



A study on the uses of medicinal plants in Phoubakchao and Laphupat Tera villages, Manipur, India

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Abstract

The present investigation was carried in Phoubakchao and Laphupat Tera villages, Manipur with an objective of assessing the traditional knowledge of using medicinal plants by the elderly people of the village in treating different diseases or ailments. The study purposively selected 50 elderly persons (respondents) and interviewed by conducting household questionnaire survey to assess their traditional knowledge regarding uses of medicinal plants for treatment of certain diseases or ailments. Identification and correct nomenclature of species was done referring published literatures and websites. Fishing is the main occupation and high level of illiteracy (82%) was observed among respondents in the present investigation. The study resulted in the documentation of 52 species of medicinal plants belonging to 35 families and the parts like leaf, rhizome, fruit, seed, root and stem are used for treatment of 31 diseases or ailments. The most prevalent method of administration of medicinal preparation is boiling (40%) and drinking (60%) among the villagers. The elderly people of the village have got vast traditional knowledge in using medicinal plants which is deteriorating in the present day mainly because of the impacts of modernization.

Keywords: Diseases, Medicinal plants, People, Questionnaire survey, Traditional knowledge

1. Introduction

Traditional knowledge (TK) has been defined as a cumulative body of knowledge, practices and beliefs evolving by adaptive processes and handed down through generations by cultural transmission, about the relation of living beings with one another and with their environment (Berkes *et al.*, 2000). The use of traditional medicines for various ailments dates back over 2000 years and is a source of remedies for rural communities throughout the world (Ernst, 2005).

Medicinal plant is an important element of indigenous medical systems all over the world. The ethnobotany provides a rich resource for natural drug research and development (Farnsworth, 1990). Herbal medicine is still the mainstay of about 75–80%

of the world population, mainly in the developing countries, for primary health care because of better cultural acceptability, better compatibility with the human body and lesser side effects (Kamraj, 2000). The study on the uses of medicinal plants for treatment of certain diseases was done by different workers (Uniyal *et al.*, 2006; Borah *et al.*, 2009; Vidyarthi *et al.*, 2013; Jima and Megersa, 2018; Singh *et al.*, 2019). New medicinal uses of plants like *Ranunculus hirtellus* Royle and *Anemone rupicola* Cambess, was reported from Chhota Bhangal area of western Himalaya by Uniyal *et al.*, (2006). In addition, five commonly occurring tree species namely, *Aesculus indica* (Wall. ex Cambess.)

Hook., *Grewia optiva* J. R. Drumm. ex Burret, *Pinus roxburghii* Sarg., *Prunus cerasoides* Buch.-Ham. ex D. Don and *Rhododendron arboretum* Sm., were also used by the *Bhangalis* for curing various ailments. Borah *et al.*, (2009) did an ethnobotanical survey for the treatment of diabetes from herbal-medical practitioners among the Mishing, Bodo tribes and other ethnic group like the Deuris etc., inhabiting in Gohpur area in Sonitpur districts of Assam. Plants like *Ferula asafoetida* H. Karst., *Mikania micrantha* Kunth, *Centella asiatica* (L.) Urb., etc., were found to use for treatment of diabetes. Vidyarthi *et al.*, (2013) studied the traditional and indigenous uses of medicinal plants by local residents in Himachal Pradesh, North Western Himalaya, India and found 75 medicinal plants like *Achyranthes aspera* L., *Aconitum heterophyllum* Wall. ex Royle, *Aconitum violaceum* Jacquem. ex Stapf, etc. were used for treatment of diseases like ring worm, stomach disorders, stomach ache, etc. Ethnobotanical study of medicinal plants used to treat human diseases in Berbere District, Bale Zone of Oromia Regional State, South East Ethiopia resulted that plants like *Solanum incanum* L., *Stephania abyssinica* (Quart.-Dill. & A. Rich.) Walp. And *Carissa spinarum* L., were the most used for treatment of diseases like stomachache, asthma, cough, earache, etc., (Jima and Megersa, 2018). Singh *et al.* (2019) in their study on traditional herbal knowledge among the inhabitants in Urgam Valley of Chamoli Garhwal, Uttarakhand, India observed that, the utilization of fifty-one species of medicinal plants (*Aconitum balfourii* Stapf for poisonous bite, *Berberis aristata* DC. and *Berberis lyceum* Royle for opthalmologic complaints, *Potentilla lineata* Trevir. for dental problems, etc.) for local health care.

Meetei (2017) studied the health care practiced by the traditional healers of Thoubal district, Manipur, using medicinal plants to treat different diseases. Baidya *et al.*, (2020) noted 38 ethnomedicinal plants (36 genera and 27 families) from the sacred groves in Karbi Anglong district, Assam, India for treatment of various health ailment like cold, dermatological, skeletal muscle pain and inflammation, general health and infectious disease and genital-urinary disorder, etc. Dorjeya and Mauryab (2021) found the local healers use the whole plant of *Juniperus polycarpos* K.Koch in the traditional Amchi system of medicine for treatment of nervous disorders, heart related diseases and kidney disorders in Ladakh, India. Naïve *et al.* (2021) recorded 97 medicinal plants belonging to 46 families and 86 genera for treatment of diseases of the respiratory system, circulatory system, etc., by the *Talaandig* tribe in Portulin, Pangantucan, Bukidnon, Philippines. Documentation of the medicinal use of plants through

ethnobotanical studies enables the development of contemporary drugs and treatments as well as for plant conservation (Heinrich, 2000; Calzada and Bautista, 2020).

The elderly people in Phoubakchao and Laphupat Tera villages under study area are found to be dependent on medicinal plants for primary healthcare treatment due to their belief in traditional medicines and incapacity to pay for modern healthcare facilities such as well-equipped hospitals. The uses of traditional medicines are declining as this treatment methods are being replaced by contemporary allopathic medication. Because of their contemporary and hectic lifestyles, the younger generations have no interest in continuing these practices. The traditional expertise of using medicinal plants to treat diseases is in danger of disappearing due to urbanization and development. Moreover, there is lack of incorporation of scientific techniques to traditional medicinal plant. Documentation, treatment and conservation of medicinal plants are also found lacking.

2. Materials and methods

2.1. Study area

Manipur is a small state located in the north-eastern region of India. The state lies between 23°50' to 25°41' north latitudes and 93°2' to 94°47' east longitudes, neighboring Myanmar (Burma) in the east, Nagaland in the north, Assam in the west and Mizoram and Tripura in the south. The state has a geographical area of about 22,327 sq. km, with 16 districts. The hill area covers about 20,089 sq.km (i.e. about 3/4th of the total land area) is inhabited by various ethnic groups, while about 2,238 sq. km (about 1/4th of the land) comprises of the valley, predominantly inhabited by the *Meitei* people. As per the 2011 census, Manipur has a population of 2.86 million of which urban and rural population are 29.20% and 70.80% respectively. The urban population of the state is an increasing trend of last decade mainly in Imphal, the capital of state. The average population density of the state is 115 persons per sq km. The state has a literacy rate of 76.94 % (Bhattacharya, 2006).

Phoubakchao village is situated in Wangoi tehsil of Imphal West district, Manipur, northeast India. The village is about 46 km from Imphal, the capital town of the state. This village is located in the latitude of 24° 32'44" N and longitude of 93°52'11" E and on the eastern direction of the Loktak Lake, the largest freshwater lake in Northeast India. The village has population of 3588 as per census data of 2011, in which male population is 1794 and female population is 1794. Total geographical area of the village is 311.86 hectares and population density is 12 persons per

hectare. Total number of house hold in village is 670. In 2011, literacy rate of Phoubakchao village was 61.28% compared to 76.94 % of Manipur. In Phoubakchao male literacy stands at 74.62 % while female literacy rate was 48.11% (District Census, 2011).

Laphupat Tera village is located in Wangoi Tehsil of Imphal West district in Manipur, India The village is located about 47 km from Imphal and comes under the jurisdiction of Imphal West district of Manipur. This village is located in the latitude of 24°30'15" N and longitude of 93°52'49" E and on the eastern direction of the Loktak lake. The total geographical area of village is 102.78 hectares. The Laphupat Tera village has population of 4129 of which 2076 are males while 2053 are females as per population census 2011. There are about 831 houses in Laphupat Tera village. Average Sex Ratio of Laphupat Tera village is 989. Laphupat Tera village has lower literacy rate compared to Manipur. In 2011, literacy rate of Laphupat Tera village was 67.25 % compared to 76.94 % of Manipur. In Laphupat Tera Male literacy stands at 78.51 % while female literacy rate was 56.19 % (District Census, 2011).

The distance of the Loktak lake from the study villages i.e., Phoubakchao and Laphupat Tera are about 650 m and 345 m respectively. Loktak lake being a large freshwater lake in northeast India, many communities living in and around the lake depending on the lake's resources like fishes, prawns, snail, oysters, fodder, fuelwoods, thatch grasses, medicinal plants, vegetables and handicraft materials for livelihood and income generation. The people living in the Phoubakchao and Laphupat Tera villages also depended on the Loktak Lake's resources and they have their own traditional knowledge in fishing, agriculture, preservation of plants and animals in relation with religious purposes, uses of plants or its parts for medicinal purposes, etc. Most of the elderly people of the village possessed vast number of traditional knowledge whereas, the younger generation is not interested in learning these knowledge because of their modern and busy lifestyles. No study on the assessment of using medicinal plants for the treatment of diseases or ailments in Phoubakchao and Laphupat Tera villages have been undertaken in the past. Hence, to fill up this gap the present study have been undertaken in Phoubakchao and Laphupat Tera villages with the aim to document the traditional knowledge of using medicinal plants for the treatment of certain diseases or ailments by the elderly people living in these villages.

2.2. Research design and data collection

The present study was conducted in Phoubakchao and Laphupat Tera villages by interviewing 50 respondents using a pre-tested research schedule and focus group interview from May to September, 2021. The village was selected purposively for the study keeping in mind the aim and objective of the study. 50 elderly persons (above 70 years of age) were selected purposively and interviewed using a research schedule to document their traditional knowledge regarding uses of medicinal plants for the treatment of certain diseases or ailments (Muthu *et al.*, 2006; Mahwasane *et al.*, 2013; Benarba *et al.*, 2015).

Following the standard methods (Jain and Rao, 1977) herbarium of the plant species were prepared and deposited in the Herbaria of Department of Forestry and Environmental Science, Pandit Deen Dayal Upadhyay Institute of Agricultural Sciences, Utlou, Manipur, for future reference. The local names and specimen of the plants used by the respondents was collected and cross checked with the published literatures (Sinha, 1996; Singh *et al.*, 2000) and the specimens of the medicinal plants which were collected were identified on the basis of vernacular name, regional floras and published literatures (Deb, 1961; Jain and Rao, 1977; Hore, 1998; Singh *et al.*, 2003). For the correct nomenclature of plant species International Plant Name Index (IPNI) (<http://www.ipni.org>) and the World Flora Online (<http://www.worldfloraonline.org>) websites were browsed.

3. Results and discussion

Table 1 presents the demographic profile of the respondents. In the demographic profile of the selected respondents, 74% of them belonged to age group of 71-80 years, 20% were in between 81-90 years and 6% belonged to 91-100 years age group. 94% of the respondents were male while 6% were female. 86% of the respondents followed Hinduism and 14% were Islam. Fishing was the main occupation (100%) of all the 50 respondents followed by 54% in agriculture. In terms of the educational level of the respondents overall, 82% were illiterate, 14% had primary (Nursery -Class VIII) education and only 4% were educated up to secondary (Cl. IX-XII) level. In the present study illiteracy was high among the respondents because in the past there were less educational facilities in the villages.

The respondents in the present study were found to use 52 species of medicinal plants for treatment of 31 diseases or ailments (Table 2). The study is in agreement with Pal and Palit (2011) who reported the use of 44 species of angiosperms against 62 diseases

Table 1. Demographic profile of the respondents

Sl. No.	Particulars	No. of respondents *
I	Age of the respondents	
a.	71-80 years	37 (74%)
b.	81-90 years	10 (20%)
c.	91-100 years	3 (6%)
II	Gender of the respondents	
a.	Male	47 (94%)
b.	Female	3 (6%)
III	Religion	
a.	Hinduism	43 (86%)
b.	Christianity	0 (0)
c.	Islam	7 (14%)
IV	Occupation of the respondents	
a.	Fishing	50 (100%)
b.	Agriculture	27 (54%)
c.	Handloom	1 (2%)
d.	Handicraft or Livestock rearing	0 (0)
f.	Business or Migrant worker	0 (0)
h.	Government/private employee	0 (0)
V	Educational level of the respondents	
a.	Illiterate	41 (82%)
b.	Primary (Nursery-CI. VIII)	7 (14%)
c.	Secondary (CI. IX-XII)	2 (4%)
d.	Under-graduate, graduate or above	0 (0)

*Figure in parentheses indicate the percentage of each category

like bronchitis, tuberculosis, asthma, diarrhea, dysentery, measles, malaria, cholera, ulcerations and typhoid among *Lepcha* communities in north Sikkim. In an ethnomedicinal survey of some wetland plants of South Orissa and their conservation, Panda and Misra (2011) also found that 48 wetland plants under 40 genera and 23 families were used by the local people against 47 ailments. Singh (2002) in his study on some ethnobotanically important plants available on the *Phumdis* of Loktak lake, Manipur, India identified 54 species of plants having importance to the local people for edible, cultural, medicinal, fodder, house making and biofertilizer purposes. A study in indigenous knowledge of medicinal plants used in the Alaknanda catchment of Uttarakhand, India also documented the uses of 100 medicinal plant species belonging to 91 genera and 51 families to cure 60 types of different ailments (Phondani *et al.*, 2009).

It is also noted that the respondents used 35 families and 6 plant parts i.e., leaf, rhizome, fruit, seed, root and stem for treatment of 31 diseases or ailments (Table 2). Plant species belonging to families Asteraceae (5 plants), Cucurbitaceae and Solanaceae 4 plants each, followed by Lamiaceae and Meliaceae (3 plants each)

were used in highest number for treatment of different diseases or ailments (Fig. 1). Similar study was conducted by Thokchom *et al.* (2015) who recorded 63 plant species belonging to 56 genera and 41 families which were used by *Chakpa* community in traditional health care system to treat over 25 diseases and ailments in Andro village of Manipur. In the percentages of plant part used for treating different diseases leaf was used in highest percentage i.e. 64%, followed by fruit 20%, rhizome, seed, root and stem 4% each (Fig. 2). The present study is in line with Devi *et al.* (2017) who conducted a wide survey of medicinal plants where 100 species belonging to 56 families and a total of 87 genera of medicinal plants were found to be used in 14 villages in Bishnupur District, Manipur. Similar study was conducted by Muthu *et al.* (2006) where the traditional healers used 85 species of plants distributed in 76 genera belonging to 41 families to treat various diseases like skin diseases, poison bites, stomachache and nervous disorders. Traditional uses of medicinal plants for treatment of various diseases was also reported in a study conducted in Nepal (Ambu *et al.*, 2020).

In the preparation method of medicinal plants 7 methods namely boiled, crushed, paste, extract juice, cooked, dried and burned were used. Boiled (40%) methods was used in highest percentage and dried, burned and paste 2% each were used in lowest (Fig. 3). These findings were in congruence to the results of Naïve *et al.* (2021). Five methods such as drink, eaten raw, applied, inhaled and chewed were used as mode of administration of medicinal plants. Drinking (60%) was the highest mode of administration of medicinal plants and the least was inhaled and chewed both 2% each (Fig. 4). Such findings were reported by Dogor *et al.* (2018), Hussain *et al.* (2018) and Jadid *et al.* (2020). 73 plant species belonging to 46 families were also reported by local practitioners for the treatment of diabetes in Manipur, India (Devi *et al.*, 2011). Further investigation noted that 5 plant species were used for treatment of piles, dysentery, diarrhoea and cough, 4 plants species were used for treatment of urinary calculi followed by headache, high blood pressure and fever which used 3 plants species each (Fig. 5). Živkovic *et al.* (2020) recorded 86 medicinal plants belonging to 43 families in Pčinja district in South-Eastern Serbia for treatment of gastrointestinal ailments, respiratory problems and skin diseases. A total of 50 medicinal plants, belonging to 26 families were also recorded for the treatment of different diseases *viz.*, asthma, arthritis, cough, fever, diabetes, dysentery, gastric and indigestion, jaundice, toothache, skin diseases, etc., in Imphal-East District, Manipur,

Table 2. Details of plants enumerated from the study area

Sl. No.	Scientific names	Family names	Local names	Part(s) used	Mode of preparation/dosage/administration	Diseases
1	<i>Achyranthes aspera</i> L.	Amaranthaceae	<i>Khujumpere</i>	Leaf	Fresh leaves are boiled and a glass of it is drunk everyday	Piles
2	<i>Acorus calamus</i> L.	Araceae	<i>Okhidak</i>	Rhizome	A teaspoonful of crushed rhizome juice is taken twice daily	Cough
3	<i>Ageratum conyzoides</i> L.	Asteraceae	<i>Khongainapi</i>	Leaf	A glass of fresh leaves are boiled and drink everyday	Vomiting
4	<i>Alisma plantago-aquatica</i> L.	Alismataceae	<i>Kakthrum</i>	Leaf	A glass of leaves are boiled and drink daily	Urinary tract infection
5	<i>Allium ramosum</i> L.	Amaryllidaceae	<i>Maroinakupi</i>	Leaf	A glass of leaves are boiled and drink daily	Urinary calculi
6	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	<i>Keehom</i>	Fruit	Fruit is eaten as raw once in a day	Piles
7	<i>Avicennia indica</i> A. Juss.	Meliaceae	<i>Heinijom</i>	Fruit	Fruit is eaten as raw once in a day	Urinary calculi
8	<i>Azadirachta indica</i> A. Juss.	Meliaceae	<i>Neem</i>	Leaf	A glass of boiled leaves are drink daily	Fever, Typhoid
9	<i>Benincasa hispida</i> (Thunb.) Cogn.	Cucurbitaceae	<i>Torobot</i>	Fruit	Juice of the fruit is applied on the forehead	Headache
10	<i>Blumea balsamifera</i> (L.) DC	Asteraceae	<i>Langthrei</i>	Leaf	A glass of boiled leaves are taken daily	High blood pressure
11	<i>Cajanus cajan</i> (L.) Millsp.	Fabaceae	<i>Mairongbi</i>	Seed	Paste of the seed is applied in the bitten area	Snake bite
12	<i>Cannabis sativa</i> L.	Cannabaceae	<i>Ganja</i>	Leaf	A glass of boiled leaves with sugar are taken daily	Diarrhoea, Dysentery
13	<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	Asteraceae	<i>Terapaibi</i>	Leaf	A glass of boiled leaves with sugar are taken daily	Stomach pain
14	<i>Celtis timorensis</i> Span.	Cannabaceae	<i>Heikreng</i>	Leaf	A glass of boiled leaves with sugar are taken daily	Urinary calculi
15	<i>Centella asiatica</i> (L.) Urb.	Apiaceae	<i>Peruk</i>	Leaf	A teaspoonful of juice of leaves with honey are taken twice daily	Urinary tract infection
16	<i>Clitoria ternatea</i> L.	Papilionaceae	<i>Aparajita</i>	Root	Root extract is applied on the affected part	Joint pain
17	<i>Cucumis sativus</i> L.	Cucurbitaceae	<i>Thabi</i>	Fruit	Raw fruit is eaten at least once daily	High blood pressure
18	<i>Cucurbita maxima</i> Duchesne	Cucurbitaceae	<i>Mairel</i>	Fruit	Fruit is cooked and eaten daily	Colitis

19	<i>Cynodon dactylon</i> Pers.	Gramineae	<i>Tingthou</i>	Leaf	Extracted juice of leaves is applied on cuts and wounds	Cuts and wounds
20	<i>Datura stramonium</i> L.	Solanaceae	<i>Shagol-hidak</i>	Leaf	Leaves are dried, burned and smoke is inhaled	Asthma
21	<i>Drymaria cordata</i> Willd.	Caryophyllaceae	<i>Tandaipambi</i>	Leaf	A teaspoonful juice of the leaves are taken daily	Diarrhoea
22	<i>Emblca officinalis</i> Gaertn.	Euphorbiaceae	<i>Heikru</i>	Fruit	A fruit is eaten raw daily	Constipation, Bleeding gums
23	<i>Artemisia indica</i> Willd.	Asteraceae	<i>Leibakngou</i>	Leaf	A teaspoonful of leaves' juice with honey is taken twice daily	Stomach pain
24	<i>Ficus hispida</i> L. f.	Moraceae	<i>Ashi-heibong</i>	Seed	A crushed seed is eaten daily	Dysentery
25	<i>Fuirena umbellata</i> Rottb.	Cyperaceae	<i>Lamhangjou</i>	Leaf	A glass of boiled leaves are taken daily.	Urinary calculi
26	<i>Houttuynia cordata</i> Thunb.	Saururaceae	<i>Toningkhok</i>	Leaf	A teaspoonful of juice of the leaf is taken with honey daily.	Dysentery
27	<i>Leucas lavandulifolia</i> Sm.	Lamiaceae	<i>Mayanglemboom</i>	Leaf	A glass of boiled leaves are taken daily	Sinusitis
28	<i>Melia azedarach</i> L.	Meliaceae	<i>Seizrak</i>	Leaf	A teaspoonful of juice of the crushed leaves is taken with honey daily	Intestinal worm infestation in children
29	<i>Mentha arvensis</i> L.	Lamiaceae	<i>Nungshhidak</i>	Leaf	A teaspoonful of crushed leaves with salt are taken twice everyday	Indigestion
30	<i>Meyna laxiflora</i> Robyns	Rubiaceae	<i>Heibi</i>	Fruit	Juice of the ripened fruit is applied on the infected part	Swelling, Boil
31	<i>Mimosa pudica</i> L.	Mimosaceae	<i>Kangphalikaithabi</i>	Leaf	A teaspoonful of juice of the leaves is taken with honey everyday	Piles
32	<i>Mukia maderaspatana</i> (L.) M. Roem.	Cucurbitaceae	<i>Lamthabi</i>	Leaf	A glass of boiled leaves are taken twice daily	Jaundice
33	<i>Oxalis corniculata</i> L.	Oxalidaceae	<i>Yensilmacha</i>	Leaf/stem	A glass of boiled leaves or stem with salt are taken daily	Indigestion
34	<i>Pharagmites karka</i> (Retz.) Trin.ex Steud.	Gramineae	<i>Tou</i>	Root	Half glass of boiled roots are taken daily	Diabetes
35	<i>Phaseolus lunatus</i> L.	Leguminosae	<i>Hawaikalandri</i>	Leaf	A glass of boiled leaves are taken everyday	Intestinal worm infestation
36	<i>Phlogacanthus thyriformis</i> (Roxb. ex Hardw.) Mabb.	Acanthaceae	<i>Nongmangkha</i>	Leaf	A glass of boiled leaves are taken daily	Fever, Cold, Cough

37	<i>Prunus persica</i> (L.) Batsch	Rosaceae	<i>Chumbrei</i>	Leaf	A glass of boiled leaves are taken once in a day	Piles
38	<i>Psidium guajava</i> L.	Myrtaceae	<i>Pungdol</i>	Leaf	Three to Four raw leaves are eaten daily	Dysentery
39	<i>Punica granatum</i> L.	Lythraceae	<i>Kaphoi</i>	Leaf	Fried leaves with <i>mustard oil</i> are applied in the infected part	Skin burns
40	<i>Rhus chinensis</i> Mill.	Anacardiaceae	<i>Heining</i>	Leaf	A glass of boiled leaves are taken daily	Dysentery, diarrhoea
41	<i>Rorippa indica</i> (L.) Hiern	Brassicaceae	<i>Uchi-hangam</i>	Leaf	Crushed leaves are applied on forehead	Headache, Dizziness
42	<i>Saccharum officinarum</i> L.	Poaceae	<i>Chungou</i>	Stem	Steam is eaten as raw once in a day	Jaundice
43	<i>Stephania glabra</i> (Roxb.) Mierts	Menispermaceae	<i>Koubuyai</i>	Rhizome	A piece of rhizome is chewed directly	High blood pressure, Cough
44	<i>Solanum indicum</i> L.	Solanaceae	<i>Leipungkhangga</i>	Fruit	A teaspoonful of crushed fruit is taken with honey once daily.	Fever, Cold, Cough
45	<i>Solanum myriacanthum</i> Dunal	Solanaceae	<i>Lam khamen</i>	Fruit	Cooked fruit is eaten once in a day.	Joint pain
46	<i>Solanum torvum</i> Swartz	Solanaceae	<i>Shingkhangga</i>	Fruit	A teaspoonful of crushed fruit is taken with honey daily	Cough
47	<i>Toona ciliata</i> M. Roem.	Meliaceae	<i>Tairen</i>	Leaf	Crushed leaf juice applied on infected part	Toothache
48	<i>Trapa natans</i> L.	Trapaceae	<i>Heikak</i>	Fruit	Few raw fruit is eaten daily	Diarrhoea
49	<i>Vitex negundo</i> L.	Lamiaceae	<i>Uriksibi</i>	Leaf	A teaspoonful of crushed leaf juice with honey are taken everyday	Piles
50	<i>Xanthium strumarium</i> L.	Asteraceae	<i>Hamengsampakpi</i>	Leaf	A teaspoonful of crushed leaves juice is taken with salt daily	Diarrhoea
51	<i>Zanthoxylum acanthopodium</i> DC.	Rutaceae	<i>Mukthrubu</i>	Leaf	A glass of boiled leaves are taken daily	Bronchitis
52	<i>Ziziphus jujuba</i> Mill.	Rhamnaceae	<i>Boroi</i>	Leaf	Crushed leaves applied on forehead	Headache

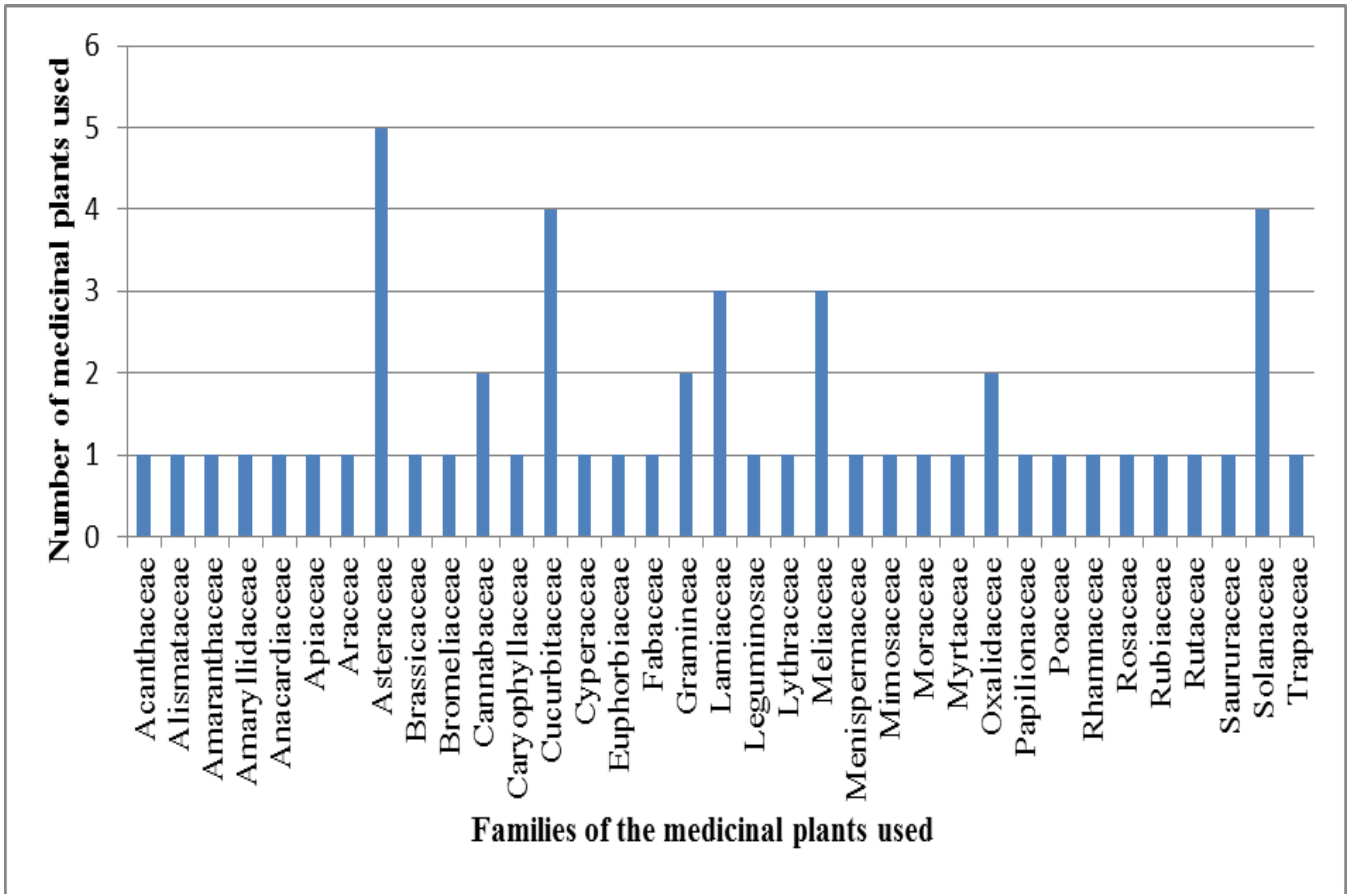


Fig. 1. Number of plants used for treatment of different diseases or ailments

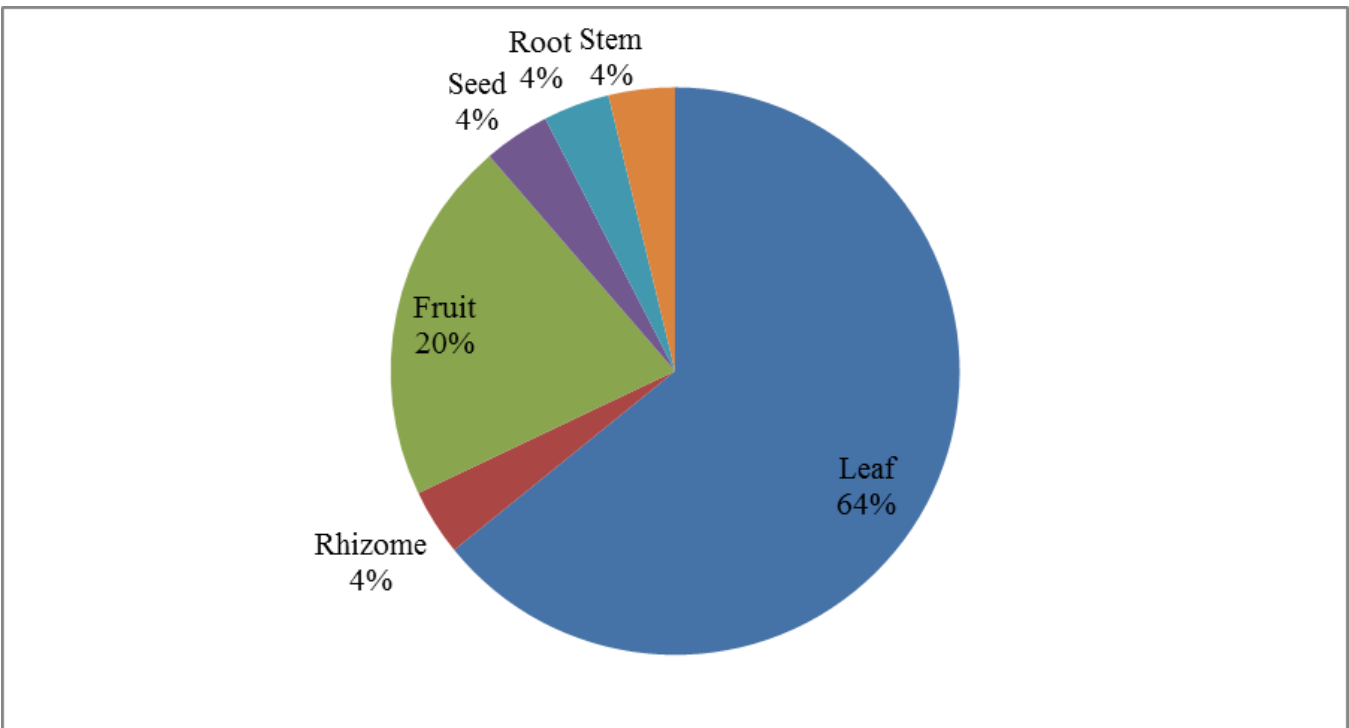


Fig. 2. Percentage of plant parts used for treating different diseases or ailments

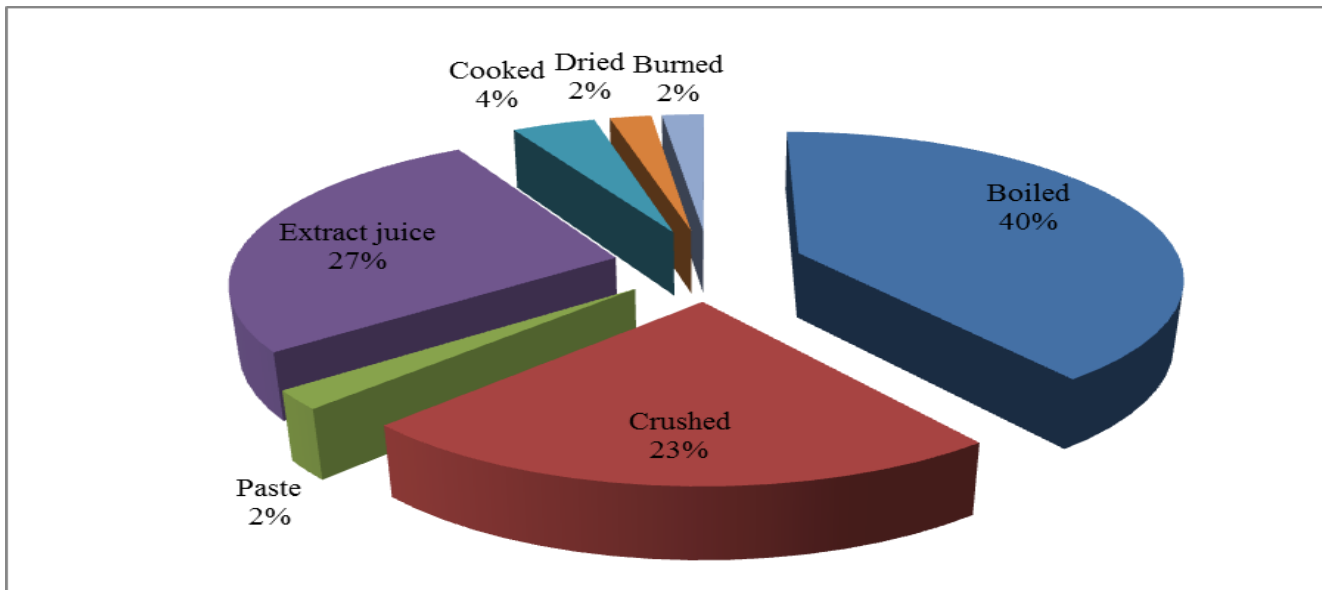


Fig. 3. Preparation method of medicinal plants

India (Leishangthem and Sharma, 2014). The respondents thought that the traditional practices of medicinal plants for treatment of certain diseases are deteriorating among the youth mainly because of impact of modernization like the availability of modern healthcare facilities and obtaining of higher educational knowledge. It is also observed that still some elderly people are using this traditional method of treatment using medicinal plants. The respondents were also of the opinion that traditional methods of treatment were more economical than the modern healthcare practices. As these villages are located in remote areas this method of treatment can also be used

as an emergency method before the modern healthcare facilities reaches to those people who are suffering from certain diseases. Therefore, it is very essential to document the eroding traditional knowledge of the people and revived it for the treatment of certain diseases. The modern healthcare facilities though costly have also got its own advantages as well as they are safe, have less risk factor, higher accuracy in treating diseases, save time and energy, availability of various methods for treating a disease, etc. Hence, a balance of both traditional knowledge and modern technology is necessary for effective treatment of diseases.

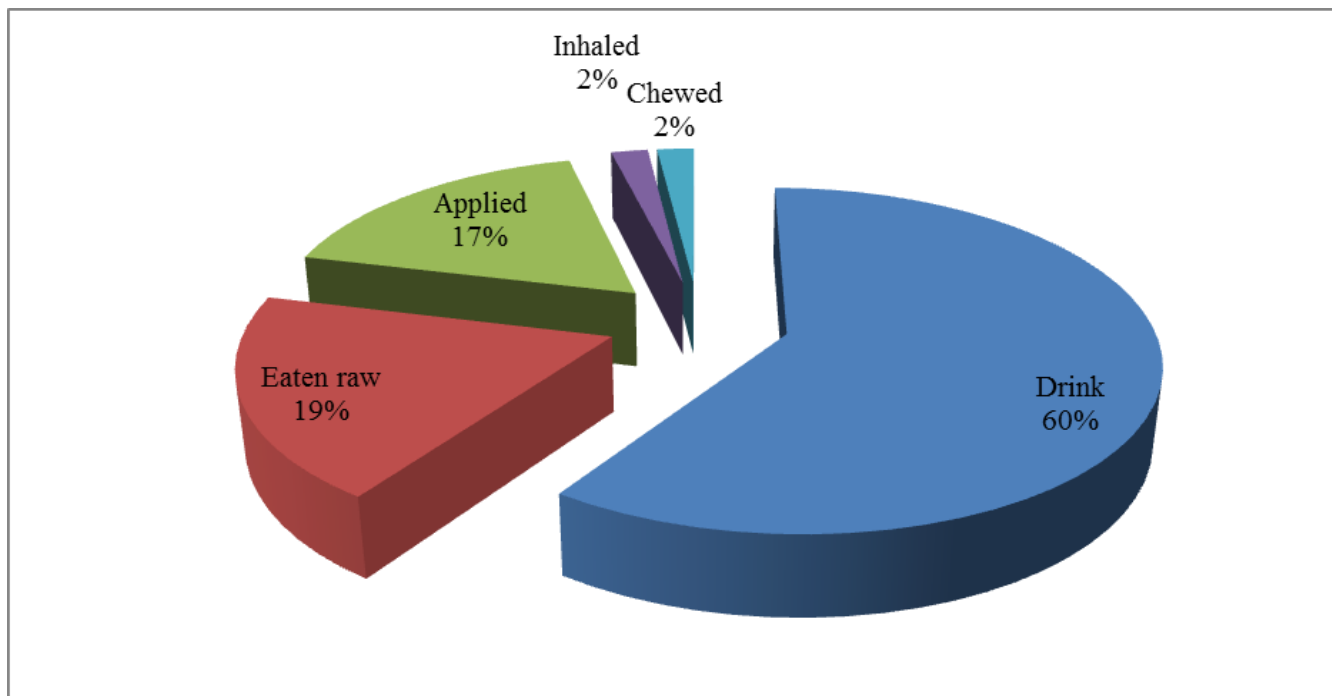


Fig. 4. Mode of administration of medicinal plants

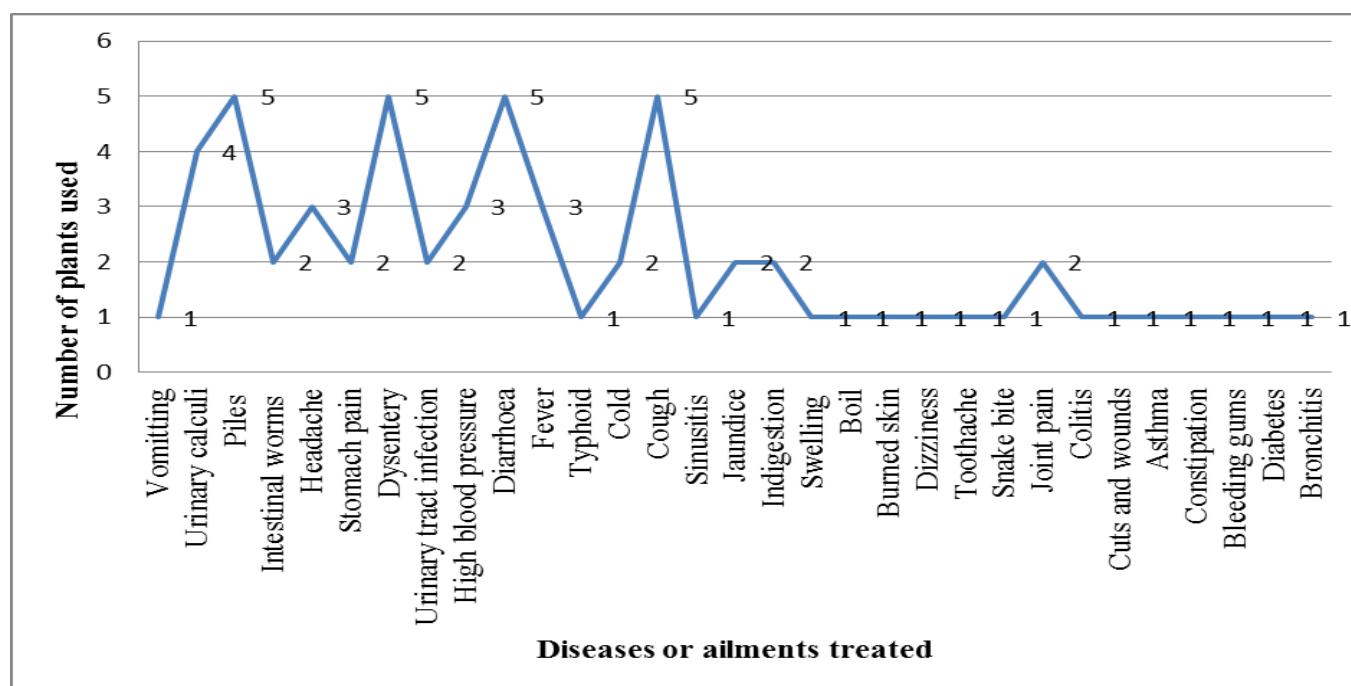


Fig. 5. Number of diseases or ailments treated and the number of plants used in treatment of different diseases or ailments

4. Conclusion

Overall, it can be observed that the elderly people living in Phoubakchao and Laphupat Tera villages have got great traditional ecological knowledge in using medicinal plants for treatment of various diseases or ailments. Such type of knowledge is a valuable asset from the ancestors. This type of traditional knowledge does not degrade the surrounding environment but in fact conserve the environment by conserving plants. This knowledge has to be utilized properly by incorporating scientific knowledge in it. This will not only help in convincing the people of the villages to take up this method of treatment but also will lead to the overall improvement of the surrounding environment by conserving the medicinal plants. Erosion of the traditional uses of medicinal plants for treatment of diseases among in the people in the present day especially among youths is observed because of the increasing availability of modern medical healthcare facilities. But some elderly people are still using these traditional methods of treatment. If this knowledge is utilized properly in a scientific manner it will lead to the overall improvement of the surrounding environment as conservation of medicinal plants will also take place. Hence, it is very important that the traditional knowledge of the people need to be documented, encouraged, revived, conserved and most importantly it can also act as a substitute or emergency method of treatment before the modern healthcare facilities reaches to those people who are suffering from certain diseases.

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References

- Ambu G, Chaudhary R P, Mariotti M and Cornara L 2020. Traditional uses of medicinal plants by ethnic people in the Kavrepalanchok District, Central Nepal. *Plants*. 9(6): 1-34.
- Baidya S, Thakur B and Devi A 2020. Ethnomedicinal plants of the sacred groves and their uses by Karbi tribe in Karbi Anglong district of Assam, Northeast India. *Ind. J. Trad. Knowl.* 19(2): 277-287.
- Benarba B, Belabid L, Righi K, Bekkar A A, Elouissi M, Khaldi A and Hamimed A 2015. Ethnobotanical study of medicinal plants used by traditional healers in Mascara (North West of Algeria). *J. Ethnopharmacol.* 4(175): 626-637.
- Berkes F, Colding J and Folke C 2000. Rediscovery of traditional ecological knowledge as adaptive management. *Ecological Applications*. 10(5): 1251-1262.
- Bhattacharya N N 2006. Manipur: Land, people and Economy. M.L. Gupta, New Delhi, India.
- Borah S, Das A K, Saikia D and Borah J 2009. A note on the use of ethnomedicine in treatment of diabetes by Mishing communities in Assam, India. *Ethnobot. Leaf.* 13: 1348- 52.
- Calzada F and Bautista E 2020. Plants used for the treatment of diarrhoea from Mexican flora with amoebicidal and giadicial activity, and their phytochemical constituents. *J. Ethnopharmacol.* 253: 112676.
- Deb D B 1961. Monocotyledonous plants of Manipur territory. *The Bulletin of the Botanical Survey of India.* 3(2): 115-138.

- Devi K Y, Devi M H and Singh P K 2017. Survey of medicinal plants in Bishnupur District, Manipur, North Eastern India. *Int. J. Appl. Res.* 3(4): 462-471.
- Devi W I, Devi G S and Singh C B 2011. Traditional Herbal Medicine Used For the Treatment of Diabetes in Manipur, India. *Res. J. Pharm. Bio. Chem. Sci.* 2(4): 709-715.
- District Census 2011. Census 2011.co.in. 2011. Accessed on August 20, 2021.
- Dogor G K F, Nyarko R A, Anning A K. and Oteng-Yeboah A 2018. Medicinal plant use and conservation practices by communities in the Togo Plateau Forest Reserve, Ghana. *J. Med. Plant Res.* 12(30): 575-589.
- Dorjeya K and Maurya A K 2021. Ethnobotany of *Juniperus polycarpos* C. Koch (Cupressaceae) in the Himalayan cold desert of Union Territory of Ladakh, India. *Ind. J. Trad. Knowl.* 20(1): 83-90.
- Ernst E 2005. The efficacy of herbal medicine - an overview. *Fund. Clin. Pharmacol.* 19(4): 405-409.
- Farnsworth N R 1990. The role of ethno pharmacology in drug development, Ciba Foundation Symposium 154. Bioactive Compounds from Plants. John Wiley & Sons, Baffins Lane, Chichester, England.
- Heinrich M 2000. Ethnobotany and its role in drug development. *Phytother. Res.* 14(7): 479-488.
- Hore D K 1998. Agriculture Biodiversity and Climate Change, North Eastern Hill University, Shillong: Souvenir; Diversity in Agricultural plants-an experience with North-East India. pp.11-13.
- Hussain W, Badshah L, Ullah M, Ali M, Ali A and Hussain F 2018. Quantitative study of medicinal plants used by the communities residing in Koh-e-Safaid Range, northern Pakistani-Afghan borders. *J. Ethnobiol. Ethnomed.* 14(30): 1-18.
- International Plant Names Index. <http://www.ipni.org>. Accessed on September 10, 2021.
- Jadid N, Kurniawan E, Himayani C E S, Andriyani, Prasetyowati I, Purwani K I, Muslihatin W, Hidayati D and Tjahjaningrum I T D 2020. An ethnobotanical study of medicinal plants used by the Tengger tribe in Ngadisari village, Indonesia. *PLOS ONE.* 15(7): 1-16.
- Jain S K and Rao R R 1977. A handbook of field and herbarium methods. Today and Tomorrow's Printers and Publishers, New Delhi, India.
- Jima T T and Megersa M 2018. Ethnobotanical Study of medicinal plants used to treat human diseases in Berbere District, bale zone of Oromia regional state, south east Ethiopia. *eCAM.* 2018: 1-16.
- Kamraj V P 2000. Herbal medicine. *Current Science.* 78(1): 35-39.
- Leishangthem S and Sharma L D 2014. Study of some important medicinal plants found in Imphal-East District, Manipur, India. *Int. J. Interdis. Multidis. Stud.* 4(9): 1-5.
- Mahwasane S T, Middleton L and Boaduo N 2013. An ethnobotanical survey of indigenous knowledge on medicinal plants used by the traditional healers of the Lwamondo area, Limpopo province, South Africa. *S. Afr. J. Bot.* 88(2013): 69-75.
- Meetei A T 2017. Traditional medicinal knowledge in north eastern region of India: A Case study of their health care practices among the Meetei Maiba healers of Thoubal District, Manipur. *IJIMS.* 4 (2): 105-111.
- Muthu C, Ayyanar M, Raja N and Ignacimuthu S 2006. Medicinal plants used by traditional healers in Kancheepuram District of Tamil Nadu, India. *J. Ethnobiol. Ethnomed.* 2(43): 1-10.
- Naive M A K, Binag S D A and Alejandro G J D 2021. Plants with benefits: Ethnomedicinal plants used by the Talaandig tribe in Portulin, Pangantucan, Bukidnon, Philippines. *Ind. J. Trad. Knowl.* 20(3): 754-766.
- Pal S and Palit D 2011. Traditional knowledge and bioresource utilization among Lepcha in North Sikkim. *NeBIO.* 2(1): 13-17.
- Panda A and Misra M K 2011. Ethnomedicinal survey of some wetland plants of South Orissa and their conservation. *Ind. J. Trad. Knowl.* 10(2): 296-303.
- Phondani P C, Maikhuri R K and Bisht N S 2009. Medicinal plants used in the health care system practiced by traditional vaidyas in Alaknanda Catchment of Uttarakhand, India. *Ethnobot. Leaf.* 13 (12): 1453-67.
- Singh A, Hart R, Chandra S, Nautiyal M C and Sayok A K. 2019. Traditional herbal knowledge among the inhabitants: A case study in Urgan Valley of Chamoli Garhwal, Uttarakhand, India. *eCAM.* 2019:1-21.
- Singh H B, Singh R S and Sandhu J S. 2003. Herbal medicine of Manipur, A colour Encyclopedia, Daya publishing House, New Delhi, India.
- Singh N P, Chauhan A S and Mondal M S 2000. Flora of Manipur, Vol. I, Botanical Survey of India, Calcutta, India
- Singh P K 2002. Some ethnobotanically important plants available on the Phumdis of Loktak lake, In: Trisal C L and Manihar T H (eds). Proceedings of a workshop on Management of Phumdis in Loktak Lake, January 22-24, 2002 Wetlands International-South Asia, New Delhi (India) and Loktak Development Authority, Manipur, India. pp. 37-42.
- Sinha S C 1996. Medicinal plants of Manipur. Manipur Association for Science & Society (MASS), Imphal.
- Thokchom S, Ningombam D S, Chanchal C H and Singh H B 2015. Folk-Medicare System of Chakpa community of Andro Village of Manipur in Northeast India. *AJEthno.* 2(4): 239-264.
- Uniyal S K R, Singh K N, Jamwal P and Lal B 2006. Traditional use of medicinal plants among the tribal communities of Chhota Bhangal, Western Himalaya. *J. Ethnobiol. Ethnomed.* 2(14): 1-8.
- Vidyarthi S, Samant S S and Sharma P 2013. Traditional and indigenous uses of medicinal plants by local residents in Himachal Pradesh, north western Himalaya, India. *Int. J. Biodivers. Sci. Ecosyst. Serv. Manag.* 9(3): 185-200.
- World Flora Online (<https://www.worldfloraonline.org/>) Accessed on September 12, 2021.
- Z'ivkovic' J, Ilic' M, S'avikin K, Zdunic'G, Ilic' A and Stojkovic' D 2020. Traditional use of medicinal plants in south eastern Serbia (Pčinja district): ethnopharmacological investigation on the status and comparison with half a century old data. *Front. Pharmacol.* 11 (1020): 1-12.