



Ethnobotany of Food Plants in The Penghulu Tribe Community in Sarolangun, Jambi

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Abstract: Tribal community in the Bukit Bulan area, Limun District, Sarolangun Regency, Jambi. This research aims to identify the ethnobotany of food plant species by the Penghulu Tribe community in Sarolangun Regency, Jambi Province. This research was conducted in Napal Melintang and Meribung Villages. Research method ethnobotanical data on food plants were obtained through qualitative data collection techniques through in-depth interviews, in contrast, potential data were obtained through vegetation analysis and exploration methods. The study's results identified as many as 88 species from 35 families of food plants originating from cultivation and wild plants, which herbaceous plants dominated. Based on the results of interviews, there are many food plant species in the forest habitat. The part of the plant that is widely used by the community is fruit, and this is because people generally grow fruit in their yards and community gardens. Cultivators mostly use food plants for direct consumption. Conclusion this research The Penghulu tribe community's dependence on food plants is still high because they can utilize, gather, and process them. 88 species of food plants have been identified from 35 families, of which 77 produce carbohydrates, vegetables, and fruit.

Keywords: Ethnobotany; Food plants; Penghulu; Sarolangun

Introduction

The Penghulu Tribe community is a local community living in the karts mountain of the Bukit Bulan area, Limun District, Sarolangun Regency. The Pengulu people live in 4 villages: Napal Melintang

Village, Meribung Village, Mersip Village and Temalang Village. The livelihoods of Penghulu people generally work as farmers and gardeners and pan for gold in the forest. The utilization of plants has been utilized by the Penghulu tribe as medicine, food, building materials and ritual materials. Animals can also use plants as

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shade trees (cover or shelter) and animal food, both natural and in captivity (Has et al., 2023). Data is needed regarding food crops from local communities, so it is feared that the younger generation's knowledge about traditional food will be lost (Saridewi et al., 2022). Plus, illegal gold mining in forest areas and agroforestry lands will also decrease the number of plants (Iksan et al., 2023). Damage to plants around the mine significantly affects the ecosystem and surrounding environment (Kusumaningtyas et al., 2022).

More data on food plants used by local communities is needed to understand the relationship between humans and natural resources in the region (Hamzah et al., 2023). Therefore, it is necessary to carry out more comprehensive studies to identify, document, and understand the various food plant species that are an essential part of the consumption patterns of local communities. With more complete data collection, we will have a deeper understanding of the nutritional potential and diversity of natural resources that can support food security and the well-being of these communities (Yusmerianti et al., 2023). Through this research, we can encourage efforts to preserve food plants, which play an essential role in local communities' culture and daily lives.

Ethnobotany is a field of science studying the interrelationships between local communities and the natural environment, including knowledge systems about local plant natural resources. Ethnobotany refers to the study of interactions between humans and plants. The use of plants is not only for economic purposes but also for spiritual interests and cultural values, including using plants as medicinal ingredients, food sources and other human needs (Helida, 2021). Ethnobotanical studies make a significant contribution to the process of identifying natural resources in an area by collecting local wisdom from local communities. Ethnobotanical knowledge is found in many traditional tribes in Indonesia, which is the result of interactions and attitudes towards the utilization of forest plants (Pei et al., 2009). Ethnobotanical knowledge is used to help solve problems, such as increasing food production, promoting sustainable agriculture, developing new medicinal species and finding strategies for environmental conservation.

Food is everything that comes from biological sources. Agriculture, plantation, forestry, fishery, animal husbandry, waters, and water, both processed and unprocessed, which is intended as food or drink for human consumption, including food additives, food raw materials, and other natural materials used in the preparation process, processing and manufacture of food or beverages (Suryana et al., 2017). Food-producing plants are one of the most important plants for the needs

of society (Valentino et al., 2022). Food plants can also be used as traditional medicine, not widely known to locals (Yelianti et al., 2023). Eighty-seven species of plants can be used as food by the Penghulu Tribe community in TNBDB. From the results of vegetation analysis, most families SAD uses as food plants are Euphorbiaceae with five species, five plant species belonging to the Euphorbiaceae family fruit producer. While the food plants from the interviews had more species, the most families of food plants from the interviews were Sapindaceae, with eight species and Euphorbiaceae, with nine species (Setyowati & Siagian, 2004).

The Penghulu tribe depends on the natural resources in the forest; they look for and collect food in the woods so that the forest becomes the heart of their survival. It has economic value and high customary values as well (Azmi, 2022). This research is fundamental to carry out because the Penghulu Tribe is a community that is very dependent on natural resources in the forest for their survival. They search for and gather food in the woods, so the forest is integral to their life. Besides having significant economic value, forests also hold high traditional significance for the Penghulu Tribe. This research can help understand the critical role of forests in their culture and livelihoods and assist in efforts to maintain the continuity of the natural resources and cultural heritage of the Penghulu Tribe.

This research is essential to understand how the Penghulu tribe community uses food. We must identify the types and quantities of food plants they frequently consume to determine why ethnobotanical research on the potential of food is relevant. Through an ethnobotanical approach, we can explore the valuable potential of plants and their use patterns. Therefore, it is essential to identify food plants often used by the Penghulu Tribe in Sarolangun Regency. This research not only brings people closer to the benefits of food plants but also acts as an effort to involve them in conserving natural resources, especially non-wood natural resources.

Method

This research was conducted in the Penghulu Tribe community in a production forest area which is still part of the Regional Service Technical Implementation Unit (UPTD) Production Forest Management Unit (KPHP) Limau Unit VII Hulu, Sarolangun Regency, Jambi Province. The research locations consisted of 2, namely in Napal Melintang Village and Meribung Village, which are in a production forest area with an altitude of around ± 300 meters above sea level. The research locations and sampling are presented in Figure 1. Medicinal plant species were identified at the

Laboratory of Medicinal Plant Conservation, IPB University.

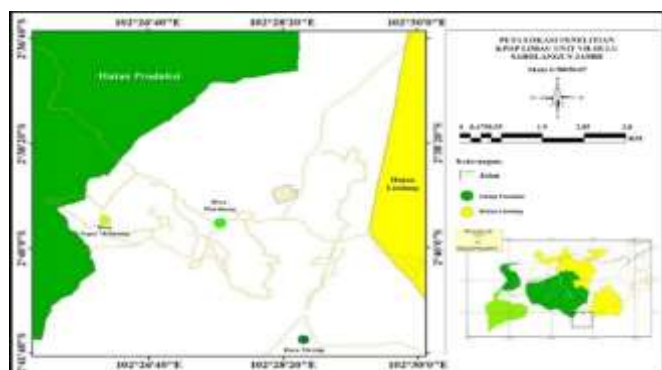


Figure 1. Map of research locations

The tools used in the data collection process were measuring rope, GPS, raffia rope, digital cameras, tally sheets, stationery, identification books and determination keys and laptops. The materials used were label paper, newsprint, cardboard, sacks, sacks, plastic specimens, hanging tags, plastic, white spirit, and interview questionnaires. The software used to help manage data is Microsoft Excel.

Ethnobotanical data in the form of local knowledge of the Penghulu people regarding the use of food plants includes primary data and secondary data. Preliminary data was obtained through in-depth interviews with informants regarding the species of food and medicinal plants used by the Penghulu people using the snowball sampling technique, namely the technique of selecting respondents with characteristics related to the research objectives and additional respondents indicated by previous respondents (Mulyadi, 2011) From the description of the first respondent, other prospective respondents were collected according to the criteria as a respondent's requirement until no more respondents met the criteria. The type of data collected is the extent of knowledge of the Penghulu people in utilizing food and medicinal plants, what parts are used for food and medicine, what medicines are used, when they are used and how they are managed. Secondary data is obtained through documentation, literature and publication studies. Documentation in the form of taking photos, sound recordings and videos.

Characteristics of Respondents

Data from interviews using the purposive sampling method regarding the use of food and medicinal plants by the Penghulu tribe in the Limau KPHP area in Sarolangun Regency were analyzed descriptively and quantitatively. Classification based on the parts used. Category based on habitus. Data analysis was conducted quantitatively and descriptively (Setiawan & Qiptiyah, 2014). Data on the characteristics of the respondents,

namely gender, age structure, type of work, and level of education.

The age class classification of the respondents was based on the category by the RI Ministry of Health (2009), namely early adolescents (12-16 years), late adolescents (17-25 years), early adults (26-35 years), late adults (36-45 years), early elderly (46-55 years), late elderly (56-65), elderly (65 years and over).

Utilization of Food Plants

Data on the use of food and medicinal plants are organized and grouped based on service, number of species for each service, family, habitat typology, frequency of encounters, classification based on disease groups, type based on parts used, and category based on habitus. Data analysis was carried out quantitatively and descriptively.

Result and Discussion

Food Ethnobotany

Diversity of Food Plants Based on Habitus

The diversity of food plants based on their habitus is divided into six. The most species in the herbaceous habitus Was 40 (44.9%). At the same time, the lowest number was found in the habitus of bamboo and lianas, each with one species (1.1%). From the results of interviews with rice cultivators in 4 villages, many herb species are used as staple food such as rice. There are 14 rice cultivars in the four villages. According to Purnama et al. (2023), farmers must use their production factors efficiently. While the habitus of bamboo is used as a vegetable ingredient, namely bamboo shoots (young bamboo shoots). According to Sumarna et al. (2023), bamboo produces many benefits, including bamboo shoots as a food ingredient. This is to the statement (Aisyah, 2018) and (Elfrida et al., 2022) that herbs have strong competitiveness and high adaptation to other plants around them (such as bushes, shrubs, and even trees). Hence, they can grow in empty places. The diversity of food plants based on their habitus is divided into six habits, as shown in Table 1.

Table 1. Percentage of the Diversity of Food Plant Habitus

Habitus	Amount (Spesies)	Persentase (%)
Herb	40	44.90
Tree	32	36.00
Palm	6	6.70
Shrub	9	10.10
Bamboo	1	1.10
Lianas	1	1.10
Total	89	100

There are 14 local rice cultivars of rice used in rice cultivators, of which nine types are found in paddy fields, and five are in field habitats. Jambi rice that grows in rice fields cannot live in rice fields, but Jambi rice that lives in areas can live in rice fields. Jambi rice that lives in its fruit fields has black spots, while rice that lives in rice fields has red fruit (red rice). The habitus of trees is dominated by fruit-producing plants of 34 species and is found in forests. Trees found around the yard of the house are duku (*Lansium domesticum*), mangosteen (*Garcinia mangostana*) and making (*Mangifera foetida*), but the fruit is not sold only for consumption.

Diversity of Food Plants Based on Habitat

Based on their habitat, food plant species are divided into five habitats (Light et al., 2002). The number of species from the interviews that were widely used by the community was found in forest habitats of 27 species (30.3%). At the same time, the small number of species found in riverside habitats is one species (1.1%). This is because fruits consumed directly by the community dominate the food plants in the forest, according to research (McLennan, 2013), many food plants in forests are dominated by fruit because they have particular adaptations related to their reproductive strategy, while the plants in the yard are cultivated (Pauletto et al., 2023).

Plants beneficial to the community, such as food ingredients are planted in the yard, such as fruits and vegetables, so people can quickly get them, by the statement (Elfrida et al., 2020) that the diversity of types of fruit plants in the yard contributes to the livelihood of people in rural areas. The selection of plants planted also pays attention to the availability of space. The statement (Podhajska et al., 2020) that the planting selection also considers the availability of space because this is an essential aspect in planning plant planting.

The planting of plants does not have a specific pattern; only ornamental plants are in the front of the yard, while other plants, such as food ingredients, medicinal plants, and large fruits, can be found on the sides, front and back of the yard (Wakhidah et al., 2020). Based on their habitat, food plant species are divided into five habitats, which can be seen in Table 2.

Table 2. Percentage of the Diversity of Food Plants Based on Habitat Type

Habitat type	Amount (Spesies)	Percentage (%)
Reverside	1	1.10
Ricefield	12	13.50
Field	23	25.80
Forest	27	30.30
Yard	26	29.20
Total	89	100

Diversity of Food Plant Status

The food plant species from the interviews that are widely used by the community are the results of cultivation carried out by the community of as many as 61 species (68.5%). The community has planted vegetables in the house's yard and behind it, so it is easy for the district to get vegetables for cooking. The community uses more food plants than wild plants from the forest. This is because wild plants are used by the community only as alternative food, not as a staple food. At the same time, the staple food has been cultivated (Jupri et al., 2022). The percentage of diversity in the status of food plants can be seen in Table 3.

Table 3. Percentage of Diversity of Food Plant Status

Status	Amount (Spesies)	Percentage (%)
Cultivation	61	68.50
Wild	28	31.50
Total	89	100

Diversity of Food Plants Part that is utilized

Based on the results of interviews, there are six parts to the species of food plants used by the community (Table 4). The part of the plant widely used by the community is fruit, with as many as 60 species (62.5%). According to the statement (Elfrida et al., 2020) Fruit is the part of the plant that people most widely use because it is rich in nutrients, has a delicious taste, is easy to store, and can be consumed directly. The percentage of food plant parts that are utilized can be seen in Table 4.

Table 4. Percentage of Parts of Food Plants that are Utilized

Plant parts	Amount (Spesies)	Percentage (%)
Seed	14	14.70
Fruit	60	62.50
Leaf	12	12.50
Root	5	5.20
Tubers	2	2.10
Flower	1	1.00
Stem	2	2.10
Total	96	100

The percentage of fruit is higher because people generally grow fruit in their yards and community gardens; fruits include duku (*Lansium domesticum*), mangosteen (*Garcinia mangostana*) and making (*Mangifera foetida*), coconut (*Cocos nucifera*). Meanwhile, the lowest percentage of the part used is the flower of 1 species (1.1%). The banana plant is an example of a part of a flowering plant used by the community as a vegetable. Banana plants can be found in the yards of houses and community gardens.

Diversity of Food Plants Based on Family

There are 35 family groups of food plant species used by the tribal people. Based on the family, there are 35 family groups. The most numerous family groups are the Poaceae family, with 17 species, and Musaceae, with ten species. The Poaceae group has 12 local rice cultivars and two local sticky rice cultivars. In the Musaceae ethnic group, the public consumes ten banana cultivars as food, apart from the Poaceae and Musaceae families. The family groups used by the community are the Aracaceae, Solanaceae, Fabaceae, Sapindaceae, Moraceae, Bombaceae, Anacardiaceae, Clusiaceae and Cucurbitaceae families. Examples of species from the Solanaceae family are Langgui (*Solanum nigrum*) and eggplant (*Salonum melongena*). The Aracaceae family, namely Manau (*Calamus manan*), palm (*Arenga pinnata*) and Langkap (*Arenga obtusifolia*). The number of species of food plant families can be seen in Figure 2.

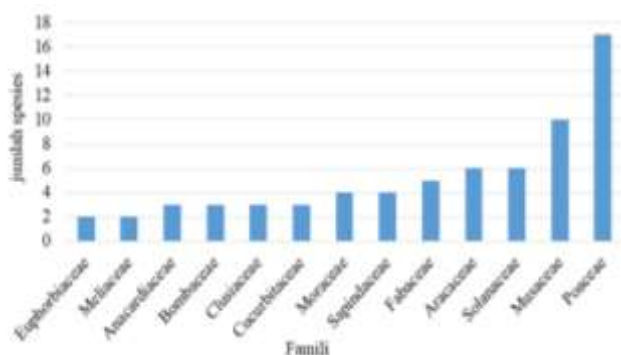


Figure 2. Number of species of food plant families totaling



Figure 3. *Arenga pinnata* (Enau)



Figure 4. *Tetrasera scandes* (Akar mempole kijang)

Diversity of Food Plants Based on Processing Method

The most processing of food plants utilized by the cultivators is the method of managing plants by directly consuming 47 species (50.5%). This is because the plants consumed directly are fruits, both those found in the forest and those cultivated. The statement (Kimengsi & Mukong, 2023) states that this reflects their consumption patterns and management of natural resources around the forest. Examples of species consumed directly are brinjal (*Mangifera caesia*), komang (*Mangifera kemanga*), idan (*Nephelium rambutan*) and campus (*Baccaurea macrocarpas*). At the same time, the lowest management method is frying as much as one species (1.1%). An example of a species used as a cooking spice is breadfruit (*Artocarpus altilis*). The percentage of how to manage food plants can be seen in Table 5.

Table 5. Percentage of Management of Food Plants

Management method	Amount	Percentage (%)
Consumed immediately	47	50.50
Boiled	20	21.10
Stir-fried	17	17.90
Used as seasoning	3	3.20
Digulai	7	7.40
Digoreng	1	1.10
Total	95	100

Food Plants Based on Function

Food is obtained from forest products from fruits, nuts, vegetables and plants that contain carbohydrates. Plant Plants contain nutrients the body needs, such as carbohydrates, proteins, vitamins, minerals, etc. Carbohydrates are the primary source of energy in most of our diets. Protein has many uses in the body, including breaking down protein molecules to get energy or compound elements such as nitrogen or sulfur for other metabolism. Vitamins are compounds that cannot be made by the body but are needed to maintain the activity of various metabolic processes or the integrity of multiple membranes. Vitamins are divided into two groups based on their solubility: vitamins that dissolve in fat and vitamins that dissolve in water. Various minerals have been declared essential for humans and can be divided into two groups, namely major minerals and minor minerals (Gaur & Agnihotri, 2017). This content can be found in plant species such as nuts, fruits, vegetables and cereals (*source of carbohydrates*) (Mudgil & Barak, 2013).

As a result of the interviews, the food plants were divided into three groups based on their function: first carbohydrate-producing food plants, second vegetable-producing plants and third fruit-producing plants.

Carbohydrate-Producing Plants

There are four carbohydrate-producing plants, namely rice (*Oryza sativa*), corn (*Zea mays*), cassava (*Manihot utilissima*) and sugar palm (*Arenga pinnata*). Rice is a plant that produces the leading food for the Penghulu people. There are 14 local rice cultivars grown in paddy fields and fields. Some types of local rice developed by the community include long nipa rice, Jambi rice, Onda Tangkui rice, black membrane rice, white membrane rice, low papak rice, selupat rice, kinci rice, Alui rice, superior rice, godang putia rice, rice silver, kuku Balam rice and tumo rice. The rice planted is a type of local rice, long Nipah rice and Jambi rice. Corn and cassava are produced in the community garden, while sugar palm is made in the yard of the community's house.

Vegetable-producing plant

There are 28 vegetable-producing plants in the yard and the forest. Vegetable-producing plants. The parts of the plants used for vegetable ingredients differ in how they are processed and used, both in cooking and eaten raw as fresh vegetables. Plants that the Penghulu people often use are pumpkin shoots (*Cucurbita moschata*), ferns (*Diplazium esculentum*), katu (*Sauropus androgynous*), eggplant (*Solanum melongena*), and Kates (*Carica papaya*) which are found in gardens and yards.

Sauropus androgynus (L.) Merr is not only used as a vegetable but also has benefits for pregnant women; proven to have pharmacological activity as an antibacterial, anti-anaemia, and anti-inflammatory and can increase the production of breast milk in nursing mothers. The difference in activity is due to the content of katuk, which has various compounds that have a role in pharmacological action (Zhang et al., 2020).

Fruit-producing plants

There are 45 fruit-producing plants in the yard and the forest. Fruit-producing plants. Fruit is a source of sugar and other carbohydrates, vitamins, mineral and sometimes fat. The fruits used are ripe and consumed immediately, except for palm (*Arenga pinnata*). Palm fruit needs to be processed into fruit and fro to be finished. Fruits that are often consumed by the community are macang (*Mangifera foetida*), duku (*Lansium domesticum*), mangosteen (*Garcinia mangostana*), and guava (*Psidium guajava*).

Durian leaf (*Durio oxleyanus*) fruit is round like a ball with a diameter of about 10-15 cm, long thorns (3-4 cm), fruit skin colour is green, falling fruit does not crack but takes time. The fruit does not contain enough alcohol; the colour of the flesh is yellow, like butter, and has a sweet taste (Maharani et al., 2021). The positive side of this type of durian is that it is resistant to storage, so it can be distributed long distances with a small size

of about 1 kg to become an ideal fruit and enough for one person (Santoso & Priyono, 2015). Besides the fruit, the stems are also used by the community as a building material to make boards.

Bird Kandis, or mundu (*Garciana dulcis*), have a flower season from January to May and a fruit season from July to December. *G.dulcis* has benefits for food and is used as a building material (Uji, 2007). Mundu fruit is green when it is not ripe and yellow when it is ripe. The outer skin is smooth and slippery, with a diameter of about 7.5 cm and a spiky shape near the end of the fruit. Mundu plants in nature, if they do not produce fruit, there is a possibility that the tree is male (Irwanto & Stiyani, 2020).

Conclusion

The dependence of the Penghulu tribe community on food plants is still relatively high. This is proven by the Penghulu Tribe Community's ability to utilize, gather, and process 88 identified food plant species from 35 families. Seventy-seven food plant species are divided into carbohydrate-producing food plants, vegetable-producing plants, and fruit-producing plants.

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Author Contributions

Conceptualization Dini Hardiani Has, Sutan Sahala Muda Marpaung, Dita Anggriani Lubis. Data curation Dini Hardiani Has. Funding acquisition: Sutan Sahala Muda Muda Marpaung. Methodology Dini Hardiani Has. Visualization M. Fauzhan Algiffari. Writing-original draft Erwika Dhora Jati, Bunga Resa Hartati, Imam Fitrianto, Iis Yulianti, Septian Putra Adi Nugroho, Yulizar Ihrami Rahmila, Fetty Dwi Rahmayanti, Ratnawaty Fadilah, Bukhari, Asnika Putri Simanjuntak, M. Fauzhan Algiffari. Editing Dini Hardiani Has, Sutan Sahala Muda Marpaung, Dita Anggriani Lubis, Erwika Dhora Jati, Bunga Resa Hartati, Imam Fitrianto, Iis Yulianti, Septian Putra Adi Nugroho, Yulizar Ihrami Rahmila, Fetty Dwi Rahmayanti, Ratnawaty Fadilah, Bukhari, Asnika Putri Simanjuntak, M. Fauzhan Algiffari.

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Conflicts of Interest

In this study, it is essential to note that the authors sincerely and openly declare that they have no conflicts of interest that could influence the results or interpretation of this study. Confirms that the integrity and objectivity of our research

remain intact. We are committed to providing honest and accurate information to the scientific community and the public at large, and this policy is our effort to ensure transparency and quality in our contributions to knowledge and understanding in this field.

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