

# UTILIZATION OF WILD PLANTS AS ALTERNATIVE FOOD AND MEDICINE AMONG THE DAYAK KENDAWANGAN SIAKARAN, WEST KALIMANTAN

Deani Rizqy Shafhira Putri<sup>1\*</sup>, Dede Mulyanto<sup>2</sup>, and Budiawati Supangkat<sup>2</sup>

<sup>1</sup>Master Program of Anthropology, Faculty of Social and Political Science, University of Padjajaran, Bandung, Indonesia 40135

<sup>2</sup>Department of Anthropology, Faculty of Social and Political Science, University of Padjajaran, Sumedang, Indonesia 45363

\*Corresponding author: deani24001@mail.unpad.ac.id

---

**Abstract** *This ethnobotanical study aims to document the local knowledge of the Dayak Kendawangan Siakaran community in Randai Village, Ketapang Regency, West Kalimantan, regarding the use of wild plants as alternative sources of food and medicine. This qualitative research used participant observation, semi-structured interviews, and free-listing questionnaires with 23 informants. This study recorded 110 wild plant species from 44 families that are used as alternative food and medicine. The most widely used plant part is the fruit (46%). Apart from the fruit, there are other parts that are used, such as tubers (5%), seeds (3%), roots (4%), leaf-bud (3%), leaves (29%), flowers (1%), stems (2%), shoots (2%), leaves and tubers (1%), fruit and leaves (1%), leaves and stems (1%), leaf-bud and tubers (1%), and all parts (1%). Most wild plants originate from native geographic states (native) Borneo (51%), followed by introductions (exotic) (45%), and endemic (4%). The primary habitat of these plants is predominantly forests and the surrounding village areas (fields, swamps, riverbanks), indicating intensive community interaction with the surrounding ecosystem. However, today the local biodiversity and culture of the community face serious threats from deforestation and land conversion. In response, the community carries out conservation practices based on local wisdom, such as transplanting wild plants in the yard.*

**Keyword:**

*Alternative food and medicine, Dayak Kendawangan Siakaran, ethnobotany, utilization of wild plants, West Kalimantan*

**Article Info**

**Received** : 03 Feb 2026

**Accepted** : 08 Apr 2026

**Published** : 15 Jun 2026

---

## 1. Introduction

The use of wild plants within a community is a product of their local knowledge. The use and processing of wild plants, based on this local knowledge, provides benefits such as maintaining a balance between human needs, environmental sustainability, and biodiversity (Gomes et al., 2023). A community's local botanical knowledge is inseparable from how they utilize existing wild plants. In general, wild plants within a community are typically used as a source of food, crafts, medicines (Geng et al., 2017 ; Ma et al., 2024), fuel (Tahir et al., 2023), cultural aspects such as ritual (Ma et al., 2024; Rahayu et al., 2023), decoration, hunting tools,

and containers (Morip et al., 2022). The use of wild plants as food usually comes from a process of experimentation. Apart from the trial process, knowledge of wild plants that can be used as food ingredients also comes from inheritance passed down from generation to generation (Asfaw et al., 2023 ; Anjeliana et al., 2024).

The use of wild plants, which occurs through a trial and error process by a community group, usually involves parts that are easy to process or consume (Asfaw et al., 2023). These include leaves, fruit, shoots, tubers, shoots, roots, and stems of wild plants. Fruit and leaves are the parts most often used as food ingredients because they are easy to process (Biri et al., 2024; Caetano et al., 2024). Parts of wild plants, such as roots and leaves, can usually be used as medicinal ingredients. However, this process is usually carried out due to inherited knowledge from parents and ancestors (Gebre et al., 2025). Similarly, the Dayak Kendawangan Siakaran people of Randai Village use wild plants not only as food but also as medicinal ingredients. This knowledge of wild plants as food and medicine was obtained through inheritance from their parents and through trial and error in the forest.

The process of utilizing wild plants inherited through local botanical knowledge can serve as a medium to identify the extent to which known wild plant species are safe for the body and have nutritional value. (Hou et al., 2024 ; de Medeiros et al., 2021). In addition to identifying wild plant species that are safe for the human body and their nutritional value, knowledge of wild plant utilization is also useful in determining the habitat, life form of the species, and the distribution area of wild plant species (Mothupi & Shackleton, 2025 ; Gebre et al., 2025 ; Kujawska, 2025 ; Awoke et al., 2025).

The process of utilizing wild plants is part of local botanical knowledge, which provides an overview of how to process wild plants within a community. The local botanical knowledge present in a community plays a crucial role in the processing and utilization of wild plants, such as reducing side effects when consumed. (Awoke et al., 2025 ; de Medeiros et al., 2021; Kujawska, 2025). Thus, in this case, the local botanical knowledge possessed by the community provides important information on how to process wild plants for use as food and medicine. Furthermore, local knowledge is also a driving factor in the use of wild plants as alternative sources of food and medicine within a community (Mothupi & Shackleton, 2025). However, on the other hand, there are several threats to local botanical knowledge and its use. One of these is external threats, such as deforestation and land conversion (Mishra et al., 2021).

Local botanical knowledge regarding the use of wild plants faces various external pressures, such as deforestation and land conversion. Overall, data from the Ministry of Environment and Forestry (KLHK) in 2023 recorded a total of 115,500 hectares of deforestation in Indonesia, with West Kalimantan Province being one of the provinces with the fastest rate of deforestation. Deforestation in West Kalimantan is caused by various human activities, one of which is the conversion of forest cover to oil palm plantations. Several studies have shown that the rate of deforestation is caused by human activities that convert forest cover to agricultural land (de Medeiros, Barbosa, et al., 2021 ; Bodo et al., 2021 ; Gori et al., 2022), and monoculture plantations such as oil palm plantations (Suwardi et al., 2025). The conversion of forest cover to monoculture plantations, namely oil palm plantations, occurred in the environment of the Dayak Kendawangan Siakaran people in Randai Village. Large tracts of forest have been converted into oil palm plantations, both privately owned and owned by local residents. This poses a threat to the local culture of indigenous communities and can ultimately lead to the erosion of local botanical knowledge regarding the use of wild plants. Therefore, to prevent this erosion of local botanical knowledge, the Dayak Kendawangan Siakaran group in Randai Village carries out wild plant conservation activities such as transplanting. This transplantation

demonstrates that local communities are not only utilizing wild plants but also striving to preserve them through practices based on local wisdom (Setiawan et al., 2025 ; Awoke et al., 2025 ; Alemu et al., 2024).

The relationship between humans and the environment in maintaining ecosystem balance is a crucial component of ethnobotanical studies. Furthermore, ethnobotanical studies provide an understanding and explanation of the use, management, and habitat structure of wild plants, based on the local knowledge of a particular group. (Jia et al., 2022 ; Tahir et al., 2023). Among the Dayak Kendawangan Siakaran people, local botanical knowledge extends beyond the use of wild plants. It also encompasses how they cultivate and preserve their diversity. This is a novelty in research into the local culture of the Dayak Kendawangan Siakaran people. This research also contributes to ethnobotanical studies, as it aims to document the diversity of wild plants, through their use as alternative foods and medicines, within the Dayak Kendawangan Siakaran community, using ethnobotanical studies.

## 2. Method

### 2.1. Research Site

This research was conducted on the Dayak Kendawangan Siakaran people of Randai Village, Marau District, Ketapang Regency, West Kalimantan. The research was conducted in September 2025.

Randai Village is a settlement located in the hilly highlands. Furthermore, Randai Village is one of ten villages in Marau District. Administratively, Randai Village borders several villages: Batu Payung Village to the north; Rangkung Village and Sungai Jelayan Village to the south; Rangkung Village to the east; and Sungai Jelayan Village to the west.

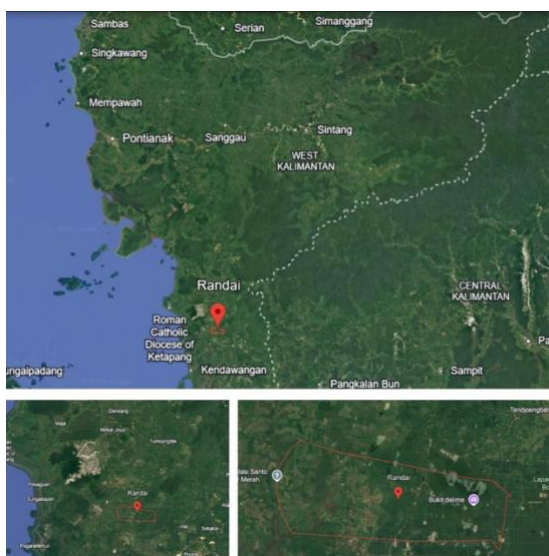


Figure 1: Map of Research Site

This research, using ethnobotanical studies, examines the local knowledge and history held by the Dayak people, which characterizes them. This allows them to cultivate beyond administrative boundaries, thanks to their local and historical knowledge. memory of the region and traces of gathering. Therefore, this research will focus on the location and coverage area, based on local knowledge and historical memory held by the Dayak Kendawangan Siakaran

people. This rationale is reinforced by the fact that the Dayak people essentially reflect a communal life structure (Sada et al., 2019 ; Widen, 2023).

## 2.2. Data Collection

The data in this study were collected through participant observation, free listing, and semi-structured interviews. Informal interviews were conducted with each informant to obtain information regarding local knowledge regarding the use of wild plants as alternative food and medicine. Each informant was selected through a purposeful sampling method. Interviews and free listing were conducted to document the wild plants they utilize as alternative food and medicine. Furthermore, interviews and free listing were conducted to obtain local names, habitats, parts used, utilization methods, and processing methods for the wild plant species they frequently use.

The activity of directly identifying wild plants used as alternative food and medicine, among the Dayak Kendawangan Siakaran people, was assisted by 23 informants, consisting of 11 women and 12 men. Direct observations in their habitats such as forests and fields were guided by 6 informants. This activity was carried out with the aim of documenting the species mentioned by the informants during the interview. After the local names of wild plants were collected, taxonomic identification was carried out to find the scientific names of the plant species. To ensure validity, all scientific names were checked through Plants of the World Online (POWO) (<https://powo.science.kew.org/>).

## 2.3. Data Analysis

The data collected through observation, interviews, and free listings will then be processed, sorted, and presented in tabular form. The classification table for wild plants used as alternative food and medicinal ingredients will be processed using Microsoft Excel. The use of the RFC (Relative Frequency of Citation) index and the Sørensen Similarity Coefficient in this study was carried out to help determine the level of knowledge of the Dayak Kendawangan Siakaran people regarding the use and habitat of useful wild plants, which will then be described anthropologically. The use of this RFC analysis aims to determine how widely a plant species is known within a community. (Tardio & Pardo-De-Santayana, 2008). The calculation in the RFC analysis is done using the formula:

$$RFC = \frac{NF}{C}$$

RFC is Relative Frequency of Citations; then NF is the number of informants who mentioned the species; and N is the total number of informants involved in this study. The use of RFC analysis has a range of values in its calculations, namely between 0 and 1. The interpretation of the range of values in the RFC analysis is: if 0, then knowledge about the species is not recognized or less familiar in the community. If 1, then knowledge about the species is very well known by the community.

In addition to the Relative Frequency of Citation, this study also uses Sørensen Similarity Coefficient to measure the similarity of structure and composition of the compared plant species, and found in two different habitats (Fadilah et al., 2024). This index can be calculated using the formula:

$$IS = \frac{2c}{a+b}$$

The Sorensen Similarity Index (IS) is obtained by multiplying 2 by c, where c is the species found in habitat (x and y), which is then divided by the sum of a (the number of species found in habitat x), and b (the number of species found in habitat y).

### 3. Results and Discussion

#### 3.1 Botanical Data on Wild Plants as Alternative Sources of Food and Medicine

Data from research results recorded 110 species of wild plants as alternative sources of food and medicine, consisting of 44 family groups.

Table 1: Diversity of Wild Plants as Alternative Food and Medicine

Taxa	Vernacular Name	Part Used	Geographic Status to Borneo	Life Form	RFC
<b>Food Species</b>					
Alismataceae					
<i>Limnocharis flava</i> (L.) Buchenau	Genjer	Leaf	Exotic	Perennial	0,52
Anacardiaceae					
<i>Bouea macrophylla</i> Griff.	Satar	Fruit	Exotic	Tree	0,43
<i>Mangifera similis</i> Blume	Asam kemantan	Fruit	Native	Tree	0,26
<i>Mangifera foetida</i> Lour.	Asam bacang	Fruit	Native	Tree	0,13
<i>Mangifera pajang</i> Kosterm.	Asam membawang	Fruit	Endemic	Tree	0,04
Amaranthaceae					
<i>Amaranthus spinosus</i> L.	Jagoi	Leaf	Exotic	Annual	0,13
Apocynaceae					
<i>Willughbeia coriacea</i> Wall.	Jantaan	Fruit	Native	Liana	0,39
Araceae					
<i>Amorphophallus titanum</i> (Becc.) Becc.	Acung	Flower	Exotic	Annual	0,04
<i>Alocasia macrorrhizos</i> (L.) G.Don	Keladiq	Tuber	Native	Shrub	0,43
<i>Colocasia esculenta</i> (L.) Schott	Keladiq sulur	Stem	Exotic	Perennial	0,13
Arecaceae					
<i>Arenga pinnata</i> (Wurmb) Merr.	Enau	Fruit	Exotic	Tree	0,65
<i>Areca catechu</i> L.	Pinang	Fruit	Exotic	Tree	0,13
<i>Salacca Affinis</i> Griff.	Ranggam	Fruit	Native	Perennial	0,35
<i>Eleiodoxa conferta</i> (Griff.)Burret	Maram	Fruit	Native	Tree	0,48
<i>Calamus manan</i> Miq.	Jelayan	Fruit	Native	Liana	0,38
<i>Calamus ruber</i> Reinw. Ex Mart.	Nangaq	Leaf-bud	Exotic	Liana	0,13
<i>Salacca wallichiana</i> Mart.	Hakam	Fruit	Exotic	Perennial	0,43
Aspleniaceae					
<i>Stenochlaena palustris</i> (Burm.f.) Bedd.	Pakuq merah	Leaf	Native	Fern	0,22
<i>Diplazium esculentum</i> (Retz.) Sw.	Pakuq ikan	Leaf	Native	Fern	0,07
Asteraceae					
<i>Cosmos caudatus</i> Kunth	Daun kasum	Leaf	Exotic	Annual	0,09
Burseraceae					
<i>Dacryodes rostrata</i> (Blume) H.J.Lam	Kariataq	Fruit	Native	Tree	0,35
Brassicaceae					
<i>Brassarda juncea</i> (L.) Su Liu & Z.H.Feng	Sensayap	Leaf	Exotic	Shrub	0,30
Clusiaceae					
<i>Garcinia xanthochymus</i> Hook.f. ex T.Anderson					

Convolvulaceae	Asam kandis	Fruit	Exotic	Tree	0,04
<i>Ipomoea aquatica</i> Forssk.					
<i>Ipomoea batatas</i> (L.) Lam.	Kangkong julur	Leaf	Native	Annual	0,39
Cucurbitaceae	Hubiq setila	Tuber	Exotic	Perennial	0,39
<i>Benincasa hispida</i> (Thunb.) Cogn.					
<i>Cucumis melo</i> L.	Kundur	Fruit, leaf	Native	Annual	0,26
<i>Cucumis sativus</i> L.	Timun padi	Fruit	Exotic	Annual	0,17
<i>Cucurbita maxima</i> Duchesne	Timun lakau	Fruit	Exotic	Annual	0,22
<i>Momordica balsamina</i> L.	Labu perenggi	Fruit	Exotic	Annual	0,22
<i>Lagenaria siceraria</i> (Molina) Standl.	Periaq tikus	Fruit	Exotic	Annual	0,04
<i>Luffa acutangula</i> (L.) Roxb.	Labu lakau	Fruit	Exotic	Annual	0,26
<i>Trichosanthes costata</i> Blume	Gambas	Fruit	Exotic	Annual	0,39
<i>Trichosanthes cucumerina</i> L.	Lapiq	Fruit	Native	Perennial	0,22
Dilleniaceae	Periaq manis	Fruit	Exotic	Annual	0,22
<i>Dillenia suffruticosa</i> (Griff. ex Hook.f. & Thomson) Martelli	Simpur	Leaf	Native	Shrub	0,09
Dioscoreaceae					
<i>Dioscorea esculenta</i> (Lour.) Burkill					
Euphorbiaceae	Gembiliq	Tuber	Native	Liana	0,17
<i>Cnidocolus aconitifolius</i> (Mill.) I.M.Johnst.					
<i>Manihot esculenta</i> Crantz	Daun ubi jepang	Leaf	Exotic	Tree	0,22
<i>Manihot glaziovii</i> Müll.Arg.	Hubiq kayu	Leaf,tuber	Exotic	Perennial	0,39
<i>Elateriospermum tapos</i> Blume	Ubi parah	Leaf	Exotic	Tree	0,22
Fabaceae	Kelampai	Fruit	Native	Tree	0,13
<i>Archidendron pauciflorum</i> (Benth.)					
<i>Dialium indum</i> L.	Jaring	Fruit	Exotic	Tree	0,04
<i>Neptunia oleracea</i> Lour.	Keranji	Fruit	Native	Tree	0,26
Gramineae	Kangkong malu	Leaf	Native	Shrub	0,17
<i>Gigantochloa hasskarliana</i> (kurz) Backer ex Heyne	Pering	Shoot	Native	Perennial	1
Hypoxidaceae					
<i>Curculigo latifolia</i> Dryand. Ex W.T.Aiton					
Lamiaceae	Jangkut	Fruit	Native	Perennial	0,17
<i>Premna serratifolia</i> L.					
<i>Vitex pinnata</i> L.	Singkil	Leaf	Native	Tree	0,56
Maliaceae	Lelaban	Leaf	Native	Tree	0,22
<i>Epicharis parasitica</i> (Osbeck) Mabb.					
<i>Sandoricum koetjape</i> (Burm.f.) Merr.	Duku	Fruit	Native	Tree	0,48
Malvaceae	Buah bunut	Fruit	Native	Tree	0,09
<i>Durio kutejensis</i> (Hassk.) Becc.					
<i>Durio oxleyanus</i> Griff.	Pekawai	Fruit	Endemic	Tree	0,39
<i>Durio dulcis</i> Becc.	Teratungan	Fruit	Native	Tree	0,22
Melastomataceae	Kusik	Fruit	Endemic	Tree	0,52
<i>Melastoma malabathricum</i> L.					
<i>Bellucia pentamera</i> Naudin	Kenduduq	Fruit	Native	Shrub	0,30
Menispermaceae	Jambu monyet	Fruit	Exotic	Tree	0,13
<i>Pycnarrhena cauliflora</i> (Miers) Diels					
Moraceae	Sengkubaq	Leaf	Exotic	Liana	0,13
<i>Artocarpus altilis</i> (Parkinson) Fosberg					
<i>Artocarpus anisophyllus</i> Miq.	Sukun	Fruit	Exotic	Tree	0,09
<i>Artocarpus camansi</i> Blanco	Mentawaq	Fruit	Native	Tree	0,26
<i>Artocarpus integer</i> (Thunb.) Merr.	Keluih	Fruit	Exotic	Tree	0,04
<i>Artocarpus sericarpus</i> F.M.Jarrett	Tebadak	Fruit	Native	Tree	0,39
Musaceae	Buah punuk	Fruit	Native	Tree	0,09
<i>Musa acuminata</i> Colla					

Myristicaceae	Pisang lilin	Leaf-bud	Native	Perennial	0,09
<i>Horsfieldia crassifolia</i> (Hook.f. & Thomson) Warb.	Kumpang	Fruit	Native	Tree	0,13
Myrtaceae					
<i>Syzygium polyanthum</i> (Wight) Walp.					
<i>Rhodomyrtus tomentosa</i> (Aiton) Hassk.	Daun galam	Leaf	Native	Tree	0,22
Passifloraceae	Karamunting	Fruit	Native	Shrub	0,22
<i>Passiflora foetida</i> L.					
Pedaliaceae	Pacat daging	Fruit	Exotic	Perennial	0,17
<i>Sesamum indicum</i> L.					
Phyllanthaceae	Langa	Seed	Exotic	Annual	0,13
<i>Baccaurea macrocarpa</i> (miq.) Müll.Arg.					
<i>Baccaurea lanceolata</i> (Miq.) Müll.Arg.	Kapul	Fruit	Native	Tree	0,30
<i>Baccaurea angulata</i> Merr.	Asam pauh	Fruit	Native	Perennial	0,43
Piperaceae	Kekalik	Fruit	Endemic	Tree	0,09
<i>Piper aduncum</i> L.					
<i>Piper</i> L.	Kecincing	Leaf	Exotic	Shrub	0,04
Poaceae	Sirih	Leaf	Native	Perennial	0,22
<i>Coix lacryma-jobi</i> L.					
<i>Dendrocalamus asper</i> (Schult. & Schult.f.) Backer	Jenjaliq	Seed	Native	Annual	0,17
<i>Saccharum officinarum</i> L.	Betung	Shoot	Native	Perennial	0,13
<i>Setaria italica</i> (L.) P.Beauv.	Tabuq hitam	Stem	Exotic	Perennial	0,13
Polypodiaceae	Jawaq	Seed	Exotic	Annual	0,22
<i>Nephrolepis biserrata</i> (Sw.) Schott					
Rosaceae	Pakuq uban	Leaf	Native	Perennial	0,04
<i>Rubus muluccanus</i> L.					
Rubiaceae	Mpringat	Fruit	Native	Shrub	0,17
<i>Coffea arabica</i> L.					
<i>Uncaria guianensis</i> (Aubl.) J.F.Gmel.	Kopi	Leaf	Exotic	Shrub	0,04
Rutaceae	Ganjir	Leaf	Exotic	Liana	0,04
<i>Melicope glabra</i> (Blume) T.G.Hartley					
Salicaceae	Segulang	Leaf	Exotic	Perennial	0,17
<i>Flacourtia rukam</i> Zoll. & Moritzi					
Sapindaceae	Rukam	Fruit	Native	Tree	0,17
<i>Nephelium laurinum</i> Blume					
Solanaceae	Rangkung	Fruit	Native	Tree	0,26
<i>Physalis angulata</i> L.					
<i>Solanum torvum</i> Sw.	Leletup	Fruit	Exotic	Annual	0,17
<i>Solanum lasiocarpum</i> Dunal	Terong pipit	Fruit	Exotic	Shrub	0,22
Zingiberaceae	Terong asam	Fruit	Native	Shrub	0,30
<i>Alpinia galanga</i> (L.) Willd.					
	Lajaq	Leaf-bud,tuber	Native	Perennial	0,09
<i>Curcuma zanthorrhiza</i> Roxb.					
<i>Etingera coccinea</i> (Blume)S.Sakai & Nagam.	Tentamuq	tuber	Exotic	Annual	0,09
<i>Etingera elatior</i> (Jack) R.M.Sm.	Tepus	Fruit	Native	Perennial	0,22
<i>Zingiber officinale</i> Roscoe					
	Lucung	Fruit	Native	Perennial	0,26
	Liak padi	Tuber	Exotic	Perennial	0,13

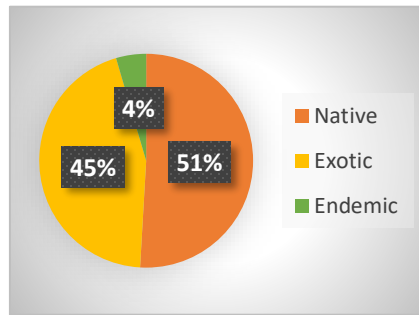
### Medicinal Species

Acanthaceae					
<i>Justicia gendarussa</i> Burm.f.	Idup idup	Leaf	Exotic	Shrub	0,17
Araceae					

<i>Monstera adansonii</i> Schott	Janda bolong	Leaf	Exotic	Ephypite	0,09
Asteraceae					
<i>Gynura procumbens</i> (Lour.) Merr.	Sambung umur	Leaf	Native	Perennial	0,04
<i>Sonchus arvensis</i> L.	Patah kemudi	Leaf	Exotic	Perennial	0,04
<i>Blumea balsamifera</i> (L.) DC.	Sensambung	Leaf	Native	Shrub	0,22
<i>Ageratum conyzoides</i> L.	Kentut kuduq	Leaf	Exotic	Annual	0,04
Euphorbiaceae					
<i>Euphorbia tithymaloides</i> L.	Pandih	Leaf,stem	Exotic	Shrub	0,04
Fabaceae					
<i>Senna tora</i> (L.) Roxb.	Kacang kuning	Leaf	Exotic	Shrub	0,22
<i>Spatholobus littoralis</i> Hassk.	Kelelait	Root	Native	Liana	0,04
Loranthaceae					
<i>Dendrophthoe glabrescens</i>	Kayu alah	Leaf	Exotic	Ephypite	0,30
Malvaceae					
<i>Donax canniformis</i> (G.Forst.) K.Schum.	Bamban	Tuber	Native	Perennial	0,26
<i>Scaphium affine</i> (Mast.) Pierre	Tempayang bangar	Leaf	Native	Tree	0,04
Myrtaceae					
<i>Syzygium zeylanicum</i> (L.) DC.	Nasiq nasiq	Leaf	Native	Shrub	0,04
Orchidaceae					
<i>Bulbophyllum beccarii</i> Rchb.f	Anggrek kuping gajah	Root	Endemic	Ephypite	0,13
<i>Grammatophyllum speciosum</i> Blume	Tabuq tenggiling	Root	Native	Ephypite	0,09
Poaceae					
<i>Eleusine indica</i> (L.) Gaertn.	Gurun banuaq	All	Native	Shrub	0,35
<i>Imperata cylindrica</i> (L.) Raeusch.	Lalang	Root	Exotic	Perennial	0,09
Polypodiaceae					
<i>Pyrrrosia piloselloides</i> (L.) M.G.Price	Sisik naga	Leaf	Native	Ephypite	0,13
Rubiaceae					
<i>Hydnophytum magnifolium</i> Merr. & L.M. Perry	Riman	Tuber	Exotic	Ephypite	0,22
Sapindaceae					
<i>Eurycoma longifolia</i> Jack	Pasak bumi	Root	Native	Perennial	0,04

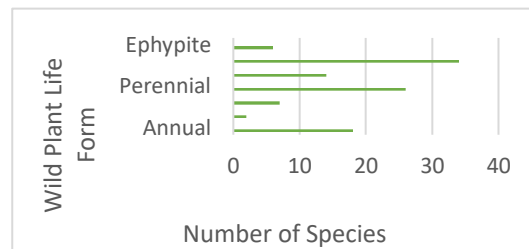
The data presented in (Table 1) shows that the distribution of wild plant species known to the Dayak Kendawangan Siakaran people is divided into three groups: exotic, native, and endemic. Exotic distribution refers to species that are not native to the region but have entered and spread into the local ecosystem; native distribution refers to plant species that are naturally present in the region (Sitepu, 2020); and endemic distribution refers to plant species that are only found in certain geographic areas (Wao et al., 2023). Therefore, after reviewing (Table 1), the number of distributions according to their geographic area for wild plants as alternative food and medicine, family groups *Arecaceae*, *Fabaceae*, *Malvaceae*, *Moraceae*, *Myrtaceae*, and *Zingiberaceae* has the largest number in the native distribution group, and in the exotic distribution geographic area, the family group *Cucurbitaceae* and *Arecaceae* has the largest distribution. Then in the endemic distribution group, the family group *Malvaceae* has the largest number of species.

Diagram 1. Percentage of Distribution of Wild Plants as Food and Medicine Alternatives



The data in (Diagram 1) shows that most of the wild plants used as alternative food and medicine originate from the island of Borneo (Kalimantan), with a distribution of (51%). In addition, as many as (4%) of the wild plants used as alternative food and medicine are endemic plants and only exist on the island of Borneo. (4%) of these plants come from the Malvaceae, Phyllanthaceae, Orchidaceae, and Anarcadiaceae families. Of these four family groups, the Dayak Kendawangan Siakaran people usually use them as food ingredients, or basic ingredients for medicines. Then, as many as (45%) of the wild plants used as alternative food and medicine are the result of introductions. This indicates a history of travel, which then resulted in the exchange of wild plant species.

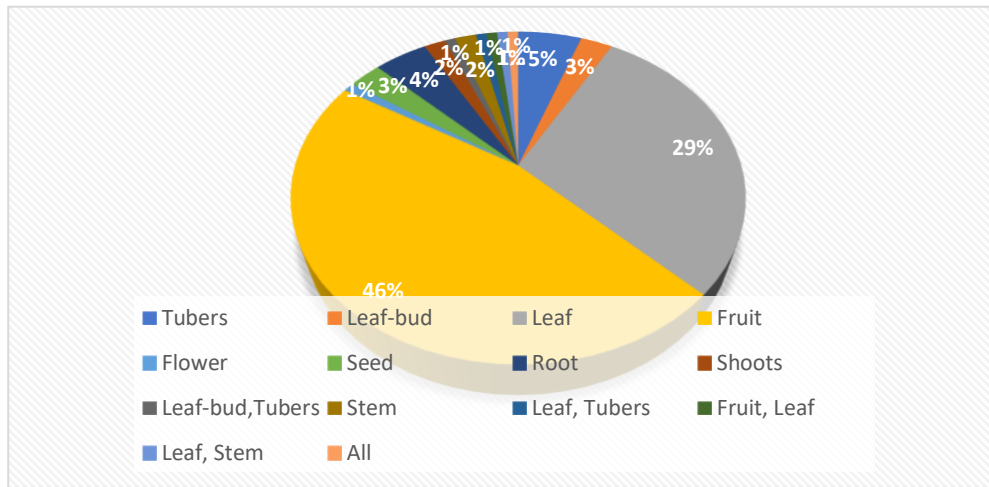
Diagram 2. Life Form of Wild Plants as Alternative Sources of Food and Medicine



The data in (Diagram 2) shows that the dominant life form of wild plants used as alternative food and medicine is Tree, with 34 species. Besides Tree, the largest number of wild plant life forms used as alternative food and medicine are Perennial, with 26 species. The Dayak Kendawangan Siakaran people are familiar with tree life forms because they frequently encounter these types of life forms while gathering in the forest. Furthermore, wild plants in the tree form also have a long life cycle, allowing them to frequently encounter wild plant species with tree life forms in their daily lives. The Kendawangan Siakaran Dayak people's familiarity with tree life forms stems from their frequent use of the fruit of these trees as an alternative food source. This has led to their extensive knowledge of species with tree life forms.

The types of life forms known to the Dayak Kendawangan Siakaran people are not only Trees and Perennials. But there are also Annuals (18 species), Shrubs (17 Species), Ferns (2 species), Liana (7 Species), and Epiphytes (6 Species). And all types of species from various life forms are used as alternative sources of food and medicine in the local life of the Dayak Kendawangan Siakaran people.

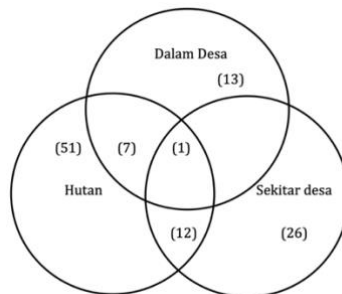
Diagram 3. Percentage of Wild Plant Parts Utilized As an Alternative Source of Food and Medicine



The data in (Diagram 3) shows that there are 14 types of wild plant parts used as alternative sources of food and medicine by the Dayak Kendawangan Siakaran people. The largest percentage of wild plant parts that can be used is fruit (46%). As much as (46%), the use of fruit is used as an alternative food when in the forest, when they do hunting and gathering activities. In addition to using fruit, the Dayak Kendawangan people also use other parts, such as tubers (5%), seeds (3%), roots (4%), leaf-bud (3%), leaves (29%), flowers (1%), stems (2%), shoots (2%), leaves and tubers (1%), fruit and leaves (1%), leaves and stems (1%), leaf-bud and tubers (1%), and all parts (1%), to be used as alternative sources of food and medicine.

### 3.2 Habitat Distribution

Diagram 4. Distribution of Wild Plant Habitats as Alternative Sources of Food and Medicine



Wild plants in the local life of the Dayak Kendawangan Siakaran people are divided into 3, namely in the forest, around the village zone (swamps, river banks, and fields), and the zone within the village (yard). From (Diagram 4) it can be seen that many wild plant species are found in the forest and in the zone around the village. Based on the calculations Sørensen Similarity Coefficient, wild plant species with high similarity are those that live in their natural forest habitats and in areas surrounding villages, such as fields, swamps, and riverbanks, compared to plants that live in habitats like yards.

The extensive knowledge of wild plants as alternative food and medicine in habitats like forests is due to the ongoing interaction between Dayak people and the forest (Nelaballi et al.,

2025). Similarly, the Dayak Kendawangan Siakaran people interact intensively with the forest and its surrounding areas. Consequently, they possess a highly developed knowledge of the species that live in habitats like forests and the areas surrounding villages, such as fields, swamps, and riverbanks.

### 3.3 Utilization of Wild Plants and Socio-Cultural Aspects of the Dayak Kendawangan Siakaran People

The local knowledge of the Dayak Kendawangan Siakaran regarding the familiarity of a wild plant species, which can be used as an alternative source of food and medicine, can be seen through the Relative Frequency Citation index. In the local botanical knowledge of the Dayak Kendawangan Siakaran, the most familiar wild plant species is *Gigantochloa hasskarliana* (kurz) Backer ex Heyne (Pering), with the number of RFCs as (1). This shows that the species *Gigantochloa hasskarliana* (kurz) Backer ex Heyne (Pering), the most feared in the lives of the Dayak Kendawangan Siakaran people. The part of this wild plant species that is used is the shoots, as an alternative food source. In addition to the species *Gigantochloa hasskarliana* (kurz) Backer ex Heyne (Pering) which is used as an alternative food source, there are other plant species that have the most mentions in local botanical knowledge as an alternative food, in the lives of the Dayak Kendawangan Siakaran people. Such as *Bouea macrophylla* Griff. (*Satar*) (0.43), *Eleiodoxa conferta* (Griff.) Burret (*Maram*) (0.48), *Salacca Wallachian* Mart. (*Hakam*) (0.43), *Epicharis parasitica* (Osbeck) Mabb. (*Duku*) (0.48), *Durio dulcis* Becc. (*Kusik*) (0.52), *Baccaurea lanceolata* (Miq.) Müll.Arg. (*Asam Pauh*) (0.43), and *Arenga pinnata* (Wurmb) Merr. (*Enau*) (0.65). Apart from the fruit, in the knowledge of the Dayak Kendawangan Siakaran people there are also other species which have the most mentions, such as the leaves of the species *Limnocharis flava*(L.) Buchenau (*Genjer*) (0.52), *Premna serratifolia* L. (*Singkil*) (0.56), and tubers in the species *Alocasia macrorrhizos*(L.) G.Don (*Keladiq*) (0.43).

Wild plants utilized by the Dayak Kendawangan Siakaran people are also divided into several parts according to their respective functions and uses (Diagram 3). The most commonly used part by the Dayak Kendawangan Siakaran people is the fruit, with a total of (46%). This fruit is usually used as an alternative food when in the forest while hunting or gathering. Because fruit is a part of wild plants that is easy to process and obtain. As an alternative food while in the forest, the Dayak Kendawangan Siakaran people usually consume the fruit directly. However, in their daily lives, the Dayak Kendawangan Siakaran people process wild plant parts such as fruit, usually by eating them directly, fermenting them, making them into spices, or even making rujak (fruit salad). Examples include species such as *Eleiodoxa conferta* (Griff.) Burret (*Maram*), the fruit of this species is not only eaten raw. They also process the fruit into sweets, rujak (fruit salad), and as a spice to add acidity to dishes. The use of the fruit as an alternative food source, and its practical processing time, also occurs in several places in Indonesia (Suwardi & Mukhtar, 2023).

In addition to using fruit as an alternative food source, the Dayak people of Kendawangan Siakaran also utilize other parts of the plant, such as leaves, tubers, and seeds. The leaves of certain species are typically used in stir-fries, salads, and clear vegetable soups. Some wild plant species used by the Dayak people of Kendawangan Siakaran as alternative food sources include: *Piper aduncum* L. or as they familiarly call it *Kecincing*. Species *Piper aduncum* L. (*Kecincing*) is usually processed by boiling and making clear soup together with bamboo shoots (*Rebung*). In addition to the species *Piper aduncum* L. (*Kecincing*), there are other types of species that are used as an alternative source of food, namely species *Syzygium polyanthum* (Wight) Walp. (*Daun Galam/Daun Salam*), *Vitex pinnata* L. (*Daun Lelaban*), and *Dillenia suffruticosa* (Griff. ex Hook.f.

& Thomson) Martelli (*Daun Simpur*). These three species usually use the young leaves as raw vegetables. Furthermore, there are also other species. *Diplazium esculentum* (Retz.) Sw. (*Pakuq Ikan*), and *Stenochlaena palustris* (Burm.f.) Bedd. (*Pakuq Merah*) which is used as an alternative food source by the Dayak Kendawangan Siakaran people. They typically prepare the two species by stir-frying them. They also call the dish made from the leaves of these two species "tumis pakuq." The use of leaves as a food source is also found in several places. (Sukoharjo et al., 2023; Ramlah et al., 2023).

Besides leaves, other species are also used as alternative food and carbohydrate sources, namely tubers and grains. Some of these species include *Dioscorea esculenta* (Lour.) Burkill, *Coix lacryma-jobi* L., *Setaria italica* (L.) P. Beauv, *Alocasia macrorrhizos* (L.) G. Don, *Ipomoea batatas* (L.) Lam., and *Manihot esculenta* Crantz, or as they are known as *kembiliq*, *jenjaliq*, *jawaq*, *keladiq*, *hubiq setila*, and *hubiq kayu*. These four species are used as a substitute for rice when away from home. They usually prepare these wild plants by boiling or grilling them. Similarly, in some places, the use of several species, such as *Dioscorea esculenta* (Lour.) Burkill, *Coix lacryma-jobi* L., and *Setaria italica* (L.) P. Beauv, is an alternative source of carbohydrates besides rice (Sukoharjo et al., 2023; Ramlah et al., 2023).

Besides being an alternative food source, the knowledge of wild plants among the Dayak Kendawangan Siakaran people also includes their use as alternative medicines. Some of the species most frequently mentioned in Dayak Kendawangan Siakaran knowledge include: *Blumea balsamifera* (L.) DC. (*Sensambung*) (0.22), *Senna Tora* (L.) Roxb. (*Kacang Kuning*) (0.22), *Dendrophthoe glabrescens* (*Kayu Alah*) (0.30) *Donax canniformis* (G. Forst.) K. Schum. (*Bamban*) (0.26), *Eleusine indica* (L.) Gaertn. (*Gurun Banuaq*) (0.35), *Hydnophytum magnifolium* Merr. & LM Perry (*Riman*) (0.22). The parts of this species that are commonly used are the leaves and tubers. However, there is one species where all parts are useful, such as *Eleusine indica* (L.) Gaertn. (*Gurun Banuaq*). Species *Eleusine indica* (L.) Gaertn. (*Gurun Banuaq*) they usually use as a medicine for broken bones and sprains mixed with several other wild plant species, namely leaves *Justicia gendarussa* Burm.f. (*Idup idup*) which has been withered over a fire, which is then tied together on the injured part.

Wild plants that are used as alternative medicinal ingredients in the knowledge of the Dayak Kendawangan Siakaran people are: *Senna Tora* (L.) Roxb. (*Kacang Kuning*), *Dendrophthoe glabrescens* (*Kayu Alah*). These two species are commonly used for hepatitis sufferers, or what they call 'sakit kuning'. The way to prepare these plant species is by boiling some of the leaves, and then giving the patient the boiled water to drink. They believe that this wild plant species can cure illnesses, because this plant species has yellow seeds. In addition, there are also other wild plant species that they believe can cure diseases and are used as alternative sources of medicine. Species *Hydnophytum magnifolium* Merr. & LM Perry (*Riman*), is one of the wild plants that is believed to be able to cure scabies, and *barakah* (tumor). How to process this wild plant as medicine to treat tumors, chop the tubers and dry them in the sun. Once dry, the tubers are boiled and the water is drunk. To use them as an alternative remedy for scabies, the dried tubers are burned until they turn into charcoal and then applied to the affected skin.

The Dayak Kendawangan Siakaran people's knowledge of wild plants used as alternative food and medicine must be continuously preserved. Therefore, they employ a method of transplanting, or replanting wild plants that can be used as alternative food and medicine sources, in their yards or fields to ensure that their knowledge of these wild plant species is not lost. Furthermore, widespread land conversion and deforestation increasingly compel them to carry out these activities to continue preserving their existing culture. Transplanting and

safeguarding the preservation of wild plants are carried out to ensure that local knowledge of wild plants and the cultural identity of a community are not lost or extinct (Liu et al., 2023 ; Aulia & Mulyanto, 2024).

#### 4. Conclusion

This study documented 110 species of wild alternative food and medicinal plants known to the Dayak Kendawangan Siakaran people, divided into 44 family groups. The most common knowledge of wild plant parts used by the Dayak Kendawangan Siakaran people was about the fruit (46%) and leaves (29%). These parts are commonly used as daily food ingredients, in various preparations. This indicates a high level of interaction with the surrounding environment and plants. However, deforestation and land conversion currently threaten their space and culture. Therefore, the only thing that can be done is to preserve these wild plant species, so that their knowledge and biodiversity are maintained.

This ethnobotanical research is an effort to preserve local knowledge about the use of wild plants as alternative sources of food and medicine. Furthermore, this research serves as a form of cultural preservation for the Dayak Kendawangan Siakaran community through recording and documentation, and provides new insights into ethnobotanical studies on local Dayak knowledge.

#### References

- Alemu, M., Asfaw, Z., Lulekal, E., Warkineh, B., Debella, A., Sisay, B., & Debebe, E. (2024). Ethnobotanical study of traditional medicinal plants used by the local people in Habru District, North Wollo Zone, Ethiopia. *Journal of Ethnobiology and Ethnomedicine*, 20(1), 1–30. <https://doi.org/10.1186/s13002-023-00644-x>
- Anjeliana, Syamswisna, & Yeni, L. F. (2024). Etnobotani Tumbuhan Liar Sebagai Alternatif Pangan Oleh Masyarakat Dayak Pesaguan Desa Serengkah Kanan Kabupaten Ketapang. *Bioscientist: Jurnal Ilmiah Biologi*, 12(2), 2714–2725.
- Asfaw, A., Lulekal, E., Bekele, T., Debella, A., Tessema, S., Meresa, A., & Debebe, E. (2023). Trees , Forests and People Ethnobotanical study of wild edible plants and implications for food security. *Trees, Forests and People*, 14(October), 100453. <https://doi.org/10.1016/j.tfp.2023.100453>
- Aulia, S. A. Z., & Mulyanto, D. (2024). Gathering Edible Wild Plants in a Mountain Village of West Java , Indonesia : Diversity of Species , Utilizations , and Local Perceptions. *Journal of Tropical Ethnobiology*, 7(2), 79–101.
- Awoke, A., Siyum, Y., Gudesho, G., Akmel, F., & Abate, K. S. (2025). Ethnobotanical study of wild and semi-wild edible plants in Yeki district, Sheka Zone, Southwest Ethiopia. In *Journal of Ethnobiology and Ethnomedicine* (Vol. 21, Issue 1). BioMed Central. <https://doi.org/10.1186/s13002-025-00810-3>
- Biri, S., Ayenew, B., Dida, G., Sebsibe, A., Gurmessa, F., Woldeab, B., Awlache, G., Kassa, Z., & Megersa, M. (2024). Ethnobotanical study of wild edible plants in Arsi Robe district of East Arsi Zone, Ethiopia. *Journal of Ethnobiology and Ethnomedicine*, 20(1). <https://doi.org/10.1186/s13002-024-00703-x>
- Bodo, T., Gimah, B. G., & Seomoni, K. J. (2021). Deforestation and Habitat Loss: Human Causes, Consequences and Possible Solutions. *Journal of Geographical Research*, 4(2), 22–30. <https://doi.org/10.30564/jgr.v4i2.3059>
- Caetano, R. de A., da Silva, E. L. G., Colin-Nolasco, L. F., da Silva, R. R. V., Carvalho, A. R., & Medeiros, P. M. (2024). Conservation of wild food plants from wood uses: evidence

- supporting the protection hypothesis in Northeastern Brazil. *Journal of Ethnobiology and Ethnomedicine*, 20(1). <https://doi.org/10.1186/s13002-024-00719-3>
- de Medeiros, P. M., Barbosa, D. M., dos Santos, G. M. C., & da Silva, R. R. V. (2021). Wild Food Plant Popularization and Biocultural Conservation: Challenges and Perspectives. *Springer*, 341–349. [https://doi.org/10.1007/978-3-030-69139-4\\_16](https://doi.org/10.1007/978-3-030-69139-4_16)
- de Medeiros, P. M., dos Santos, G. M. C., Barbosa, D. M., Gomes, L. C. A., Santos, É. M. da C., & da Silva, R. R. V. (2021). Local knowledge as a tool for prospecting wild food plants: experiences in northeastern Brazil. *Scientific Reports*, 11(1), 1–14. <https://doi.org/10.1038/s41598-020-79835-5>
- Fadilah, A., Sulistijorini, & Ariyanti, N. S. (2024). Potensi Cadangan Biji Tumbuhan Bawah Pasca Erupsi Merapi di Taman Nasional Gunung Merapi Seed Bank Potential of Understorey Plants After The Eruption of Merapi Volcano in Mount Merapi National Park. *Jurnal Sumberdaya HAYATI*, 10(1).
- Gebre, A., Gitima, G., & Berhanu, Y. (2025). Ethnobotanical study of wild edible plants in Goba District Southwest Ethiopia. *Scientific Reports*, 15(1), 1–14. <https://doi.org/10.1038/s41598-025-11862-6>
- Geng, Y., Hu, G., Ranjitkar, S., Shi, Y., Zhang, Y., & Wang, Y. (2017). The implications of ritual practices and ritual plant uses on nature conservation: a case study among the Naxi in Yunnan Province, Southwest China. *Journal of Ethnobiology and Ethnomedicine*, 13(1), 58. <https://doi.org/10.1186/s13002-017-0186-3>
- Gomes, L. C. A., de Medeiros, P. M., & Prata, A. P. do N. (2023). Wild food plants of Brazil: a theoretical approach to non-random selection. *Journal of Ethnobiology and Ethnomedicine*, 19(1), 1–12. <https://doi.org/10.1186/s13002-023-00603-6>
- Gori, B., Ulian, T., Bernal, H. Y., & Diazgranados, M. (2022). Understanding the diversity and biogeography of Colombian edible plants. *Scientific Reports*, 12(1), 1–15. <https://doi.org/10.1038/s41598-022-11600-2>
- Hou, S., Huang, P., & Yao, Z. (2024). Ethnobotany study on wild edible plants used by the Tujia ethnic group in Laifeng, southwest Hubei, China. *Journal of Ethnobiology and Ethnomedicine*, 20(1). <https://doi.org/10.1186/s13002-024-00735-3>
- Jia, X., Zhao, Y., Zhu, Y., Zeng, X., Liang, X., Xie, J., & Wu, F. (2022). Ethnobotany of wild edible plants in multiethnic areas of the Gansu–Ningxia–Inner Mongolia junction zone. *Journal of Ethnobiology and Ethnomedicine*, 18(1), 1–14. <https://doi.org/10.1186/s13002-022-00549-1>
- Juhaeti, T., & Setyowati, N. (2021). Pemanfaatan dan Prospek Serealia Minor Jali ( *Coix lacryma-jobi* L. ) dalam Pembuatan Kuliner Untuk Pengembangan Usaha Industri Rumah Tangga. *Jurnal Pengabdian Multidisiplin*, 3.
- Kujawska, M. (2025). Food habits related to wild edible plants of the Paraguayan people in the Atlantic Forest. *Journal of Ethnic Foods*, 12(1). <https://doi.org/10.1186/s42779-025-00289-z>
- Liu, S., Huang, X., Bin, Z., Yu, B., Lu, Z., & Hu, R. (2023). Wild edible plants and their cultural significance among the Zhuang ethnic group. *Journal of Ethnobiology and Ethnomedicine*, 19(52). <https://doi.org/10.1186/s13002-023-00623-2>
- Ma, X., Luo, D., Xiong, Y., Huang, C., & Li, G. (2024). Ethnobotanical study on ritual plants used by Hani people in Yunnan, China. *Journal of Ethnobiology and Ethnomedicine*, 20(1), 1–25. <https://doi.org/10.1186/s13002-024-00659-y>
- Mishra, A., Swamy, S. L., Thakur, T. K., Bhat, R., & Bijalwan, A. (2021). Use of Wild Edible Plants : Can They Meet the Dietary and Nutritional Needs of Indigenous Communities in Central

India. *Foods*, 10.

- Morip, T., Krey, K., & Pattiselanno, F. (2022). Kajian Etnobiologi Kelompok Etnik Dani : Bentuk Interaksi Masyarakat Dengan Taman Wisata Alam Gunung Meja , Manokwari , Papua Barat. *Jurnal Ilmu Lingkungan*, 20(2), 231–241. <https://doi.org/10.14710/jil.xx.x.xxx-xx>
- Mothupi, F. M., & Shackleton, C. M. (2025). Traditional knowledge and consumption of wild edible plants in rural households, Limpopo Province, South Africa. *Journal of Ethnobiology and Ethnomedicine*, 21(1). <https://doi.org/10.1186/s13002-025-00773-5>
- Nelaballi, S., Mcconkey, K. R., & Marshall, A. J. (2025). Contemporary Hunting Practices in a Mosaic Landscape of Tropical Forests and Plantations in West Kalimantan , Indonesia. *Human Ecology*, 467–487.
- Rahayu, S. M., Batoro, J., Sukenti, K., & Hakim, L. (2023). Ethnobotanical study of peraq api ritual in Sasak Tribe of Lombok Island, Indonesia and its potential for sustainable tourism. *Biodiversitas*, 24(10), 5485–5494. <https://doi.org/10.13057/biodiv/d241030>
- Ramlah, R., Indrastuti, I., Haerani, H., & D, N. I. (2023). Pemanfaatan Diversifikasi Pangan Sehat Jewawut Sebagai Peluang Usaha Masyarakat Desa Lego. *Beru'-Beru': Jurnal Pengabdian Kepada Masyarakat*, 2(2), 126–133.
- Sada, C., Alas, Y., & Anshari, M. (2019). Indigenous people of Borneo (Dayak): Development, social cultural perspective and its challenges. *Cogent Arts and Humanities*, 6(1). <https://doi.org/10.1080/23311983.2019.1665936>
- Setiawan, R. B., Yusniwati, Wati, D. R., Sari, I. P., Rahmah, S., Haryanti, S., & Bosma, P. A. L. (2025). Conservation Comprehensive Approach: Study on Exploration, Habitat Analysis, Propagation, and Reintroduction of the Indonesian Endemic Endangered Titan Arum (*Amorphophallus titanum* Becc.). *Jurnal Manajemen Hutan Tropika*, 31(3), 261–273. <https://doi.org/10.7226/jtfm.31.3.261>
- Sitepu, B. S. (2020). Keragaman dan Pengendalian Tumbuhan Invasif di KHDTK Samboja , Kalimantan Timur. *Jurnal Sylva Lestari*, 8(3), 351–365.
- Sukoharjo, D. I. K., Tengah, J., Helbawanti, O., Sutrisno, J., Nuryaman, H., & Marwanti, S. (2023). Helbawanti dkk , 2023 Agrisaintifika Jurnal Ilmu - Ilmu Pertanian. *Agrisaintifika Jurnal Ilmu-Ilmu Pertanian*, 7(2), 66–77.
- Suwardi, A. B., Baihaqi, B., & Harmawan, T. (2025). Diversity, utilization, and sustainable management of wild edible fruit plants in agroforestry systems: a case study in Central Kalimantan, Indonesia. *Agroforestry Systems*, 99(3), 1–15. <https://doi.org/10.1007/s10457-025-01165-0>
- Suwardi, A. B., & Mukhtar, E. (2023). The diversity and traditional knowledge of wild edible fruits in Bengkulu , Indonesia. *Ethnobotany Research and Applications*, 25.
- Tahir, M., Abraham, A., Beyene, T., Dinsa, G., Guluma, T., Alemneh, Y., Van Damme, P., Geletu, U. S., & Mohammed, A. (2023). The traditional use of wild edible plants in pastoral and agro-pastoral communities of Mieso District, eastern Ethiopia. *Tropical Medicine and Health*, 51(1). <https://doi.org/10.1186/s41182-023-00505-z>
- Tardio, J., & Pardo-De-Santayana, M. (2008). Cultural Importance Indices : A Comparative Analysis Based on the Useful Wild Plants of Southern Cantabria ( Northern Spain ) 1. *Economic Botany*, 62(2001), 24–39.
- Wao, Y. P., Priska, M., & Peni, N. (2023). Struktur Vegetasi Habitat Tumbuhan Endemik. *Edumatsains*, 7(2), 383–393.
- Widen, K. (2023). Orang Dayak dan Kebudayaannya. *Journal Ilmu Sosial, Politik Dan Pemerintahan*, 12(2), 207–218. <https://doi.org/10.37304/jispar.v12i2.9834>