



Ethnobotany of postnatal herbal medicine of the Malay community of Ketapang as a source of culture-based biology learning

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Article Information	Abstract
Keyword: Ethnobotany; Herbal medicine; Learning resources; Malay tribe; Postnatal Kata Kunci: Etnobotani; Jamu; Sumber belajar; Suku melayu; Pasca melahirkan History: Received : 26/12/2024 Revised : 23/01/2025 Accepted : 30/01/2025 Published : 18/02/2025	Along with the development of health services and the use of modern medicine led to the loss of knowledge of medicinal plants for postnatal herbs. The purpose of this study was to determine the kinds of herbal medicine, plants used by the Ketapang Malay Community in Natai Kuini village, and the ethnobotanical potential of postnatal herbal medicine plants as a learning resource. This research uses an exploratory descriptive method with a qualitative approach where researchers divide the 2 stages of research from plant data collection and postnatal herbs by interview and observation. The interview used snowball sampling technique. Further data collection is in the form of questionnaire results of potential learning resources. The results of the study found 27 spesies of plants and 15 types of postnatal herbs. Potential learning resources aspects of the clarity of potential 95.31%. Aspects of target clarity 97.92%, suitability of objectives 97.92%, feasibility of exploration guidelines 97.92%, clarity of information revealed score 90.63%, clarity of expected results 90.63% and interpretation of 'very good' with an average presentation of 95.06%. This research has a scientific impact on education by providing new insights into the ethnobotanical potential of postpartum herbal plants as an effective learning resource, especially in the context of biodiversity and classification of living things for Class X students. <i>Abstrak. Seiring dengan berkembangnya pelayanan kesehatan dan penggunaan obat modern menyebabkan hilangnya pengetahuan terhadap tumbuhan obat untuk jamu pasca melahirkan. Tujuan penelitian ini untuk mengetahui macam-macam jamu, tumbuhan yang digunakan Masyarakat Melayu Ketapang didesa Natai Kuini, dan potensi etnobotani tumbuhan jamu pasca melahirkan sebagai sumber belajar. Penelitian ini menggunakan metode deskriptif eksploratif dengan pendekatan kualitatif dimana peneliti membagi 2 tahap penelitian dari pengambilan data tumbuhan dan jamu pasca melahirkan dengan wawancara dan observasi. Wawancara menggunakan teknik snowball sampling. Pengambilan data selanjutnya berupa hasil angket potensi sumber belajar. Hasil penelitian ditemukan 27 jenis tumbuhan dan 15 jenis jamu pasca melahirkan. Potensi sumber belajar aspek dari kejelasan potensi 95.31%. Aspek kejelasan sasaran 97.92%, kesesuaian tujuan 97.92%, kelayakan pedoman eksplorasi 97.92%, kejelasan informasi yang diungkap skor 90.63%, kejelasan hasil yang diharapkan 90.63% dan interpretasi "sangat baik" dengan rata-rata presentasi 82,08%. Penelitian ini memiliki dampak ilmiah pada pendidikan dengan memberikan wawasan baru tentang potensi etnobotani tanaman herbal pascapersalinan sebagai sumber belajar yang efektif, terutama dalam konteks keanekaragaman hayati dan klasifikasi makhluk hidup untuk siswa Kelas X.</i>

A. Introduction

Indonesia is very rich in biodiversity. This biodiversity needs to be properly utilised and preserved for environmental sustainability and the welfare of society (Fardana et al., 2023). West Kalimantan itself has tropical rainforests with a high diversity of plant species that are used by the community traditionally in fulfilling their daily needs. Forms of plant use include food sources, medicine, colour producers, vegetable pesticides, ornamental plants, animal feed, firewood, building and crafts (Liyanti et al., 2015). Biodiversity in West Kalimantan contributes significantly to the achievement of the Sustainable Development Goals (SDGs), especially in the goals of terrestrial ecosystem conservation (SDG 15) and poverty alleviation (SDG 1). According to Helida (2021) sustainable utilisation of biological resources can support the local economy, especially for indigenous communities that depend on forest products. For example, medicinal plants that have high economic value can be developed into traditional pharmaceutical products, supporting public health while creating jobs.

Threats to biodiversity in West Kalimantan are increasing. The latest shows that deforestation in this region continues to occur due to the expansion of oil palm plantations. According to Masyithoh & Nurjannah (2024) in West Kalimantan, the area of oil palm plantations was recorded at 936.40 million hectares (Mha) in the 2014-2016 period. This figure then increased to 1,475.70 million hectares (Mha) in 2017-2019. This increase triggered various claims and allegations that oil palm plantations are one of the factors causing deforestation in Indonesia. These allegations are supported by a number of data indicating that the growth of oil palm plantation area is in line with the level of deforestation in Indonesia. Therefore, concrete measures are needed to protect biodiversity in West Kalimantan.

Ethnobotany as the study of the use of plants utilised by an ethnic group in everyday life (Syamsuri et al., 2023). In addition, ethnobotany is a descriptive form through documenting plant knowledge through the community. So that it can meet the needs of life such as for household tools, the use of plants for building materials (boards), medicines, the use of traditional ceremonies, and the use of plants for food crops (food). The use of plants as medicine is included in the means of using natural materials that are more affordable and natural so that medicinal plants are still widely used by the community (Ramadhan & Utami, 2023).

Medicinal plants are all types of plants that are known to contain compounds that are useful and efficacious to prevent, alleviate or cure a disease. In ancient times, humans were very dependent on plants that were known to have medicinal effects to overcome various types of human diseases. In Indonesia, our ancestors have long utilised certain plants as medicines (Helmina & Hidayah, 2021). Plants for medicinal purposes have long been used by ethnic groups in

Indonesia, with the diversity of ethnicities that exist, the use of plants as medicines is also increasingly diverse. The community believes and believes that various plants can be useful as medicines to cure diseases suffered by the community. This traditional medicine was originally known by the community with herbal concoctions, so that until now herbal medicine is still believed by the community as a drug that is able to treat various types of diseases, even when it has been developed in modern industry (Rizal et al., 2021). Knowledge about medicinal plants is often kept only by the older generation in indigenous communities. If there is no documentation or inheritance, this knowledge can be lost (Nurchayati & As'ari, 2021).

Plants have various health benefits for humans and other living things. Utilising plants as traditional medicine is knowledge that is passed down from generation to generation based on the customs and habits of the local community (Zumaidar et al., 2019). Medicinal plants can not only be used to maintain health, but can also be used to restore the health of postpartum mothers (Silalahi et al., 2020). *Jamu* is a traditional Indonesian herbal medicine that has been used for centuries and until now people in Indonesia often consume *jamu* as a treatment or prevention of disease (Kusuma et al., 2020). One of the herbs consumed is postnatal herbal medicine.

Along with the development of health services and the use of modern medicine will have an impact on the loss of local community knowledge of the functions and benefits of plants as traditional medicines. In addition, the current generation's lack of interest in using plants as medicine is caused by several factors including their bitter taste, distinctive odour so that most women do not like them (Maulani & Jonyanis, 2024). To make knowledge about traditional medicine important, one way is to make postnatal herbal medicine a culture-based learning resource.

Local culture-based learning resources are a model of learning approach that priorities student activities with various cultural backgrounds. Local cultural values are values or traditions that are agreed upon and embedded in a society. These cultural values must be maintained and preserved in order to remain and be remembered by the next generation. Local cultural values can be applied to learning, so that students are able to learn according to experiences in students' daily lives (Amri et al., 2021).

This study aims to determine the types, parts, processing methods, and utilisation of plants used by the Ketapang Malay community as postnatal herbs, as well as to determine the potential of these plant species as culture-based biology learning resources. In addition, this research confirms its contribution to the preservation of local culture as well as the development of innovative learning resources that support 21st century competencies, such as critical thinking and student creativity.

B. Material and method

The type of research used in this research is exploratory descriptive with a qualitative approach. The research was conducted in Natai Kuini village, Ketapang district by collecting data directly through interviews and observations. Interviews were conducted using snowball sampling technique. The research was conducted since August 2023.

The selection of informants was carried out based on criteria, namely postpartum mothers, mothers who have given birth, village midwives, traditional healers, namely people who have the knowledge and ability to concoct and make herbal medicine/traditional medicine. The data collected includes the name of the plant, the part used, the process of making and its usefulness. The addition of samples was stopped when the data was saturated and did not provide new data anymore. All data will be analysed narratively. Furthermore, direct observation

is carried out to obtain what has been obtained from the results of interviews which will be analysed descriptively. The findings will be identified with books (Flora Vans Steenis & Flora of Java), articles and other relevant sources to obtain additional information about the ethnobotanical plants of postnatal herbal medicine.

The results of the identification and findings of plants used by the Malay community of Ketapang will later be analysed for potential biology learning resources, especially at the junior and senior high school levels. The potential of learning resources will be reviewed from the syllabus to determine the potential of learning resources, researchers distributed questionnaires to 3 biology teachers from 3 different schools by giving 18 questions from 6 indicators that have been validated by expert validators. as for the 18 questions can be seen in the Table 1.

Table 1. Questions related to learning resource indicators from the research

No.	Indicator	Question	Description	
			(+)	(-)
1.	Clarity of potential	Does the ethnobotany of postnatal herbal medicine of the Ketapang Malay community have the potential to be used as a culture-based biology learning resource?	✓	
		Can the ethnobotany of postnatal herbal medicine of the Ketapang Malay community not be used as a culture-based biology learning resource that is utilised directly or indirectly?		✓
2.	Clarity of purpose	Can the results of research on the types of postnatal herbal medicine plants of the Ketapang Malay community be utilised to achieve biology learning objectives?	✓	
		Can biology learning objectives not be achieved by utilising the results of research on the types of postnatal herbal medicine plants of the Ketapang Malay community?		✓
		Can ethnobotanical research on postnatal herbal medicine of the Ketapang Malay community help learners to identify, classify, and analyse the types of postnatal herbal medicine plants?	✓	
		Can ethnobotanical research on postnatal herbal medicine of the Ketapang Malay community not help learners to identify, classify, and analyse the types of postnatal herbal medicine plants?		✓
3.	Clarity of material objectives	whether information on the results of ethnobotanical research on postnatal herbal medicine of the Ketapang Malay community can help students better understand the level of flora biodiversity, especially ethnobotanical plants of postnatal herbal medicine?	✓	
		Does utilising the types of postnatal herbal medicine plants of the Ketapang Malay community as a Culture-Based Biology Learning Resource not help students to observe, identify, and analyse directly?		✓
		Can information on the results of ethnobotanical research on postnatal herbal medicine be used as a culture-based biology learning resource on biodiversity level material?	✓	
		Can information on the results of ethnobotanical research on postnatal herbal medicine not be used as a culture-based biology learning resource on biodiversity?		✓
4.	Clarity of information revealed	Do the results of the ethnobotanical research on postnatal herbal medicine of the Ketapang Malay community provide clear information?	✓	
		The results of ethnobotanical research on postnatal herbal medicine of the Ketapang Malay community do not provide clear information?		✓
		Whether information on ethnobotanical plants of postnatal herbal medicine is feasible as a culture-based biology learning resource?	✓	
		Whether information on ethnobotanical plants of postnatal herbal medicine is not feasible as a culture-based biology learning resource?		✓
5.	Clarity of exploration guidelines	Does the information on ethnobotanical plants for postpartum herbal medicine not qualify as a culture-based biology learning resource?	✓	
		whether the results of research on the ethnobotany of postnatal herbal medicine of the Ketapang Malay community cannot help students in understanding the material in biology learning?		✓
6.	Clarity of expected gains	Whether the results of ethnobotanical research on postnatal herbal medicine of the Ketapang Malay community are expected to help students in understanding the material?	✓	
		whether the results of ethnobotanical research on postnatal herbal medicine of the Ketapang Malay community cannot be used as a culture-based learning resource?		✓

Table 2 Learning resource potential questionnaire assessment score

Percentage	Assessment category
0-20%	Very less good
21-40%	Less good
41-60%	Good enough
61-80%	Good
81-100%	Very good

(Source: Nurdiana et al., 2024)

The use of a Likert scale provides answers that are clear (firm). Later the questionnaire results will be analysed to determine the potential as a learning resource. Formula 1 by Sugiyono (2012) used to calculate the percentage of the teacher questionnaire. Furthermore, the percentage score of the ethnobotanical questionnaire results of postnatal herbal medicine was analysed according to the assessment score criteria as shown in the Table 2.

$$p = \frac{f}{n} \times 100\% \dots \dots \dots \text{Formula 1}$$

Description:
p = Percentage
f = Total score obtained
n = Maximum score

C. Results and discussion

Ethnobotany is a scientific discipline that focuses on the study of how humans interact with plants traditionally, and in its development, explores human relationships with natural resources in the surrounding environment (Yuza & Fitri, 2024). The ethnobotany studied in this study is plants and postnatal herbs used by the Ketapang Malay community in Natai Kuini village. Ketapang Malay people in Natai Kuini village usually utilise plants for postnatal treatment.

Based on the research conducted in Natai Kuini village, 15 types of postpartum herbal medicine were found, this finding shows that the number of herbs available is quite large. The plants used as ingredients for postpartum herbs can be seen in Table 4.

Table 3 Postnatal herbal medicine in the Malay community of Ketapang

No	Herb name	Plants used	Plant part used	Manufacturing process	How to use	Benefits of herbs
1	<i>Jamu kunyit</i>	<i>Kunyit</i> (turmeric)	Rhizome	Prepare 200 grams of turmeric, 250 grams of kencur, 3 betel leaves, 100 grams of brown sugar, 1 papaya leaf and enough salt. Wash the ingredients used. Finely grate the herbal ingredients to facilitate the mixing process. Add 3 to 4 cups of water, bring to a boil and add brown sugar. Boil for 20 minutes over low heat. Turn off the heat and let stand until warm enough to drink.	Take 1-2 times a day before morning and evening meals.	Beneficial for postnatal wellness
		<i>Kencur</i>	Rhizome			
		<i>Sirih</i> (betel)	Leaves			
		<i>Pepaya</i> (papaya)	Leaves			
2	<i>Kunyit asam</i>	<i>Kunyit</i>	Rhizome	Prepare turmeric 200 grams, brown sugar 250, kencur 250 grams, tamarind 100 grams, 1,500 ml water, papaya leaves, ½ teaspoon salt. Peel and wash the turmeric and kencur rhizomes. Grate turmeric, kencur, papaya leaves until smooth to facilitate the mixing process. Boil the smooth herbal ingredients. Add 1,500 ml of water to the pot, add brown sugar, tamarind and salt and stir until evenly distributed. Boil for 20 to 30 minutes over low heat. Switch off the heat and leave until warm enough to drink.	Take it 1/2 time a day before lunch.	Helps maintain the body's stamina.
		<i>Kencur</i>	Rhizome			
		<i>Asam Jawa</i> (tamarind)	Leaves			
		<i>Pepaya</i>	Fruit			
3	<i>Jamu jahe</i>	<i>Jahe</i> (ginger)	Rhizome	Prepare ginger 200 grams, temulawak 1 segment, dried bandotan to taste, searai wangi to taste, brown sugar 100 grams, salt 1 teaspoon, tamarind to taste and water 500 ml. wash the ingredients used. Puree all ingredients, put all ingredients into a pot, add water and bring to a boil, add brown sugar, salt, tamarind and stir well until	Take it 1/2 time a day before lunch.	Boosts immune system for a fresh, energised body.
		<i>Temulawak</i>	Rhizome			
		<i>Bandotan</i>	Root			
		<i>Serai wangi</i> (citronella)	Trunk			
		<i>Asam Jawa</i>	Fruit			

No	Herb name	Plants used	Plant part used	Manufacturing process	How to use	Benefits of herbs
				dissolved, reduce heat, boil for 15-20 minutes, strain the water and discard the pulp, leave until warm enough to drink.		
4	<i>Bedak dingin</i>	<i>Rastuk</i> <i>Pegagan</i> (gotu kola)	Root Leaves	Prepare 1 ounce of rastuk root, 5 pieces of gotu kola, 500 grams of rice, and enough water. Wash all the ingredients used. Puree all ingredients to form a powder. Add water little by little while forming a round. After the dough is formed round, dry it in the sun until it is completely dry. Store the cold powder in an airtight container. Cold powder is ready to use.	Add a little water and apply the cold powder on the face and neck in a thin, even layer. Allow the cold powder to dry until it disappears from the face.	Beneficial to cool the face so that it feels relaxed.
5	<i>Bedak panas</i>	<i>Bangle</i> <i>Lengkuas</i> (galangal) <i>Jahe</i> <i>Temulawak</i> <i>Jeruju</i>	Rhizome Rhizome Rhizome Rhizome Leaves	Prepare 2 segments of bangle, 1 segment of ginger, 2 segments of galangal, 1 sheet of jeruju, 300 grams of rice, and enough water. Wash all the ingredients used. Blend all ingredients to form a powder. Add water little by little while forming a round. After the dough is formed round, dry it in the sun until it is completely dry. Store the hot powder in an airtight container. The hot powder is ready to use.	Dissolve the hot powder with enough water and apply from the abdomen to the toes. Performed 2-3 times/day.	Helps to tone the abdominal muscles to the toes.
6	<i>Bedak maroyan</i>	<i>Kencur</i> <i>Bawah putih</i> (garlic) <i>Sirih</i>	Rhizome Tuber Leaves	Prepare 4 segments of kencur, 3 cloves of white bottom, 5-7 pieces of betel nut, enough water and 500 grams of rice. Wash all the ingredients used. Blend all ingredients to form a powder. Add water little by little while stirring until the dough can be formed. Dry in the sun until completely dry. Store the maroyan powder in an airtight container. Maroyan powder is ready to use. Maroyan powder can be in round shape or powder shape.	Applied to the chest and breasts, twice a day.	Helps to facilitate breastfeeding after childbirth.
7	<i>Jamu peluncur</i>	<i>Cabai Jawa</i> (Javanese long pepper) <i>Kunyit</i> <i>Cengkeh</i> (cloves) <i>Jambu biji</i> (guajava) <i>Lada</i> (pepper) <i>Jahe</i>	Fruit Rhizome Seed Leaves Seed Rhizome	Prepare 5 Javanese long pepper, turmeric to taste, 5 cloves, 5 guava leaves, 500 grams of dried ginger. Wash the ingredients thoroughly. Cut the ingredients into small pieces. Drain the ingredients, make sure all the water is drained to avoid the ingredients becoming damp and mouldy. Dry the herbal ingredients under the sun until dry. Grind the dried herbal ingredients into powder. Sieve the powder so that it does not have a coarse texture. Store the herbal powder in an airtight container.	Brewed using warm water 3 times per week in the morning or afternoon.	Accelerates the discharge of postpartum blood or helps the postpartum blood to flow.
8	<i>Jamu untalan</i>	<i>Cabai Jawa</i> <i>Pala</i> (nutmeg) <i>Kayu manis</i> (cinnamon)	Fruit Seed Stem Bark	Prepare 7 Javanese chillies, 5 cinnamon sticks, 7 nutmegs, enough water. Wash all the ingredients used. Dry all ingredients under the sun until dry. Roast all ingredients over low heat until they change colour and become fragrant. Remove all ingredients and grind to a fine powder. Combine all the powdered ingredients in a clean container and add water little by little until the mixture is easy to form round. Store in an airtight container. Untalan is ready to use.	2-3 times a day for 1-2 weeks.	Maintains endurance after childbirth and accelerates wound healing

No	Herb name	Plants used	Plant part used	Manufacturing process	How to use	Benefits of herbs
9	<i>Jamu tuntas</i>	<i>Temulawak</i>	Rhizome	Prepare temulawak 500 grams, turmeric 2 segments, ginger 2 segments, Javanese chilli 5 pieces, water to taste. Peel and wash the ingredients used. Cut them into small pieces for easy mashing. Boil all the ingredients that have been mashed in boiling water. Stir evenly and wait for 15-20 minutes, cook over low heat. Strain the boiled water and discard the pulp. Remove and allow to cool. Jamu is ready to drink.	Drink 3 times a week in the morning or evening.	Cleansing of dirty blood after childbirth
		<i>Kunyit</i>	Rhizome			
		<i>Jahe</i>	Rhizome			
		<i>Cabai Jawa</i>	Fruit			
10	<i>Jamu membuang bau</i>	<i>Pala</i>	Seed	Prepare 5 lemongrass leaves, 5 betel leaves, 5 turmeric segments, 3 jeringau roots and 300 ml water. wash the ingredients used. Cut them into small pieces for easy mashing. Boil all the ingredients that have been mashed in boiling water. Stir evenly and wait for 20-30 minutes to cook over low heat. Strain the boiled water and discard the pulp. Remove and let cool. Jamu is ready to be served.	Take 2-3 times a day depending on the need.	To eliminate body odour and improve mother's health from within
		<i>Serai</i>	Leaves			
		<i>Sirih</i>	Leaves			
		<i>Kunyit</i>	Rhizome			
11	<i>Jamu melancar asi</i>	<i>Jeringau</i> (sweet flag)	Root	Prepare ginger 3 segments, turmeric 3 segments, garlic 1 clove, shallot 1 clove, beluntas leaves 3 sheets, katuk leaves 3 sheets, bangle 3 segments, brown sugar to taste and 500 ml water. Peel and wash the ingredients used. After cleaning, cut into small pieces so that it is easy to mash. Stir evenly and wait for 15-20 minutes, cook over low heat. Strain the cooking water and discard the pulp. Jamu is ready to be served.	Drink 2-3 times a day regularly.	This herb helps to facilitate breastfeeding after childbirth
		<i>Jahe</i>	Rhizome			
		<i>Kunyit</i>	Rhizome			
		<i>Bawang Putih</i>	Tuber			
		<i>Bawang Merah</i> (onion)	Tuber			
		<i>Beluntas</i> (pluchea)	Leaves			
12	<i>Jamu bacam</i>	<i>Katuk</i>	Leaves	Prepare tamarind 1 spoon, turmeric 1 segment and rice 1 handful and enough water. Wash the ingredients thoroughly. Roast the turmeric, rice and tamarind until browned. Pound the burnt ingredients until smooth. Put the mashed ingredients into a clean cloth / napkin add a little water and then squeeze to get the juice. The resulting juice is ready for consumption.	Take it once a week in the morning, afternoon or evening.	Relieves headache in mothers after childbirth, maintains digestive health and boosts immunity
		<i>Bangle</i>	Rhizome			
		<i>Asam Jawa</i>	Fruit			
13	<i>Jamu sehat</i>	<i>Kunyit</i>	Rhizome	Prepare tamarind 1 spoon, turmeric 1 segment and rice 1 handful and enough water. Wash the ingredients thoroughly. Roast the turmeric, rice and tamarind until browned. Pound the burnt ingredients until smooth. Put the mashed ingredients into a clean cloth / napkin add a little water and then squeeze to get the juice. The resulting juice is ready for consumption.	Taken once a day, can be taken anytime morning, noon or night.	Health provides freshness and fitness to the body.
		<i>Temulawak</i>	Rhizome			
		<i>Kunyit putih</i>	Rhizome			
14	<i>Jamu pelancar darah</i>	<i>Tapak dara</i> (periwinkle)	Root	Prepare 2 segments of kencur, 3 segments of temulawak, 3 segments of ginger, 100 grams of rice and enough water. Wash the herbal ingredients thoroughly. Cut the ingredients into small pieces. Drain the herbal ingredients. Dry the herbal ingredients in the sun until dry. Grind the dried herbal ingredients into powder. Sieve the powder so that it does not have a rough texture. Add enough water and apply on the body.	Apply to the body 2-3 hours in the morning.	Improve blood circulation in postpartum mothers.
		<i>Jahe</i>	Rhizome			
		<i>Kencur</i>	Rhizome			

No	Herb name	Plants used	Plant part used	Manufacturing process	How to use	Benefits of herbs
15	<i>Jamu pilis</i>	<i>Cabai Jawa</i>	Fruit	Prepare 2 Javanese chillies, 100 grams of rice, 2 ginger segments, 2 ginger segments, 1 nutmeg, 2 cloves. Wash the herbal ingredients thoroughly. Puree the ingredients used. Combine the ingredients that have been refined and mix well until all the ingredients are mixed. add water little by little while stirring until the mixture becomes thick. Take a sufficient amount of jamu pilis mixture and apply it to the forehead, temples and nape. Store in a closed place to prevent mould.	Apply on the forehead, temples, and nape of the neck. Leave on for 15-30 minutes or until dry.	Pilis helps relieve headaches and prevents the eyes from becoming blurry or myopic.
		<i>Jahe</i>	Rhizome			
		<i>Temulawak</i>	Rhizome			
		<i>Pala</i>	Seed			
		<i>Cengkeh</i>	Flower			

Table 4 Type of postpartum herbs of Ketapang Malay community

No	Pictures of plants	Local name	Scientific name	family	Compound content
1		<i>Kunyit</i>	<i>Curcuma longa</i>	<i>Zingiberaceae</i>	Compounds in turmeric rhizome powder that have potential as antioxidants based on Pa values are ascorbic acid, quercetin, β carotene, arabinose, bis demethoxycurcumin, demethoxycurcumin, curcumin, caffeic acid, cinnamic acid, letestuienin A, and calebin A (Suprihatin et al., 2020).
2		<i>Liak putih/ jahe</i>	<i>Zingiber officinale</i>	<i>Zingiberaceae</i>	Ginger rhizomes also contain various phytochemical compounds, including alkaloids, flavonoids, phenolics, triterpenoids, and saponins. Based on pharmacological activity, ginger is useful in antioxidant activity. Ginger water extract also contains gingerol, shogaol, zingeron, zingiberin, sesquiphellandrene, volatile oil, flavonoids, phenols, and terpenoids (Sari & Nasuha, 2021).
3		<i>Tapak dara</i>	<i>Catharanthus roseus</i>	<i>Apocynaceae</i>	The group of compounds contained in the leaves of tapak dara (<i>Catharanthus roseus</i>) by phytochemical screening method are alkaloids, flavonoids, saponins, tannins and steroids (Putri & Nasution, 2022).
4		<i>Serai wangi</i>	<i>Cymbopogon citratus</i>	<i>Poaceae</i>	Specific parameters of antioxidant activity test of kitchen lemongrass extract were positive for alkaloid, flavonoid, phenolic, tannin, saponin (Hutahaen & Februyani, 2023).
5		<i>Bandotan</i>	<i>Ageratum conyzoides</i>	<i>Asteraceae</i>	Babadotan plants as wild plants have a lot of phytochemical content spread in each organ starting from the roots, stems, leaves and flowers. Phytochemicals present in this plant include Alkaloids, Flavanoids, Chalcones, Tannins, Saponins, HCN, Glycosides, Steroids, Kumarins, Chromones, Terpenoids, Resins, Kardenolid, Phenol, Isoflavone glycosides (falvonoid group), Flavone polymethoxylated Sterols, and essential oils (Meliyaningsih et al., 2024)

No	Pictures of plants	Local name	Scientific name	family	Compound content
6		Rastuk	<i>Vetiveria zizanioides</i>	Poaceae	The roots of <i>Veriveri zizanioides</i> contain flavonoids and terpenoids (Agustin et al., 2024)
7		Lada	<i>Piper nigrum</i>	Piperaceae	<i>Piper nigrum</i> contains chemical compounds such as alkaloids, phenols, coumarins, tannins, saponins, glycosides, flavonoids and essential oils (Hasrawati et al., 2022).
8		Kencur	<i>Kaempferia galanga</i>	Zingiberaceae	The content of compounds contained in kencur consists of starch, minerals, essential oils as much. Essential oils in the form of sineol, methyl canyl acid, and pentadekaan, synod acid, ethyl ester, borneol, kamphene, paraeumarin, abisic acid, alkaloids, and gum (Rohama et al., 2024).
9		Sirih	<i>Piper betle</i>	Piperaceae	Some of the chemical compounds contained in green betel leaves are phenol compounds, cavicol, alkaloids, flavonoids, saponins, tannins, steroids, and essential oils (Sadijah et al., 2022).
10		Katuk	<i>Sauropus androgynus</i>	Euphobiaceae	Ethanol extract of katuk leaves (<i>Sauropus androgynus</i>) phytochemical screening obtained that katuk leaves contain alkaloids, tannins, flavonoids, saponins, and triterpenoids (Syahadat & Siregar, 2020).
11		Jeruju	<i>Acanthus ilicifolius</i>	Acanthaceae	Jeruju contains alkaloid compounds, flavonoids, tannins, steroids and saponins, all of which can be utilised as antimicrobials Alviona (Rahmazsanti et al., 2023).
12		Jambu biji	<i>Psidium guajava</i>	Myrtaceae	Guava leaf extract contains antibacterial compounds, namely saponins, tannins, and flavonoids (Jannah et al., 2024).
13		Sawi langit	<i>Vernonia Cinerea</i>	Asteraceae	Based on the results of phytochemical screening, it shows that overall the sky mustard roots contain secondary metabolite compounds, namely tannins, alkaloids, flavonoids, terpenoids and saponins (Lestari et al., 2021).
14		Bangle	<i>Zingiber montanum</i>	Zingiberaceae	Bangle rhizome contains essential oil which contains chemical compounds such as pinen, karyofillen, sabinene and caryofillen oxide. Bangle fresh root extract contains phytochemical compounds such as alkaloids, phenolics, flavonoids, saponins and triterpenoids (Setyani et al., 2021).

No	Pictures of plants	Local name	Scientific name	family	Compound content
15		Jariangau	<i>Acorus calamus</i>	<i>Acoraceae</i>	Ethanol extract of jeringau rhizome contains the highest levels of phenolic compounds and flavonoids, followed by alkaloid compounds, terpenes and tannins (Hardiansi et al., 2020)
16		Luntas	<i>Pluchea indica</i>	<i>Asteraceae</i>	Chemical compounds in eel leaf are flavonoids, saponins, and tannins (Andasari et al., 2021)
17		Pepaya	<i>Carica papaya</i>	<i>Caricaceae</i>	Papaya contains flavonoids, tannins, terpenoids and phenolic compounds (Waruwu et al., 2021)
18		Temulawak	<i>Curcuma xanthorrhiza</i>	<i>Zingiberaceae</i>	Flavonoids, alkaloids and triterpenoids (Megawati & Yuliana, 2019). Contains curcuminoid and xanthorrhizol compounds that have broad biological activities in the health field (Widyastuti et al., 2021).
19		Lengkuas	<i>Alpinia galanga</i>	<i>Zingiberaceae</i>	Galangal contains bioactive flavonoid compounds that have antioxidant effects (Lallo et al., 2022)
20		Kunyit putih	<i>Curcuma zedoaria</i>	<i>Zingiberaceae</i>	The results of phytochemical screening of ethanol extracts of white turmeric rhizomes (<i>Curcuma zedoaria</i>) contain alkaloids, saponins, terpenoids, steroids, flavonoids and tannins (Firmansyah & La, 2022).
21		Cabe jawa	<i>Piper retrofractum</i>	<i>Piperaceae</i>	Contains alkaloids, flavonoids, tannins, saponins, terpenoids, and piperine (Umarudin et al., 2024).
22		Bawang merah	<i>Allium cepa</i>	<i>Alliaceae</i>	Shallots contain various secondary metabolites such as flavonoids, tannins, saponins, volatile oils, kaempferol, flavonglycosides, floroglusin, dihydroalliin, cycloalliin, methialliin, quercetin, polyphenols, and also found sulphur in the bulbs (Setiawan et al., 2021).

No	Pictures of plants	Local name	Scientific name	family	Compound content
23		<i>Bawang putih</i>	<i>Allium sativum</i>	<i>Amaryllidaceae</i>	Garlic contains sulphur, amino acids, minerals, vitamins, and lipids (Moullia et al., 2018). Garlic also contains the substances alicin and hydrogen sulfide (Amir et al., 2022).
24		<i>Pegagan</i>	<i>Centella asiatica</i>	<i>Apiaceae</i>	Gotu kola contains bioactive compounds such as asiaticoside in the form of glycosides. Gotu kola also contains alkaloids, saponins, tannins, flavonoids, steroids, and triterpenoids (Sutardi, 2016).
25		<i>Kayu manis</i>	<i>Cinnamomum burmanni</i>	<i>Lauraceae</i>	Cinnamon contains bioactive compounds, including vanillic, caffeic, gallic, protocatechuic, p-coumaric, and ferulic acids (Yuwanda et al., 2023)
26		<i>Cengkeh</i>	<i>Syzygium aromaticum</i>	<i>Myrtaceae</i>	The chemical compounds contained in cloves are phenols, flavonoids, hydroxy benzoate, and hydrokinetic acid, with the main chemical compound eugenol (Kalalo et al., 2020).
27		<i>Pala</i>	<i>Myristica fragrans</i>	<i>Myristicaceae</i>	Nutmeg seeds are also known to contain secondary metabolites such as alkaloids, flavonoids, saponins, tannins, phenols, and terpenoids (Abdulkadir et al., 2023).

Table 5 Compliance with learning resource requirements

Indicator	Presentation	Interpretation
Clarity of potential	95.31%	Very good
Clarity of purpose	97.92%	Very good
Clarity of objectives	97.92%	Very good
Clarity of information revealed	97.92%	Very good
Clarity of exploration guidelines	90.63%	Very good
Clarity of expected gains	90.63%	Very good
Average	95,06 %	Very good

A total of 27 plant species are used as postnatal herbs by the Ketapang Malay community in Natai Kuini village. Differences in the number of plants used by a community group are influenced by lifestyle and the availability of plants around their environment (Hafizah & Fitmawati, 2023).

Based on the explanation above, it is obtained that the ethnobotanical potential of postnatal herbal medicine of the Malay community in Ketapang is in accordance with the biology teaching material, namely Biodiversity. One of the characteristics of a good learning resource is its ease of access, both because of its proximity to the user and because of the sufficient availability of various learning resources (Nurliza et al., 2023).

Based on the findings of the interviews that have been conducted, through observation and documentation of the morphological characteristics of plants. The identification results that have been verified by plant experts and the results of the use of plants as postpartum herbs will be used as learning resources in the form of documents of the findings. The results of the questionnaire obtained regarding the potential of learning resources can be seen in Table 5.

Learning about local potential aims to increase students' understanding of the advantages and wisdom that exist in the area where they live, as well as to make the learning process more practical and meaningful (Wulandari & Djukri, 2021). All learning resources should not be viewed in isolation, but rather

as an integral part of the learning process that can contribute positively to learning outcomes (Karmadi et al., 2023). Based on Table 5, it shows 6 requirements for learning resources, namely: aspects of clarity of suitability for purpose, clarity of objectives, clarity of information disclosed, clarity of exploration guidelines, and clarity of expected gains.

Clarity of potential

Potential clarity is defined as an object that has the capacity to help students learn if it contains problems that can be overcome in teaching and learning activities. The availability of the object in this study is the herbal medicine plant material after the birth of the Ketapang Malay community. Information that can be raised in this study is biodiversity and classification of living things. Learners can learn directly about the biodiversity of plant species and their use as traditional herbal medicine because the ethnobotanical potential of postpartum herbal medicine can be used as a learning resource. The potential of an object is determined by its availability, as well as problems that can be revealed to produce facts and concepts from the results of research intended to be taught (Febriyanda et al., 2022). The clarity of potential learning resources can be seen from the utilisation of objects that have educational value and relevance to learning. Research Manalu & Suhartini (2023) shows that the Lake Toba environment with its biodiversity, such as fish, aerial plants, benthic animals, and phytoplankton, can be a learning resource despite environmental threats. Research (Alfazali et al., 2021) highlighted 19 species of Echinoidea with different substrate types as objects that provide an overview of species and ecosystem diversity. Meanwhile, research Sunarya et al. (2024) utilised Dayak medicinal plants as a learning resource, providing opportunities for students to get to know the diversity of plant species and their uses in traditional medicine. Some of these studies show great potential in improving students' understanding of biodiversity and its utilisation, as well as being relevant to the curriculum objectives.

Clarity of purpose

Learning resources that are in accordance with learning objectives have an important role in supporting the achievement of student competencies. Research by Manalu & Suhartini (2023) showed that the potential of local biodiversity in Lake Toba is relevant to learning objectives, such as identifying the level of biodiversity, describing Indonesia's biodiversity and its threats, and finding solutions for environmental conservation. Research by Sunarya et al (2024) stresses the importance of choosing learning resources based on specific objectives, where ethnobotany of Dayak medicinal plants in Kayu Ara Village can help students observe, identify, classify, and analyse the types of plants and their benefits. Research

by Alfazali et al. (2021) supports the basic competencies of the 2013 Curriculum (KD 3.2) with a focus on analysing biodiversity, its threats, and conservation efforts. All of these studies show that the selected learning resources have succeeded in achieving clarity of learning objectives on biodiversity, both at the species and ecosystem levels, as well as analysing threats and conservation efforts.

Clarity of learning resources with objectives, learning resources must be selected based on what objectives are to be achieved by using them. Learners can observe, identify, classify and analyse the types of herbs after giving birth to the Ketapang Malay community. Learners can know the type of biodiversity and its role in life. The potential of plants can be utilised because the location of plants is affordable, this is in accordance with the opinion of Nurdiana et al. (2024) that the determination of learning resource objects must pay attention to relevance to learning objectives and ease of reach so that students can make it possible to learn.

Clarity of material objectives

The importance of material clarity in the biology learning process as a learning resource is expressed in research (Muldayanti et al., 2021), material on Plantae highlights the interaction between students as subjects and objects studied to clarify learning targets. Research by Alfazali et al (2021) discusses the diversity of Echinoidea in the coastal intertidal zone which is in accordance with KD 3.2 in the 2013 Curriculum, including the level of biodiversity, classification of living things, threats, and conservation efforts. Meanwhile, research by Sunarya et al. (2024) reviewed traditional Dayak medicinal plants that are relevant as learning materials for biodiversity, with coverage of gene, species, and ecosystem submaterials. It can be concluded that the clarity of the learning resources helps students understand biodiversity from various aspects, such as its benefits, threats, and conservation efforts. In addition, this learning resource is in accordance with the high school learning outcomes which include the concept of biology, its branches, its benefits in life, and relevant global issues.

The target in question is the clarity of the target of observation (object) and target designation (subject). Clarity of observation targets, namely plants found in Ketapang district. The target designation is students in junior and senior high school, especially biology teaching material (biodiversity). According to Ardiyanto et al. (2024) The scope of biological material includes an understanding of biology, its various branches, its benefits for life, the level of organisation of life, and relevant biological issues at the global level.

Clarity of information disclosed

The utilisation of local biodiversity-based learning resources can increase the clarity of information conveyed to students. Research by Faturrahman et al

(2024) on the diversity of Basidiomycota fungi in West Kalimantan provides factual knowledge that supports learning material on the role of fungi while introducing local potential to students. Research on traditional medicinal plants by Sunarya et al. (2024) of the Dayak community in Kayu Ara Village also shows that local wisdom is a clear and relevant source of information, allowing students to directly understand the knowledge of medicinal plants around them. In addition, research by Manalu & Suhartini (2023) in the waters of Lake Toba revealed the potential of local ecosystems as a learning medium for recognising biodiversity from the species to genus level. Thus, a local potential-based learning approach can provide a more meaningful, relevant and factual learning experience for students.

The clarity of information revealed in this study is 27 types of plants used as postnatal herbs and 14 types of postnatal herbs. Information obtained from observations is clearer and more factual because students are faced directly with environmental conditions in Ketapang district. This is in accordance with the opinion of Rahmawati & Sriyati (2024) that objects found in the field will provide real experience to students, more concrete learning, and verbatim.

Clarity of exploration guidelines

However, requires careful planning and clear protocols according to clarity of exploration guidelines interpretation. Case studies such as the role of bintagur trees (Faturrahman, et al., 2024) and environmental changes in the colourful village of Jodipan Malang (Qomariansyah et al., 2023) show that with a systematic approach, students can gain a deeper understanding of the surrounding environment. In the research of Manalu & Suhartini (2023) explained that the potential of Lake Toba as a learning resource is very large, but it needs to be balanced with consideration of obstacles such as the water environment and limited tools.

Clarity of exploration guidelines is a working procedure in the field that starts from determining the object of research, tools and materials, how to work, and data analysis and conclusion drawing (Kabani et al., 2023). In this study, plants used in postnatal herbal medicine of the Ketapang Malay community can be utilised as a learning resource and a knowledge based on local wisdom that can be a natural laboratory in biology learning because it is not yet available.

Clarity of expected gains

Clarity of expected gains, namely the gains in question in the form of: 1) Affective gains, students will have positive scientific attitudes in participating in protecting, maintaining, and utilising nature and the environment for good purposes. 2) Cognitive acquisition, students are able to use critical thinking to gain knowledge and solve problems through environmental observation activities as a learning

resource so that they experience academic improvement, this is in accordance with the results of research Nursela et al. (2023) which reveals that context-based learning has a positive effect on motivation and academic success. 3) Psychomotor acquisition is a domain that includes movement behaviour and physical coordination, motor skills and physical abilities. Skills that will develop if you often practice in learning activities that can be measured based on distance, speed, speed, technique and method of implementation.

In the learning process, the use of this learning resource can improve students' skills such as skills in digging up information, analysing, identifying, implementing the scientific attitude of students both in conducting learning and in communicating with each other, and so on which is more about training students' independence to be able to implement the knowledge gained from school to the community and its environment.

D. Conclusion

Ethnobotany of postnatal herbal medicine plants is a study of how humans use the plants around them as postnatal herbs for mothers who have given birth. The research was conducted in Natai Kuini village, Ketapang district and found 15 types of herbs and 27 species of postnatal herbs. Based on the results of the questionnaire analysis, the potential of learning resources was found to be very good with an average of 95.06%.

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