

# Documentation of medicinal plants used by Aneuk Jamee tribe in Kota Bahagia Sub-district, South Aceh, Indonesia

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Manuscript received: 6 November 2020. Revision accepted: 6 December 2020.

**Abstract.** Suwardi AB, Mardudi, Navia ZI, Baihaqi, Muntaha. 2021. Documentation of medicinal plants used by Aneuk Jamee tribe in Kota Bahagia sub-district, South Aceh, Indonesia. *Biodiversitas* 21: 6-15. Aneuk Jamee is one of the ethnic communities living along the western-south coast of Aceh. Various plants are used by the Aneuk Jamee tribe as a traditional medicine in treating diseases and disorders. The aim of this study was therefore to document the medicinal plants used by the Aneuk Jamee tribe in the Kota Bahagia sub-district, South Aceh, Indonesia. This study was conducted in three villages, namely Jombo Keupok, Seuneubok Kuranji, and Alur Dua Mas, Kota Bahagia subdistrict, South Aceh District, Aceh Province. This study was based on field surveys, plant collection, and interviews with the local people. Interviews were performed with 60 informants selected by using the Snowball Sampling technique. A total of 96 medicinal plant species, consisting of 50 families, have been documented to be used by the Aneuk Jamee tribe in the Kota Bahagia subdistrict. Fifty-nine (61%) species are cultivated and 37 (39%) species are wild. Leaves are the most widely used plant part (28%), followed by the fruit (19%), flower and tuber (6% each), seed (3%), and sap (2%) and the main mode of preparations are decoction (60%), followed by raw consumption (14%), smeared (10%), pounded (7%), dropped (6%), and affixed and squeezed (1% each). The high informant consensus factor (ICF=0.98) was assigned to the diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism category.

**Keywords:** Biodiversity, Traditional medicine, Aneuk Jamee, Kota Bahagia

## INTRODUCTION

Plants are valuable in human livelihoods, providing a source of nourishment (Navia and Chikmawati 2015; Elfrida et al. 2010; Navia et al. 2019; Navia et al. 2020a; Suwardi et al. 2020a; Suwardi et al. 2020b), condiments and spices (Navia et al. 2020b), fragrances (Dar et al. 2017), ritual or magical values (Abbink 1995; Sutrisno et al. 2020), and traditional medicine (Liu et al. 2009; Silalahi et al. 2015; Nurlinda et al. 2018; Tsioutsiou et al. 2019; Suwardi et al. 2019; Gowramma et al. 2020). Indonesia comprises more than 40,000 species of plants, of which approximately 6,000 have been used in traditional healing processes (Elfahmi et al. 2014). These plants are considered for their richness in biologically active secondary metabolites and essential oils for disease prevention (Ngbolua et al. 2018; Suwardi et al. 2018; Ortiz et al. 2020), and human beings have refined medicinal plants and their chemical properties in varying ways for therapeutic usages (Colalto 2018; Kumar et al. 2018). Traditional medicine has been focused on meeting the objectives of wider coverage of primary healthcare provision across all countries of the world (Bekalo et al. 2009). The World Health Organization (WHO) has confirmed that about 80% of the people living in developing countries rely on medicinal plants as part of

their healthcare system (Ngbolua et al. 2016). The relationship between humans and plants has long been identified as one of the aspects of human civilization, particularly in medicinal domains (Yeung et al. 2020).

Aneuk Jamee is one of the ethnic communities in Indonesia inhabiting along the west-south coast of Aceh (Melalatoa 1995). Historical evidence suggests that the Minang tribe from West Sumatra migrated to western Aceh in the 17th century and assimilated with the indigenous population to establish new customs and culture recognized as Aneuk Jamee (Ramli and Erwandi 2019). Like most tribes in the province of Aceh, Aneuk Jamee also uses various species of plants as traditional medicines. This knowledge is gained through experience passed down from generation to generation. However, the knowledge of medicinal plants possessed by rural communities has rarely been documented and is generally known merely to the elderly or traditional healers. Moreover, the younger generation, especially those already integrated into modern life, is less concerned with this traditional knowledge (Maulidiah et al. 2020). Several previous studies have shown the lack of ability of older generations to pass traditional knowledge to the younger generation (Sousa et al. 2012; Saynez-Vaquest et al. 2016; Navia et al. 2020a), resulting in the disaffection of younger generations from their surrounding environment and the ultimate loss of

nature-related information. Traditional knowledge and use of medicinal plants are an integrated component among the Aneuk Jamee tribe, the extent of which has not yet been extensively studied. Documentation of medicinal uses of plants across ethnobotanical studies is important as an opportunity to promote the development of pharmaceutical drugs and the conservation of plants (Calzada and Bautista 2020). Various ethnobotanical studies suggest the use of medicinal plants for the treatment that has been used in their respective populations over several generations (Navia et al. 2020a; Navia et al. 2020b; Sutrisno et al. 2020; Suwardi et al. 2020c). The aim of this study was therefore to document the medicinal plants used by the Aneuk Jamee tribe in the Kota Bahagia sub-district, South Aceh, Indonesia.

district consists of 18 sub-districts and 260 villages with a total population of 238,081,000 people (The Central Bureau of Statistics of South Aceh District 2020).

Kota Bahagia is one of the subdistricts in the South Aceh district located between 3°0'46" N, 97°33'30" E, 0.6-44.2 masl. Climatic conditions in the Kota Bahagia subdistrict are tropical humid, having an average annual rainfall varying 161.33 mm -440.78 mm, and the average daily temperature of the area is 29°C. This subdistrict has an area of 195.82 km<sup>2</sup> with a total population of 7,266 people consisting of 3,580 men and 3,686 women (The Central Bureau of Statistics of South Aceh District 2020). The study was conducted from July to Sept 2020 in the Jombo Keupok, Seuneubok Kuranji, and Alur Dua Mas villages, Kota Bahagia subdistrict, South Aceh District, Aceh Province (Figure 1).

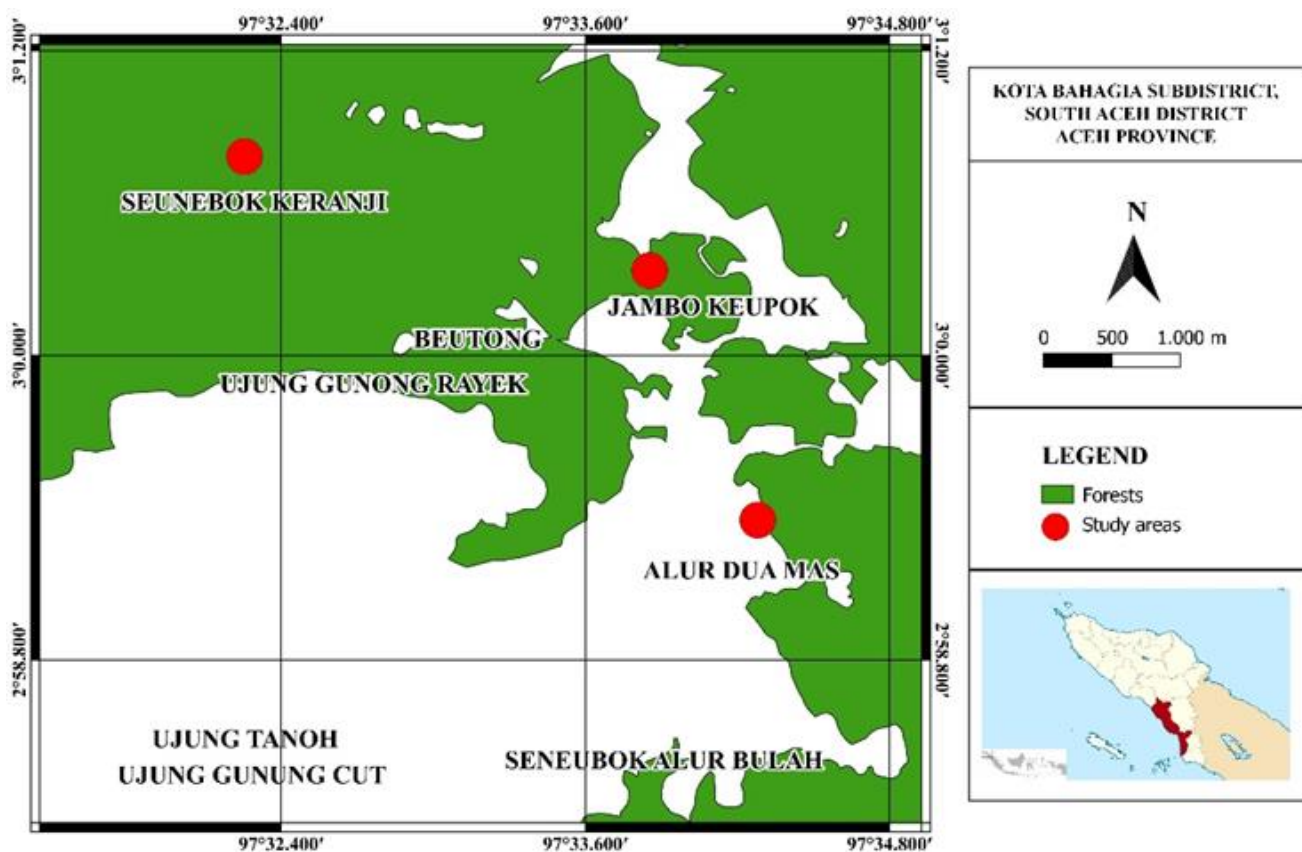
## MATERIALS AND METHODS

### Study area

South Aceh district is located between 02° 23'24"-03°44'24" N and 96°57'36" - 97° 56' 24" E with an average elevation of 25 meters above sea level (masl). This district has an area of 4,173,67 km<sup>2</sup> with land use is dominated by protected areas, namely protected forests (36.5%), Gunung Leuser National Park (18.8%), Trumon Wildlife Reserve (13.9%), Animal Corridors (0.2%), Coastal Border (0.3%) and River Border (1.2%) of the total area. South Aceh

### Data collection

Data were collected through in-depth interviews with 60 informants who were selected using the Snowball Sampling technique (Table 1). Key people are people who practice the use of plants for traditional medicines. Subsequent informants were determined by the direction of the previous respondents. The interview activities have been carried by using a semi-structured questionnaire to assess traditional practices for the use of medicinal plant species, the part used, and the mode of preparation.



**Figure 1.** Map of Kota Bahagia Subdistrict, South Aceh District, Aceh Province, Indonesia showing the study area

**Table 1.** The demographic structure of respondents

Parameter	Specification	Frequency	Percentage
Gender	Male	38	63.3
	Female	22	36.7
Age	15-25	5	8.3
	26-35	12	20
	36-45	15	25
	46-55	14	23.3
	56-65	10	16.7
	>65	4	6.7
Education	None	6	10
	Elementary School	17	28.3
	Junior High School	16	26.7
	Senior High School	16	26.7
	University	5	8.3

The samples of plants were collected along with noting down their vernacular names. The identification of plant species was conducted in the Laboratory of Biology, Samudra University, Aceh, Indonesia. The botanical names have been updated using the Plants of the World online. (<http://www.plantsoftheworldonline.org>). For this study, we do not deposit plant specimens into the herbarium.

### Data analysis

#### Use Value (UV)

The Use Value is calculated as the proportion of the number of citations per species (U) to the number of informants (N) following Polat et al. (2015):

$$UV = U/N$$

High UV implies high use-reports for a plant that possesses significance to the local community. Low UV suggests that there are few reports related to its use.

#### Informant Consensus Factor (ICF)

Informant Consensus Factor (ICF) is determined by using the following Cornara et al. (2014):

$$ICF = (Nur - Nt) / Nur - 1$$

Where Nur is the number of useful reports in each category and Nt is the number of species used by all informants for a particular category.

## RESULTS AND DISCUSSION

### Characteristics of medicinal plants

A total of 96 medicinal plant species, consisting of 50 families, have been documented which are used by the Aneuk Jamee tribe in the Kota Bahagia subdistrict (Table 2).

Lamiaceae and Fabaceae are the most represented plant family with 7 species, followed by Asteraceae (6 species), Euphorbiaceae (5 species), and Acanthaceae, Amaranthaceae, Arecaceae, Rubiaceae, and Solanaceae

with 4 species each. The other 41 families possess one to 3 representative species each. Fifty-nine (61.46%) species are cultivated and 37 (38.54%) species are wild. *Piper betle* and *Psidium guajava* are common plant species that have been used as traditional medicine by local people in the study area. *P. betle* widely found planted in home gardens and consistent with the reported in West Java, Central Java, East Java, and Bali (Sari et al. 2015). Respondents stated that along with the use as medicine, *P. betle* is also used as a material in traditional ceremonies. In addition, *P. guajava* provides multiple purposes, along with that plant as a medicine, this plant harvested the fruit for raw consumption. *P. guajava* has widely grown in the home garden, in line with the report by Elfrida et al. (2020) in the Aceh Tamiang district. The average number of species identified by each age group of the respondent ranged from  $12.8 \pm 0.11$  (15-25 years) to  $94.81 \pm 0.02$  (> 65 years). In addition, the average number of species identified by each educational status of the respondent ranged from  $22.8 \pm 1.14$  (Senior High School) to  $42.22 \pm 0.12$  (Junior High School). Thirty-seven (38.5%) medicinal plants were recognized by all respondents include *Durio zibethinus*, *Myristica fragrans*, *P. betle*, *P. guajava*, and *Kaempferia galanga*.

### Plant part used

The leaves (28%) were the most used as traditional medicine, followed by the fruit (19%), flower and tuber (6% each), seed (3%), and sap (2%). Certain diseases are treated with the whole plant, approximately 20 % of the total plant species identified in this study area (Figure 2).

Leaves are the most commonly used plant part as an ethnomedicinal practice of the Aneuk Jamee tribe. The leaves have been widely used in traditional medicine due to the presence of bioactive compounds other than parts of plants (Ismail and Ahmad 2019). These studies are consistent with the reports by Tantengco et al. (2018) that local communities in the Philippines have the most used leaves in ethnomedicinal practices compare to other parts of the plants. During the discussion, the respondents stated that leaves are also easy to collect and are the most abundant part of the plant. In addition, the use of plant parts as traditional medicine can protect plants and ensure the sustainability of plant usage. Leaves are known to synthesis a wide range of secondary metabolites such as alkaloids, saponins, and phenolic compounds (Ghorbani 2005; Tantengco et al. 2018) that could be concerned for the pharmacological effects encountered by the Aneuk Jamee tribe. Several of the plants used as traditional medicine by the Aneuk Jamee tribe, such as *Psidium guajava*, are known to have flavonoids and tannins expressing antidiarrheal activity (Ezekwesili et al. 2010; Shakeera et al. 2013). In addition, secondary metabolites such as flavonoids, tannins, glycosides, and terpenoids, revealed by *P. guajava* leaves extract, have been reported to have various pharmacological properties such as antibacterial, anticough, antidiabetic, antihyperlipidemic, cardioprotective, antimutagenic, hepatoprotective, and larvicidal (Ngbolua et al. 2018).

**Table 2.** Utilization of plant species as traditional medicine by Aneuk Jamee tribe in Kota Bahagia Sub-district, South Aceh, Indonesia

Scientific name	Family	Vernacular name	Plant type	Habit	Part used	Mode of preparation	Disease	UV
<i>Acalypha australis</i> L.	Euphorbiaceae	Anting-anting	Shrub	Wild	Whole plants	Decoction, smeared	Wounds, diarrhoea, dysentery, cough	0.30
<i>Acalypha hispida</i> Burm.f.	Euphorbiaceae	Ekor kucing	Shrub	Cultivated	Leaves, flower	Decoction, pounded, smeared	Dysentery, nosebleed, anthelmintic, skin burn	0.68
<i>Acanthus ebracteatus</i> Vahl	Acanthaceae	Jeruju	Herb	Wild	Leaves	Decoction	Hepatitis	0.30
<i>Achyranthes aspera</i> L.	Amaranthaceae	Bungo bayom	Herb	Cultivated	Leaves, flower	Decoction	Fever, malaria, rheumatism, dysmenorrhea	0.80
<i>Adenanthera pavonina</i> L.	Fabaceae	Si bayi	Tree	Wild	Leaves	Decoction	Gastric ulcer	0.53
<i>Ageratum conyzoides</i> L.	Asteraceae	Simamih	Herb	Wild	Leaves	Smeared, decoction	Sore throat, wounds, itch	0.47
<i>Alpinia galanga</i> (L.) Willd.	Zingiberaceae	Langkuweh	Herb	Cultivated	Tubers	Decoction	Cough, fever, flatulence, stomachache	0.97
<i>Amaranthus spinosus</i> L.	Amaranthaceae	Bayam duri	Herb	Cultivated	Whole plants	Decoction, smeared	Fever, diarrhoea	0.68
<i>Annona muricata</i> L.	Annonaceae	Dienlando	Tree	Cultivated	Fruit	Raw consumption	Gastric ulcer, sprue, hypertension	0.97
<i>Areca catechu</i> L.	Arecaceae	Pinang	Palm	Cultivated	Seed	Raw consumption	Gastric ulcer, jaundice, itch	0.95
<i>Arenga pinnata</i> (Wurmb) Merr.	Arecaceae	Ijuok	Palm	Wild	Fruit	Decoction	Diabetes	0.53
<i>Artemisia vulgaris</i> L.	Asteraceae	Barucina	Herb	Wild	Leaves	Decoction	Dysentery, diarrhea, leukorrhea	0.30
<i>Averrhoa bilimbi</i> L.	Oxalidaceae	Limbieng	Tree	Cultivated	Fruit	Raw consumption	Hypertension	0.53
<i>Barleria cristata</i> L.	Acanthaceae	Daun madu	Herb	Cultivated	Whole plants	Decoction, pounded, smeared	Gastric ulcer, pimple	0.37
<i>Basella alba</i> L.	Basellaceae	Limayuong	Herb	Cultivated	Leaves, fruit	Decoction, pounded, smeared	Gastric ulcer, toothache, insomnia, skin burn	0.48
<i>Bidens pilosa</i> L.	Asteraceae	Bungo adet-adet	Herb	Wild	Whole plants	Decoction	Tuberculosis, haematemesis	0.43
<i>Canna indica</i> L.	Cannaceae	Bunga tasbih	Herb	Cultivated	Leaves, flowers	Decoction	Hypertension, fever, jaundice	0.52
<i>Carica papaya</i> L.	Caricaceae	Botiek	Shrub	Cultivated	Leaves	Raw consumption, decoction	Fever, malaria	0.93
<i>Celosia argentea</i> L.	Amaranthaceae	Bungo bayom	Herb	Cultivated	Leaves	Decoction	Hypertension	0.78
<i>Centella asiatica</i> (L.) Urb.	Apiaceae	Pegago	Herb	Cultivated	Whole plants	Decoction	Cough	0.58
<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob.	Asteraceae	Tutuba	Shrub	Wild	Leaves	Decoction, pounded, smeared	Gastric ulcer, wounds	0.37
<i>Citrus maxima</i> (Burm.) Merr.	Rutaceae	Jeruk bali	Tree	Cultivated	Fruit	Raw consumption	Sprue	0.82
<i>Clerodendrum chinense</i> (Osbeck) Mabb.	Lamiaceae	Bungo balai	Shrub	Wild	Flower	Decoction	Sore throat, sprue	0.63
<i>Clerodendrum indicum</i> (L.) Kuntze	Lamiaceae	Rumput pikuben	Shrub	Wild	Leaves, flower	Decoction	Gastric ulcer, diabetes	0.27
<i>Clerodendrum thomsoniae</i> Balf.f.	Lamiaceae	Kantin	Shrub	Wild	Flower	Decoction	Irritant contact dermatitis due to plants	0.28
<i>Clinacanthus nutans</i> (Burm.f.) Lindau	Acanthaceae	Sogi ijau	Herb	Cultivated	Leaves	Decoction	Sore throat, sprue	0.27
<i>Cocos nucifera</i> L.	Arecaceae	Karambie	Palm	Cultivated	Fruit	Decoction	Diarrhoea, digestive problems, constipation	0.77
<i>Coleus amboinicus</i> Lour.	Lamiaceae	Nilam babi	Herb	Wild	Leaves	Decoction	Hepatitis	0.72
<i>Colubrina asiatica</i> (L.) Brongn.	Rhamnaceae	Pilaut	Shrub	Cultivated	Leaves	Decoction	Fever, sore throat	0.53
<i>Combretum indicum</i> (L.) DeFilipps	Combretaceae	Pocah pingan	Climber	Wild	Leaves, flower	Decoction	Anthelmintic	0.42
<i>Cordyline fruticosa</i> (L.) A.Chev.	Asparagaceae	Junjuang	Shrub	Cultivated	Whole plants	Smeared	Bruise, wounds	0.32

<i>Crinum asiaticum</i> L.	Amaryllidaceae	Babakuong	Herb	Cultivated	Leaves, fruit	Smeared, decoction	Wounds, bruise, rheumatism	0.35
<i>Cucumis melo</i> L.	Cucurbitaceae	Melon	Herb	Cultivated	Fruit	Raw consumption	Hypertension	0.30
<i>Cyclea barbata</i> Miers	Menispermaceae	Cincau	Shrub	Cultivated	Leaves	Decoction	Sore throat, sprue	0.55
<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae	Sereh	Grass	Cultivated	Whole plants	Decoction	Sore throat, sprue, hypertension	0.72
<i>Cyperus rotundus</i> L.	Cyperaceae	Umpuik lading	Grass	Wild	Leaves, flower	Decoction, squeezed	Cough	0.45
<i>Decalobanthus mammosus</i> (Lour.) A.R.Simões & Staples	Convolvulaceae	Bidaro upas	Climber	Wild	Tuber	Pounded, decoction	Cough, bruise	0.60
<i>Dioscorea alata</i> L.	Dioscoreaceae	Gaduong angina	Climber	Wild	Tuber	Pounded, decoction	Sore throat, sprue	0.48
<i>Dioscorea hispida</i> Dennust.	Dioscoreaceae	Gaduong tanah	Climber	Wild	Tuber	Pounded, decoction	Sore throat, sprue	0.60
<i>Durio zibethinus</i> L.	Malvaceae	Drien	Tree	Cultivated	Fruit	Raw consumption	Anemia	0.27
<i>Erythrina subumbrans</i> (Hassk.) Merr.	Fabaceae	Reudeup	Tree	Wild	Leaves, flower, fruit	Decoction	Sore throat, hepatitis	0.42
<i>Erythrina variegata</i> L.	Fabaceae	Dodok	Tree	Wild	Leaves, flower, fruit	Decoction	Jaundice	0.38
<i>Euphorbia hirta</i> L.	Euphorbiaceae	Didieh	Herb	Wild	Whole plants	Dropped	Eye inflammations	0.47
<i>Gomphrena globosa</i> L.	Amaranthaceae	Bungo kenop	Herb	Cultivated	Flower	Decoction	Fever, cough, dysentery	0.43
<i>Gynura japonica</i> (Thunb.) Juel	Asteraceae	Daun inggu	Herb	Wild	Leaves	Decoction	Influenza, malaria	0.27
<i>Hellenia speciosa</i> (J.Koenig) S.R.Dutta	Costaceae	Sitawa	Shrub	Wild	Leaves	Decoction	Gastric ulcer	0.22
<i>Hibiscus rosa-sinensis</i> L.	Malvaceae	Kembang sepatu	Shrub	Cultivated	Flower	Decoction	Gastric ulcer	0.32
<i>Hippobroma longiflora</i> (L.) G.Don	Campanulaceae	Katarak	Herb	Cultivated	Leaves, flower	Dropped	Eye inflammations	0.27
<i>Illicium verum</i> Hook.f.	Schisandraceae	Bunga lawang	Tree	Cultivated	Fruit	Decoction	Flatulence, fever	0.77
<i>Imperata cylindrica</i> (L.) P.Beauv.	Poaceae	Rumput Padang	Grass	Wild	Whole plants	Decoction	Fever, sore throat, sprue	0.87
<i>Jasminum sambac</i> (L.) Aiton	Oleaceae	Pandak kaki	Tree	Cultivated	Leaves, flower	Dropped	Eye inflammations	0.65
<i>Jatropha podagrica</i> Hook.	Euphorbiaceae	Jiyak bali	Tree	Cultivated	Sap	Dropped	Wounds, toothache	0.73
<i>Justicia gendarussa</i> Burm.f	Acanthaceae	Sogi itom	Herb	Cultivated	Leaves	Decoction	Sore throat	0.53
<i>Kaempferia galanga</i> L.	Zingiberaceae	Kencur	Herb	Cultivated	Tuber	Decoction	Cough, fever	0.57
<i>Kalanchoe pinnata</i> (Lam.) Pers.	Crassulaceae	Si dingin	Herb	Cultivated	Leaves	Affixed to the forehead	Fever	0.38
<i>Lansium domesticum</i> Corrêa	Meliaceae	Langsat	Tree	Cultivated	Seed	Raw consumption	Malaria	0.47
<i>Lawsonia inermis</i> L.	Lythraceae	Inai	Shrub	Cultivated	Leaves	Decoction	Gastric ulcer	0.35
<i>Lophatherum gracile</i> Brongn.	Poaceae	Mimilang	Grass	Wild	Whole plants	Decoction	Sore throat	0.27
<i>Luffa acutangula</i> (L.) Roxb.	Cucurbitaceae	Patulo	Climber	Cultivated	Fruit	Decoction	Sore throat, anthelmintic	0.27
<i>Luffa aegyptiaca</i> Mill.	Cucurbitaceae	Pio	Climber	Cultivated	Fruit	Decoction	Fever	0.23
<i>Magnolia × alba</i> (DC.) Figlar	Magnoliaceae	Cempaka putih	Tree	Cultivated	Flower	Dropped	Eye inflammations	0.37
<i>Magnolia champaca</i> (L.) Baill. ex Pierre	Magnoliaceae	Nangoe	Tree	Cultivated	Flower	Decoction	Gastric ulcer	0.45
<i>Manilkara zapota</i> (L.) P.Royen	Sapotaceae	Sawoh	Tree	Wild	Leaves	Decoction	Hypertension, diarrhea	0.28
<i>Melastoma malabathricum</i> L.	Melastomataceae	Kaduduok	Shrub	Wild	Leaves	Smeared	Wounds	0.73
<i>Mirabilis jalapa</i> L.	Nyctaginaceae	Bungo kembangsubuh	Herb	Cultivated	Whole plants	Decoction	Gastric ulcer, pimple	0.85
<i>Morinda citrifolia</i> L.	Rubiaceae	Mengkudu	Tree	Cultivated	Fruit	Raw consumption, decoction	Stroke, Influenza, headache, diabetes, hypertension, rheumatism	0.95
<i>Murraya koenigii</i> (L.) Spreng.	Lamiaceae	Salam koja	Shrub	Wild	Leaves	Decoction	Diarrhoea, diabetes, sore throat	0.73
<i>Myristica fragrans</i> Houtt.	Myristicaceae	Buah palo	Tree	Cultivated	Seed	Pounded, smeared	Sprain	0.77

<i>Nicandra physalodes</i> (L.) Gaertn.	Solanaceae	Lolotuok	Herb	Wild	Fruit	Decoction	Hypertension	0.38
<i>Nicotiana tabacum</i> L.	Solanaceae	Tembakau	Herb	Cultivated	Leaves	Decoction	Jaundice	0.30
<i>Nypa fruticans</i> Wurmb	Arecaceae	Nipah	Palm	Wild	Leaves	Decoction	Jaundice	0.37
<i>Ocimum tenuiflorum</i> L.	Lamiaceae	Kemangi	Shrub	Cultivated	Whole plants	Raw consumption	Fever, sore throat	0.88
<i>Oldenlandia corymbosa</i> L.	Rubiaceae	Sititom	Herb	Wild	Leaves	Decoction	Hepatitis	0.55
<i>Orthosiphon aristatus</i> (Blume) Miq.	Fabaceae	Kumis kucing	Herb	Cultivated	Leaves, flower	Decoction	Diabetes, hypertension, bladder stone	0.47
<i>Pachyrhizus erosus</i> (L.) Urb.	Fabaceae	Bengkuang	Climber	Cultivated	Tuber	Raw consumption	Influenza, sore throat	0.60
<i>Paederia foetida</i> L.	Rubiaceae	Daun kentut	Climber	Wild	Whole plants	Decoction	Flatulence	0.38
<i>Pandanus amaryllifolius</i> Roxb. ex Lindl.	Pandanaceae	Panden musang	Shrub	Cultivated	Leaves	Decoction	Fever, insomnia, hypertension	0.65
<i>Persea americana</i> Mill.	Lauraceae	Pukat	Tree	Cultivated	Fruit	Raw consumption	Eye inflammations	0.37
<i>Phyllanthus acidus</i> (L.) Skeels	Phyllanthaceae	Ceremai	Tree	Cultivated	Fruit	Raw consumption	Sprue	0.32
<i>Phyllanthus niruri</i> L.	Phyllanthaceae	Dukong anak	Herb	Wild	Whole plants	Decoction	Gastric ulcer, diabetes	0.45
<i>Piper betle</i> L.	Piperaceae	Sirih	Climber	Cultivated	Leaves	Decoction, pounded, smeared	Fever, sore throat, wounds	0.98
<i>Plantago major</i> L.	Plantaginaceae	Tutup bumi	Herb	Cultivated	Whole plants	Decoction	Cough	0.78
<i>Plectranthus purpuratus</i> Harv.	Lamiaceae	Paladang	Herb	Cultivated	Whole plants	Decoction	Gastric ulcer, hemorrhoids, hepatitis	0.63
<i>Pluchea indica</i> (L.) Lees.	Asteraceae	Capa	Herb	Wild	Whole plants	Decoction	Flatulence, hepatitis	0.37
<i>Psidium guajava</i> L.	Myrtaceae	Asomsogi	Tree	Cultivated	Fruit, leaves	Raw consumption, decoction	Dengue, diarrhea	0.98
<i>Punica granatum</i> L.	Punicaceae	Delima	Tree	Cultivated	Fruit	Eaten raw	Stroke, sore throat	0.60
<i>Ricinus communis</i> L.	Euphorbiaceae	Jiyak	Tree	Cultivated	Sap	Dropped, decoction	Wounds, hernia	0.73
<i>Selaginella doederleinii</i> Hieron	Selaginellaceae	Paku ayom	Herb	Wild	Whole plants	Decoction	Hepatitis	0.47
<i>Senna alexandrina</i> Mill.	Fabaceae	Galinggang	Shrub	Wild	Leaves	Decoction	Scabies,	0.43
<i>Solanum lasiocarpum</i> Dunal	Solanaceae	Terong	Shrub	Cultivated	Fruit	Eaten as vegetable	Diabetes	0.58
<i>Solanum nigrum</i> L.	Solanaceae	Rimbang	Shrub	Cultivated	Fruit, leaves	Decoction, dropped	Eye inflammations	0.63
<i>Spondias dulcis</i> Parkinson	Anacardiaceae	Kadunduong	Tree	Cultivated	Fruit	Raw consumption, decoction, dropped	Anemia, eye inflammations	0.52
<i>Syzygium cumini</i> (L.) Skeels	Myrtaceae	Jambu kleng	Tree	Cultivated	Leaves, Fruit	Decoction, Raw consumption	Diabetes, constipation	0.97
<i>Tamarindus indica</i> L.	Fabaceae	Asam jawa	Tree	Cultivated	Fruit	Raw consumption	Sore throat, sprue	0.95
<i>Trema orientale</i> (L.) Blume	Cannabaceae	Sitopuung	Tree	Wild	Leaves	Decoction	Cough, asthma, sore throat, fever	0.75
<i>Uncaria gambir</i> (W.Hunter) Roxb.	Rubiaceae	Sibubuik	Climber	Wild	Leaves	Decoction	Flatulence	0.73

The second-largest proportion of plant parts used by the Aneuk Jamee tribe as traditional medicine is fruit. *Averrhoa bilimbi* fruit is used by the Aneuk Jamee tribe as a hypertension treatment. Susanti et al. (2017) reported that the extract of *A. bilimbi* fruit could reduce blood glucose levels and can be used as a treatment for diabetes. *A. bilimbi* is known to contain flavonoids and saponins that act as antidiabetic agents (Kumar et al. 2013). The natural diuretic activity of *A. bilimbi* plays a significant role in combating hypertension (Andriyanto et al. 2011). Fruit of *Morinda citrifolia* is used for stroke, influenza, headache, diabetes, hypertension, and rheumatism, while *Solanum lasiocarpum* fruit is used for diabetes.

### Mode of preparation

The major mode of preparation by the Aneuk Jamee tribe was found to be decoction (60%), followed by raw consumption (15%), smeared (10%), and pounded (7%) (Figure 3).

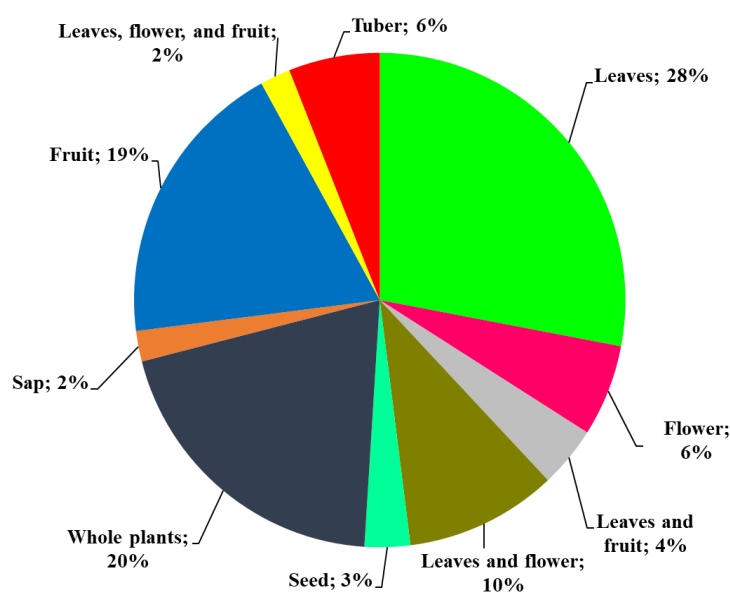
In order to treat diseases, the Aneuk Jamee tribe applied both internal and external administration routes. Most plant species have been used alone in the treatment of diseases, while several plants are combined. For example, *Oldenlandia corymbosa* was used alone in the treatment of hepatitis, while *Centella asiatica* was administered orally for cough treatment in combination with honey. In Indian folk medicine, the *C. asiatica* are useful for the treatment of asthma, skin disorders, gastric ulcer and body aches, gastric catarrh, kidney troubles, leprosy, stomach disorders, cure dysentery, and improve memory power (Jamil et al. 2007), while in Nepal, the leaf juice mixed with palm leaves used for cooling to body and stomach (Mahato and Chaudhary 2003).

### Use value

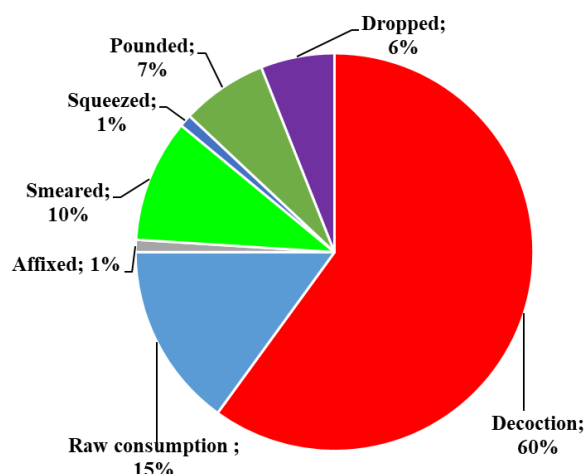
The use-value (UV) of plants has been calculated to quantify the importance of a specific plant on the basis of how often it is cited by a specific number of people. UV scores ranged from 0.13 to 0.97, with *Hellenia speciosa* having lower UV (0.22) and *Psidium guajava* and *Piper betle* having the highest UV (0.97 each). *P. guajava* and *P. betle* are widely used by the Aneuk Jamee tribe to treat various diseases. *P. guajava* decoction has been used by the Aneuk Jamee tribe to treat various diseases such as dengue and diarrhoea. *P. guajava* is also the most widely used medicinal plant in many countries, such as Mexico, Africa, Asia and Central America (Naseer et al. 2018). In Andhra Pradesh, India, leaves of guava have been documented for use in mouth gastric ulcer (Lingaiah and Rao 2013), while in North Sikkim, India, raw young leaves and tender shoots of guava have been used for toothache and mouth gastric ulcer (Pradhan and Badola 2008). The decoction of leaves of *P. betle* is used to treat fever and sore throat, while leaves of *P. betle* were squeezed and placed on the wounds. *P. betle* leaf extracts contain bioactive compounds, such as sterol (Pradhan et al. 2013), which are responsible for the antibacterial activity and are suitable for wounds. Essential oil from the leaves of this plant has been used for antiseptic treatment (Amalia et al. 2008). In the traditional Indian system, *P. betle* leaves are used as digestive and pancreatic lipase stimulating activity (Mula et al. 2008).

### Informant consensus factor

Diseases reported by respondents have been classified according to the International Classification of Diseases - 10 ver. 2019 (<https://icd.who.int>). Out of these categories, ICF values were determined and shown in Table 3.



**Figure 2.** Plant part used by the Aneuk Jamee tribe in Kota Bahagia Sub-district, South Aceh, Indonesia



**Figure 3.** Mode of preparation of medicinal plants using by Aneuk Jamee tribe in Kota Bahagia Sub-district, South Aceh, Indonesia

**Table 3.** Categories of disease in the study area and the informant consensus factor (ICF)

Classification of diseases	Specified disease name	Number use-report	Number species	ICF value
Certain infectious and parasitic diseases (CID)	Dysentery, diarrhea, ringworm, scabies, tuberculosis, malaria, dengue, anthelmintic	386	13	0.973
Diseases of liver (LD)	Hepatitis	152	7	0.960
Diseases of the circulatory system (CSD)	Hemorrhoid, hypertension, stroke	56	3	0.964
Diseases of the digestive system (DSD)	Constipation, hernia, gastric ulcer, stomachache, toothache, haematemesis	503	21	0.960
Diseases of the eye and adnexa (EAD)	Eye inflammation	441	18	0.961
Diseases of the genitourinary system (GD)	Dysmenorrhea, leukorrhea, bladder stone, menstrual pain, vaginal discharge	56	3	0.964
Diseases of the musculoskeletal system and connective tissue (MCD)	Rheumatism	38	3	0.946
Diseases of the respiratory system (RSD)	Asthma, influenza, sore throat, sprue	631	25	0.962
Diseases of the skin and subcutaneous tissue (DS)	Itch, swelling, irritant contact dermatitis due to plants	61	4	0.950
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (DBF)	Anemia	56	2	0.982
Endocrine, nutritional and metabolic diseases (ENM)	Diabetes	145	8	0.951
Injury, poisoning, and certain other consequences of external causes (IPD)	Wound, bruise, sprain	259	10	0.965
Mental and behavioral disorders (MBD)	Insomnia	34	3	0.939
Symptoms and signs involving the circulatory and respiratory systems (DCR)	Cough, nosebleed	271	10	0.967
Symptoms and signs involving the skin and subcutaneous tissue (SCT)	Skin burn	100	4	0.970
Symptoms, signs, and abnormal clinical and laboratory (SSA)	Fever, cold, flatulence, pimple, jaundice, headache	584	24	0.961

A total of 47 diseases in 16 categories were documented in the study area. The most common use-report categories are diseases of the respiratory system (631 use-report, 25 species), followed by symptoms, signs and abnormal clinical and laboratory (584 use-reports, 24 species), diseases of the digestive system (503 use-reports, 21 species), diseases of the eye and adnexa (441 use-reports, 18 species), and certain infectious and parasitic diseases (386 use-reports, 13 species). The ICF values ranged from 0.939 to 0.982. The highest ICF value (0.982) is for

diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (anemia), while the lowest is for mental and behavioral disorders (0.939). Sandjaja et al. (2013) reported that the prevalence of anemia in rural areas is higher than in urban areas. This is affected by the consumption pattern of rural communities, which is still dominated by vegetables as a source of iron (non-heme iron), resulting in low use and absorption of iron. The respondents cited two species of plants for the treatment of anemia, i.e., *Spondias dulcis* and



*Durio zibethinus*. During the discussion, the respondents stated that the Aneuk Jamee tribe often consumes the fruit of *D. zibethinus* and the young fruits of *S. dulcis* which are believed to prevent anemia. *D. zibethinus* fruit is reported to be rich in nutrients including antioxidants that are important in the prevention of anemia (Amir and Saleh 2014), while *S. dulcis* fruits are rich in bioactive compounds and used in traditional medicines in Sri Lanka, India, Vietnam, and Malaysia to treat anemia, regulate blood glucose levels, and digestive problems (Jayarathna et al. 2020).

Traditional knowledge of medicinal plants in the Aneuk Jamee tribe has been passed down from generation to generation. This traditional knowledge, however, is not well documented. Transfer of knowledge is still being carried out orally. However, during discussions with the respondents, it was noted that many children were interested in learning medicinal plants with healers or elders in their village. This traditional knowledge needs to be protected by involving the Indonesian Government through the Education Office with the integration of traditional knowledge into the basic education curriculum. This practice could be an effort to preserve traditional knowledge, natural resources, and biodiversity. Ramadoss and Moli (2011) reported that biodiversity education programs could increase student's knowledge, motivation, and expertise to conserve and protect local natural resources and biodiversity in India.

## ACKNOWLEDGEMENTS

We are grateful to all the respondents in the study area for their kind friendliness and knowledge sharing. We are also thankful that this study has been supported by Samudra University, Indonesia.

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