

Ethnobotany of medicinal plants in the Dayak Linoh Tribe in Sintang District, Indonesia

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Abstract. Julung H, Supiandi MI, Ege B, Zubaidah S, Mahanal S. 2023. *Ethnobotany of medicinal plants in the Dayak Linoh Tribe in Sintang District, Indonesia. Biodiversitas 24: 767-775.* The Linoh Dayak people have long used medicinal plants to deal with health problems in their community. However, along with the advancement of science, the influx of foreign cultures and the degradation of nature and the environment, traditional knowledge about medicinal plants is only owned by the older generation, and the transmission of information is limited by word of mouth and not well documented. This study aimed to document various medicinal plants used by the Dayak Linoh people. The research used a qualitative approach using field surveys. Informants were selected using the *purposive sampling* method. The informants interviewed consisted of customary leaders (key informants), village heads (main informants), and recommended informants, such as traditional birth attendants (village midwives), hamlet heads, and community members who know medicinal plants. Medicinal plant data were obtained through in-depth interviews, participatory observation, and documentation related to the local names of the plants, the parts used, and how to manage and use them. Data analysis was carried out in a qualitative descriptive manner. The results showed that 55 species of medicinal plants consisting of 34 plant families were used by the Dayak Linoh tribe. The most widely used part of the plant is the leaf (39, 71%). People in the community boiled the leaves and drank the extract. The most used families in the three tribal communities of the Dayak Linoh tribe, were Zingiberaceae (9 species) and Myrtaceae (3 species). The plant parts used by the Dayak Linoh tribe were root, tuber, rhizome, stem, bark, banana heart, fruit, fruit skin, leaf, and seed. The Dayak Linoh tribe used medicinal plants to treat boil (7 plants) and for postpartum stamina recovery (7 plants). The communities processed and used the medicinal herbs conventionally by boiling and drinking.

Keywords: Dayak Linoh, ethnobotany, medicinal, plants, traditional

INTRODUCTION

West Kalimantan, Indonesia, is inhabited by various tribes, who live side by side and form a community together, one of which is the Dayak Linoh tribe in Nabal Village, Sungai Tebelian District, Sintang District. In general, most of the Dayak people who live in the interior of West Kalimantan are still very closely related to the forest and nature, so they still depend on nature to meet their daily needs (Fajarwati and Masruri 2019). Dayak tribal communities have been known to utilize forest plants that have the potential as medicines to treat health problems (Yusro et al. 2014; Supiandi et al. 2021). The Dayak Linoh tribe still uses traditional medicinal plants as their local wisdom practice.

Local wisdom is all forms of knowledge, belief, understanding, insight, customs, values, and social norms that guide human behavior within the community to solve various problems and maintain environmental balance (Vitasurya 2016; Sibarani 2016). Local wisdom functions for (a) the conservation and preservation of natural resources, (b) the development of culture and knowledge, and (c) a repository of choices that maintain cultural and biological diversity (Virginia 2016). Previous studies have proven that local wisdom in a local community group,

including the Dayak Linoh tribe, may be lost because the local wisdom, such as information on the use of plants as traditional medicines, is only conveyed orally and is not well documented (Rashid et al. 2018; Ege et al. 2021) and the influence of modern technology reduces the use of traditional medicines (Wahyu 2021).

In the Dayak Linoh Tribe the number of people who know about traditional medicine using plants has begun to decrease. As a result, this knowledge is not well documented and can be lost. For example, the loss of traditional knowledge of local plants have been reported from the studies in Nigeria (Ayantunde et al. 2008), Dominica (Quinlan and Quinlan 2007), Mexico (Saynes-Vaquez et al. 2016), Brazil (Sousa et al. 2012), and in Bengkulu, Indonesia (Wiryo et al. 2017, 2019).

As a first step to support the preservation of traditional medicine for the Dayak Linoh tribe, it is very important to conduct ethnobotanical research on medicinal plants involving traditional healers. Ethnobotany is a scientific study of the interaction between humans and plants that can be applied to human health and can provide insight into how people interact locally with local resources (Kewessa et al. 2015; Marin et al. 2015; Gaoue 2017; Akgul et al. 2018; Pei et al. 2020). Ethnobotanical studies also have the potential to unify and integrate local and scientific

knowledge to achieve local wisdom conservation (Ajesh et al. 2012). They can be used to deal with human problems in the future (Pei et al. 2020).

The specific objectives of this research were: (i) to document the species of medicinal plants, (ii) to reveal how the community uses the parts of medicinal plants, (iii) to reveal how the community processes plants as traditional medicine, and (iv) to reveal the properties of medicinal plants based on local knowledge of the community. The results of this study may be used to discover new species of medicinal plants which should be further investigated by pharmacists in order to improve public health.

MATERIALS AND METHODS

Study area

This research on the Dayak Linoh ethnic community was conducted in July 2022 in forest areas, plantation areas, community settlements, and house yards in Nobal Village, Sungai Tebelian Subdistrict, Sintang District, West

Kalimantan, Indonesia (Figure 1). It is located at 00°06' N-00°40' S and 111°37' E - 111°22' E.

Procedures

The research used a qualitative approach using field surveys. The research instruments used to collect data were interview guides, observation sheets, and ethnobotanical documentation. The data collection was carried out in the following stages: (i) Determining the informants: Informants in this study consisted of traditional leaders (key informants), village heads (main informants), and recommended informants, i.e., traditional (village) midwives, herbal medicine healers, hamlet heads, and community members who know medicinal plants (Table 1). (ii) Conducting in-depth interviews with predetermined informants. (iii) Conducting participatory observations on three communities of the Dayak Linoh tribe, Sungai Tebelian Subdistrict, in Sintang District. (iv) Searching for data regarding research variables in the form of notes, pictures, and archives that are useful for completing research data.

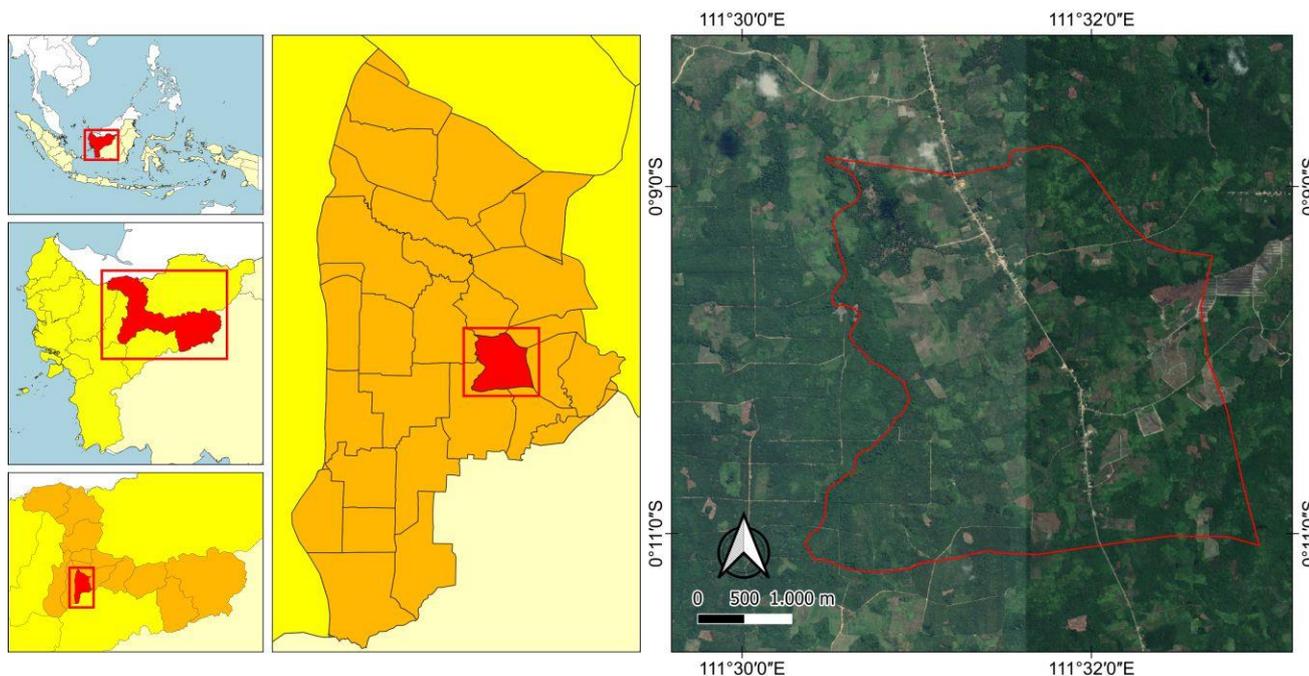


Figure 1. Research area in Nobal Village, Sungai Tebelian Subdistrict, Sintang District, West Kalimantan, Indonesia

Table 1. Characteristics of respondents to the Dayak Linoh tribe in Nobal Village, Sintang, Indonesia

| Name | Age | Gender | Type of respondent | Profession |
|------------------|-----|--------|------------------------|--------------|
| Ladulfus Abdulah | 54 | Man | Traditional leader | Farmer |
| Rudy Asdar | 38 | Man | Village head | Village head |
| Anin | 57 | Woman | Herbal medicine shaman | Farmer |
| Sumiati | 60 | Woman | Village midwife | Farmer |
| Agata Ripah | 65 | Woman | Village midwife | Farmer |
| Marianus | 44 | Man | Hamlet head | Hamlet head |
| Aleksander Amat | 62 | Man | Community member | Farmer |
| Suliah | 61 | Woman | Community member | Farmer |
| Resa | 47 | Woman | Community member | Farmer |
| Ajan | 60 | Man | Community member | Farmer |

Data analysis

The medicinal plants were identified to get the scientific names using online portals, i.e., the *International Plant Names Index* (IPNI) accessible on the ipni.org, *Plants of the World Online* (powo.science.kew.org), *The Plant List* (theplantlist.org), and *The Global Biodiversity Information Facility* (gbif.org). The next stage was consulting plant experts to group the data based on species, used parts, method of processing and administration, and uses.

RESULTS AND DISCUSSION

Results

Plants used as medicine by the Dayak Linoh tribe, in Nobal Village, Sungai Tebelian Subdistrict, Sintang District, are presented in Table 2. The Dayak Linoh ethnic community used 55 plant species as traditional medicines from 34 families (Table 2). The family Zingiberaceae had the most species (9), followed by Myrtaceae (3 species). The other families were represented by two or one species.

Parts of plants used as medicine

The plant parts widely used by the Dayak Linoh people in Sungai Tebelian Subdistrict, Sintang District, West Kalimantan as traditional medicinal ingredients can be seen in table 3. The leaf is the most used part (39.71%) as a traditional medicinal ingredient, followed by the rhizome (14.71%), stem (13.24%), and fruit (11.76%) (Table 3).

Methods of processing and administration of traditional herbal medicines

The most common method of medicinal plant processing by the Dayak Linoh tribe was boiling (40.35%), followed by pounding (33.33%) and cooking (10.35%). The other methods were conducted much less frequently (Table 4). The most used administration method of traditional plant medicines by the Dayak Linoh tribe was drinking (34.92%), followed by pasting (23.81%). The other methods were used much less frequently (Table 5).

Fifty health problems were treated using medicinal plants by the Dayak Linoh people in Nobal Village, with the most frequent being boils and low stamina after childbirth; each was reported seven times (Table 6).

Table 2. Data on medicinal plants of the Dayak Linoh Tribe in Nobal Village, Subdistrict Tebelian, Sintang District, Indonesia

| Family | Scientific name | Local name | Plant part | Preparation and administration | Use |
|-------------|--|--------------------------------|----------------|---|--|
| Acoraceae | <i>Acorus americanus</i> (Raf.) Raf. | Jerangau putih | Rhizome | The rhizomes are finely ground and rubbed on the forehead, chest and stomach. | Treating colds of the children |
| Acanthaceae | <i>Andrographis paniculata</i> (Burm. f.) Wall. ex Nees. | Sambiloto | Leaf | The leaves are boiled and drunk. | Reducing hypertension |
| Acanthaceae | <i>Graptophyllum pictum</i> (L.) Griffith. | Juar merah (kecombrang Merah) | young stem | The young stems are pounded and rubbed on the feet that are red due to allergies. | Treating red feet due to allergies |
| Annonaceae | <i>Annona muricata</i> L. | Nangka belanda (SIRSAK) | Leaf | The leaves are finely ground and then crushed using free-range leaves or banana leaves, then placed on the stomach part of the pancreas. | Treating sore throat (disorders of the pancreas) |
| Apocynaceae | <i>Alstonia scholaris</i> (L.) R. Br. | Pelaik | Leaf | The leaf sap is rubbed on the body parts that are boils. | Treating small boils on the body |
| Araceae | <i>Alocasia plumbea</i> K. Koch ex Van Houtte. | Keladi hitam | Tuber and stem | The tubers and stems are pounded and rubbed on the wound. | Treating venomous animal bites |
| Arecaceae | <i>Cocos nucifera</i> L. | Nyiur hijau (kelapa hijau) | Fruit | The water is used for bathing and drinking. | Treating smallpox, reducing bleeding during childbirth |
| Arecaceae | <i>Araca catechu</i> L. | Pinang | Fruit | The contents of the young areca nut are mashed, mixed with egg yolk, and rubbed on the baby's mouth with a rash. | Treating rashes in the baby's mouth |
| Asteraceae | <i>Blumea balsamifera</i> (L.) DC. | Kasembung (Ambung-ambung) | Leaf | The leaves are heated over the fire; after they get warm, they are placed on the forehead or head. | Reducing fever in children |
| Asteraceae | <i>Ageratum conyzoides</i> L. | Babadotan | Leaf | The leaves are mashed and affixed to the abrasions.. | Treating blisters from falling |
| Blechnaceae | <i>Blechnum orientale</i> L. | Paku kijang (Paku ekor monyet) | Shoot | The shoots are finely ground together with kapok leaves (kabu) and bebija (jaga) and then placed on the boil, until it deflates or bursts | Treating boils on the neck and head |

| | | | | | |
|-----------------|---|---------------------------------|-----------------------|---|--|
| Blechnaceae | <i>Stenochlaena palustri</i> (Burm.) Bedd. | Paku nait (Pakis Udang) | The tendrils (stolon) | The tendrils are dried, then boiled with the base of nipa leaves, taken 3 times a day. | Treating kidney stones |
| Balsaminaceae | <i>Impatiens balsamina</i> L. | Cerongak (Bunga Pacar) | Root | The roots which die by themselves, are burned, and rubbed with coconut oil on the stomach | Streamlining difficult childbirth |
| Bombacaceae | <i>Ceiba pentandra</i> (L.) Gaertn. | Kabu-kabu (Kapuk) | Leaf | The leaves are pounded and affixed to the body around the boils. | Treating boils |
| | | | Leaf | The leaves are crushed and placed on the head or forehead. | Reducing fever in children |
| Bromeliaceae | <i>Ananas comosus</i> (L.) Merr. | Nanas | Fruit | The fruit is peeled and then eaten. | Accelerating contractions during labor |
| Caricaceae | <i>Carica papaya</i> L. | Pepaya | Leaf | The leaves are boiled and the water is drunk, or the leaves are mashed, and the water is squeezed and drunk directly. | Treating malaria |
| Campanulaceae | <i>Isotoma longiflora</i> (L.) C. Presl. | Bunga mata | Flower | The flowers are soaked in a glass filled with clean water, then dropped on the sore eye. | Treating myopic eyes |
| Chenopodiaceae | <i>Spinacia oleracea</i> L. | Bayam hijau | Stem, leaf | The stems and leaves are boiled / cooked and used as vegetables. | Overcoming (lack of blood) iron deficiency in pregnant women |
| Clusiaceae | <i>Garcinia xanthochymus</i> Hook. f. ex T. Anderson. | Asam kandis | Fruit | The fruit added with lemongrass stalks and turmeric are pounded and applied to the swollen feet. | Treating swollen legs due to sprains |
| Convolvulaceae | <i>Ipomoea aquatica</i> Forssk. | Kangkung Air | Stem, leaf | The stems and leaves are boiled/cooked and eaten as vegetables. | Overcoming (lack of blood) iron deficiency in pregnant women |
| Dryopteridaceae | <i>Nephrolepis biserrata</i> (Sw.) Schott. | Pakis pedang (Bekoruk) | Young leaf (shoot) | The leaves are cooked and used as a vegetable. | Increasing breast milk in nursing mothers |
| Euphorbiaceae | <i>Excoecaria cochinchinensis</i> Lour. | Sembulung darah | Leaf | The leaves are boiled and the water is drunk. | Treating vomiting blood |
| Euphorbiaceae | <i>Sauropus androgynus</i> (L.) Merr. | Katuk/cangkok | Leaf | The leaves are pounded and placed on boils. | Treating ulcers on the nipples |
| | | | Young leaf | The leaves are cooked and used as a vegetable. | Increasing breast milk in nursing mothers |
| Fabaceae | <i>Spatholobus littoralis</i> Hassk. | Bajakah merah | Stem | The stems are sliced into small pieces, dried in the sun, boiled and the water is drunk. | Treating cancer cells and tumors |
| Iridaceae | <i>Eleutherine Americana</i> Merr. | Bawang lombak (Bawang Dayak) | Tuber | The tubers are boiled and the water is drunk, or the leaves are dried, brewed, and the water is drunk. | Treating cyst cells, tumors, and cancer |
| Lamiaceae | <i>Vitex pinnata</i> L. | Loban (Ngkeleban) | Young leaf | The leaves are baked on fire, then attached to the solar plexus that hurts. | Treating liver dysfunction |
| Lamiaceae | <i>Ocimum basilicum</i> L. | Selasih | Leaf, flower, fruit | The leaves are boiled and the water is drunk; the old fruit is boiled, mixed with palm sugar and drunk. | Reducing body odor and fever |
| Liliaceae | <i>Crinum asiaticum</i> L. | Lobak rimbak | Tuber | The tubers are finely ground and affixed to the enlarged/swollen testicles. | Treating hernia (Komang toluk) |
| Malvaceae | <i>Hibiscus rosa-sinensis</i> L. | Bunga tungsung (Kembang Sepatu) | Leaf | The leaves are finely ground mixed with <i>Sida rhombifolia</i> (Singa Puri) and centipede ferns, then affixed to the boils, until the boils burst and deflate. | Treating boils and swelling external body parts |
| Malvaceae | <i>Sida rhombifolia</i> L. | Singa puri | Leaf | The leaves are finely ground with hibiscus. Then it is placed around the boil, until it deflates and the boil bursts. | Treating boils and swelling external body part |
| Meliaceae | <i>Lansium domesticum</i> Corr | Langsat | Bark, seed | Bark or seeds are boiled and drunk | Treating malaria and fever accompanied by chills |

| | | | | | |
|------------------|---|---|--------------------------------|---|---|
| Musaceae | <i>Musa acuminata</i> Colla | Pisang ungu | Flower | The flowers are cooked and used as a vegetable. | Enhancing postpartum breastfeeding |
| Musaceae | <i>Musa paradisiaca</i> L. | Pisang Nipah (Kepok) | Flower | The flowers are cooked and used as a vegetable | Enhancing postpartum breastfeeding |
| Myrtaceae | <i>Psidium guajava</i> L. | Jambu biji | Shoot | The shoots are chewed and the liquid is swallowed, or the shoots are boiled and the warm water is drunk. | Treating stomach pain due to diarrhea and dysentery |
| Myrtaceae | <i>Syzygium polyanthum</i> (Wight.) walp. | Bungkang (Daun Salam) | Leaf | The leaves are boiled and the water is used for bathing. | Treating smallpox |
| Myrtaceae | <i>Rhodomyrtus tomentosa</i> (Aiton) Hassk. | Kemuntin (Kemunting) | Leaf | The leaves are pounded and mixed with a little clean water, then dripped or placed on the injured body part. | Stopping bleeding from minor injuries caused by sharp objects |
| Pteridaceae | <i>Adiantum venustum</i> G. Don. | Akar Perut Manuk | Root, stem, leaf | The roots are boiled and used for bathing at sunset. | Treating pain that appears briefly in the morning and evening. |
| Poaceae | <i>Imperata cylindrica</i> (L.) P. Beauv. | Alang | Root | The roots are boiled and drunk, together with pasak bumi and red ginger. | Treating sick men who lack stamina |
| | | | Root | The roots of the reeds are boiled with yellow curcuma, yellow root and yellow bamboo root and turmeric, then taken 2 times a day | Treating jaundice (Hepatitis B) |
| | | | Root | The roots of the reeds together with the <i>Strobilanthes crispus</i> (keji beling) leaves, the and <i>Orthosiphon aristatus</i> (cat's whiskers) leaves are boiled and the water is drunk. | Treating urinary tract infections and disorders of the kidneys |
| Poaceae | <i>Cymbopogon citratus</i> (DC.) | Serai | Stem | The stems are boiled, mixed with red ginger and the water is drunk with honey. | Treating colds and coughs |
| Piperaceae | <i>Piper betle</i> L. | Sirih | Leaf | One sheet of leaf is chewed and the liquid is swallowed, The leaves are boiled and the water is drunk and also sprinkled on the female genital area. | Treating stomach pain Treating leukorrhea (taste toluk) and cleaning female genitalia due to vaginal discharge |
| Piperaceae | <i>Piper nigrum</i> L. | Lada | Fruit and seed | The fruit, including the seed is pounded, boiled and the liquid is drunk or rubbed into the stomach | Treating colds |
| Rubiaceae | <i>Morinda citrifolia</i> L. | Engkudu (Mengkudu) | Leaf | The leaves are boiled and the water is drunk. | Treating swelling of the heart and for hypertension |
| Scrophulariaceae | <i>Scoparia dulcis</i> L. | Sapu manis/jaka tua | Whole plant (root, stem, leaf) | The plants are pounded and affixed to the outside of the tooth that hurts, or used for gargling. | Treating toothache |
| Verbenaceae | <i>Premna serratifolia</i> L. | Berbuas (Buas) | Young leaf | The leaves are finely ground and rubbed on the swollen body parts. | Treating swelling in the body and reducing body odor. |
| Xanthorrhoeaceae | <i>Dianella ensifolia</i> (L.) DC. | Jerangau hantu | Fruit | The fruit is ground and heated, and put it on the stomach part of the pancreas every evening. | Treating pancreatic disorders (Ngurak) |
| Zingiberaceae | <i>Kaempferia galanga</i> L. | Cokur (Kencur) | Rhizome | The rhizomes are chewed or mashed, then sprayed or smeared on the stomach. | Treating vomiting children and relieving coughs |
| Zingiberaceae | <i>Curcuma xanthorrhiza</i> Roxb. | Entomu kuning (temulawak orange/kuning) | Rhizome | The rhizomes are boiled, together with reed roots, yellow bamboo roots, turmeric, and yellow roots, and the water is drunk. | Recovery of stamina after childbirth and treating jaundice (hepatitis B) |

| | | | | | |
|---------------|---|--------------------------------|---------|---|---|
| Zingiberaceae | <i>Alpinia galangal</i> L. | Lengkuas | Rhizome | The rhizomes are finely ground, and rubbed or smeared on the affected skin | Treat, tinea versicolor, scabies and ringworm |
| Zingiberaceae | <i>Zingiber officinale</i> Linn. Var. <i>rubrum</i> . | Liak merah (Jahe Merah) | Rhizome | The rhizomes of red ginger mixed with turmeric, aromatic ginger and a sour mangosteen are mashed, drunk directly or boiled and then drunk mixed with honey. | Recovery of stamina after childbirth, reducing ulcers and swelling in the internal and external body parts |
| Zingiberaceae | <i>Curcuma zedoria</i> (Christm.) Roscoe. | Entomu Putih (temulawak putih) | Rhizome | The rhizome mixed with red ginger, turmeric, aromatic and sour mangosteen are crushed and drunk directly or boiled and then drunk mixed with honey | Recovery of stamina after childbirth |
| Zingiberaceae | <i>Zingiber officinale</i> Var. <i>amarum</i> | Jahe Emprit (Loyak Putih) | Rhizome | The rhizomes mixed with turmeric, aromatic ginger and sour mangosteen are mashed, drunk directly, or boiled and then drunk mixed with honey. | Recovery of stamina after childbirth |
| Zingiberaceae | <i>Curcuma longa</i> L. | Kunyit | Rhizome | The rhizomes mixed with turmeric, red ginger, aromatic ginger and sour mangosteen are mashed, taken directly or boiled and then drunk mixed with honey. | Recovery of stamina after childbirth, stomach acid and stomach ulcers, reducing swelling and wounds in the body |
| Zingiberaceae | <i>Zingiber zerumbet</i> (L.) J.E.Smith. | Lempuin hitam | Rhizome | The rhizomes are chewed and sprayed on the body that hurts. | Treating pain and aches in the body from behind through to the chest |
| Zingiberaceae | <i>Zingiber cassumunar</i> Roxb. | Mengelai (Bangle) | Rhizome | The rhizomes are finely ground and smeared / all over the body. | Accelerating postpartum recovery, anti-pain and pain in the body |

Table 3. Parts of plants used as medicine by the Dayak Linoh people

| The part of the plant used | Total | Percentage |
|----------------------------|-------|------------|
| Leaf | 27 | 39.71% |
| Rhizome | 10 | 14.71% |
| Stem | 9 | 13.24% |
| Fruit | 8 | 11.76% |
| Flower | 4 | 5.88% |
| Root | 4 | 5.88% |
| Layer Tuber | 2 | 2.94% |
| Seed | 2 | 2.94% |
| The tendril (Stolon) | 1 | 1.47% |
| Tuber | 1 | 1.47% |

Table 4. Methods of processing medicinal plants by the Dayak Linoh tribe

| Processing method | Total | Percentage |
|-------------------|-------|------------|
| Boiled | 23 | 40.35% |
| Pounded | 19 | 33.33% |
| Cooked | 6 | 10.53% |
| Baked (pepes) | 4 | 7.02% |
| Chewed | 4 | 7.02% |
| Burned | 1 | 1.75% |

Table 5. Administration methods of herbal medicines by the Dayak Linoh tribe

| Administration method | Total | Percentage |
|------------------------|-------|------------|
| Drunk | 22 | 34.92% |
| Pasted | 15 | 23.81% |
| Eaten after processing | 7 | 11.11% |
| Smeared | 7 | 11.11% |
| Eaten immediately | 3 | 4.76% |
| Spread | 3 | 4.76% |
| Used for showering | 3 | 4.76% |
| Ejected | 2 | 3.18% |
| Dropped | 1 | 1.59% |

Discussion

The Dayak Linoh ethnic community in Sungai Tebelian Subdistrict, Sintang District, West Kalimantan, Indonesia, is still very closely connected with nature by utilizing plants as ingredients for traditional medicine. These medicinal plants were obtained in the forest near the community housing settlements in the tribal community. Forests are an important source of medicinal plants for traditional healthcare systems (Shah and Bhat 2019). Forest ecosystems are home to medicinal plant resources (Oktavia et al. 2022).

Table 6. Health problems treated using medicinal plants by the Dayak Linoh tribe

| Health problem | Total |
|-------------------------------------|-------|
| Bleeding during labour | 1 |
| Cyst | 1 |
| Diarrhea | 1 |
| Difficult labor | 1 |
| Disorders of the kidneys | 1 |
| Dysentery | 1 |
| Gastric wound | 1 |
| Headache | 1 |
| Heart swelling | 1 |
| Hernia | 1 |
| Kidney stones | 1 |
| Labor contractions | 1 |
| Lack of stamina in men | 1 |
| Liver disfunction | 1 |
| Myopic eyes | 1 |
| Rash on the baby's mouth | 1 |
| Red feet due to allergies | 1 |
| Ringworm | 1 |
| Scabies | 1 |
| Scratch from falling | 1 |
| Stomach acid (ulcer) | 1 |
| Tinea versicolor | 1 |
| Toothache | 1 |
| Urinary tract infection | 1 |
| Venomous animal bites | 1 |
| Vomiting | 1 |
| Wounds in the body | 1 |
| Aches in the body | 2 |
| Bleeding | 2 |
| Body odor | 2 |
| Cancer | 2 |
| Cough | 2 |
| Disorders of the pancreas | 2 |
| Hepatitis B | 2 |
| Hypertension | 2 |
| Iron deficiency in pregnant women | 2 |
| Malaria | 2 |
| Pain in the body | 2 |
| Smallpox | 2 |
| Stomach ache | 2 |
| Tumor | 2 |
| Vaginal discharge | 2 |
| Cold | 3 |
| Swelling in the internal body parts | 3 |
| Difficult breastfeeding | 4 |
| Fever | 4 |
| Little breast milk | 4 |
| Swelling in the external body parts | 4 |
| Boil | 7 |
| Low stamina after childbirth | 7 |

In addition, the various species of plants used as medicine are still well preserved, and some are even cultivated in the yard of the house. The three tribal communities that live side by side in West Kalimantan have local wisdom to look after, sort, and collect medicinal plants.

In the Dayak Linoh tribal community, the most widely used plant family is Zingiberaceae, because it is very easy

to find and cultivate around the yard of the house and is used as a cooking spice and medicine in everyday life. These plants are used for traditional medicines and first aid given to patients before going to the health office because they are very easy to find, cost nothing, are very popular, and do not cause side effects. The previous research also states that the use of traditional herbal medicines is considered safe (Moreira et al. 2014). The results of previous studies stated that the Zingiberaceae family could be utilized in ethnomedicine (Kumar et al. 2013). Zingiberaceae rhizome extract contains essential oils, including terpenes, alcohol, ketones, flavonoids, and phytoestrogens which are useful as medicine (Zahara et al. 2018). Laokor and Juntachai (2021), stated that the Zingiberaceae has long been used in traditional medicine to treat skin disorders caused by fungi.

The Dayak Linoh community utilizes Zingiberaceae to carry out traditional medicinal practices, and this local habit or wisdom has been maintained to this day. Some medicinal plants from the Zingiberaceae are used to deal with several health problems; for example, *Kaempferia galanga* L. is used to treat vomiting children and to relieve coughs, *Curcuma xanthorrhiza* Roxb. for recovery of stamina after childbirth and treating jaundice (hepatitis B), *Alpinia galanga* L. for tinea versicolor, scabies, and ringworm, *Zingiber officinale* Linn. Var. *rubrum*. for the recovery of stamina after childbirth, reducing boils and swelling in the internal and external body parts. *Curcuma zedoaria* (Christm.) Roscoe and *Zingiber officinale* Var. *amarum*, are used for recovery of stamina after childbirth, *Curcuma longa* L. for recovery of stamina after childbirth, gastric acid, and stomach ulcers, reducing swelling and wounds in the internal body parts. *Zingiber zerumbet* (L.) JE Smith is for treating aches in the back and in the chest, while *Zingiber cassumunar* Roxb is used as an anti-pain and pain in the body and to accelerate postpartum recovery.

Kaempferia galanga L. is widely used by the community as an ethnomedicine (Labrooy et al. 2018). *Curcuma xanthorrhiza* is used traditionally to treat liver damage, hypertension, diabetes, and cancer (Salleh et al. 2016). *Curcuma xanthorrhiza* is used traditionally to treat several diseases such as lack of appetite, stomach disorders, liver disease, constipation, bloody diarrhea, dysentery, arthritis, child fever, hypotriglyceridemia, hemorrhoids, vaginal discharge, rheumatism, and skin eruptions (Rahmat et al. al., 2021). The flower of *K. galanga* has antimicrobial and antioxidant properties (Khairullah et al. 2020). *Kaempferia galanga* contains, among others, 1,8-cineole, α -fenchyl acetate, camphor, methyl cinnamate, and guaiol (Aronson 2016). *Curcuma zedoaria* is known as an herbal medicine and has many biological activities (Sulistiyani et al. 2014). *Zingiber officinale* is a spice plant that has long been used as herbal medicine such as antiemetic, stomachic, expectorant, anti-inflammatory, aphrodisiac, etc., in traditional medicine systems as well as antibacterial, antidiabetic, antiemetic, hypolipidemic, hepatoprotective (Imtiyaz et al. 2013). The active ingredient, i.e., curcumin or diferuloylmethane in *C. longa*, has functions such as anti-inflammatory, hepatoprotective, anti-cancer, anti-fungal, neuroprotective activities (Ansar et al. 2020).

Zingiber zerumbet can function as a biomedical such as anti-proliferative, anti-inflammatory, and antioxidant effects (Ahmadabadi et al. 2019). Traditionally *Z. cassumunar* has been used as a medicine to treat diseases such as inflammation, pain, and respiratory problems and it also functions as an antioxidant, anti-inflammatory, anticancer, neuroprotective/neurotropic, cosmetic, and antifungal/antimicrobial bioactivity (Han et al. 2021).

In their community, people gain knowledge about the use of plant organs through traditions that have been carried out for a long time, through their previous parents orally by word of mouth and through dreams, which is still being done now (Julung et al. 2018; Supiandi and Leliavia 2020). In this case, the use of traditional medicinal plants should be done appropriately and supervised by parents or local herbalists who know traditional medicinal plants (Azis et al. 2017).

This study revealed that people in the Linoh Dayak community utilized various plant organs as medicinal ingredients, i.e., tendril (stolon), root, tuber, rhizome, stem, leaf, flower, fruit, fruit peel, and seed. Other studies also show that various plant organs are used as medicine (Yusro et al. 2014; Suharjo et al. 2014). The part of the plant that is widely used in traditional medicine in the Dayak Linoh community is the leaf, with a total of 27 plants (49%) because the leaves were easier to obtain and easy to process (Megersa and Tamrat 2022), and the removal of several leaves did not damage the plants. Similarly, the people in Jambur Labu Village, Aceh Province used the leaves of plants for traditional medicine (Elfrida et al. 2021). Leaves can be used as medicine because they accumulate secondary metabolites, such as flavonoids, saponins, alkaloids, shikonin, vinblastine, vincristine, ajmalicin, and essential oils (Lee et al. 2014; Kabera et al. 2014; Ahmad et al. 2015).

This research concluded that the Dayak Linoh people in Nobal Village, Sungai Tebelian Subdistrict, still have knowledge regarding the use of plants as traditional medicine. Knowledge of traditional medicines in the Dayak Linoh tribe can be used for developing modern medicine.

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