrence**: Common.

**Flowering & fruiting**: Jul.-Sep.

**Parts used**: Leaves & flowers.

**Taste/Potency**: Bitter (*kha*) & sweet (*ngar*)/Cool (*sil*).

**Use**: Wounds, bile disease, high blood pressure and malarial fever. Also promotes heat, growth of flesh, stops bleeding, and removes fever from wounds. Plant is substituted for bear’s bile.

**Toxicity**: Non-toxic.

**Mode of use**: Used with other herbs.

**Harvesting**: Leaves and flowers are collected during Jul.-Aug.

**National status**: Threat not known.

**Local status**: Not vulnerable. Commonly found and mostly used by amchis.

Family : Violaceae

Vernacular names : Ta mig (Am), Ta mig pa, Metog serchen (Km).

Habitat & distribution : Forest margins, meadows; 2100-4500 m, WCE Nepal. Distributed in the Himalaya (Kashmir to Arunachal Pradesh), W & N China, North Temperate Zone. Locally found in Jagdulla, Mukroman, Dokpa, Kagmara, Pungmo, Ringmo, Dho areas.

Diagnostic characters : Perennial herb with nodular rootstock. Leaves broadly ovate, base cordate, toothed, long-stalked. Flowers bright yellow with dark brown streaks to the center, and with very short, rounded spur, borne solitarily or paired. Capsule ovoid, glabrous.

Occurrence : Common.

Flowering & fruiting : May-Jul.

Parts used : Whole plant.

Taste/Potency : Bitter (kha) & sweet (ngar)/Cool (sil).

Use : Heals wounds, joins fractured bones, closes the mouth of the channels. It is also beneficial for head and bile disorders.

Toxicity : Non-toxic.

Mode of use : Used with other herbs.

Harvesting : Plant is collected during Jul.-Aug.

National status : Threat not known.

Local status : Not vulnerable. Commonly found and mostly used by amchis.

Notes

1 Snellgrove (1992) refers to Dolpo as a ‘cultural and geographical entity’ within which we have included the village development committees of Phoksumdo, Bijer, Saldang, Tingyud (Tinje), Mukot, Tsharkha and the VDCs in the buffer zone of Shey Phoksundo National Park.

2 The ancient religion of Bon prevailed in Tibet prior to Buddhism. In the 11th century, Bon religion appeared as a structured doctrine, which in its practice had many similarities with Buddhism regarding its doctrine and its practice. In 1978, the Dalai Lama accepted the Bon religion as a distinct school of practice, thus assimilating Bon to Buddhism as a whole (Kind 1999).

3 Buffer zones have been demarcated by HMG/N to promote local management of resources and to reduce the park-people conflict through sharing of park revenue for community development. In the mountain national parks, the buffer zone may also be inside the park as well as in its periphery. The buffer zone of Shey Phoksumdo National Park includes three village development committees inside the park (Saldang, Bijer and Phoksumdo) and eight (Dho, Tripurakot, Raha, Pahada, Rimi, Kalgao in Dolpa and Kimri and Dolphu in Mugu district) outside the park.


5 The terms ‘Amchi’ and ‘Sowarigpa’ are used interchangably in this book as in amchi/sowarigpa tradition. Amchi is a generic term for the practitioners of the Sowarigpa tradition who are also known as menpa, soje, lhaje, etc.

6 Medicine not only cures diseases, but through the ritual practice it also receives the power to transform negative forces into positive ones. The five main demons of samsara associated with the negative mental dispositions (of anger, desire, ignorance, jealousy and pride) are transformed into wisdom (Kind 1999).

7 Sacred texts and objects are hidden in safe sanctuaries to be revealed (as terma) when the need and conditions arise.

8 Shakyamuni Buddha manifested as the Medicine Buddha and revealed the teachings of the Gyushi (Donden 1986).

9 Upon meeting the Dolpo amchi Karma Lhundup in Lhasa, Amchi Nyima Tsering a major figure in the Tibet College of Medicine pointed to the contributions of Dolpo amchis to the development of the tradition and that there was a need for further dialogue and interaction among the amchis of Dolpo (who have been relatively isolated) with those elsewhere in the Himalayas.

10 Amchi Karma Gejor has three children of whom he hopes one who is currently studying in Kathmandu furthers his medical lineage. A major problem in recent years is the lack of interest among the younger generation to pursue this medical tradition, as it has become a difficult profession with which one sustains a living (pers. comm., April 2001).

11 Dr Trogawa Rinpoche, a renowned amchi based in Darjeeling, India at the First National Conference of Amchis in Nepal (January 14-16, 2001) organized by the Himalayan Amchi Association.
Medical schools for amchis are in Lhasa, Thimphu, Dharamsala and Darjeeling. Amchis of Nepal are also interested in having such a school here in Nepal so that amchis can be formally trained and recognized through the provision of certificates.

The gombas (monasteries) are the focal point of religious activities and teaching and contain ancient religious scriptures, thankas, wall paintings, etc. Phoksumdo VDC alone has 14 Bon-po gombas.

Chortens (stupa) are religious monuments which contain the relics of great lamas. In Phokundo, there are two types of chortens; the larger dome shaped Yungdung-kolyak-chorten and the smaller Yungsu-chokbi-chorten.

Laptsai, thobo and mani or mendong/madang are three different types of stone piles erected by the villagers. Stone piles erected atop mountain passes are called laptsai. Mani or madang is a chain of stone piles erected near the chortens or at the entrance of the village. Tibetan religious words and symbols are carved on the stones. Thobo or tho is a stone pile erected by the local people on mountain ridges.

Lhaptsen is the king of the spirits, Lombo is the minister, and Simutong is the name of a female spirit.

Refer to chapter by Tripathi and Schmitt in Ghimire et al. (2001).

Dhami and Jhankri are traditional healers who use plants and other medical materials as well as faith healing processes. They are found in Dolpo in the southern periphery of the park and are usually of Hindu faith.

Annually are species which flower, set seeds and die after one year; Biennials are species which flower, set seeds and die after two years; Monocarpic are species which flower after a determined number of years (more than two) and which die afterwards. Perennials herbs are herbs whose aerial part dries up during winter but whose root system remains alive. Perennials can be very old.

Six plant taxa found in Dolpo fall under the CITES Appendix II, these are Ceropogia sp., Dioscorea deltoidea, Nardostachys grandiflora, Orchidaceae, Podophyllum hexandrum and Taxus baccata. Among them Nardostachys grandiflora and Orchidaceae (Dactylorhiza hatagirea) are traded. Shrestha and Joshi (1996), based on IU CN threat categories, reported 60 species of non-endemic threatened plants and 47 species of endemic threatened plants in Nepal. Among them Nardostachys grandiflora, Neopicrorhiza scrophulariiflora, Paris polyphylla and Pistacia chinensis subsp. integerrina are found in Dolpo. Using the authority provided by the Forest Act (1993), His Majesty's Government (HMG) of Nepal, with a notice published in Nepal Rajpatra (section 50, No 43, part 3) dated February 12, 2001, has imposed restrictions for the collection of 19 different forest products under three different categories: 1- ban for collection, use, sale, distribution, transportation and export; 2- ban for export outside the country; and 3- ban for transportation, export and felling. In the recent amendment, the status of Cordyceps sinensis has been changed from the category 1 to 2 and a new species Neopicrorhiza scrophulariiflora and Juglans regia (bark) have been included under the category 1 (HMG, 2001). Besides these, other species found in Dolpo which fall under the HMG protection are Dactylorhiza hatagirea (category 1), Nardostachys grandiflora (2) and Valeriana jatamansi (2).

Potentially vulnerable species need to be carefully monitored although small amounts of plants used by the amchis or by the traditional health care centre do not represent a major threat.

Allium fasciculatum Rendle (Ri gok) and A. wallichii Kunth (Zimbu nagpo, gonyo) also found in the area are used for similar purposes.
Androsace robusta (Knuth) H and.-Mazz. (Pangatrong, Pankyey dakyahawo) found in the area is also used for similar purposes.

Under the same local generic name, the following plants found in the area are used for similar purposes. Anemone obtusiloba D. Don (subka ngonpo), A. polyanthes D. Don (subka marpo), A. rupicola Cambess. (subka karpo) and A. vitifolia Buch.-Ham. ex D.C. (subka).

Under the same local name, Arisaema tortuosum var. tortuosum (Wall.) Schott is used for similar purposes.

Asparagus filicinus is considered as female type, whereas A. racemosus Willd. (Nye shing, Nye sugpa) is considered as male type and is used for similar purposes under the same amchi name.

Under the same local generic name, Aster himalaicus C.B. Clarke (Metog lugmig yungwa) is used for similar purposes.

Berberis angulosa Wall. ex Hook f. & Thoms. (Kyernak, Kyerkar), B. lysium Royle (Kyer wa) and B. mucrifolia Ahrendt (Kyerkar, Duktser) found in the area are also used for similar purposes.

Bistorta amplexicaulis (D. Don) Greene (Lakang, Pangla metok, Myakuri) and B. vivipara (L.) S.F. Gray (Ram bu god pa) found in the area are also used for similar purposes.

Corydalis meifolia (Gudue serpo, Gudue metog) found in the area is also used for similar purposes.

Cynanchum auriculatum Wight (D hungmo nyung) found in the area is also used for similar purposes.

Under the same local name, Cynoglossum wallichii G. Don and Galium hirtiflorum Requien ex D.C. are also used for similar purposes.

Under the same local generic name, Elsholtzia densa Benth (Jiruk nakpo) and E. fruticosa (D. Don) Rehder (Jiruk serpo) are used for similar purposes.

Euphorbia stracheyi Boiss. (Thron bu, Thar nu chung ba) is also used for similar purposes.

Under the same local name, Heracleum lallii C. Norman is used as substitute.

Under the same local generic name, Incarvillea arguta (Royle) Royle (Ukchoe menpa) is used as substitute.

Juniperus squamata Buch.-Ham. ex D. Don (Shug tser, Pama) also found in the area is used for similar purposes.

Under the same local generic name, Leontopodium cf. monocephalum Edgew. (Tawa thokar goepa) and L. stracheyi (Hook. f.) C.B. Clarke ex Hemsley (Tawa thokar yungpa) are used for similar purposes.

Under the same local generic name, Morina nepalensis D. Don (Changtser yungpa) is used for similar purposes.

Under the same local generic name, Myricaria squamosa D. Don (Changtser yungpa) is used for similar purposes.

Under the same local name, Myricaria squamosa Desv. (Wombu) is used for similar purposes.

Other species with same local name of Lugru serpo (Pedicularis klotzschii H urus, P. oederi Vahl.) and Lugru marpo (P. pyramidata Royle, P. trichoglossa Hook. f.) found in the area are used for similar purposes.
Polygonatum hookeri Baker (Pangi ranye) and P. verticillatum (L.) All. (Ranye goepa) found in the area are also used for similar purposes.

Under the same local generic name Primula buryana Balf. f. (Shang dril karpo), P. involucrata Wall. ex D uby (Shang dril karpo) and P. reidi Duthie var. williamsii Ludlow (Shang dril ngonpo) are also used for similar purposes.

Ranunculus hirtellus Royle ex D. Don (Gatsa) and R. tricuspid Maxim (Suruk) found in the area are also used for similar purposes.

Rheum acuminatum Hook. f. & Thoms. ex Hook. (Chumtsa) and R. moorcroftianum Royle (Chumtsa) found in the area are also used for similar purpose as substitute.

Rosa brunonii Lindl. (Se goe mo, Seldoka) found in the area is also used for similar purposes as a substitute.

Rubus hypargyrus Edgew. (Kanda ka ri) found in the area is also used for similar purposes.

Other related species locally found and used for different medicinal purposes are Saussurea fastuosa (Decne.) Sch. Bip. (Changtser yungwa), S. graminifolia Wall. ex D C. (Solgong menpa, Gangla metok), S. nepalensis Spreng. (Jagopoe mar po) and S. pachyneura Franch. (Konpa gabkye chungwa).

Swertia angustifolia Buch.-H am. ex D. Don (Ngul tik), S. ciliata (D. Don ex G. Don) B.L. Burtt (Bal tik), S. dilatata C.B. Clarke (Sumchu tik) and S. mussofi Franch (Zang tik) also found in the area are used for similar purposes.

Valeriana hardwickii Wall, also found in the area, is used for similar purposes under the same local name.
References


CSIR (1986). The Useful Plants of India. Publications & Information Directorate, Council of Scientific and Industrial Research (CSIR), New Delhi, India.


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*This list of amchis from the entire district is compiled from the Himalayan Amchi Association's records. Some of the amchis listed here are still undergoing studies.
Selected Biographies

Karma Lhundup, Komang

Amchi Karma Lhundup traces his lineage to King Trisong Detsen of Tibet. He is also recognized as an reincarnation of the learned Gomchen Chaknak Lama. He received his early education under the guidance of his uncle Tulku Pema Khyentse Dorje. At the age of 15, he started the study of medicine, astrology and other sciences. At the age of 26, he moved from Namdo to Komang where he rebuilt the ancient monastery of Dratshang. In 2000, he visited the Tibet Autonomous Region of the People’s Republic of China through a small grant from WWF Nepal Program which enabled him to observe recent developments in the amchi tradition of medicine and interact with the amchis in Lhasa. He is currently training ten young students in the medical and spiritual tradition of the Dolpo and building a monastery in Pu, Shimen. He is one of the key resource persons for WWF’s medicinal plants conservation and traditional health care development activities in Dolpo. He is fifty-three years old.

Sherab Tenzin, Bijer

Amchi Sherab Tenzin hails from the medical lineage of Yangton Gyaltsen from Lubrak in Mustang and is the chief lama of the Samling Monastery, a major Bonpo centre for learning built in the twelfth century. He began the study of medicine at the age of eleven and after four years of diligent study and practice, he started to examine patients and provide treatment since the age of fifteen. He has travelled several times to the Bonpo centre in Solan, India, to study with the scholars and amchis there as well as to share his own experience. He is widely recognized and respected both as an amchi and a lama throughout Dolpo. At the age of fifty, he is a key resource person for WWF's medicinal plants conservation and traditional health care development in Dolpo.

Sherab Nyima, Pungmo

Amchi Sherap Nyima is of the Khyungpo Dorik lineage and resides at Yungdrung Tsukmo Monastery in Pungmo. He received basic instructions on the Gyushi from Dupthok Rinpoche of Pungmo and at the age of 15, he travelled to Saldang and studied the Gyushi and various other medical texts from Lama Tsultrim of Dechen Labrang Monastery. He then went to India and studied medicine and philosophy from Menri Tri Rinpoche and Lopon Tenzin Namdak Rinpoche where he also studied blood-letting and moxibustion from the Tibetan Amchi Tenzing Dukdak. He returned to Dolpo with a geshe (equivalent to a doctorate) degree from the Institute of Bonpo Dialectics in Solan, India, and has since been serving his community. He is currently working at the traditional health care centre established by the project in Phoksumdo.

Tengyal Zangpo, Punikha

Amchi Tengyal Zangpo is of the Dong lineage of accomplished amchis and lamas. At the age of twenty-one, he started the study of medicine with Gekoe Rinzin Gyaltsen and Tsultrim Nyima. At the age of thirty-six, he travelled to India and studied Bon and medicine from Menri Tri Rinpoche and Lopon Tenzin Namdak Rinpoche of Monri Monastery. He has also studied the Gyushi from Lama Tsultrim of Saldang and Sherab Gyaltsen. Since the Gangchen Menkhang Traditional Health Care Centre was established in 2000, the sixty-one year old amchi has been serving as amchi along with the other amchis of Phoksumdo.
Amchi Karma is of the lineage of Hawa Sidul of Lo, Mustang. From the age of fourteen, he learned to identify medicinal plants and collect them for his father. From the age of seventeen, he studied the Gyushi and other medical texts from his father and also from Gekar Ugen Gyaltse and Gekar Pema Thongtol. He began to practice medicine at the age of twenty-five and has treated many people all over Dolpo and Jangthang (Tibet Autonomous Region). He has recently participated in the refresher training provided by the Remote Area Development Committee, the Himalayan Amchi Association and WWF’s People and Plants project. He is closely involved with the establishment of a traditional health care centre in Dho, Upper Dolpo, which is being supported by WWF.

Amchi Tsewang Ngodup is a sixth-generation amchi who has been practicing for the last thirty years. He was trained as an amchi by his father Amchi Tsering Tashi and the learned Amchi Kusho Dege Khangsar Lama and Amchi Woser. He has studied many medical texts and has much experience in the techniques of bloodletting and moxibustion. He has also treated many patients suffering from rheumatism and other such illnesses common in Dolpo. At the age of sixty, Amchi Tsewang Ngodup continues to treat patients in the Upper Dolpo area.

Sonam Dukgye is a fifth-generation amchi living in Polde Village in Tingyu VDC. His family originated from the Ngari region of Western Tibet. He comes from a lineage of lamas and has practiced medicine and religion as taught by Lhaje Tenzin, Khenrab Gyaltse, Kusho Tsampa and his father Dukthar. At the age of 18, Sonam Dukgye started the study and practice of medicine. The major texts that he has studied are the Gyushi, Men-ngak Lhenthab, Baidurya Ngonpo and Zinthik. He has been able to diagnose and cure many illnesses that were not diagnosed.

Pema Bhuti comes from a medical lineage that has had eight generations of amchis. Since ten years of age, she has studied with her brother Tulku Dorje Tsewang and uncle Lama Yonten. She has also studied the Chimagyud and the techniques of pulse and urine analysis and is currently studying the identification and preparation of medicine. Three of her uncles and her brother are amchis. She plans to continue the study of medicine and become a fully accomplished amchi. Pema Bhuti has great potential to become a major woman amchi of Dolpo. She participated in the month-long refresher training organized by the Himalayan Amchi Association in January-February 2001 and was the youngest participant at the age of fourteen.
Accepted botanical names of the plants which are described are given in roman bold type; those which are not
described but mentioned either in the text or notes are given in the roman type (not bold); synonyms are in italic.
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About the Authors

Suresh Kumar Ghimire is an Assistant Lecturer at the Central Department of Botany, Tribhuvan University. He received his Masters Degree in Botany from Tribhuvan University in 1992. His major fields of interest are biodiversity, environment, systematics, phytogeography and ethnobotany. Since 1996, he has worked as a consultant for WWF Nepal Program. He has supervised eight M.Sc. level theses and published about 20 papers in national and international journals/publications. He was awarded the Krishna Chandra Regmi Award of Tribhuvan University in 1995.

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Yeshi Choden Lama is a staff at WWF Nepal Program and is involved in projects implemented by WWF in and around Nepal's protected areas. With a background in Sociology-Anthropology, her main interest lies in understanding the interrelationship between cultures and their environment to further conservation of culture and biodiversity, as well as promote sustainable living in areas of high biological and cultural significance.
This book is an outcome of field work involving scientists and local experts involved in the WWF Nepal Program and People and Plants applied ethnobotany project, which is a component of the Northern Mountains Conservation Project implemented in cooperation with the Department of National Parks and Wildlife Conservation in Shey Phoksumdo National Park and its buffer zone in north-west Nepal. The book attempts to bring together the traditional knowledge of the amchis of Dolpo related to the ecology, management and sustainable use of medicinal plants. It is also an attempt to promote the exchange of knowledge between the amchis of the Himalayan region, as well as with other resource stakeholders, in order to further conservation and the sustainable use of medicinal plants. The book has three parts: Part I describes the medical and ethno-ecological knowledge and practices of the amchis; Part II discusses the relationship between conservation, health care and the trade of medicinal plants; and Part III contains descriptions of selected medicinal plants that are most important in terms of their use by the amchis, their conservation significance and economic value.