

Ethnobotany of Medical Plant by the Community in Sitellu Tali Urang Jehe Sub-District Pakpak Bharat District North Sumatera

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Abstract

Pakpak is one of the subethnic groups in North Sumatera that still uses many medicinal plants, especially the people in Sitellu Tali Urang Jahe. The aim of the study was to find out the types of plants used in medicine, to find out the organs of plants used for treatment, to find out how to use plants for treatment, to know the cultural significance of ICS which are used as medicinal plants by the people of Sitellu Tali Urang Jehe sub-district, Pakpak Bharat district. This research method was conducted using qualitative and quantitative methods. Qualitative research was carried out by participatory observation using literature and community knowledge about medicinal plants, while quantitative research was carried out by calculating the percentage of plant species, plant organs and calculating the value of the Cultural Significance Index (ICS). Based on the research results obtained 30 species of plants belonging to 21 families. Plant organs used as medicine are leaves 57%, stems 12%, flowers 9%, rhizomes 9%, roots 3% and fruit 3%. Utilization of plants as medicine, namely by drinking 48%, taped 48%, and dripped 3%. The Calculation of the ICS value of *Piper betle* L. has the highest preference or importance value among other plants, namely 50, while *Alyxia* sp., *Ageratum conyzoides* L., *Angiopteris angustifolia*, *Cheilocostus speciosus*, *Cnidioscolus aconitifolius*, *Crassocephalum crepidioides*, *Crotalaria pallida*, *Desmodium heterophyllum*, *Impatiens platypetala*, *Oxalis barrelieri*, *Polygala paniculata*, has the lowest importance value among other plants, namely 3.

INTRODUCTION

Indonesia as a country rich in biodiversity has a lot of natural potential with the tropical climate. Indonesia is an archipelago located in the equatorial region and is known as one of the countries with a high level of diversity (Helmina & Hidayah, 2021). Indonesia has more than 1.000 species of plants that can be used as medicine and about 300 species that have been used for traditional medicine (Takoy et al., 2015).

Medical plants are type of plants used as ingredients for traditional medical herbs where the active ingredients can be used as synthetic medicinal ingredients either singly or mixtures that are considered and believed to cure a disease or it can have an effect on health (Marpaung, 2018). Medical plants are types of plants that in certain parts of the roots, stem, skin, leaves, and excretions are believed to cure or reduce the pain (Haziki & Syamswisna, 2021).

The current tendency of people to consume traditional medicines caused by lifestyle issues back to nature and the high cost of modern medicines has made the demand for medicinal plants increase and this has become a community tradition (Suraida et al., 2020). The medical tradition of a society cannot be separated from the local culture. Perceptions about the concepts of illness, health and the diversity of plant species used as traditional medicine are formed through a socialization process that has been trusted and believed to be true for generations (Pelokang et al., 2018).

Pakpak ethnicity is a sub-ethnic area with the main area of Pakpak Bharat Regency, with community activities that work as farmers. Pakpak Bharat Regency has eight sub-districts, one of the eight sub-district is Sitellu Tali Urang Jehe District. This sub-district has 10 villages (Bharat, 2021). Two of these villages are Tanjung Meriah Village and Tanjung Mulia Village. Tanjung Meriah and Tanjung Mulia districts have hills with temperatures reaching 18-20°C. The population is mostly Batak, Karo, Java, Aceh, Mandailing and Nias. Most of the people are farmers and work as traders in the market.

Based on the results of observations made in the two villages, it shows that people in this area still use plants as medicine. The results of the interviews showed that there were several types of medicinal plants, namely the Sampula plant (*Melastoma sylvaticum*) which was used for wounds and clearing the eyes, the organs of this plant used are the leaves and stems then processing method is squeezed, Bereng (*Psophocarpus tetragonolobus*) which was used to draw venom (poison) and Bakong leaves (*Crynum asiaticum* L.) which was used for sprains, the organs of this plant used leaves and method processing is affixed. The purpose of this study was to find out the types of plants used for treatment, to know the organs of plants used for treatment, to know how to use plants for treatment and to know the Cultural Significance Index (ICS) of plants used as medicine by the people of the District. Sitellu Tali Urang Jehe.

METHOD

The research was conducted from October to December 2022 which took place in Sitellu Tali Urang Jehe District, Pakpak Bharat Regency. Plant identification was carried out at the Medanase Laboratory, University of North Sumatra.

The tools used in this study were stationery, camera, voice recorder, raffia, newsprint, plastic bags, plant scissors, alcohol spray, cardboard, black cloth, ruler, label paper, thread, markers, razor blades, sacks, pH, soil meter and thermohygrometer. While the material used was 70% alcohol, the questionnaire guidelines used in interviews with respondents, object plants were identified.

This research was conducted using qualitative and quantitative methods. The qualitative method is carried out by using literature and public knowledge about medicinal plants and quantitative data which is used to process the data. Determination of informants in the participatory observation stage using Purposive sampling and Snowball sampling techniques. Purposive sampling technique, namely the technique of selecting informants with certain considerations, this is the person who is considered to know the most about medicinal plants, and used 19 respondents. The Snowball sampling technique is a technique for selecting respondents who have characteristics related to the research objectives and previous respondents, namely the community (Has et al., 2020).

Quantitative descriptive analysis of data on the percentage of plant species used, plant organs, utilization and ICS (Index Cultural Significance) values. This analysis aims to evaluate or measure the importance of one plant species for local communities (Has et al., 2020). Percentage data are obtained using the following formula:

1. Percentage of Plant Species %

$$= \frac{\sum \text{Plant species}}{\sum \text{All respondents mentioned}} \times 100\%$$

2. Percentage of Plant Organs %

$$= \frac{\sum \text{Plant Organs}}{\sum \text{All Organs used}} \times 100\%$$

3. ICS (*Index of Cultural Significance*)

$$ICS = \sum_{i=1}^n \sum (q \times i \times e) n$$

Where:

n : amount of benefits

q : quality Value

i : intensity Value

e : exclusivity value

This method includes three assessment components namely:

1. Quality of use

The quality of use is a variation of the various characteristics of the use of plant species by providing the following assessment:

Value 5 = main food ingredient

Value 4 = secondary food

Value 3 = other foods + secondary ingredients and traditional medicinal ingredients

Value 2 = material for rituals, myths and recreation

Value 1 = plants that are known but not specifically used

2. Intensity of use

The assessment of the intensity of use is based on the influence of the use of plant species in everyday life in a society, namely:

Value 5 = very high intensity

Value 4 = moderately high use intensity

Value 3 = medium use intensity

Value 2 = low use intensity

Value 1 = minimum use intensity

3. Exclusivity of use

The exclusivity assessment of the use of plant species is based on the level of preference, namely:

Value 2 = the most preferred plant species and the main choice and cannot be replaced

Value 1 = there are several species that are likely to be selected

Value 0.5 = secondary source with exclusivity

Table 1. Value Category Index Cultural Significance (ICS)

Score	ICS Value Range	Category	Code
3	43-62	High	H
2	23-42	Medium	M
1	3-22	Low	L

Source (Has et al., 2020)

ICS (Index of Cultural Significance) is the sum of the calculations for the use of a plant species from 1 to n, where n indicates the umpteenth (last) use while I describe the value 1 to n, and so on. The value of ICS is described in Table 1.

RESULT AND DISCUSSION

Based on research on medicinal plants conducted in Tanjung Meriah Village and Tanjung Mulia Village, Sitellu Tali Urang Jehe District, Pakpak Bharat Regency, 30 species of medicinal plants from 21 families were obtained as Table 2.

Based of usage the type of medicinal plant by the people of Sitellu Tali Urang Jehe District (see Figure 1.), the highest percentage as medicine is betel (*Piper betle* L.) with a

value of 94% from the Piperaceae family. Most of Piperaceae family used for traditional medicine such as sore eyes and cleans the feminine area. Betel is one of the traditional medicinal plants in Indonesia, this plant is widely used in everyday life as a medicine which has many benefits (Naufalza, 2021). The second type of medicinal plant is gambier (*Uncaria gambir*) with a value of 89.4% from the Rubiaceae family. Gambier is a plant in Indonesia which is generally used for betel nut. Gambier has many benefits, one of which is as a medicine for wounds, diarrhea and dysentery (Deswati et al., 2022). The types of medicinal plants that had the lowest percentage were Rakut bide (*Desmodium heterophyllum*) from the Fabaceae family with a value of 5.2%, and Pahpaleto (*Polygala paniculata*) from the Plantaginaceae family with a value of 5.2%.

Table 2. Types of Medicinal Plants

No	Name	Plant Name Scientific name	Family	Habitus
1	Pulosari	<i>Alyxia</i> sp.	Apocynaceae	Liana
2	Bandotan	<i>Ageratum conyzoides</i> L.	Asteraceae	Herba
3	Sintrong	<i>Crassocephalum crepidioides</i> Benth.	Asteraceae	Terna
4	Sembung	<i>Blume balsamifera</i> DC.	Asteraceae	Perdu
5	Kirinyuh	<i>Eupatorium inulifolium</i> Kunth.	Asteraceae	Herba
6	Pinang	<i>Areca catechu</i> L.	Arecaceae	Pohon
7	Nampu	<i>Homalomena rubescens</i> Kunth.	Araceae	Herba
8	Landik	<i>Barleria lupulina</i> Lindl.	Acanthaceae	Perdu
9	Daun ungu	<i>Grathophyllum pictum</i> L.	Acanthaceae	Perdu
10	Pacar tere	<i>Impatiens platypetala</i> Lindl.	Balsaminaceae	Herba
11	Pacing tawar	<i>Cheilocostus speciosus</i> Smith.	Costaceae	Herba
12	Papaya jepang	<i>Cnidioscolus aconitifolius</i> Mill.	Euphorbiaceae	Herba
13	Ketepeng	<i>Cassia alata</i> L.	Fabaceae	Perdu
14	Orok-orok	<i>Crotalaria pallida</i> L.	Fabaceae	Herba
15	Legum	<i>Desmodium heterophyllum</i> (Willd.) DC.	Fabaceae	Herba
16	Nilam	<i>Pogostemon cablin</i> Benth.	Lamiaceae	Perdu
17	Bangun-bangun	<i>Coleus ambonicus</i> Lour.	Lamiaceae	Perdu
18	Kumis kucing	<i>Orthosiphon aristatus</i> (Blume.)	Lamiaceae	Herba
19	Bakung	<i>Crinum asiaticum</i> L.	Liliaceae	Herba
20	Senduduk	<i>Melastoma malabathricum</i> L.	Melastomataceae	Perdu
21	Bunga raya	<i>Hibiscus rosasinensis</i> L.	Malvaceae	Perdu
22	Pakis kathok	<i>Angiopsis angustifolia</i> Presl.	Marattiaceae	Herba
23	Pohon tereup	<i>Arthocarpus elasticus</i> Reinw.	Moraceae	Pohon
24	Belimbing tanah	<i>Oxalis barelieri</i> L.	Oxalidaceae	Herba
25	Rumput wangi	<i>Polygala paniculata</i> L.	Plantaginaceae	Herba
26	Sirih	<i>Piper betle</i> L.	Piperaceae	Liana
27	Gambir	<i>Uncaria gambir</i>	Rubiaceae	Perdu
28	Jahe	<i>Zingiber officinale</i> Rosc.	Zingiberaceae	Herba
29	Kunyit	<i>Curcuma domestica</i> Vall.	Zingiberaceae	Herba
30	Kunyit putih	<i>Curcuma zedoaria</i> Rosc.	Zingiberaceae	Herba

The Way of Community to Obtains Medicinal Plants

Based on the sources of obtaining medicinal plants by the people of Sitellu Tali Urang Jehe sub-district, obtaining plants as medicine, namely yards, forests and fields, this can also be seen from the air temperature and soil pH in Sitellu Tali Urang Jehe sub-district. The air temperature in Tanjung Meriah village is 25° and Tanjung Mulia is 26° with a soil pH of 6.

Wild plants used of peoples Sitellu Tali Urang Jehe include Bandotan (*Ageratum conyzoides*), Bunga Pancur (*Impatiens platypetala*), Sampula (*Melastoma*

malabathricum). Cultivated plants used include Pakis kathok (*Angiosperis angustifolia*), landik (*Barleria lupulina*), Orok-orok (*Crotalaria pallida*), legum (*Desmodium heterophyllum*) blimbingan (*Oxalis barelieri*), rumput wangi (*Polygala paniculata*), nampu (*Homalomena rubescens* Kunth). Bandotan (*Ageratum conyzoides*), Bunga Pancur (*Impatiens platypetala*) Sampula (*Melastoma malabathricum*) is a wild plant found in the forest. Legum (*Desmodium heterophyllum*), blimbingan (*Oxalis barelieri*), rumput wangi (*Polygala paniculata*), nampu (*Homalomena rubescens* Kunth) is cultivated plants.

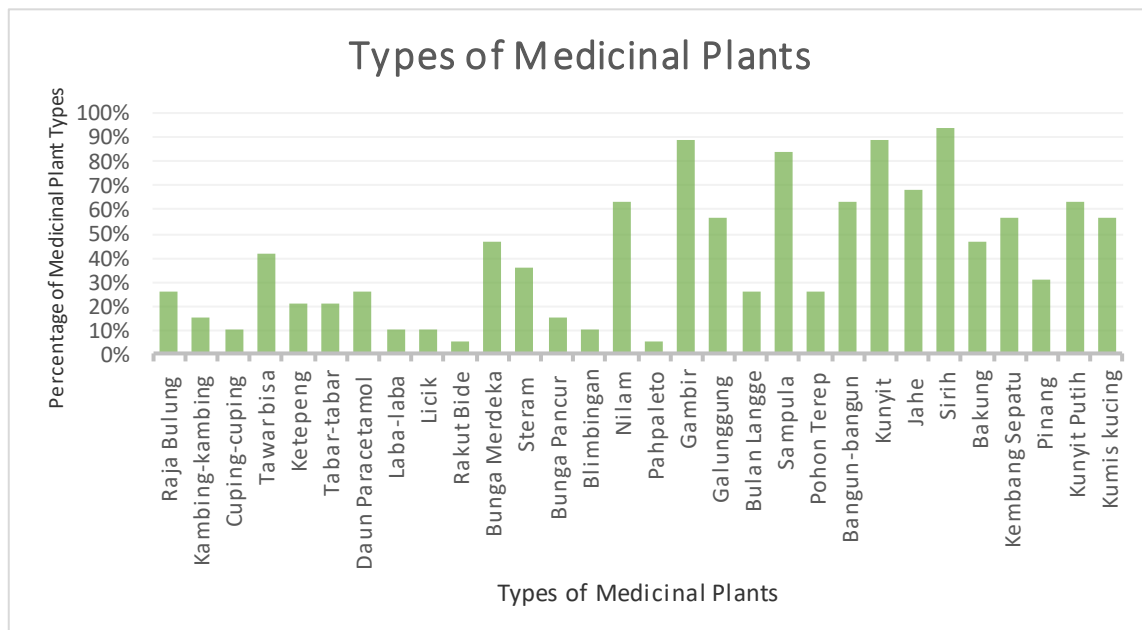


Figure 1. Percentage of Medicinal Plant Species

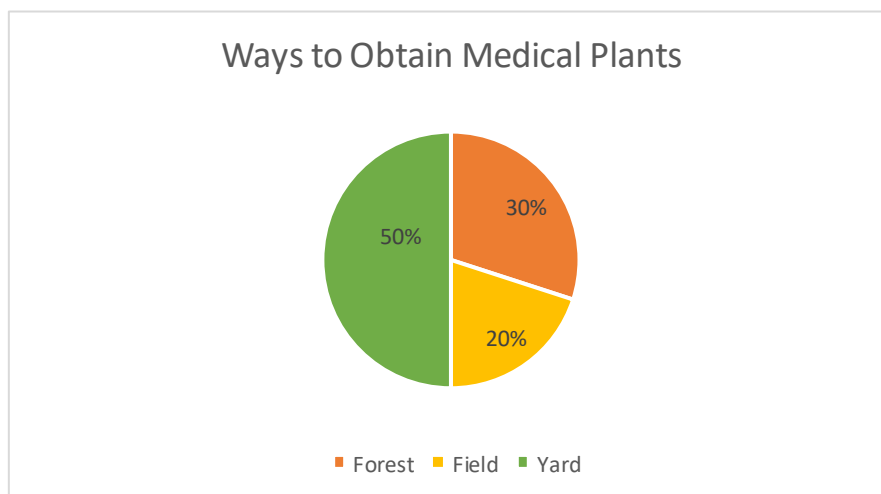


Figure 2. Percentage of Ways to Obtain Medicinal Plants

Based on the source of obtaining medicinal plants by the community in Tanjung Meriah and Tanjung Mulia Villages, Sitellu Tali Urang Jehe District as seen in Figure 2., 50% people obtain medicinal plants in their yards. The community uses the yard of their house to cultivate plant species that are used as medicine such as betel, patchouli, turmeric, ginger, cuping-cuping, tawar bisa, bangun-bangun and kumis kucing. Plants planted in the yard of the house are plants that are used to make it easy to obtain medicinal plants when

they are needed. According to Sukenti et al. (2020), yard land is one of the potential lands that can be used for growing plants such as ornamental plants, fruits, vegetables, spices, and medicines. Furthermore, how to obtain plants as medicine in the fields 20% of this is that some plants that grow wildly are believed by the community to be used as medicine, namely starfruit, pahpaleto, bulan langge and licik.

Plant Organs that are Used as Medicine

The parts of plant organs that are used as medicine by the people of Sitellu Tali Urang

Jehe District, there are 5 parts of plant organs that are used out of 30 known plant species.

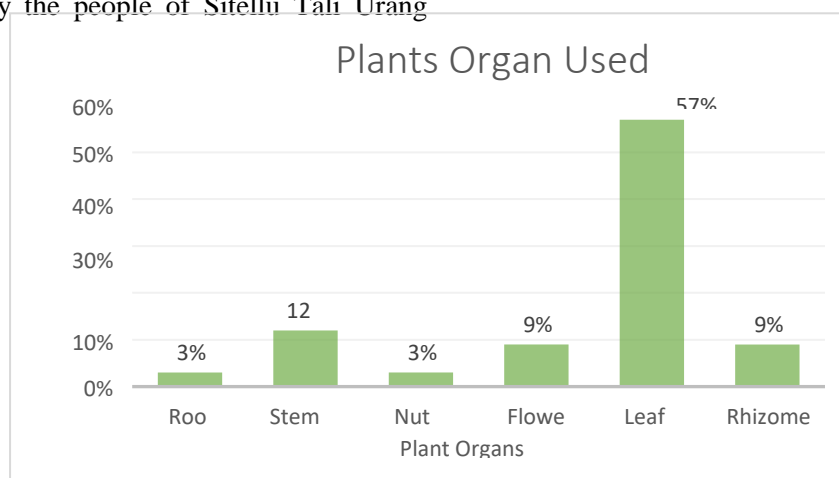


Figure 3. Percentage of Medicinal Plant Organs

Figure 3. shows the percentage of medicinal plant organs. Based on the most widely used plant organs as medicine are leaves with a value of 57%. The people of Sitellu Tali Urang Jehe sub-district utilize more of the organ parts of the leaves because the leaves are generally easier to use as medicine and easy to obtain besides that the leaves are also easy to process as medicine. According to Mais, Simbala, and Koneri (2018), the parts of plant organs that are used as traditional medicine are leaves because these parts are very easy and simple. Apart from being relatively easy to find, the properties of the leaves are known to be hereditary in terms of healing compared to other parts. Furthermore, plant organs other than leaves used are roots and nut which have a percentage value of 3%. Plants that are commonly used for their roots include papaletto, and plants that are used for their nuts are areca nuts.

Utilization of Medicinal Plants

Based on the results of the interviews, it was shown that the people of Sitellu Tali Urang Jehe District used plants as medicine by drinking, sticking and dripping. The medicine plants are boiled extracted to be consumed while the plants that are attached to them are crushed first and placed on the area used as healing medicine.

Based on utilization of plants as medicine it, shows in Figure 4., the way of drinking with

a percentage value of 51%. Communities in Tanjung Meriah Village and Tanjung Mulia Village, Sitellu District, Tali Urang Jehe use medicinal plants more by drinking them after boiling, which is easier and more hygienic. This can be seen based on several diseases suffered by the people of Sitellu Tali Urang Jehe Subdistrict, namely in curing stomach ailments, stomach aches, coughs, colds, anti-inflammatories, lowering blood pressure, back pain, jaundice and facilitating menstruation. Local people believe that by drinking the disease they suffer will be able to recover and react to healing quickly compared to other methods (Mingga et al., 2019).

Utilization of medicinal plants by the community in the villages of Tanjung Meriah and Tanjung Mulia, Sitellu District, Tali Urang Jehe is described in Figure 4. It shows that 48% of the use of plants as medicine is stricked, by sticking them directly to the sick parts of the body, such as fever, wounds and sprains. Furthermore, it is used as a medicine with 6% drops, namely by dripping it directly in healing. Treatment carried out by the community is categorized into 2 types, namely, treatment for external diseases and treatment for internal diseases. Treatment outside the human body such as skin diseases, toothaches, sore eyes and wounds, while internal medicine is a treatment that eats and drinks processed medicinal plants for a long time, internal medicine such as fever, hypertension, diarrhea, diabetes, intestinal

worms, and stomach ulcers (Mulyani et al., 2020).

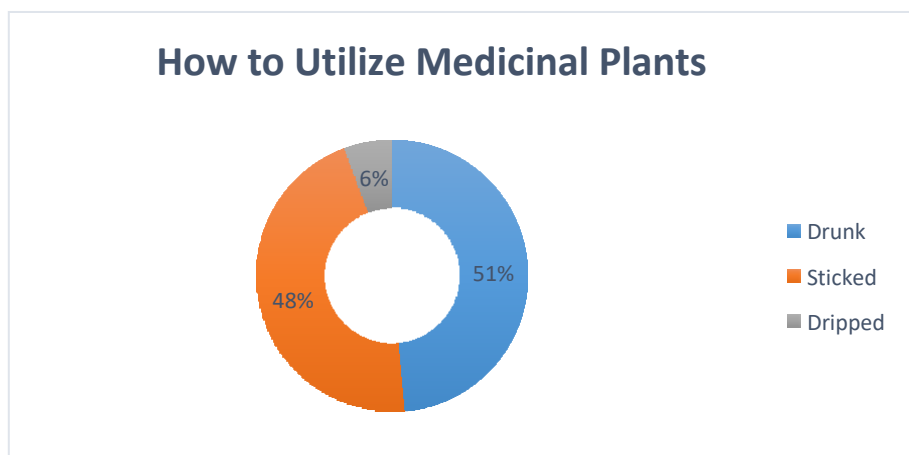


Figure 4. Percentage of Medicinal Plant Utilization

Index of Cultural Significance (ICS) of Medicinal Plants by the Community of Sitellu Tali Urang Jehe District

Based on the results of interviews with 19 respondents by the community in Tanjung

Meriah and Tanjung Mulia Villages, Sitellu Tali Urang Jehe District, the ICS (Index of Cultural Significance) of the plants used was obtained, so the value of each plant was obtained as Table 3.

Table 3. Types of Plants with ICS Values

No	Local Name	Scientific name	ICS Value
1	Sirih	<i>Piper betle</i> L.	50
2	Kunyit	<i>Curcuma domestica</i> Vall.	48
3	Jahe	<i>Zingiber officinale</i>	48
4	Gambir	<i>Uncaria gambir</i>	30
5	Sampula	<i>Melastoma malabathricum</i>	30
6	Bangun-bangun	<i>Coleus ambonicus</i> Lour.	24
7	Kembang sepatu	<i>Hisbiscus rosa-sinensis</i>	24
8	Kunyit putih	<i>Curcuma zedoria</i>	24
9	Kumis kucing	<i>Orthosiphon aristatus</i>	24
10	Nilam	<i>Pogostemon cablin</i>	18
11	Pinang kacam	<i>Areca catechu</i> L.	18
12	Steram	<i>Grathophyllum pictum</i>	12
13	Bulan langge	<i>Blumea balsamifera</i> DC.	12
14	Bunga merdeka	<i>Eupatorium inulifolium</i>	12
15	Bakung	<i>Crynum asiaticum</i> L.	12
16	Galunggung	<i>Blumea balsamifera</i> DC.	6
17	Tawar bisa	<i>Barleria lupulina</i>	6
18	Ketepeng	<i>Cassia alata</i>	6
19	Pohon tereup	<i>Artocarpus elasticus</i>	6
20	Raja bulung	<i>Alyxia</i> sp.	3
21	Kambing-kambing	<i>Ageratum conyzoides</i>	3
22	Tabar-tabar	<i>Cheilocostus speciosus</i>	3
23	Daun paracetamol	<i>Cnidocolus aconitifolius</i>	3
24	Laba-laba	<i>Crassocephalum crepidioides</i>	3
25	Licik	<i>Crostarsaria pallida</i>	3
26	Rakut bide	<i>Desmodium heterophyllum</i>	3

27	Bunga pancur	<i>Impatiens platypetala</i>	3
28	Cuping-cuping	<i>Angiopteris paniculata</i>	3
29	Pahpaletto	<i>Polygala paniculate</i>	3
30	Blimbingan	<i>Oxalis barelieri</i>	3

Table 4. Value of the Culture Significance Index (ICS) Category

Score	Index Culture Significance (ICS)	Total
3	High (43-62)	3
2	Medium (23-42)	6
1	Low (3-22)	21

Result showed that the plants medicine in Tanjung Meriah Village all types were used Singly. Peoples use it without mixing other plants at one time. Used on one plant organ to treat a particular disease. Various methods of processing plants organs.

Based on the results of the ICS values in Tanjung Meriah Village and Tanjung Mulia Village, Sitellu Tali Urang District, plant species with values of high, medium, and low were obtained as see--n in Table 4. According to Saputra, Harso, and Ramadanil (2019), ICS (Index of Cultural Significance) is the result of a quantitative ethnobotanical analysis which shows the importance value of each plant type based on community needs. The ICS calculation results show the level of importance of each useful plant species by the community.

The results of the calculation of plant species that have a very high level of utilization in everyday life by the people of Sitellu Tali Urang Jehe District are betel (*Piper betle L.*) with an ICS value of 50, followed by turmeric and ginger with an ICS value of 48. Betel (*Piper betle L.*) used by the community as a medicine for sore eyes, to clean vaginal discharge. Besides that, betel is also used as a traditional ceremony, namely marriage in Pakpak custom. According to Kaban, Atmawarni, and Tumanggor (2022), objects and media in traditional pakpak marriages, namely betel nut, are placed on a plate and rice will be given by the man to the woman. Then turmeric (*Curcuma domestica Vall.*) used by the community to treat flatulence and stomach pain, stomach acid and menstrual pain. Ginger (*Zingiber officinale*) used by the community to treat flatulence and coughs. Apart from being used as medicine, turmeric (*Curcuma domestica Vall.*) and ginger (*Zingiber officinale*) are also used as daily cooking spices.

Plants that have moderate ICS values are gambier (*Uncaria gambir*), coverula (*Melastoma malabathricum*), hibiscus (*Hibiscus rosa-sinensis*), bangun-bangun (*Coleus ambonicus Lour.*), white turmeric (*Curcuma zedoria*), and kumis kucing (*Orthosiphon aristatus*) each has an ICS value of 24-30. This is because these plants only have one use as medicine. Furthermore, plants that have the lowest ICS value in the people of Sitellu Tali Urang Jehe District include patchouli (*Pogostemon cablin*), areca nut (*Areca catechu L.*), steam (*Graphophyllum pictum*), bulan langge (*Blumea balsamifera DC.*), bunga merdeka (*Eupatorium inulifolium*), daffodils (*Crynum asiaticum L.*), galunggung (*Blumea balsamifera DC.*), tawar bisa (*Barleria lupulina*), ketepeng (*Cassia alata*), teureup trees (*Artocarpus elasticus*), king bulung (*Alyxia sp.*), kambing-kambing (*Ageratum conyzoides*), tabar-tabar (*Cheilocostus speciosus*), paracetamol leaves (*Cnidioscolus aconitifolius*), spider (*Crassocephalum aconitifolius*), cunning (*Crostasaria pallida*), rakut bide (*Desmodium heterophyllum*), bunga pancur (*Impatiens platypetala*), pahpaletto (*Polygala paniculata*), cuping-cuping (*Angiopteris angustifolia*), and belimbingan (*Oxalis barrelieri*) each have an ICS value of 3-18, this is because these plants have an intensity of use that is less attractive to the people of Sitellu Tali Urang Jehe District or the level of preference for plants it can be replaced. In this case, the intensity of the use of species that are often easy to find and have a large role in people's lives makes the utilization value of these plants high. The high and low value of utilization and people's preference for a plant that is used in everyday life (Has et al., 2020).

CONCLUSION

Based on research that has been conducted on the Ethnobotany of Medicinal Plants by the Community of Sitellu Tali Urang Jehe District, Pakpak Bharat Regency, it was found that 30 species of plants belonging to 21 families, plant organs used as medicine, namely leaves 57%, stems 12%, flowers 9%, rhizomes 9%, 3% root and 3% nut. The use of plants as medicine by the community is by drinking, sticking, and dripping. Based on the high and low ICS values of medicinal plants by the Sitellu Tali Urang Jehe Sub-District Community, namely, the *Piper betle* L. plant has the highest preference or interest value among other plants, namely 50, while *Alyxia* sp., *Ageratum conyzoides*, *Angiopteris angustifolia*, *Cheilocostus speciosus*, *Cnidioscolus plants aconitifolius*, *Crassocephalum crepidiodes*, *Crotalaria pallida*, *Desmodium heterophyllum*, *Impatiens platypetala*, *Oxalis barrelieri*, and *Polygala paniculata* which has the lowest importance value among other plants, namely 3.

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