



MEDICINAL PLANTS AND TRADITIONAL MEDICINE SYSTEM OF SIKKIM: A REVIEW

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ABSTRACT

Sikkim doctrines the aboriginal religious practices, culminates indigenous traditions associated with religion and faith based healing therapies and is a natural hub of traditional medicine. Faith healers and occupational folk medicine therapeuticians acts as alchemists. In this unfathomed virgin and picturesque state of pulchritudinous blooming orchids, rural population are directly depended upon the traditional medicines prescribed by the faith healers and the traditional occupational folk medicine doctors for their basic health issues and amenities. The knowledge of herbs or plant based panacea is a part of indigenous knowledge which has been snowballed from generation and ages since primordial origin. On the basis of proper signs and symptoms of the diseases, these herbal medicines are chosen. Their choice of medicine also depends upon the availability, particular

geography; faith associated belief and cost effectiveness. This practice is on the verge of extinction as The Himalayan belt is prone to natural catastrophes like earthquake, flashfloods, incessant rainfall, landslides etc and the availability of the medicinal flora is on decline. It is the precise time to amalgamate the documentation process of the traditional medicine of Sikkim for future references. In this paper, a total of 123 medicinal plants have been discussed which are prescribed or used by the traditional medicine system of Sikkim (*Amchi*, *Jhankri*, *Ayurveda*, *Tibetan* and *Lama/Pandit*).

Key words: Sikkim, medicinal plants, traditional medicine, *Jhankri*, *Amchi*, *Boomthing*, *Fedongma*

INTRODUCTION

India is acknowledged as one of the 12 mega diversity centers of the world. Sikkim covering just 0.2% of the geographical area of the country and has been identified as one of the biodiversity Hot-Spot in the Eastern Himalayas. ^[1, 2] Nature has been chiefly generous in her gift of sylvan possessions to the small Himalayan region Sikkim. ^[1] Verdant forest and variety of medicinal plants, shrubs, herbs and orchid in state is truly rich. Medicinal plant ought to be given the status of a “National Importance” because there sustainable availability is essential to sustain one of the world’s oldest medicinal traditions of India ^[2].

Sikkim is inhabited by various ethnic tribes like *Lepcha*, *Bhutia*, *Limboo*, *Sherpa* and *Nepali*. ^[3] The greater part of population lives in far-flung areas. Traditions of using plant resources for their vital needs such as food, medicine, firewood, timber, fodder and agricultural tools. They collect plants from different habitats, such as forest, scrub, grassland and cultivated lands and use them as crude drugs. ^[3] Through their experience to treat and diagnosed different diseases they expand knowledge on the useful and harmful properties of these plants. Such knowledge forms the basis for the better utilization of the plants wealth. ^[3] At present, due to rapid growth of modern medicine this old age conventional medicinal knowledge is in jeopardy of being lost in Sikkim. The same as changes in land use pattern due to urbanization and industrialization destroy much of the habitat of the useful plant and the elder healers passed away without handing down their knowledge.

The loss of traditional medicinal knowledge in a culture that is undergoing rapid is as irreversible as the lost of plant species. Therefore efforts should be made to bring together the documented traditional medicines of Sikkim.

Traditional Medicinal System

About 60% of the world’s population uses traditional medicines as their primary health care. ^[4,5] World Health Organization defines Traditional medicine as referring to health practices, approaches, knowledge and beliefs incorporating plant, animal and mineral based medicine, spiritual therapies, manual techniques and exercise, applied singularly or in combination to treat, diagnose and prevent illnesses or maintain well-being. ^[6] Another of the names used in connection with traditional medicine is also complementary medicine. ^[7] Their practices vary from country to country and region to region as they are influence by the culture, history and philosophy. ^[8] By this defining it became obvious that the traditional medicine has broad range against different diseases and disorders. On the other hand the medicinal systems such

as Ayurveda, Unani and Siddha practiced in India, the traditional Chinese medicine, Tibetans medicine, Japanese system are considered as a highly evolved and sophisticated. In between folk medicine, ethno-medicine, community medicine and others fall. Classification of Traditional medicine differs from person to person but classification of traditional medicine into a scholarly medicine system, folk medicine and shamanistic medicine system seems to be appropriate classification. ^[9, 10]

Folk medicine refers to practices and beliefs that involve herbal medicine, spiritual and manual therapies and exercises to diagnose, prevent or treat an alignment or illness. This type of medical system is known to a limited segment of the population in the culture which is transmitted orally as general knowledge and is practiced in a culture having prior experience. Shamanistic medicine refers to as spiritual form of medicine where a person's illness is allied to the cause of spiritual procession. Shaman is a trace which will communicate with spiritual head regarding the cause of illness and seek remedy of the sleekness. This type of Shamanistic medicine system is still practiced in most part of Asia sub-continent. ^[11]

Following the above classification, the next section will account a concise description of the traditional medicine practiced in Sikkim will be described.

Ayurvedic System

Ayurvedic medicine originated and developed in India which is possibly the oldest traditional medicine system in the world having its origin in the Vedic period. ^[12, 13] The Ayurveda is made up of two words, *Ayus* (long life) and *Veda* (to knowledge or science). Therefore, Ayurveda literally means “*science of long life*”. ^[14, 15] The two ancient Ayurvedic scriptures, the *Charaka samhita* describing internal medicine system and the *Sushruta samhita* dealing with the principles and practices of surgery are considered fundamental pioneering texts on the Ayurvedic medicine. ^[16]

Ayurveda holds that the life is the amalgamation of *Sarira* (body), *Indriya* (sense organs), *Sattya* (mind) and *Atma* (soul). Five basic elements (mahabhutas) namely *Prithivi* (earth), *Jala* (water), *Agni* (fire), *Vayu* (air) and *Akasa* (ether) characterize the entire universe. ^[16] Everything in the universe is the creation of these five basic elements. *Prithivi* (earth) symbolizes the solid state of matter having stability and firmness characteristics. *Jala* (water) represents the liquid state of matter with flux or instability qualities. *Agni* (fire) brings about the conversion of the substance from solid to gas and stands for the transformation. *Vayu*

(air) is the gaseous state of the matter and signifies mobility. *Akasa* (ether) is the field without physical existence where activity takes place. ^[16, 17]

It is the most validly recorded, culturally based health care system in Sikkim. In addition, this traditional knowledge provides mammoth prosperity and heritage to our Nation. ^[17] There are two types of Ayurveda practitioners survive in Sikkim. The first type includes the scholarly Ayurveda practitioners trained from educational institutes, training centers, colleges and universities. The second types include Ayurveda which is based on traditional healers who learn the knowledge and skill of the profession from their father or from the gurus (teacher) and obtain the necessary knowledge and skill about the healing practice.

Tibetan System

Historically, Tibetan medicine was practiced by the Tibetan populace in Tibet in the eighth to ninth century of the Common Era (CE). ^[18] In Tibetan medicine system all living and non-living things are made up of five vital elements: earth, water, space, fire and air. The Earth which signifies support and mass; water denotes cohesion and liquidity; fire symbolizes heat and kinetic energy; air represents growth and movement and space signifies place where actions occur. The forces called the *Nyipa sum* rule the body physiology. Energy always flows in and out from the basic five elements to *Nyipa sum* and *vice versa*. To keep *Nyipa sum* in the stability is the main goal of Tibetan medicine. *Nyipa sum* is of three types: *rLung*, *mKhris-pa* and *Bad-kan*. *rLung* corresponds to the fragile flow of energy and resembles more with the air. *rLung* symbolizes circulation. Circulation of blood, nervous system impulses, thoughts in the mind and food on the digestive tract; expelling of feces, urine, semen and blood during menstruation as well as giving birth all fall on the domain of *rLung*. *mKhris-pa* keeps the body temperature balanced and it is associated with the element fire. *mKhris-pa* covers metabolic process and liver function. ^[19] *mKhris-pa* is responsible for the correct decision of the mind with respect to anger, aggression and hatred as well. *Bad-kan* corresponds to both earth and water. The diseases arising due to the coldness fall on the domain of *Bad-kan*. *Bad-kan* is responsible for sustaining bodily fluid, providing lubrication to the joints and for having good memorization. These three humors are interconnected to seven constituents and three modes of excretion of the body. Food (nutrition), blood, flesh, fat, bone, marrow and semen are seven constituents of the body. Three modes of excretion are through sweat, urine and feces. So long as three humors, seven body constituents and three modes of excretion are balanced, one would be in good physical and mental health. If

this subtle balance is disturbed, one will fall sick. Inappropriate eating habit, repulsive behavior and offensive climate are thought to upset this equilibrium resulting in the symptom of the disease. Tibetan doctors will figure out the disorder in *Nyipa sum* or diagnose the symptoms of the disease by three ways. First is the observation. Patient's urine is examined. Secondly, pulse reading of the patient is done. Thirdly, asking the patients about his or her past health records, food habit and the locality they live help the doctor to diagnose the disease¹⁶. The Tibetan medical system has now broad spectrum diagnostic treatments in a wide range of conditions, including Internal Medicine,^[20] Cardiology,^[21] Pulmonology,^[22-24] Gastrointestinal medicine,^[25] Infectious disease,^[26-31] Oncology,^[32-37] Neuropsychiatry,^[38-41] Rheumatology,^[42-43] Urology,^[44] Rehabilitation medicine,^[45-47] Dermatology,^[48-49] and Palliative care.^[50] In Sikkim, Tibetan medical practitioners are popularly known as *Amchi*. The word *Amchi* is actually the name given to Tibetan medicine doctors or practitioners and the healing practice is commonly popular in the upper mountainous regions. These practitioners can either be trained in the institute or can be hereditary (passed from father to son). Tibetan medicines are popular in the mountainous regions of Nepal, India and also in the Tibetan autonomous region, China. However, Tibetan refugees are considered as the main carrier of these medical practitioners throughout the mountainous regions.

Folk Medicine

Folk medicine is defined as the treatment of ailments outside clinical medicine by remedies and simple measures based on experience and knowledge handed down from generation to generation. In Sikkim, it is an unofficial health related practices that has traditionally existed and is being learned verbally and through observation and demonstration. Folk medicine employs principles and practices sourced from the indigenous cultural development in treating symptoms of illness. Plant constitutes major forms of medicines in folk medicines. A particular plant as a medicinal value must have been selected after countless hits and trials of treatments. Advantageous medicinal plants were treasured as medicine. Folk medicine builds an extremely close relationship with the nature or habitat from where plants are obtained.

Shamanistic Medicine (Faith Healing System)

The faith healing system is defined as a method of treating disease by prayer and exercise of faith in God and it is not included in the official system of health care system. Mostly flourishing on the rural and traditional societies, faith healing is still a force to reckon with in these societies. In Sikkim Shamanistic medicine is practiced by the different ethnic people

viz. *Subba, Rai, Sherpa, Tamang, Bhutia, Lepcha, Gurung and Mangar*. Traditional spiritual leader Shaman is called *Dhami-Jhankari (Bijuwa, Fedongma (Subba Shaman), Boomthing (Lepcha Shaman), Mangpa (Rai Shaman)) and Pandit-Lama* in Sikkim. ^[51]

In the shamanic process of therapeutic, the disease or illness is believed to be caused by the curse of the gods and goddesses as well as by the witches and demons. If a person meets a brutal death such as accident, murder or suicide and the funeral rituals are not properly made, his soul will not go to the heaven or the hell. The souls roam around and are called the *pichas* (ghosts). If the *pichas* happen to touch the human, he or she is bound to become sick. The *bokshi* (witches) and for that matter *dayan* (soul of dead witches) are also thought to cause sickness in human. In addition, if a person does *kukarma* (misdeeds), he or she may be cursed with sickness by the God. When possessed by ghost, witch or any other spirit or cursed by the God, they manifest in diseases in human such as sleep disorder, loss of appetite, depression, headache, fever, aches and pains in different parts of the body, weakness, vomiting, hysterical and epileptic symptoms and acute stomach pain. In course of the treatment, the shaman undergoes into ecstatic trance state in such a way that soul leaves his body. The soul travels to the sky (heaven where gods and goddesses live) or deep into the earth (underworld where the demons live). The shaman in this trance state communicates with the spirit helpers to diagnose and finds cure for the illness or diseases of the patients.

(a) Jhankri/ Dhami

Jhankri/Dhami is popular name of the shamans in different ethnic groups of Sikkim. Shaman who exercises evil spirits from the bodies of sick people and they use drum (*Dhyangro*) and sticks in their nightlong healing rituals. A *Kirati* (Rai) Shaman is called *Mangpa*. Shamans are called *Bijuwa* and *Fedangwa* by Subba ethnic groups in Sikkim. There are two ways to achieve the power or the authority of *Dami/ Jhankri*. In first ways a person especially a child is kidnapped by the *Ban-Jhankri* (Forest Shaman), the mentor and doyen of all *Jhankris*. *Ban-Jhankris* are believed to live in the caves on the mountains in the forest. They indoctrinate and teach the abducted child. It is believed that in course of this schooling, the child will turn into a full-fledged *Jhankris*. The second way to become a *Jhankri* is to possess by a force of spiritual or divine spirit. The *Jhankri* use the ritual mantra and diagnose the type of spirit. They cure either by offering and placating their own powerful spirit or suck the offending spirit from the patient's body using a spirit bone or stick. The *Jhankri's* usual accessories for the treatment are a *Dhyangro* (a musical drum) and a broom called *Chamer*. Some herbs are

burned and smokes are created. Chanting the sacred mantras, playing the *Dhyangro* and cleaning the patient's body from the evil spirit with the broom, the *Jhankri* in euphoric manner travels into trance state where he communicates with God, Goddess or spirit for the safe recovery of the patients.

(b) *Pundit-Lama*

They are the scholars and teachers of the different tribal and religious groups in Sikkim. Lama is a name for educator of the Dharma in Tibetan Buddhism. Historically, the word was used for acclaimed spiritual masters. Today the name can be used as an honorific name conferred on a monk or nun. Pundits is a scholar and a teacher, chiefly one skilled in the Sanskrit languages, who has mastered the four Vedic scriptures, Hindu rituals, Hindu law, religion, music or philosophy under a Guru in a Gurukul system. Both Pundits and Lama are the priests. They all diagnose and cure illness through prayers and rituals. This type of the treatment is called ceremonial healing. In Sikkim *Bhutia*, *Lepcha*, *Sherpa*, *Tamang* and *Gurung* are the ethnic tribe of Buddhist cult whereas *Sharma*, *Chettri*, *Rai*, *Subba*, *Newar*, *Kami-Damai* and *Sunar* were typically adept Pundit (Hindu Priests).

Sikkim and its herbal plants

Sikkim, the Himalayan kingdom, is small, landlocked state of India. It is bound on the north by China (Tibet plateau), on the east by Chumbi valley of Tibet and Bhutan, on the west by Nepal and on the south by Darjeeling district of West Bengal.^[52] Geographically Sikkim lies between 27°05' - 28°07' N latitude and 88°31' - 56'E longitude, which is the smallest but biologically most diverse Himalayan states in India.^[53] It is unique in several ways- most importantly; it's close proximity to both the Tibetan plateau, Bay of Bengal and Nepal on the west thereby having affinities with tropical forest in the south and cold desert in the north within a short distance of just 100 kilometers. Heavy precipitation throughout winter as well as summer season has given rise to lush green vegetation. The state is gifted with rich flora and fauna diversity. Species wise, the state harbors over 4500 Flowering plants, 550 Orchids, 36 Rhododendrons, 16 Conifers, 28 Bamboos, 362 Ferns and its allies, 9 Tree ferns, 30 Primulas, 11 Oaks, over 424 Medicinal plants, 144 mammals, 550 Birds, 48 Fishes, over 600 Butterflies, 28 Glaciers, 227 high altitude lakes and over 104 rivers and streams^[54-56]. It is a cornucopia of ethnic people, viz. the *Lepcha*, *Bhutia*, *Limboo*, *Sherpa* and *Nepali*, which have long practiced their traditional medicine and mostly believed on traditional herbal medical care.^[57, 58] The rural communities of Sikkim have a long tradition of using plant resources for

their various basic needs such as food, fodder, medicine, firewood, timber and agricultural tools. They collect plants from various habitats, such as forest, scrub, grassland and cultivated fields, and use them as crude drugs. In the last few years there has been an exponential growth rate in the field of traditional medicine and these drugs are gaining popularity both in developing and developed countries due to their less side effects. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. ^[59] Among these 2500 species are found in India, out of which 150 species are used commercially. India is the largest creator of herbal medicine and is called as Botanical garden of the World. ^[60-62] Traditional medicine, *Ayurveda*, *Tibetan Amchi* and various folk healers is well accepted by majority of the population resides in rural as well as urban areas. Traditional medicine in Sikkim comprises those practices based on beliefs that were in existence often for hundreds to thousands of years before the development of modern medicine which are still in use today. The total population of Sikkim is 5.40 lakhs and about 80% population resides in rural areas where access to government health care facilities is less. ^[52] Sikkim is a natural store house of precious medicinal plants.

The Himalayan plant diversity plays a pivotal role to fulfill the needs and demands of medicinal plant of Sikkim. The earliest record of medicinal plant used in Himalayas is found during 4500 BC and 1600 BC (The Rig Veda) which is considered to be the oldest human knowledge and describes 67 medicinal plants. ^[16] After Rig Veda, Ayurveda described the use of 1200 important medicinal plants. ^[16] The knowledge of using these systems was accessed to local healers in Sikkim (*Jhankri*, *Bijuwa* and *Phedangpa*). It has been estimated that the Himalayan region harbor over 10,000 species of medicinal and aromatic plants, out of which more than 490 species of medicinal plants find their habitat in Sikkim. ^[1] This review paper focuses the amalgamation of documented traditionally important medicinal plants of Sikkim

Most of the researches have been carried out regarding the Indigenous knowledge and use of traditional medicine of Sikkim. However, none of the literature reviews has amalgamated the traditionally important medicinal plants. Here, in this review article we tried to amalgamate the documented medicinal plants of major Sikkim's Himalayan medicinal plants (**Table- 1**).

Table 1: Documented Traditional Medicine of Sikkim

S.No.	Plants (Family)	Vernacular Name (Nepali)	Gender specific treatment (Male /Female/ Both)	Parts of the plants used	Treatment /Diagnosis	Habitat range	Location
1.	<i>Astilbe rivularis</i> (Saxifragaceae)	<i>Buro Okhati/Bans upari</i>	Both	Fresh Rhizomes powder	Toothache ^[57] diarrhea and dysentery ^[58]	6000 – 9000 ft.	Throughout Sikkim.
2.	<i>Curculigo orchioides</i> (Hypoxidaceae)	<i>Kalo musalikanda</i>	Both	Rhizomes infusion	Piles and gastritis ^[57]	4000 – 5000 ft.	Throughout Sikkim.
3.	<i>Dactylorhiza hatagirea</i> (Orchidaceae)	<i>Panch-anguli</i>	Both	Tubers paste	Gastritis, jaundice, bodyache and bone fracture ^[57,58]	5000 – 6000 ft.	Pakyong and Barapathing (East Sikkim); Dentam and Maneybhanjang (West Sikkim).
4.	<i>Nardostachys grandiflora</i> (Valerianaceae)	<i>Jatamansi</i>	Both	Rhizomes powder	Bronchial, liver complaints and urinary problem ^[57]	6000 – 8000 ft.	Pendam, Rhenock, Rongli and Pakyong (East Sikkim); Sombaria, Soreng, Dentam and Sakyong (West Sikkim).
5.	<i>Nardostachys jatamansi</i> (Caprifoliaceae)	<i>Jatamansi</i>	Both	Rhizomes powder	Nervous disorder ^[57, 58, 62]	6000 – 8000 ft.	Pakyong (East Sikkim), Soreng and Dentam (West Sikkim).
6.	<i>Hippophae salicifolia</i> (Elaeagnaceae)	<i>Daale chuk</i>	Both	Berry (fruit), Roots nodule	Berry part is used as juice and also for digestion purposes; Root nodule are chewed against Vomiting, remove foul smell from mouth ^[57]	8000 – 10,000 ft.	Lachen (North Sikkim).
7.	<i>Onosma hookeri</i> (Boraginaceae)	<i>Lalijari</i>	Both	Oil	Oil extracted from root are used against Hair tonic and antidandruff agent ^[57]	2000 – 4000 ft.	Throughout Sikkim.
8.	<i>Meconopsis simplicifolia</i> (Papaveraceae)	<i>Poppy</i> (Blue poppy)	Both	Rhizomes powder	Tonic in renal diseases ^[57]	1000 – 7000 ft.	Tsongu (East Sikkim); Thangu and Yume Samdung (North Sikkim); Dzongri and Chewabanjang (West Sikkim).
9.	<i>Osbeckia</i>	<i>Lathey</i>	Both	Roots	Urinary problems and	4000 –	Throughout Sikkim.

	<i>nepalensis</i> (Melastomataceae)			decoction	diabetes ^[57]	5000 ft.	
10.	<i>Paris polyphylla</i> (Melanthiaceae)	<i>Bako</i>	Both	Roots paste	Skin disease, wounds and in any poisonous bite ^[57]	3000 - 4000 ft.	Throughout Sikkim.
11.	<i>Picrorhiza kurroa</i> (Scrophulariaceae)	<i>Kutki</i>	Both	Rhizomes powder	Heart complaints, piles, malarial fever ^[54, 58] , body ache, urinary complaints, anemia ^[57, 62] constipation ^[57] brain tonic, emetic, paralysis ^[54] , jaundice. ^[54, 62] cathartic, purgative and dyspepsia ^[58]	11,000 - 14,000 ft.	Chewabanjang (West Sikkim); Thangu and Yumthang Valley (North Sikkim).
12.	<i>Rubia manjith</i> (Rubiaceae)	<i>Majito</i>	Both	Roots decoction	Jaundice, urinary tract infection, liver and general tonic ^[57]	4000 - 8000 ft.	Throughout Sikkim.
13.	<i>Rheumobile</i> (Polygonaceae)	<i>Keju</i>	Both	Roots and Rhizomes powder	Rheumatic arthritis and heart tonic ^[57]	2000 - 4000 ft.	Throughout Sikkim.
14.	<i>Rubus ellipticus</i> (Rosaceae)	<i>Aiselu</i>	Both	Roots paste	Bone fracture ^[57]	3000 - 10,000 ft.	Throughout Sikkim.
15.	<i>Stephania glabra</i> (Menispermaceae)	<i>Gurjagano</i>	Both	Roots	Diabetes, fever, gastric problem, amoebic dysentery, leprosy and anticancer drug ^[57]	2000 - 4000 ft.	Throughout Sikkim.
16.	<i>Thysanolaena maxima</i> (Poaceae)	<i>Kucho/Amliso</i>	Both	Young roots	Bronchial problem, rheumatic pain and skin swelling ^[57] Boils and mouth wash ^[58, 63]	2000 - 7000 ft.	Throughout Sikkim.
17.	<i>Aconitum bisma</i> (Ranunculaceae)	<i>Bikhma/Bikh</i>	Both	Tubers and roots	Food poisoning, asthma. ^[54, 58] cough, cough and bronchitis ^[54] antidiabetic ^[54, 58] , malaria, diarrhea ^[54, 62] body pain, diaphoretic, diuretic, expectorant, febrifuge, dyspepsia, debility, leprosy, paralysis,	14,000 - 16,000 ft.	Chewabanjang (West Sikkim); Yumthang, Yume Samdong and Thangu (North Sikkim).

					rheumatism, spermatorrhoea and typhoid [58]		
18.	<i>Aeschynanthus sikkimensis</i> (Gesneriaceae)	<i>Balay patay</i>	Both	Rhizomes decoction	Fever and throat pain [54]	5000 – 7000 ft.	Throughout Sikkim.
19.	<i>Aesculus indicus</i> (Sapindaceae)	<i>Pangra</i>	Both	Fruits and seeds oil	Rheumatism and mumps [54]	4000 ft.	Sumin forest of Pakyong (East Sikkim).
20.	<i>Aesandra butyracea</i> (Sapotaceae)	<i>Chiuri</i>	Both	Fruits	Rheumatism [54]	3000 ft.	Duga-Pendam (East Sikkim) and Malbasey (West Sikkim).
21.	<i>Allium wallichii</i> (Amaryllidaceae)	<i>Bana lasuna</i>	Both	Leaves	Viral flue and high altitude sickness [54]	10,000 – 11,000 ft.	Barsey (West Sikkim) and Yumthang (North Sikkim).
22.	<i>Artemisia vulgaris</i> (Asteraceae)	<i>Titeypati</i>	Both	Leaves decoction	Blood clotting [54, 64] measles and fever, tonic, antiseptic, asthma [54, 3] appetizer, blood purifier [3]	4000 – 9000 ft.	Throughout Sikkim.
23.	<i>Bergenia ciliata</i> (Saxifragaceae)	<i>Pakhan bhed</i>	Both	Rhizomes, roots and Barks	Fever [54, 58] boils [54] coughs, pulmonary affection, anti-scorbic [58]	4000 – 14,000 ft.	Throughout Sikkim.
24.	<i>Betula utilis</i> (Betulaceae)	<i>Bhoj patra</i>	Both	Barks	Bone fracture [54]	5000 – 7000 ft.	Throughout Sikkim.
25.	<i>Bischofia javanica</i> (Phyllanthaceae)	<i>Kainjal</i>	Female	Leaves and barks	Irregular menstruation and pain [54]	2000 – 3000 ft.	Throughout Sikkim.
26.	<i>Brugmansia suaveolens</i> (Solanaceae)	<i>Kalo dhatura</i>	Both	Leaves	Swellings, sprain and rheumatism [54]	3000 – 4000 ft.	Throughout Sikkim.
27.	<i>Buddleja asiatica</i> (Scrophulariaceae)	<i>Bhinsen pati</i>	Both	Leaves and stems	Skin problem and abortificant [54]	2000 – 3000 ft.	Throughout Sikkim.
28.	<i>Cordyceps sinensis</i> (Ophiocordycipitaceae)	<i>Yarsa gumba</i>	Both	Whole plants	Rejuvenates liver, heart and immune booster [54]	Above 14,000 ft.	Tso Lhamo plateau and Yume Samdong (North Sikkim) and some parts of West Sikkim.

29.	<i>Daphne bholua</i> (Thymelaeaceae)	<i>Kagatey</i>	Both	Barks and Roots	Fever and intestinal problem ^[54]	4000 – 8000 ft.	Barsey west Sikkim and Dzongu North Sikkim.
30.	<i>Dioscorea deltoidea</i> (Dioscoreaceae)	<i>Kurkur tarual</i>	Both	Tubers	Rheumatoid arthritis, asthma and fever ^[54]	3000- 4000ft.	Throughout Sikkim.
31.	<i>Ephedra sikkimensis</i> (Ephedraceae)	<i>Somlata</i>	Both	Whole plants	Against high blood pressure, high fever, gout and arthritis ^[54]	3000 – 4000 ft.	Throughout Sikkim.
32.	<i>Eupatorium cannabinum</i> (Asteraceae)	<i>Banmara</i>	Both	Leaves and stems	Used in wound ^[54, 58] infection ^[54]	1000 – 7000 ft.	Throughout Sikkim.
33.	<i>Fraxinus floribunda</i> (Oleaceae)	<i>Lakuri</i>	Both	Barks	Boils, gout, sprain and fracture ^[54]	4000 – 5000 ft.	Throughout Sikkim.
34.	<i>Heracleum wallichii</i> (Apiaceae)	<i>Chimping</i>	Both	Fruits and roots	Influenza ^[54,58] aphrodisiac ^[54]	7000 – 9000 ft.	Throughout Sikkim.
35.	<i>Angelica cyclocarpa</i> (Apiaceae)	<i>Chimping</i>	Both	Seeds	Fever, stomach disorder and headache ^[63]	7000 – 9000 ft.	Throughout Sikkim.
36.	<i>Lindera neesiana</i> (Lauraceae)	<i>Timbur</i>	Both	Flowers and fruits	Excessive night seminal discharge and vomiting ^[54]	7000 – 9000 ft.	Throughout Sikkim.
37.	<i>Orchis latifolia</i> (Orchidaceae)	<i>Panchamala</i>	Both	Tubers	Nutritious and aphrodisiac ^[54]	6000 – 8000 ft.	Throughout Sikkim.
38.	<i>Oxalis corniculata</i> (Oxalidaceae)	<i>Chari amilo</i>	Both	Leaves juice and roots	Dysentery, anemia and tympanitis ^[54]	2000 – 3000 ft.	Throughout Sikkim.
39.	<i>Panax pseudoginseng</i> (Araliaceae)	<i>Ginseng</i>	Both	Roots	Reduce fever, indigestion, vomiting and tonic ^[54] aphrodisiac, diabetes ^[58] sexual impotency and gastric ^[63]	8000 – 10,000 ft.	Barsey (West Sikkim); Dzongu and Yumthang (North Sikkim).
40.	<i>Podophyllum hexandrum</i> (Berberidaceae)	<i>Papari</i>	Both	Whole plants	Wounds and diarrhea ^[54, 58]	4000 – 5000 ft.	Throughout Sikkim.
41.	<i>Rubia monjita</i> (Rubiaceae)	<i>Manghito</i>	Both	Roots and Stems	Skin disease and Scorpion sting ^[54]	3000 – 8000 ft.	Throughout Sikkim.
42.	<i>Saussurea gossypiphora</i>	<i>Kapisful</i>	Both	Roots	Cuts, cough, asthma, fever, dysentery and	14,000 ft. above	Throughout Sikkim.

	(Asteraceae)				influence used for sexual dysfunction [54]		
43.	<i>Stephania glabra</i> (Menispermaceae)	<i>Taubarkey</i>	Both	Root bulbs	Diabetes, tuberculosis, asthma and fever [54]	4000 – 10,000 ft.	Throughout Sikkim
44.	<i>Swertia chirata</i> (Gentianaceae)	<i>Chiraita</i>	Both	Plants extract	Malaria and fever [54] liver stimulant, asthma, dyspepsia, debility, febrifuge, laxative, stomachic, anti-helminthic, tonic, anti-diarrhea [58] constipation, skin disease and worm [62]	6000 – 9000 ft.	Throughout Sikkim.
45.	<i>Taxus baccata</i> (Taxaceae)	<i>Dhengre salla</i>	Female	Leaves and bark extracts	Breast and throat cancer [54]	6000 – 9000 ft.	Mostly Barsey (West Sikkim).
46.	<i>Acorus calamus</i> (Acoraceae)	<i>Bojho</i>	Both	Rhizomes	Bronchitis, rheumatism, diarrhea [58, 62] dyspepsia [58] epilepsy, asthma and colic pain [63]	4000 – 7000 ft.	Throughout Sikkim.
47.	<i>Clematis buchananiana</i> (Ranunculaceae)	<i>Pinsasay lahara</i>	Both	Roots	Sinusitis and nose block [58]	3000 – 4000 ft.	Throughout Sikkim.
48.	<i>Costus speciosus</i> (Costaceae)	<i>Betlauree</i>	Both	Tuber extracts	Urinary tract infection and inflammation [58]	2000 – 3000 ft.	Throughout Sikkim.
49.	<i>Dichroa febrifuga</i> (Hydrangeaceae)	<i>Basak</i>	Both	Dried leaves	Fever [58]	2000 – 3000 ft.	Throughout Sikkim.
50.	<i>Drymaria cordata</i> (Caryophyllaceae)	<i>Abijalo</i>	Both	Leaves and steams	Sinusitis [58, 3] laxative and anti-febrile [58] epilepsy [3]	1000 – 8000 ft.	Throughout Sikkim.
51.	<i>Ficus cunia</i> (Moraceae)	<i>Khasray Khanium</i>	Both	Latex and roots juice	Bladder complaints, boiled, visceral obstruction, leprosy and liver complaints [58]	2000 – 4000 ft.	Throughout Sikkim.
52.	<i>Holarrhena antidysenterica</i> (Apocynaceae)	<i>Aulay khirra</i>	Both	Barks	Amoebic dysentery [58]	4000 – 5000 ft.	Throughout Sikkim.
53.	<i>Hydrocotyle asiatica</i> (Apiaceae)	<i>Golpatta/ Ghoratpray</i>	Both	Steams	Against high blood pressure [58]	4000 – 6000 ft.	Pakyong, Mamring and Rongli (East Sikkim).

54.	<i>Hymenodictyon excelsum</i> (Rubiaceae)	<i>Latikaram</i>	Both	Barks powder	Hemorrhoids ^[58]	3000 – 4000 ft.	Throughout Sikkim.
55.	<i>Litsea citrata</i> (Lauraceae)	<i>Sil timur/ doom</i>	Both	Fruits	Stomach disorders ^[58]	6000 – 8000 ft.	Barsey (West Sikkim) and some parts of North and South Sikkim.
56.	<i>Mesua ferrea</i> (Calophyllaceae)	<i>Nagesuri</i>	Women	Dried barks	Skin diseases and menstrual disorder ^[58]	2000 – 5000 ft.	Throughout Sikkim.
57.	<i>Oroxylum indicum</i> (Bignoniaceae)	<i>Totala</i>	Both	Seeds	Throat complication, hypertension, sore throat and throat infection ^[58]	2000 – 3000 ft.	Throughout Sikkim.
58.	<i>Paederia foetida</i> (Rubiaceae)	<i>Biri</i>	Both	Dried fruits extracts	Toothache ^[58]	2000 – 3000 ft.	Throughout Sikkim.
59.	<i>Physalis minima</i> (Solanaceae)	<i>Jangali phakphakay</i>	Both	Dried fruits	Abate toothache ^[58]	4000 – 6000 ft.	Throughout Sikkim.
60.	<i>Phytolacca acinosa</i> (Phytolaccaceae)	<i>Jaringa</i>	Both	Fresh leaves	Body ache and wasting condition ^[58]	6000 – 8000 ft.	Throughout Sikkim.
61.	<i>Piper longum</i> (Piperaceae)	<i>Pipla</i>	Both	Fruits and Roots	Alterative, tonic, Bronchitis, asthma, cough, leprosy, appetizer and antidote to snake bites ^[58]	4000 – 5000 ft.	Throughout Sikkim.
62.	<i>Pteris biaurita</i> (Pteridaceae)	<i>Thaday uniu</i>	Both	Stems	Stop bleeding and infection ^[58]	4000 – 5000 ft.	Throughout Sikkim.
63.	<i>Rhus semialata</i> (Anacardiaceae)	<i>Bhakimlo</i>	Both	Fruit extracts	Diarrhea and dysentery ^[58]	2000 – 5000 ft.	Throughout Sikkim.
64.	<i>Rumex nepalensis</i> (Polygonaceae)	<i>Halhalay</i>	Both	Roots	Hepatitis, loss of hair ^[58] food poisoning, cut and wounds ^[62]	5000 – 9000 ft.	Throughout Sikkim.
65.	<i>Terminalia belerica</i> (Combretaceae)	<i>Barra</i>	Both	Fruits	Stomach dysfunction ^[58]	2000 – 3000 ft.	Malbasey and Reshi (West Sikkim); Tinkitam (South Sikkim) and Rorathang (East Sikkim).
66.	<i>Terminalia chebula</i> (Combretaceae)	<i>Harra</i>	Both	Fruits	Tonsillitis and pharyngitis ^[58]	2000 – 3000 ft.	Throughout Sikkim.
67.	<i>Urtica dioica</i> (Urticaceae)	<i>Sisnu</i>	Both	Roots	Minor fracture ^[58]	3000 – 8000 ft.	Throughout Sikkim.
68.	<i>Viscum articulatum</i> (Santalaceae)	<i>Har choor</i>	Both	Entire plants	Minor fracture ^[58]	7000 – 9000 ft.	Barsey and Manaybung (West Sikkim) and Dzongu (North

							Sikkim).
69.	<i>Zanthoxylum alatum</i> (Rutaceae)	<i>Bokay timbur</i>	Both	Tender branchlets	Toothache ^[4] , tooth decay ^[62]	6000 – 8000 ft.	Mostly Barsey (West Sikkim).
70.	<i>Abroma augusta</i> (Malvaceae)	<i>Kapsi</i>	Female	Barks	Menstrual disorder ^[62]	7000 – 8000 ft.	Throughout Sikkim.
71.	<i>Agrimonia pilosa</i> var. <i>nepalensis</i> (Rosaceae)	<i>Kunka pankhi</i>	Both	Roots	Gastric disorder and bloody dysentery ^[63]	2000 – 4000 ft.	Throughout Sikkim.
72.	<i>Aloe barbadensis</i> (Liliaceae)	<i>Gheukumari</i>	Both	Whole plants	Stomach disorder, tonic, purgative, anti-helminthic ^[55,3] menstrual suppression, constipation and arthritis ^[3]	6000 – 8000 ft.	Throughout Sikkim.
73.	<i>Anisomeles indica</i> (Lamiaceae)	<i>Ilamay</i>	Both	Leaves	Asthma ^[63]	4000 – 7000 ft.	Throughout Sikkim.
74.	<i>Berberis wallichiana</i> (Berberidaceae)	<i>Chitrokanra</i>	Animal	Fruits	Against rabies ^[63]	5000 – 11,000 ft.	Throughout Sikkim.
75.	<i>Dioscorea pentaphylla</i> (Dioscoreaceae)	<i>Githey</i>	Women	Tuberous roots	Birth control ^[63]	2000 – 3000 ft.	Throughout Sikkim.
76.	<i>Elatostema sessile</i> (Urticaceae)	<i>Gaglato</i>	Both	Leaves	Gastric disorder ^[63]	6000 – 7000 ft.	Throughout Sikkim.
77.	<i>Engelhardia spicata</i> (Juglandaceae)	<i>Mouwaha</i>	Both	Green bracts	Stomach ailments and throat pain ^[63]	2000 – 6000 ft.	Throughout Sikkim.
78.	<i>Equisetum diffusum</i> (Equisitaceae)	<i>Singera</i>	Both	Shoots	Body pain ^[63]	3000 – 4000 ft.	Throughout Sikkim.
79.	<i>Evodia fraxinifolia</i> (Rutaceae)	<i>Khanakpa</i>	Both	Fruits	Body ache and nasal sneezing ^[63]	7000 – 9000 ft.	Barsey (West Sikkim).
80.	<i>Eurya japonica</i> (Theaceae)	<i>Jhingoni</i>	Both	Roots	Muscle pain and boils ^[63]	6000 – 1000 ft.	Barsey (West Sikkim).
81.	<i>Fagopyrum esculentum</i> (Polygonaceae)	<i>Phapar</i>	Both	Leaves	Stomach ache and constipation ^[63]	2000 – 8000 ft.	Throughout Sikkim.
82.	<i>Ficus hookeriana</i> (Moraceae)	<i>Nebara</i>	Both	Fruits	Diabetes ^[63]	2000 – 4500 ft.	Throughout Sikkim.
83.	<i>Centella asiatica</i> (Apiaceae)	<i>Golpat / Brahmi</i>	Both	Leaves	Liver disorder ^[63]	3000 – 4000 ft.	Throughout Sikkim.
84.	<i>Caryopteris</i>	<i>Thulasri ful</i>	Both	Flowers	Allergy ^[63]	3000 –	Throughout Sikkim.

	<i>odorata</i> (Verbenaceae)					5000 ft.	
85.	<i>Cestrum fasciculatum</i> (Solanaceae)	<i>Ban Baigun / Kundali ful</i>	Both	Fruits	Measles ^[63]	4000 – 6000 ft.	Throughout Sikkim.
86.	<i>Cissampelos pareira</i> L. var. <i>hirsuta</i> (Minespermaceae)	<i>Gar-tamarkay</i>	Both	Stems	Stomach problem and liver disorder ^[63]	3000 – 9000 ft.	Barsey west Sikkim.
87.	<i>Clematis montana</i> (Ranunculaceae)	<i>Simegharh</i>	Animal	Stems	Stomach ache of cattle ^[63]	3000 – 8000 ft.	Throughout Sikkim.
88.	<i>Codonopsis viridis</i> (Campanulaceae)	<i>Aniomukh</i>	Children	Leaves	Infant diarrhea ^[63]	3000 – 4000 ft.	Throughout Sikkim.
89.	<i>Coelogyne fuscescens</i> (Orchidaceae)	<i>Sunakhari</i>	Both	Pseudo-bulbs	Stomach ache ^[63]	6000 – 9000 ft.	Throughout Sikkim.
90.	<i>Cuscuta reflexa</i> (Convolvulaceae)	<i>Binajari</i>	Women	Stems	Menstrual disorders ^[63]	3000 – 5000 ft.	Throughout Sikkim.
91.	<i>Cyathula prostrata</i> (Amaranthaceae)	<i>Luga Kara</i>	Both	Shoots	Joint pain ^[63]	5000 – 7500 ft.	Throughout Sikkim.
92.	<i>Cyanodon dactylon</i> (Poaceae)	<i>Dhubo</i>	Man	Shoots	Seminal problem ^[63, 3]	6000 – 8000 ft.	Throughout Sikkim.
93.	<i>Cynoglossum zeylanicum</i> (Boraginaceae)	<i>Selay pati</i>	Both	Roots	Constipation ^[63]	4000 – 6000 ft.	Throughout Sikkim.
94.	<i>Dioscorea bulbifera</i> (Dioscoreaceae)	<i>Ghar Tarul</i>	Women	Roots	Birth control ^[63]	2000 – 4000 ft.	Throughout Sikkim.
95.	<i>Fragaria indica</i> (Rosaceae)	<i>Bhnui-aisayloo</i>	Both	Fruits	Throat pain ^[63]	3000 – 8000 ft.	Throughout Sikkim.
96.	<i>Geranium nepalense</i> (Geraniaceae)	<i>Gajal ghar</i>	Both	Roots	Stomach disorder ^[63]	3000 – 5000 ft.	Rongli and Sumin forest Pakyong (East Sikkim); Malbasey, Zoom and Dentam (West Sikkim); Borong, Temi and Yangyang (South Sikkim).
97.	<i>Houttuynia cordata</i> (Saururaceae)	<i>Gandhdya</i>	Both	Leaves	Gastric disorders ^[63]	3000 – 4500 ft.	Throughout Sikkim.
98.	<i>Hedyotis scandens</i> (Rubiaceae)	<i>Kalelehara</i>	Both	Roots and Shoots	Jaundice, gastric ^[63]	3000 – 4500 ft.	Throughout Sikkim.

99.	<i>Helicia nilagirica</i> (Proteaceae)	<i>Bandhary</i>	Both	Fruits	Cough and cold ^[63]	4000 – 7000 ft.	Throughout Sikkim.
100.	<i>Hoya lanceolata</i> (Asclepiadaceae)	<i>Aulay Khari</i>	Both	Roots	Cold sickness ^[63]	4000 – 6000 ft.	Throughout Sikkim.
101.	<i>Hydrocotyle javanica</i> (Apiaceae)	<i>Batuli paat</i>	Both	Leaves	Liver disorder ^[63]	2000 – 3000 ft.	Throughout Sikkim.
102.	<i>Juglans regia</i> (Juglandaceae)	<i>Okhar</i>	Both	Nuts	Rheumatism ^[63]	7000 – 9000 ft.	Sumin forest Pakyong and Padamchey (East Sikkim); Dentam and Soreng (West Sikkim); Dzongu (North Sikkim).
103.	<i>Lantana camara</i> (Verbenaceae)	<i>Box phul</i>	Both	Barks and stems	Toothache ^[63]	3000 – 6000 ft.	Throughout Sikkim.
104.	<i>Lycopodium phlegmaria</i> (Lycopodiaceae)	<i>Thula Nagbeli</i>	Both	Rhizomes	Constipation ^[63]	6000 – 8000 ft.	Barsey, Dentam and Yuksom (West Sikkim); Ravangla (South Sikkim); Yumthang (North Sikkim).
105.	<i>Lyonia ovalifolia</i> (Ericaceae)	<i>Angrey</i>	Both	Leaves	Skin diseases ^[58]	7000 – 9000 ft.	Barsey (West Sikkim); Ravangla (South Sikkim); Sumin forest Pakyong (East Sikkim).
106.	<i>Melastoma malabathricum</i> (Melastomataceae)	<i>Lotry</i>	Animal	Flowers	Foot sores of cattle ^[63]	3000 – 4000 ft.	Throughout Sikkim.
107.	<i>Michelia velutina</i> (Magnoliaceae)	<i>Sweto champa</i>	Both	Barks	Worm ^[58]	2000 – 3000 ft.	Throughout Sikkim.
108.	<i>Peperomia reflexa</i> (Piperaceae)	<i>Piplay pati</i>	Both	Leaves	Fever ^[63]	3000 – 4000 ft.	Throughout Sikkim.
109.	<i>Pilea microphylla</i> (Urticaceae)	<i>Sanu gagleto</i>	Both	Petals	Pain relief ^[63]	4000 – 7000 ft.	Throughout Sikkim.
110.	<i>Plantago erosa</i> (Plantaginaceae)	<i>Quley chiroto</i>	Both	Leaves	Boil ^[63]	5000 – 7000 ft.	Anden, Rumbuk, Buriakhop and Singling (West Sikkim); Ravangla (South Sikkim); Dzongu (North Sikkim).
111.	<i>Rhododendron arboreum</i> (Ericaceae)	<i>Gurans</i>	Both	Petals	Bloody dysentery ^[63]	7000 – 9000 ft.	Barsey West Sikkim.
112.	<i>Rubia cordifolia</i> (Rubiaceae)	<i>Majeto</i>	Both	Roots	Astringent in cut and wound ^[63]	3000 – 7000 ft.	Throughout Sikkim.

113.	<i>Sarcopyramis nepalensis</i> (Melastomataceae)	<i>Angurkati</i>	Both	Leaves	Constipation ^[63]	3000 – 4000 ft.	Throughout Sikkim.
114.	<i>Schima wallichii</i> (Theaceae)	<i>Chilawna</i>	Both	Fruits	Dandruff ^[63]	2500 – 4000 ft.	Throughout Sikkim.
115.	<i>Vitex negundo</i> (Lamiaceae)	<i>Sewali</i>	Both	Leaves	Rheumatism ^[63]	4000 – 5000 ft.	Throughout Sikkim.
116.	<i>Tupistra nutans</i> (Liliaceae)	<i>Teeta</i> <i>Nakema</i>	Both	Whole plants	Diabetes ^[63]	3000 – 6000 ft.	Throughout Sikkim.
117.	<i>Curcuma aromatica</i> (Zingiberaceae)	<i>Fatcheng</i>	Both	Rhizomes	Appetizer, tonic, carminative, anti-helminthic and oil is used to cure early stage of cervix cancer ^[63]	2000 – 3000 ft.	Padamchey, Rorathang and Rhenock (East Sikkim).
118.	<i>Kaempferia rotunda</i> (Crassulaceae)	<i>Bhuichampa</i>	Both	Tubers	It is used to cure swelling, fracture, bruises and insect bites ^[63]	3000 – 4000 ft.	Throughout Sikkim.
119.	<i>Ocimum basilicum</i> (Lamiaceae)	<i>Tulsi</i>	Both	Leaves and seeds	Leaves juice is used against cold and cough. Seeds are used in dysentery, gonorrhea ^[63]	2000 – 4000 ft.	Throughout Sikkim.
120.	<i>Sapindus mukorossi</i> (Sapindaceae)	<i>Ritha</i>	Both	Fruits, roots and barks	Tonic, anti-helminthic, purgative, dandruff and piles ^[63]	2000-3000ft.	Throughout Sikkim.
121.	<i>Agave americana</i> (Asparagaceae)	<i>Hattibar</i>	Both	Leaves and Roots	Leaf; Skin Ulcer Root; Diuretic, diaphoretic and anti-syphilis ^[64]	2000-4000ft.	Throughout Sikkim.
122.	<i>Ammomum aromaticum</i> (Zingiberaceae)	<i>Ban Elainchi</i>	Both	Seeds and roots	Seed paste - Stomach trouble, wound and small pox, root paste - hypoglycemic and anti-helminthic ^[3]	4000-6000ft.	Throughout Sikkim.
123.	<i>Ammomum subulatum</i> (Zingiberaceae)	<i>Elainchi</i>	Both	Seeds	Seed paste; liver tonic, bowel and appetizer ^[64]	4000-6000ft.	Throughout Sikkim.

CONCLUSION

In fact, Ayurvedic systems of treatment are escalating their popularity day by day whereas the folk and shamanistic medical practices are declining and in many areas are nearing extinction. In many cases threat of Traditional medicine is related mainly by factors; increasing the commercialization and modernization as well as growing demands for the

medicinal plants leading to their deterioration and a lack of momentous financial and income generating opportunities to encourage the practices of traditional healers. Higher study as well as advanced research on the traditional medicines is the demand of today. Most of the population in Sikkim depends on more than one type of health care systems depending on the types of ailments and medicine available and cost preference while the majority of the population does not have a choice of allopathic medicine, due to side effect, unavailability and high cost. Therefore, firstly it would support the folk healer's confidence in their own tested recipe along with the support of their livelihood. Secondly, it should offer a scientific basis for the folk system of medicine addressing the pharmaceutical issues relating to vital areas such as quality assurance and standardization with the good fabricate practices. Awareness should also be paid to the intellectual property right issue because the traditional medicine is a national wealth.

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