

## **ETHNOMEDICINAL STUDY OF SOME EDIBLE PLANTS IN KALWIN VILLAGE, MYEIK TOWNSHIP**

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### **Abstract**

In this paper conducts the ethnobotanical study of some edible plants in Kalwin village, Myeik Distric, Tanintharyi Region. In this study, twenty seven species belonging to fifteen families were collected from Kalwin village near Myeik University during during June to October 2019. Local people used these plans not only for food but also medicinal for their daily life. Ethnobotanical methods using structured interview were employed and collected data have been analyzed by using quantitative methods of data analysis. Different plants parts are used to cure different diseases as home remedy. These plants species are used in study area to cure various diseases like cough, headache, boils, fever, diarrhea and external ulcers etc. Score given to the species according to preference ranking for treatment of cough, ulcer, food poisoning and diarrhea were calculated. Used value, ranking, informant consensus factor (ICF) and fidelity level (FL) of twenty seven species were also computed.

**Keywords:** Quantitative methods, Ethnobotany, Used value, Informant consensus factor, Fidelity level

### **Introduction**

Plants have traditionally been used as a source of medicine long time ago to control various ailments afflicting human. The knowledge of usage plants have been orally transferred from elder to younger. Today 80% of the world's population rely dominantly on plants and plant extract for health care.

Ethnomedicine refers to the study of traditional medicinal practice which concern valuable information and relationship between plants and people. Ethnomedicine even today plays an important role in rural areas and a lot of locally produced drugs are still used as household remedies for various types of illness. The ethnomedicinal data include the actual sources of ethnobotanical data, i.e. the interviewer and interviewee: plant used for medicine, plant part and preparation for use.

Edible plants are part of plants that are eaten by humans. Edible plants in the kitchen are not only for cooking but they also have enough medicinal properties. Woman of the household was well versed in the use of edible plants for treat illness. There is much overlap between medicinal and edible plants. Many plants used as food for local people are also used as therapeutic system. Let food be medicine and medicine be the food. Those are famous words from the ancient Greek physician Hippocrates, often called the father of Western medicine.

In this paper ethnomedicinal uses of 27 edible plant species belonging to 15 families were under taken. The aim of this paper is to know the outstanding characters of eighteen edible plant species and their ethnomedicinal uses by qualitative and quantitative approaches.

### **Aim and Objectives**

- To investigate ethnomedicinal utilization of some edible plants in Kalwin village, Myeik township
- To know most effective medicinal plants used by the community to treat the diseases

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## Materials and Methods

### Data collection and identification

The data were collected from Kalwin village during June to October 2019. Ethnobotanical methods like structured interviews were used for qualitative and quantitative data analysis. The questionnaires include gender, age of respondent, local name of plant, part use, how to prepare for medicinal purpose. In this ethnobotanical study, total of 12 interviewees were selected randomly between the different ages of 50 to 75 years and they are workers, fishermen and housewife. The ethnomedicinal data include the actual sources of ethnobotanical data, i.e. the interviewer and interviewee: plant used for medicine, plant part and preparation for use.

Preference Ranking was done by using methods described by Martin (1995) to indicate most effective medicinal plants used by the community to treat the disease. Twelve key informants were selected to assess the degree of effectiveness of medicinal plants against the ailment. The medicinal plant believed to be most effective to treat the illness has got the highest value and the least effective got the lowest value. The value of each species was summed up and rank was determined based on the total score.

Used value (UV), developed by Phillips and Gentry (1994) is to provide a quantitative measurement for the relative importance of species. UV is based on the number of uses and number of people that cited a given plant, is used to indicate the species that are considered most important by a given population. UV is calculated by using the formula  $UV = (\sum U_i)/n$ , where  $U_i$  is the number of use-reports cited by each informant for a given species, and  $n$  is the total number of informants. UV is high when there are many use report for a plant, implying that the plant is important, and low approach to zero when there are few use reports.

Informant Consensus Factor (ICF) was used to analyzed the agreement degree of the informants' plant knowledge about each category. This quantitative method is based on the classic paper by Trotter and Logan (1986) who introduced the informant agreement ratio (IAR), which has come to be called as Informant Consensus Factor (ICF). ICF is calculated using the following formula:  $ICF = (Nur - Nt) / (nur - 1)$ , where  $Nur$  is the number of use report of informants in each category, and  $Nt$  is the number of the taxa used for a particular category. High ICF values (approach to 1.00) are obtained when only one or a few plant species are reported to be used by a high proportion of informants for a particular category, whereas low ICF values indicate that informants disagree over which plant to used.

Fidelity Level (FL) is calculated by Friedman *et al.* (1986) using formula of  $FL(\%) = (N_p/n) \times 100$ , where  $N_p$  is the number of informants who suggested the use of a plant for a particular purpose and  $n$  is the total number of informants. High FL values are obtained for plants for which almost all use mentions refer to same purpose, that the plants are most preferred and low FL obtained for plants are used for many different purposes.

### Study Area

Myeik is saturated in Tanintharyi Region of southern part of Myanmar. It is located 12° 26' N and 98° 37' E elevation 15 meter above sea level. The town is closed to the sea, so the weather is neither too hot nor too cold. The area of Myeik is 7783 square miles. As of 2014, the estimated population was over seven lakh. They are workers, government servants, traders, business men and fishermen. Most of the people are Myanmar and Buddhist. Myeik is famous for its products pearl, rubber, edible bird's nest, dried fish, dried prawn and ngapi. Kalwin is a village located near Myeik University. Most of people in the study area are Myanmar Buddhist but they speak Myanmar language with distinctive accent.

## Results

**Table 1 List of edible plants used by villagers in study area**

No.	Scientific name	Family	Part Use	Ethnomedicinal Uses
1.	<i>Acacia concinna</i> (Wild.)DC.	Fabaceae	Fresh leaves	Fever, Constipation
2.	<i>Allium cepa</i> L.	Amaryllidaceae	Bulb	Urinary disorder, Antidote for bee, Scorpion sting, Nail fungus
3.	<i>Allium sativum</i> L.	Amaryllidaceae	Bulb	Colic
4.	<i>Ananas comosus</i> (L.) Merr.	Bromeliaceae	Fresh ripe fruits, Fresh leaves	Digestion, Vermifug, Food poisoning, Fever
5.	<i>Carica papaya</i> L.	Caricaceae	Fresh ripe fruits, Latex, Fresh leaves	Mild laxative, Diabetes, Hypertension, Eczema, Antidote
6.	<i>Cassia tora</i> L.	Fabaceae	Leaves, Root	Insomnia, Food poisoning
7.	<i>Citrus aurantiifolia</i> L.	Rutaceae	Fruits	Dizzy, Fungus infection, Cough
8.	<i>Citrus hystrix</i> D.C.	Rutaceae	Fresh fruits	Antidandruff, Paralysis
9.	<i>Cocos nucifera</i> L.	Arecaceae	Oil	Hair tonic , Heat burn, Skin ulcer, Diarrhea, Sunburn,
10.	<i>Curcuma longa</i> L.	Zingiberaceae	Dried rhizome powder	Stomach ache, Colic, Astringent, Antidiarrheal drug, Knee pain, Backaches, colic, Diabetic
11.	<i>Colocasia esculenta</i> (L.) Scott.	Araceae	Leaves	Painful sore, Joints swelling pain
12.	<i>Dregea volubilis</i> Benth.	Apocynaceae	Leaves	Vermifuge,
13.	<i>Gnetum gnemon</i> L.	Gentaceae	Leaves	Antidote, Burn
14.	<i>Hibiscus sabdariffa</i> L.	Malvaceae	Leaves	Ulcer
15.	<i>Ipomoea aquatic</i> Forsk.	Convolvulaceae	Young leaves	food poisoning, Dysentery,
16.	<i>Morinda citrifolia</i> L.	Rubiaceae	Fresh ripe fruits, Fresh leaves	Cough, Asthma, Muscle pain, Cough, Constipation
17.	<i>Musa spp.</i>	Musaceae	Young Fruit, Sap	Hair tonic, Lactogenic food, Headache, Wounds,
18.	<i>Nipa fruticans</i> (Thumb.) Wurm.	Arecaceae	Fermented Liquid	Food poisoning, Burn, Asthma, Mumps,
19.	<i>Ocimum basilicum</i> L.	Labiataeae	Fresh leaves, Dry seeds	Cough, Dysentery
20.	<i>Piper betle</i> L.	Piperaceae	Fresh Leaves	Ulcers, Cough, Fever
21.	<i>Piper nigrum</i> L.	Piperaceae	Dry seeds	Milk supply, Malaria, Relief pains
22.	<i>Psidium guajava</i> L.	Myrtaceae	Fresh Bark, Fresh leaves	Dizziness, Bad breath, Toothache, Diarrhea
23.	<i>Sandoricum koetjape</i> (Burm.f.)Merr.	Meliaceae	Fresh Bark, Fruit skin	Toothache, Bedsore, Chickenpox, Prickly Heat, Wounds, Diarrhea,
24.	<i>Sauropus albicans</i> Burm.	Phyllanthaceae	Fresh leaves	Thrush, Asthma,
25.	<i>Terminalia catappa</i> L.	Combretaceae	Fresh leaves	Dysentery, Diarrhea,
26.	<i>Tamarindus indica</i> L.	Caesalpiniaceae	Fresh Bark, Fruit, Seed	Sun cover , Prickly heat, Aperient, Antidote
27.	<i>Zingiber officinale</i> L.	Zingiberaceae	Fresh rhizome	Cough, Knee pain, Motion sickness, Tincture ,Fever

**Table 2 Medicinal knowledge and gender**

Respondents	Male/Female	Score for Male	Score for Female
R1	F		15
R2	M	13	
R3	F		14
R4	F		13
R5	M	12	
R6	M	14	
R7	F		12
R8	M	11	
	<b>Total Score</b>	<b>50</b>	<b>54</b>

### Comparison of knowledge of medicinal plants between men and women

Generally medicinal knowledge is a gender base practice both man and women perform in this practice. It was found that among eight respondents interviewed 50% were women and 50% of men show in Table 2. The source of medicinal plant knowledge is different between women and men. From the table total score for men is 50 and for women is 54 respectively. From this result women have more significant medicinal knowledge than men in study area of Kalwin village.

**Table 3 Preference ranking values of five medicinal plants for cough treatment in study area**

Respondant	R1	R2	R3	R4	R5	Total Score	Ranking
<i>Citrus aurantiifolia</i> L.	5	2	5	4	1	17	2 <sup>nd</sup>
<i>Morinda citrifolia</i> L.	2	1	1	3	1	8	4 <sup>th</sup>
<i>Ocimum basilicum</i> L.	1	3	1	1	1	7	5 <sup>th</sup>
<i>Piper betle</i> L.	5	4	4	5	5	23	1 <sup>st</sup>
<i>Zingiber officinale</i> L.	4	5	1	1	1	12	3 <sup>rd</sup>

### Rank of five medicinal plants used to treat cough

All the five popular species mention above are popular in curing cough. Simple preference ranking exercise conducted on six plants for treatment of cough in study area was listed in Table 3. According to the information *Piper betle* L. was listed as most significantly used medicinal plant that local people want to cure cough. Most local people cultivate the *Piper betle* L. as cash crop in their home garden. The second rank of plant species was *Citrus aurantiifolia* L. and *Zingiber officinale* L. got third rank and these are medicine from the kitchen. The fourth rank of plant species for curing cough is *Morinda citrifolia* L. it is used not only for medicine but also used as vegetable. The last one is *Ocimum basilicum* L. it is popular spice among local people and cultivates for their income.

**Table 4 Ranking of five medicinal plants used to treat external ulcer**

Plant Name	Respondents						Scores	Rank
	R1	R2	R3	R4	R5	R6		
<i>Cocos nucifera</i> L.	4	3	3	4	5	4	23	2 <sup>nd</sup>
<i>Colocasia esculenta</i> Scott.	2	5	2	3	2	1	15	4 <sup>th</sup>
<i>Hibiscus sabdariffa</i> L.	3	2	4	2	3	3	17	3 <sup>rd</sup>
<i>Musa</i> spp.,	1	1	1	1	1	2	7	5 <sup>th</sup>
<i>Sandoricum koetjape</i> Merr.	5	4	5	5	4	5	28	1 <sup>st</sup>

**Rank of five medicinal plants used to treat external ulcer**

Five species are valued for their medicinal effect in healing external ulcers. According to the information, *Sandoricum koetjape* Merr. was listed as most significantly used medicinal plant that local people want to cure external ulcers. The bark is grind with rice water to treat bed sore, chickenpox, measles, prickly heat and wounds. The second rank of plant species was *Cocos nucifera* L. Coconut oil mixed with *Curcuma* powder is an effective natural remedy for healing the skin ulcer. *Hibiscus sabdariffa* L. was third rank and crush fresh leaves mixed with cooked rice and apply on the ulcer. *Colocasia esculenta* Scott. leaf was fourth rank. Ash of banana used for wound was fifth rank described in (table 4).

**Table 5 Ranking of four species for food poisoning**

Plant Name	Respondents						Scores	Rank
	R1	R2	R3	R4	R5	R6		
<i>Ananas comosus</i> Merr.	2	3	4	2	3	3	17	2 <sup>nd</sup>
<i>Cassia tora</i> L.	1	2	2	3	1	2	11	3 <sup>rd</sup>
<i>Ipomoea aquatic</i> Frosk.	4	4	3	4	4	4	23	1 <sup>st</sup>
<i>Nipa frutican</i> Wurmb.	3	1	1	1	2	1	9	4 <sup>th</sup>

**Rank of plant species for food poisoning**

Local people used four species for curing food poisoning table 4. Juice from leaves of *Ipomoea aquatic* Forsk. was first rank and *Ananas comosus* Merr. was second rank for food poisoning. Drinking root paste of *Cassia tora* L. with rice water can relieve food poisoning was third rank. Local people used fermented *Nipa frutican* Wurmb. as vomiting agent when food poisoning was fourth rank were shown in Table 5.

**Table 6 Preference ranking values of herbal remedy for diarrhea**

Plant Name	Respondents						Scores	Rank
	R1	R2	R3	R4	R5	R6		
<i>Cocos nucifera</i> L.	4	2	3	3	3	3	18	1 <sup>st</sup>
<i>Psidium guajava</i> L.	1	3	2	4	1	4	15	2 <sup>nd</sup>
<i>Terminalia catappa</i> L.	2	1	4	2	4	2	15	2 <sup>nd</sup>
<i>Sandoricum koetjape</i> Merr.	3	4	1	1	2	1	12	3 <sup>rd</sup>

**Preference ranking values of herbal remedy for diarrhea**

Plants species which were listed as remedy for diarrhea by the local people are listed in Table 5 in their order of preference. *Cocos nucifera* L. was first rank to help the diarrhea. Treat the diarrhea *Psidium guajava* L. fresh leaves juice mix with sugar was second rank. Herbal tea made from leaves or juice from of *Terminalia catappa* L. was also second rank. Eating dried fruit skin *Sandoricum koetjape* Merr. was third rank.

**Table 7 Use value, ranking and fidelity level of plants**

No.	Scientific Name	Use Value	Ranking	FL%
1.	<i>Acacia concinna</i> (Wild.)DC.	0.78	2	78.21
2.	<i>Allium cepa</i> L.	0.35	3	38.67
3.	<i>Allium sativum</i> L.	0.33	3	40.21
4.	<i>Ananas comosus</i> (L.) Merr.	0.86	2	70.14
5.	<i>Carica papaya</i> L.	1.53	1	90.21
6.	<i>Cassia tora</i> L.	0.45	3	60.32
7.	<i>Citrus aurantiifolia</i> L.	1.23	1	89.00
8.	<i>Citrus hystrix</i> D.C.	1.00	1	92.00
9.	<i>Cocos nucifera</i> L.	0.69	2	75.00
10.	<i>Curcuma longa</i> L.	2.30	1	97.34
11.	<i>Colocasia esculenta</i> (L.) Scott.	0.23	3	34.21
12.	<i>Dregea volubilis</i> Benth.	0.34	3	14.12
13.	<i>Gnetum gnemon</i> L.	0.39	3	45.56
14.	<i>Hibiscus sabdariffa</i> L.	0.34	3	21.43
15.	<i>Ipomoea aquatic</i> Forsk.	0.48	3	65.23
16.	<i>Morinda citrifolia</i> L.	1.22	1	90.17
17.	<i>Musa spp.</i>	0.83	2	77.47
18.	<i>Nipa fruticans</i> (Thumb.) Wurm.	0.76	2	75.83
19.	<i>Ocimum basilicum</i> L.	1.10	1	89.55
20.	<i>Piper betle</i> L.	3.2	1	94.78
21.	<i>Piper nigrum</i> L.	1.25	1	93.14
22.	<i>Psidium guajava</i> L.	0.62	2	70.21
23.	<i>Sandoricum koetjape</i> (Burm.f.) Merr.	0.73	2	73.44
24.	<i>Sauropus albicans</i> Burm.	0.88	2	74.80
25.	<i>Terminalia catappa</i> L.	0.03	3	67.21
26.	<i>Tamarindus indica</i> L.	1	1	94.00
27.	<i>Zingiber officinale</i> L.	2.00	1	96.21

### Use Value and Ranking of Plants species

The villagers used edible plants for medicinal purposes. The Uv value 1 and above was first group, between 0.5 and 0.9 was second group and less than 0.5 was third. The first group has ten species, highest UV value was observed in 2.30 *Curcuma longa* L. and followed by *Zingiber officinale* L. 2.00. The second group show eight species and Uv = 0.88 *Sauropus albicans* Burm. and *Ananas comosus* (L.) Merr. UV= 0.86 were high value. In the third group the lowest UV value was 0.03 *Terminalia catappa* L.

### Fidelity Level (FL)

FL values for total of twenty seven species were shown in table. A high FL 80 to 100% can imply that the plants were most preferred as long as there is considerable number of used mention informants.

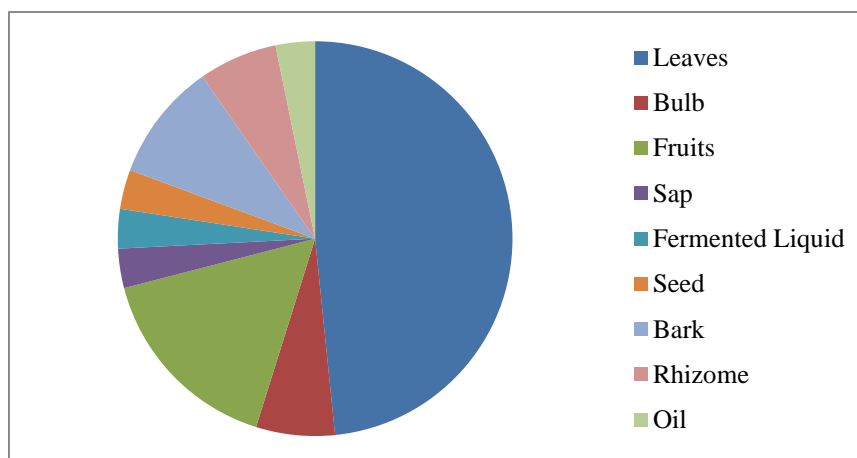


**Table 8 Informant Consensus Factor (ICF)**

Used categories	Number of used report (Nur)	Number of taxa	Informant Consensus Factor
cough	18	5	0.76
external ulcer	23	5	0.81
food poisoning	12	4	0.72
diarrhea	19	4	0.83

**Informant Consensus Factor (ICF)**

The CIF value of each of four categories was showed in table. CIF value range from 0.72 to 0.83 and the value 0.83 and 0.81 showed the informant agreed of using a single species for each category. Diarrhea and external ulcers showed the CIF value of 0.83 and 0.81 respectively. It indicated that the informants agreed of using a single species for each category. Five plant used report of eighteen was CIF value of 0.76 found in treatment of cough. Other category of CIF 0.72 for external ulcers the informants used four medicinal plants recorded twelve use report shown in table.



**Figure 1** Medicinal plant part used by local people

**Medicinal plant part used**

Medicinal properties derived from plants can come from many different parts of plant including leaves, roots, bark, fruits, seeds and flowers etc. In this study 48% of edible plants leaves are used as medicine and that of 16% from the fruits. Bark 10% and other plant parts include the following: bulb and rhizome 6%, Seed, fermented liquid, and sap, 4% and oil 1% were shown in Figure 1. In study area the most frequently utilized medicinal plant parts were leaves. The reason why leaves used mostly is they are collected very easily than other parts.

**Discussion**

In this research, the morphological characters and ethnomedicinal uses of twenty seven species belonging to fifteen families were documented.

In this research, ethnomedicinal uses of twenty seven species belonging to fifteen families were documented. All these plants were cultivated in the home garden. As the informants mention during the study, women spend much time for garden duty. These are agreed with those of Zemedede (2004). It was found that women have more significant medicinal knowledge than men in Kalwin village. Many respondents indicated that they used to preferred modern medicine primarily and

they would use herbal medicine if the modern medicine did not help. Some respondents said that they preferred herbal medicine than modern medicine because plants are safer and cause less harmful side effects. These are agreed with those described by Yu Yu Tin (2020).

Over all analysis showed that uses of plants for treatments of different ailments range from simple to fatal diseases. Five plants species were used for treatment of cough, among them *Piper betle* L. was listed as most significantly used. For the treatment of external ulcers, *Sandoricum koetjape* Merr. was most significant than other four species. Local people used four species for curing food poisoning, among them juice from leaves of *Ipomoea aquatic* Forssk. was first rank and *Ananas comosus* Merr. was second. Four species were valued for medicinal effect in diarrhea, among them *Cocos nucifera* L. was most significant.

There is no standardized measure on the dose for most of the ethnomedicine in the study area. The dose depends on the healer that prepares the herbs for medicinal purpose or it may also depend upon the disease severity. These are agreed with those reported by Mussarat *et.al.* (2014). Local people in study area used palm sugar, salt, honey, rice water, lime stone, cooked rice, indigo and sugar as medicinal ingredient for both external and oral. Most of ethnomedicines are prepared using single plant in the region while some others are prepared by mixing parts of more than one plant. These are agreed with those reported by Mussarat *et.al.* (2014).

Plants were cultivated in home gardens, so can be easily collected. Freshly harvested plant parts are used for traditional remedy preparation against various ailments. The uses of fresh plant materials for remedy preparations better than use of dried plant materials. These are agreed with those reported by Mussarat *et.al.* (2014).

## Conclusion

In conclusion, edible plants are not only important for local food consumption but also income in the local community. Further investigation on nutritional value and pharmaceutical activities of edible plants will add more value to the traditional knowledge.

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