

4. Hitherto Unreported Ethno-Medicinal Plants of Darjeeling Himalayan Region (India)

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Introduction

Darjeeling Himalayan region is one of important parts of the Eastern Himalayans, globally known as one of the mega biodiversity hotspot zones. Situated between 26° 31' 05" – 27° 13' 10" N latitude and 87° 59' 30" - 88° 53' E longitude with altitudinal variation from 130m (at Sukuna) to 3636 m (at Sandakphu), it shares its eastern boundary with Bhutan, western boundary with Nepal and the northern boundary with the state of Sikkim. The southern boundaries are somewhat complicated and shares with the district of Jalpaiguri and North Dinajpur of West Bengal state, Purnea district of Bihar state and Bangladesh. The region harbours a large number of plant species with wide range of diversity and distribution (Das 1995; Bhujel 1996). The region was explored large number of botanist since eighteen century and during 1848-49 Sir Joseph Dalton Hooker explored the region and made an immense contribution to the Flora of British India. Bhujel (1996) and Rai (2002) have also analyzed the vegetation structure of Darjeeling Himalayan region, which showed the formation of categories like tropical, riverine, dry mixed, wet mixed, grassland, sub temperate, temperate deciduous, evergreen-Oak forest, coniferous-Rhododendron forest and sub alpine type in different parts of the district.

The contribution to the knowledge of ethnobotany from this region has been made by Biswas and Chopra (1956), Yonzone and Mondal (1981), Bhujel *et al* (1984), Yonzone *et al* (1984; 1985, 1996), Rai *et al* (1998) and Bhujel and Rai (1999, 2002, 2007).

Large fraction of population of this region lives in the villages and far-flung areas and they are mostly depend on the forest resources for meeting most of their daily needs including food, fuel, medicine, household articles and the materials needed in performing their rituals (Rai & Bhujel 2007). The history of ethnic uses of plants in this region dates back to the time of their

arrival (Rai *et al* 1998). The existence of traditional knowledge on medicinal plants and their uses are more common among the spiritual healers locally known as *Jhankri*, *Bijuwa*, *Boongthing*, *Phedangma* and *Lama* (Rai & Bhujel 1999).

People and their Belief

Use of herbal medicine among the ethnic communities is prevalent particularly in villages and urban area; unfortunately there is no known reputed medical training institute and registered practitioners for any systems of medicine in the region. Consultation to the community priest is indispensable before the treatment of any ailment among all the communities particularly in the village and urban areas.

Bhutia: Bhutias are the Tibetan descendents, an original inhabitant of *Bhot* the present day Tibet Autonomous Region of China. Basically they are the followers of Buddhism. Their priest 'Lama' conducts all the rites associated to their cultural and religious affairs raising prayer flags. Qualified and experienced practitioner known as *Amji* and *Pow* or sometimes spiritual healers known as *Lama*. Medicines are given in the form of powder and pills obtained from the different herbs. In some cases gold, pearls and other mineral particles are also added for the synergistic action of the herbs. During the course of treatment pulse rate of the patient is generally observed and diagnosis is made.

Lepcha: Lepcha people call themselves as *Rong* and locate their original home in the neighbourhood of the great mountain Mt. Kanchanzonga. They are of mongoloid descent and the place they live is called *Mayal lyang*. Their spiritual priest is called *Boongthing* (male) and *Mun* (female). They are qualified and experienced practitioner of herbal drugs in the region. The direct use of plant parts is found in most of the prescriptions, in the form of paste and water extracts. In some cases animal parts particularly of bear, deer and tiger are also added in the formulation.

Gorkha or Nepalese: They are the dominant race in Darjeeling Himalayan region, basically cultivators and are resourceful and hard working. They have taught agriculture to the aboriginal Lepchas (O'Malley 1907). Gorkha is a generic category and includes castes like Bahun (Brahmin), Bhujel, Chhetri, Damai, Gurung, Kami, Manger (Thapa), Newar (Pradhan), Rai(Khambu-Kirat) Sarki, Sherpa, Subba (Limbu-Kirat), Sunuwar(Mukhia), Tamang (Murmi), Thakuri, Thami, Yakha(Dewan)and Yolmu(Kagate) with much diversity in their religious faith and languages (Subba 1992). Most of the people are animist where shamanism is associated with

their caste and clan, culture and tradition recognized by the society. Medicines are known as *jaributi* or *pahare dabai* and exist in the practices of shamans known as *Dhami* and *Jhankri* and the enthusiastic village folks known as *Baidhya*.

The direct uses of plant parts with different ingredients are found in most of the prescriptions in the form of paste, decoction, water extract and pills or tablets. In this system also some of the ingredients are animal parts as in the Lepcha system.

Materials and Method

Regular visits to selected areas were made and the people of different races and castes were contacted to develop necessary understandings and close relationship so that they feel free to divulge their traditional knowledge. They key informants taken were experienced village folks and the priests of all ethnic groups living in the region. A number of places where ceremonies and rituals were being conducted were also visited to observe the exact use of the plants. After the interview the plant specimens in question were spotted and recognized with their help. These specimens were collected, recorded in the field notebook, processed into mounted herbarium sheets (Jain & Rao 1976). The plant identification and matching was done at the NBU herbarium, BSI-Gangtok and BSI Howrah. The specimens are deposited in the herbarium of Taxonomy and Ethnobiology Laboratory, Kalimpong College, Kalimpong.

Enumeration

The enumeration of thirty plants has been made alphabetically along with their botanical names, families, voucher specimens, local names, ranges of distribution and uses (Table-1). The abbreviations used are: Nep: *Nepali*, Lep: *Lepcha*, Bhu: *Bhutia*, Eng: *English*.

Result and Discussion

In the enumeration thirty medicinal plants belonging to twenty three families are presented in alphabetical order along with their local names and range of distribution. Uses of plant parts and the method of preparation and administration with doses also presented. Except few plants ecological status of the studied plants are not immediately facing the challenges for their existence in the region. On the other hand depletion of the traditional knowledge system in the region is alarming. The number of herbal healers that used to support their family members with this noble profession also declining and none of the member from their family is willing to take this profession nowadays. The young generations are preferred to go nearby town area and work enduring physical labour rather to take this profession. One of the reasons of not attracting

the young generation by this profession may be due to lack of any financial support to these herbal practitioners. In this part of the Himalayan region they are deprived of support from government agencies, non government organization and the research institutes though their peer knowledge are exploited by the researchers time to time for their interest only. Government of India and many non government agencies have taken initiatives many parts of the country to protect the biological species and have taken measures for conservation in any form *i.e in-situ* or *ex-situ*. In the neighbouring state of Sikkim the state government immensely encourages the traditional herbal healers or the practitioners to retain their age old practices and to keenly transmit this noble profession to their successor. They have created a fund called *Jaributi Kosh* that assists financially to develop herbal garden of their own. They also facilitates to get exposure to the herbal healers or the practitioners organizing exhibition of national and international level and facilitates in recognition of their contribution to the society locally and globally.

Conclusion

Darjeeling Himalayan region of the country is known as one of the store house of biological resources. This region attracted many renowned botanists, foresters, political officers, development workers and the policy makers since past two centuries and the diversity and richness of the plant species within the limit of the Himalayan region is still incomparable with the similar area of other parts of the country as per the floristic records. Tradition knowledge system of the ethnic community of this region is also diverse and rich as the plant species.

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Table: 1 List of ethno-medicinal plants of Darjeeling Himalayan region

SLNo	Name of plants	Families	Altitude of occurrence	Local name	Parts used	Diseases to be treated	Preparation and Administration
1	<i>Acmella calva</i> (DC.) Jansen	Compositae	500-1500m	Nep: Kalijhar	Freshly collected inflorescence	Tonsillitis, mouth sores and toothache	Directly chewed for 15-20 minutes
2	<i>Artocarpus lacucha</i> Buch.-Ham.	Moraceae	200-1200m	Nep: Barahar/Barhar Lep: Sungyen-kung	Freshly collected latex	Pneumonia in children, and intestinal worm.	Small amount (about 1 tea spoonful) of latex is mixed with a half tea spoonful of water and administered orally
3	<i>Bischofia javanica</i> Blume	Bischofiaceae	250-1500m	Nep: Kainjal Lep: Sumong-kung	Freshly collected stem bark	Dysentery	Filtered juice (about 250-300ml) is administered orally three times in a day.
4	<i>Boehmeria rugulosa</i> Weddell	Urticaceae	300-1000m	Nep: Daar Lep: Sedeng	Sticky juice from stem bark	Snakebites	Paste mixed with the stem bark paste of <i>Gmelina arborea</i> is applied externally.
5	<i>Callicarpa macrophylla</i> Vahl	Verbenaceae	200-1200m	Nep: Bhatiguyenlo Lep: Sagna-kung	Freshly collected young shoots	Pneumonia and fever	Filtered juice (about 180-200ml) is administered orally.
6	<i>Cissampelos pareira</i> L.	Menispermaceae	300-1200m	Nep.: Batul pate Ben.: Akanandi/ Nemuka Lep.: Tamshap-rip.	Roots	Stomach pain	crushed or sometimes cut down to small pieces (about 3-5mm), which is administered orally
7	<i>Citrus aurantium</i> L.	Rutaceae	400-1200m	Nep.: Kali jyamir Lep.: Silum-kung	Fruit is very sour in taste	Diarrhoea	The vinegar called <i>chuk</i> is prepared from the fruit, which (about one teaspoon a day) is administered orally in case of and dysentery. The vinegar is applied externally on mumps to prevent further swellings.
8	<i>Clematis acuminata</i> DC. var.	Ranunculaceae	1200-2400m	Nep.: Kaneshi lahara	Freshly collected root	Sinus pain	Crushed and tightened in a clean cotton cloth then heated over the oven for few minutes. The strong

	<i>acuminata</i>						fume is inhaled through nose.
9	<i>Clematis smilacifolia</i> Wall.	Ranunculaceae	600-1600m	Nep.: Pinase lahara/Halure lahara	Freshly collected root	Food poisoning, locally called <i>harital</i> . It is also prescribed in case of stomach colic called <i>nash</i> believed to be caused by evil eyes	Crushed and the filtered juice (about 150-200ml) is administered orally
10	<i>Clinopodium umbrosum</i> (M.Bieb.) C.Koch	Labiatae	1500-2500m	Nep: Phusray Jhar	Freshly collected leaves and young shoots	Burns	Extracted juice is applied externally on the affected area.
11	<i>Daphne involucreata</i> Wall.	Thymelaeaceae	1400-2200m	Nep: Sano-argale/ Sano-kagate	Freshly collected roots	Food poisoning called <i>harital</i>	Filtered juice (about 180-200ml) is administered orally.
12	<i>Didymocarpos aromaticus</i> Wall. ex D.Don	Gesneriaceae	900-2200m	Nep: Kunkum-pati Lep: Tib-lusang	Freshly collected rootstock	Dysentery	Filtered juice (about 1-2 spoonful) is administered orally
13	<i>Diploknema butyracea</i> (Roxb.) H.J.Lam.	Sapotaceae	200-1200m	Nep: Chiwri Lep: Yel-kung	Seeds	Rheumatism and emollient for chapped hands during winter season	Oil extracted from the roasted seed is used.
14	<i>Edgeworthia gardneri</i> (Wall.) Meisner	Thymelaeaceae	1200-2200m	Nep: Kagate/ Lokota Lep: Dhenok	Freshly collected root	Food poisoning known as <i>harital</i>	Filtered juice (about 180-200ml) is administered orally
15	<i>Elsholtzia blanda</i> (Benth.) Benth.	Labiatae	1200-2100m	Nep: Mrigae-jhar/Mirey-jhar	Freshly collected young shoots	Diarrhoea	Filtered juice is administered orally.
16	<i>Entada rheedii</i> Sprengel subsp. <i>sinohimalen</i>	Mimosoideae	200-1000m	Nep: Pangra Lep: Kulhok-rik.	Seeds	Mumps	Paste is prepared and mixed with vinegar; it is then applied externally on mumps and covered with cloth to check

	<i>sis</i> (Grierson & Long) Panigrahi						Further swelling.
17	<i>Gmelina arborea</i> Roxb.	Verbenaceae	200-1000m	Nep: Khamari Lep: Numbong-kung	Freshly collected stem bark	Food poisoning and mushroom poisoning	Filtered juice (about 200-250ml) is administered orally. It also removes the foetid discharges and worm from ulcer.
18	<i>Hypericum uratum</i> Buch-Ham. ex D. Don	Hypericaceae	1200-2800m	Nep: Urilo Lep: Tumbomri	Freshly collected young shoots	Urinary troubles (strangulation of urine)	Filtered juice (about 5-10ml) is administered orally. The same dose is also prescribed in case of food poisoning known as <i>harital</i> .
19	<i>Litsea cubeba</i> (Lour.) Persoon	Lauraceae	600-2000m	Nep: Situmbur Lep: Tanghaercher-kung	Mature fruits	Cholera, indigestion and stomach colic	Filtered juice (about 1 spoonful) is administered orally. Sauce prepared from the mature fruits along with the leaves (10-15) of <i>Mentha arvensis</i> is eaten with meals, believed to be medicinal.
20	<i>Mahonia napaulensis</i> DC.	Berberidaceae	1300-2600m	Nep: Chuttra/ Keshari.	Stem bark	Fever, flatulence and also as blood purifier	Decoction (about 100-150ml) is administered orally. The paste prepared from the stem bark is applied externally in case of cellulites.
21	<i>Mussaenda macrophylla</i> Wall.	Rubiaceae	1200-2000m	Nep: Sitalu/ Dhobini Lep: phool Tang-bop.	Freshly collected root	Juvenile jaundice and burning of urination	Filtered juice (about 180-200ml) is orally administered. Lepcha people use the root extract orally in case of common cold.
22	<i>Pentaplex fragrans</i> (D. Don) Ha	Antennariaceae	1800-3500m	Nep: Chinde	Young shoots and stem barks	Diabetes, gall and kidney stone	It is boiled and eaten as vegetables and as pickle.
23	<i>Phytolacca acinosa</i> Roxb.	Phytolaccaceae	600-1500m	Nep: Jaringo	Freshly collected taproot	Food poisoning	Filtered juice (about 200-250ml) is administered orally.
24	<i>Piper</i>	Piperaceae	1600-	Nep: Daley-	Ripe fruits	Phlegm cough	Powder prepared from

	<i>mullesua</i> D.Don	e	3000m	chabo/Pipla Eng: Piper			the fruits is mixed with a tea spoonful of honey and administered orally.
25	<i>Rheum acuminatum</i> Hook.f.	Polygonaceae	3500-3700m	Nep: Khokim	Rootstock	Fever, common cold body ache and high altitude sickness	Decoction (about 180-200ml) is administered orally.
26	<i>Rubus ellipticus</i> Smith	Rosaceae	1200-2400m	Nep: Ainselu/ Bhotay kanra Lep: Kasim-kung.	Freshly collected roots or young shoots	Tonsillitis and diarrhoea	Filtered juice (about 150-180ml) is administered orally. Lower dose (1-2 tea spoonfuls) is given in case of children.
27	<i>Rumex nepalensis</i> Sprengel	Polygonaceae	1100-2100m	Nep: Halhalley jhar	Freshly collected root	Stomach colic	Filtered juice (about 1-2 spoonful) is administered orally.
28	<i>Scoparia dulcis</i> L.	Scrophulariaceae	200-1000m	Nep: Khareto jhar	Freshly collected shoots	Piles and kidney trouble	Filtered juice (about 180ml) is administered orally at every morning in empty stomach, till get relief.
29	<i>Vitex negundo</i> L.	Verbenaceae	200-1200m	Nep: Simali	Shoots	Jaundice, body swelling, common cold and flu	Steam bath is taken 2-3 times daily.
30	<i>Youngia japonica</i> (L.) DC.	Compositae	600-2100m	Nep: Mulapate jhar	Latex	Fever and burning urination	1-2 drops extracted from the healthy plant are dissolved in 150-180ml of lukewarm water and is orally administered.