Species and utilization of medicinal plants by the Malay ethnic group in Rokan Hulu District, Riau Province, Indonesia

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Abstract. Traditional medicine is a part of the nation's cultural heritage and therefore needs to be preserved, studied, and further developed. Research on Indonesian traditional medicine covers studies on single herbal ingredients as well as compound formulations. To date, research has included the cultivation of medicinal plants, chemical content analysis, toxicity testing, pharmacodynamics, formulation, and clinical trials. In general, the use of traditional medicine is considered safer than modern medicine. This is because traditional medicines tend to have relatively mild side effects when used properly, which requires the accuracy of the raw materials, correct dosage, appropriate timing and method of use, proper interpretation of information, and avoidance of misuse. This study aims to identify the species of plants and their utilization as traditional medicine by the Malay ethnic group in Rambah Subdistrict. Data were collected through semi-structured interviews using interview guides with selected informants. Respondents were chosen using a snowball sampling technique. A qualitative approach was applied through interviews to understand the ways medicinal plants are used, while a quantitative approach was employed to analyze the frequency of plant use based on the interview data. The results revealed that there are 96 species of medicinal plants belonging to 49 families. The parts of the plants utilized include leaves (46 species), fruits (22 species), tuber (11 species), flowers (8 species), roots (6 species), stem (8 species), seeds (3 species), twig (1 species), and latex (1 species) with leaves being the most commonly used part, and twig and latex the least. The processing of medicinal plants is carried out traditionally by boiling, pounding, or brewing to treat various diseases.
Key Words: leaf, medicinal plant, species, traditional medicine.

Introduction. Indonesia is a country with high biodiversity because it is located on the equator with a tropical climate, which has the potential for the growth and development of most plants (Budiman et al 2018). Treatment with herbal plants is widely used in developing countries, especially in those countries whose communities have a poor economy (Ansori et al 2020). Many medicinal plants in Indonesia have not yet been identified or studied for their chemical properties. There is currently a rapidly increasing demand for the use of medicines from herbal plants throughout the world (Solikhah et al 2020). Riau Province is one of the provinces in Indonesia well known for its abundant natural resources. Rokan Hulu Regency is part of Riau Province, and within it lies Rambah Subdistrict, which still possesses relatively undisturbed biodiversity. Many members of the traditional communities in Rambah Subdistrict continue to utilize plants for traditional medicine, handicrafts, and daily consumption. Traditional medicines derived from plants are prepared as *simplisia* (raw dried materials) or herbal concoctions used to maintain health or treat various ailments (Lim & Pranata 2020). However, the raw materials for traditional medicines, particularly those from plants, are still largely harvested from the wild, putting some plant species at risk (Ndhlovu et al 2021).

Traditional medicine is a part of the nation's cultural heritage and therefore needs to be preserved, studied, and developed. Research on Indonesian traditional medicine includes studies on single herbal ingredients as well as compound formulations (Qasrin et al 2020). Such research has covered the cultivation of medicinal plants, chemical content analysis, toxicity testing, pharmacodynamics, formulation development, and clinical trials.

Generally, traditional medicines are considered safer than modern medicines. This is because they tend to have fewer side effects when used correctly, which involves verifying the authenticity of the plant material, ensuring the correct dosage, timing, and method of use, properly interpreting information, and preventing misuse (Pranaka et al 2020).

Unfortunately, this traditional knowledge is often undocumented, making it difficult to disseminate widely. A lack of public awareness regarding this knowledge may lead to the loss of natural habitats and the extinction of valuable medicinal plants, especially forest species, due to overexploitation and land conversion. With advances in science, technology, and the economy in Indonesia, younger generations are generally less interested in traditional arts and knowledge. Many perceive this knowledge as outdated and irrelevant in the current era of globalization. As a result, there is a declining interest among the youth to learn about traditional medicine and the use of medicinal plants, which may gradually lead to the loss of this cultural heritage (Falah et al 2020). Medicinal plants are those that can be used as herbal remedies, containing compounds with therapeutic properties that are safe for human use.

Medicinal plants have distinct advantages over conventional medicines, as they have the ability to enhance the body's biomolecular activities. Medicinal plants not only treat but can also promote healing by improving the overall system at the cellular and molecular levels. However, knowledge of traditional medicines is still limited and is typically passed down orally through generations, making it difficult to share widely. Village shamans or traditional healers who possess this knowledge are generally over 50 years old, raising concerns about the lack of younger successors to preserve and continue this tradition. As a result, the continuity of traditional medicinal practices risks being lost over time. This decline is evident in the increasing preference for modern medicines, which are perceived as more practical and easier to obtain (Sharma et al 2021).

Living organisms are capable of producing secondary organic compounds (secondary metabolites) through secondary reactions of primary organic materials such as carbohydrates, fats, and proteins. These secondary metabolites are generally the final products of metabolic processes and play important roles in physiological functions. They are typically small molecules with specific structures, not universally found in all organisms, and each compound serves distinct functions, mainly for self-defense or environmental adaptation. Secondary metabolites are valuable biomolecules that can serve as lead compounds in the discovery and development of new drugs. Common secondary metabolites found in plants include alkaloids, flavonoids, steroids, saponins, terpenoids, and tannins (Zhou et al 2023).

The applications of secondary metabolites are extensive. In pharmacology, they are used as antioxidants, antibiotics, anticancer agents, anticoagulants, and carcinogenesis inhibitors; they also function as eco-friendly bioagents for pest control. Various secondary metabolites such as alkaloids, terpenoids, flavonoids, and steroids have demonstrated significant biological activities. For instance, flavonoids isolated from various plants have shown promising bioactivities, including cytotoxicity against cancer cells, inhibition of histamine release, antifungal, and antibacterial effects. Meanwhile, terpenoids can be developed as environmentally friendly antimicrobials (Nugraha et al 2022). The aim of this study is to investigate the traditional knowledge of the Malay ethnic community in utilizing plants for medicinal purposes and to identify the species of medicinal plants used by the Malay people in Rambah Subdistrict, Rokan Hulu District, Riau Province. In addition, the study examines the presence of secondary metabolites such as alkaloids, flavonoids, terpenoids, steroids, and tannins in these plants.

Material and Method

Study site. This research was conducted over a period of one year, from July 2024 to July 2025, in all villages within Rambah Subdistrict, namely: Babussalam, Koto Tinggi, Menaming, Pasir Baru, Pasir Maju, Pematang Berangan, Rambah Tengah Barat, Rambah Tengah Hilir, Rambah Tengah Hulu, Rambah Tengah Utara, Sialang Jaya, Suka Maju, Tanjung Belit, and Pasir Pengaraian. Nine of these villages are predominantly inhabited by the Malay ethnic group, while five villages - Menaming, Pasir Baru, Rambah Tengah Barat,

Rambah Tengah Hulu, and Sialang Jaya - are mainly inhabited by the Javanese and Mandailing ethnic groups. After fieldwork in these villages, laboratory work was carried out at the Biology Education Study Program Laboratory, Faculty of Teacher Training and Education.

Research design. This study consisted of three main activities conducted within one year: interviews with traditional village healers as key informants, identification of medicinal plants, and preparation of herbarium specimens.

Equipment, tools, and materials. The equipment used in this study included stationery, knives, sewing needles, an electric oven, specimen bottles, and a video camera. Materials included 70% alcohol, newspaper, manila paper, cardboard, label paper, corn thread, plastic bags, raffia string, glue, and the collected plant specimens for herbarium preparation.

Fieldwork. In the field, observations were conducted with community members knowledgeable about the functions and uses of medicinal plants utilized by the Malay ethnic group. Respondents were interviewed to determine the species of plants used and the parts utilized. After interviews, all plant organs were documented using a camera. For small plants, the entire plant was collected; for larger plants, only representative samples of the plant organs were taken. Plant organs were cut to a length of approximately 30 cm, sprayed with 70% alcohol, wrapped tightly in newspaper, tied with raffia string, and placed in plastic bags. All preserved samples were then transported to the Biology Education Study Program Laboratory for preparation into dried herbarium specimens.

Laboratory work. At the laboratory, herbarium specimens were prepared and dried using an electric oven. First, specimens were removed from the newspaper, arranged neatly on fresh newspaper, pressed between pieces of cardboard sized to fit the specimens, and tied with raffia string. Drying was performed in an oven at temperatures of 40°C and 60°C for three days until completely dry. Once dried, specimens were mounted on manila paper and secured using corn thread. Each specimen was labelled and identified using reference books (Noor & Asih 2018; Gunawan et al 2022).

Data analysis. The collected data were analyzed descriptively to document the plant species identified and the parts used by the Malay ethnic group.

Results

Species of traditional medicinal plants used by the Malay community. The following are the species of plants utilized by the Malay community in Rambah Subdistrict, Rokan Hulu Regency, Riau Province, for traditional medicinal purposes. These plants are categorized into 96 species belonging to 49 families, as presented in Table 1. Table 1 shows the high diversity of medicinal plants found in the Malay community area, specifically in Rambah Subdistrict, Rokan Hulu Regency. This finding demonstrates that the Malay people in this region continue to uphold their cultural traditions of using medicinal plants. Although some plant species are becoming harder to find, the Malay community in Rambah Subdistrict has successfully cultivated these species by planting them in home gardens and fields. The methods of utilizing these plants remain traditional. Typically, the Malay community in Rambah Subdistrict processes medicinal plants manually through boiling, pounding, filtering, brewing, drying, and roasting (Aini et al 2024). These plants are used to treat a wide range of health complaints, both internal and external, including colds, headaches, gastritis, constipation, pain, hemorrhoids, hypertension, stomach aches, fever, cough, wounds, gout, cholesterol, and to maintain the health of various organs (Loresa et al 2023).

Table 1

Species of traditional medicinal plants of the Malay tribe found in Rambah District, Rokan Hulu Regency, Riau Province

No.	*Vernacular name*	*Species*	*Family*	*Medical utility*	*Plant organ*	*Processing*	*Consumption type*
1	Keji Beling	*Strobilanthes crispa*	Acanthaceae	Kidney stone	Leaf	Boiled	Drunk
2	Jerangau Merah	*Acorus calamus*	Acoraceae	Rheumatism	Tuber	Pounded	Drunk
3	Jerangau Putih	*Acorus* sp.	Acoraceae	Rheumatism	Tuber	Pounded	Drunk
4	Bawang Merah	*Allium cepa*	Amaryllidaceae	Fever	Tuber	Not processed	Rub, eaten
5	Bawang Putih	*Allium sativum*	Amaryllidaceae	Fever, hypertension	Tuber	Not processed	Rub
6	Jambu Monyet	*Anacardium occidentale*	Anacardiaceae	Mouth ulcer	Leaf	Pounded, boiled	Drunk
7	Kedondong	*Spondias dulcis*	Anacardiaceae	Cough	Fruit	Pounded	Rub, eaten
8	Srikaya	*Anona squamosa*	Annonaceae	Inflammation	Leaf, root	Dried, boiled	Drunk
9	Kenanga	*Cananga odorata*	Annonaceae	Asthma, rheumatism	Flower	Boiled	Drunk
10	Daun Sop	*Apium graveolens*	Apiaceae	Hypotention	Leaf	Not processed	Eaten
11	Daun Pegage	*Centella asiatica*	Apiaceae	Boils, cancer cores	Leaf	Not processed	Pasted, eaten
12	Ketumbar	*Coriandrum sativum*	Apiaceae	Rheumatism	Fruit	Boiled	Eaten
13	Jinten	*Trachyspermum roxburghianum*	Apiaceae	Fever	Leaf	Pounded, boiled	Pasted, drunk
14	Pinang	*Areca catechu*	Arecaceae	Halitosis	Fruit	Pounded	Eaten
15	Kelapa	*Cocos nucifera*	Arecaceae	Hypertension	Fruit, twig, leaf	Boiled	Eaten
16	Sedap Malam	*Polianthes tuberosa*	Asparagaceae	Skin care	Flower	Pounded	Rub
17	Lidah Buaya	*Aloe vera*	Asphodelaceae	Skin diseases, skin wound care, mouth ulcer	Latex	Not processed	Patch, rub, drunk
18	Daun Sangi	*Cosmos caudatus*	Asteraceae	Stomach ache, diabetes, gout	Leaf	Boiled	Drunk
19	Tapak Leman	*Elephantopus scaber*	Asteraceae	Tonsel, measles, leukorrhea, inflammation, hernia nucleus pulposus	Leaf	Boiled	Drunk
20	Daun Dewa	*Gynura difaricata*	Asteraceae	Stroke	Leaf	Boiled	Drunk
21	Matahari	*Helianthus annuus*	Asteraceae	Muscle cramps	Seed	Dried	Eaten
22	Tempuyung	*Sonchus arvensis*	Asteraceae	Cholelithiasis	Leaf	Boiled	Drunk
23	Selada Air	*Nasturtium microphyllum*	Brassicaceae	Eczema	Leaf	Not processed	Eaten
24	Nanas	*Ananas comosus*	Bromeliaceae	Cholesterol, miscarriage	Fruit	Not processed	Eaten
25	Betik	*Carica papaya*	Caricaceae	Malaria, fever, constipation, diabetes	Fruit, leaf	Boiled	Eaten, drunk
26	Asam Kanis	*Garcinia xanthochymus*	Clusiaceae	Diabetes, cough	Fruit	Boiled	Drunk
27	Ceguk	*Combretum indicum*	Combretaceae	Helmints	Flower	Boiled	Drunk
28	Adam Hawa	*Rhoeo discolor*	Commelinaceae	Cough, constipation	Leaf, root	Boiled	Drunk

29	Kangkung	*Ipomoea aquatica*	Convolvulaceae	Varicella	Leaf, stem	Pounded	Rub
30	Cocor Bebek	*Kalanchoe pinnata*	Crassulaceae	Fever	Leaf	Pounded	Pasted
31	Kemiri	*Aleurites moluccana*	Euphorbiaceae	To blacken hair	Fruit	Pounded	Rub
32	Daun Ubi	*Manihot esculenta*	Euphorbiaceae	Fever	Leaf	Pounded	Pasted
33	Jarak	*Ricinus communis*	Euphorbiaceae	Tootache, mouth ulcer	Leaf	Not processed	Pasted
34	Saga	*Adenanthera pavonina*	Fabaceae	Diabetes	Leaf	Boiled	Drunk
35	Gelinggang	*Cassia alata*	Fabaceae	Tinea versicolor	Leaf	Pounded	Rub
36	Putri Malu	*Mimosa pudica*	Fabaceae	Wormy, fever	Root	Boiled	Drunk
37	Petai	*Parkia speciosa*	Fabaceae	Hemorrhoids	Fruit	Not processed	Eaten
38	Turi	*Sesbania grandiflora*	Fabaceae	Dysentery	Flower	Boiled	Drunk
39	Melinjo	*Gnetum gnemon*	Gnetaceae	Kidney disease	Leaf	Boiled	Drunk
40	Daun Mint	*Mentha piperita*	Lamiaceae	Cough	Leaf	Boiled	Drunk
41	Selasih	*Ocimum basilicum*	Lamiaceae	Diurection	Leaf	Boiled	Drunk
42	Daun Kemangi	*Ocimum sanctum*	Lamiaceae	Infertility	Leaf	Not processed	Eaten
43	Kumis Kucing	*Orthosiphon aristatus*	Lamiaceae	Diabetes	Leaf	Boiled	Drunk
44	Kayu Manis	*Cinnamomum burmanni*	Lauraceae	Guasiness, diabetes	Stem	Boiled	Drunk
45	Alpukat	*Persea americana*	Lauraceae	Indigestion	Fruit	Not processed	Eaten
46	Benalu Api	*Loranthus* sp.	Loranthaceae	Stomach, ache	Leaf	Boiled	Drunk
47	Inai	*Lawsonia inermis*	Lythraceae	Dysmenorrhea	Leaf	Boiled	Drunk
48	Kembang Sepatu	*Hibiscus rosa-sinensis*	Malvaceae	Fever	Fruit	Boiled	Drunk
49	Senuduk	*Marumia nemorosa*	Melastomataceae	Wound	Leaf	Pounded	Patch
50	Cincau	*Cyclea barbata*	Menispermaceae	Skin medication	Leaf	Boiled	Drunk
51	Sukun	*Artocarpus altilis*	Moraceae	Asthma, diabetes	Leaf	Boiled	Drunk
52	Cempedak	*Artocarpus integer*	Moraceae	Bleeding gums	Fruit	Not processed	Eaten
53	Kelor	*Moringa oleifera*	Moringaceae	Diabetes, rheumatism hypertension	Leaf	Boiled	Drunk
54	Pisang	*Musa paradisiaca*	Musaceae	Puerperium, diarrhea	Fruit	Not processed	Eaten
55	Pala	*Myristica fragrans*	Myristicaceae	Insomnia	Flower	Dried, boiled	Drunk
56	Kayu Putih	*Melaleuca leucadendra*	Myrtaceae	Rheumatism	Stem	Boiled	Drunk
57	Jambu Kelutuk	*Psidium guajava*	Myrtaceae	Diarrhea	Leaf	Pounded, boiled	Drunk
58	Cengkeh	*Syzygium aromaticum*	Myrtaceae	Toothache	Leaf	Pounded	Pasted
59	Daun Merah	*Syzygium oleana*	Myrtaceae	Hemorrhoids, hypertension	Leaf	Boiled	Drunk
60	Salam	*Syzygium polyanthum*	Myrtaceae	Hearthburn	Leaf	Boiled	Drunk
61	Pakis	*Nephrolepis cordifolia*	Nephrolepidaceae	Sore eye	Leaf	Boiled	Eaten
62	Melati	*Jasminum sambac*	Oleaceae	Kidney disease	Fruit	Dried, boiled	Drunk
63	Belimbing Wuluh	*Averrhoa bilimbi*	Oxalidaceae	Bleeding gums	Leaf, stem, fruit	Boiled	Eaten, drunk
64	Meniran	*Phyllanthus urinaria*	Phyllanthaceae	Toothache, cough	Leaf, seed	Pounded, boiled	Pasted, drunk
65	Daun Katuk	*Sauropus androgynus*	Phyllanthaceae	Hyperpigmentation	Leaf	Pounded	Pasted
66	Sirih Cina	*Peperomia pellucida*	Piperaceae	Uric acid	Leaf, root	Boiled	Drunk

67	Sirih Hijau	*Piper betle*	Piperaceae	Toothache	Leaf	Not processed	Eaten
68	Sahang	*Piper nigrum*	Piperaceae	Influenza, lochia	Fruit	Pounded	Eaten
69	Sirih Merah	*Piper ornatum*	Piperaceae	Leukorrhea	Leaf	Boiled	Rub
70	Cabe Jawa	*Piper retrofractum*	Piperaceae	Arthritis	Leaf	Boiled	Drunk
71	Sereh	*Cymbopogun citratus*	Poaceae	Bone fracture, fever	Stem	Boiled	Drunk
72	Serai Wangi	*Cymbopogon nardus*	Poaceae	Bone fracture	Stem	Pounded	Patch
73	Alang-alang	*Imperata cylindrica*	Poaceae	Fever	Root	Boiled	Drunk
74	Tebu	*Saccharum officinarum*	Poaceae	Stomachache, constipation	Stem	Ponded	Drunk
75	Air Mata Pengantin	*Antigonon leptopus*	Polygonaceae	Diabetes, wound dressing, flu, cough, hypertension	Flower	Pounded, boiled	Pasted, drunk
76	Jintan Hitam	*Nigella sativa*	Ranunculaceae	Analgesic	Fruit	Boiled	Drunk
77	Kopi	*Coffea arabica*	Rubiaceae	Acne	Seed	Boiled	Rub
78	Kaca Piring	*Gardenia jasminoides*	Rubiaceae	Diabetes	Flower	Boiled	Drunk
79	Mengkudu	*Morinda citrifolia*	Rubiaceae	Hypertension, skin diseases, stomachache	Fruit, leaf	Boiled, pounded	Patch, drunk
80	Nusa Indah	*Mussaenda pubescens*	Rubiaceae	Cancer	Flower	Boiled	Drunk
81	Limau Nipis	*Citrus aurantifolia*	Rutaceae	Mouth ulcer	Fruit	Not processed	Eaten
82	Matoa	*Pometia pinnata*	Sapindaceae	Miscarriage	Fruit	Not processed	Eaten
83	Cakar Ayam	*Selaginella doederleinii*	Selaginellaceae	Hepatitis	Leaf	Boiled	Drunk
84	Pasak Bumi	*Eurycoma longifolia*	Simaroubaceae	Fever	Root	Boiled	Drunk
85	Ginseng Jawa	*Talinum paniculatum*	Talinaceae	Appetite enhancer	Leaf	Boiled	Drunk
86	Mahkota Dewa	*Phaleria macrocarpa*	Thymelaeaceae	Antitumor	Fruit	Boiled	Drunk
87	Lengkuas	*Alpinia galanga*	Zingiberaceae	Tinea versicolor, allergy	Tuber	Pounded	Pasted, rub
88	Lengkuas Merah	*Alpinia purpurata*	Zingiberaceae	Fever	Tuber	Boiled	Drunk
89	Kapulaga	*Amomum compactum*	Zingiberaceae	Hypertension, cough	Fruit	Boiled	Drunk
90	Jahe	*Zingiber officinale*	Zingiberaceae	Respiratory infection	Tuber	Pounded, boiled	Drunk
91	Temu Hitam	*Curcuma aeruginosa*	Zingiberaceae	Hearthburn	Stem	Boiled	Drunk
92	Kunyit	*Curcuma domestica*	Zingiberaceae	Hypertention, fever, tootache	Tuber	Boiled	Eaten, drunk
93	Kunyit Putih	*Curcuma mangga*	Zingiberaceae	Contusion	Tuber	Boiled	Drunk
94	Temulawak	*Curcuma xanthorrhiza*	Zingiberaceae	Stiff, hepatitis	Tuber	Boiled	Drunk
95	Kecombrang	*Etlingera elatior*	Zingiberaceae	Boost breast milk production	Fruit	Boiled	Drunk
96	Kencur	*Kaempferia galanga*	Zingiberaceae	Kidney stone	Tuber	Boiled	Drunk

Based on the analysis presented in Table 1, 96 species belonging to 49 families were identified as being used for traditional medicine by the Malay community in the villages of Rambah Subdistrict, Rokan Hulu Regency. The parts of the plants utilized include leaves (46 species), fruits (22 species), tuber (11 species), flowers (8 species), stems (8 species), roots (6 species), stem (8 species), seeds (3 species), twig (1 species), and latex (1 species), with leaves being the most commonly used part, and twig and latex the least. The processing of medicinal plants is carried out traditionally by boiling, pounding, or brewing to treat various diseases.

For comparison, Hidayat et al (2021) found 102 species used by the Malay community in Lingga Regency, Riau Archipelago Province. Furthermore, Chandra et al (2022) identified 80 species among the Dayak Mahap and Malay communities in Tembesuk village, Sekadau Regency, while Pradita et al (2021) documented 30 species used by the Dayak Paus and Malay communities for maternal and child postpartum care in Pengadang village, Sanggau Regency, West Kalimantan. Knowledge of these medicinal plants has been inherited through generations and is based on empirical experience and traditional skills.

The use of traditional medicinal plants by the Malay community has been practiced for generations and is still preserved today. The community possesses extensive knowledge of various medicinal plants, passed down from generation to generation. In practice, they use different parts of plants - leaves, fruits, tubers, flowers, stems, roots, seeds, twigs and latex - to treat various ailments, from mild to chronic diseases. The preparation of these medicinal plants is carried out using simple methods such as boiling, pounding, or brewing. Most of these plants are easily found in home gardens or the surrounding environment (Jiang et al 2020).

This traditional knowledge includes not only the identification of plant species but also methods of preparation, dosage, and specific therapeutic uses for particular diseases. Such traditional practices remain trusted and are often the first line of treatment before seeking modern medical care (Ng et al 2020).

Conclusions. Based on the findings, it can be concluded that the Malay community in Rambah Subdistrict, Rokan Hulu Regency, actively preserves the tradition of using medicinal plants for traditional healthcare practices. This study identified 96 species from 49 plant families, with leaves being the most commonly used leaves (46 species), fruits (22 species), tuber (11 species), flowers (8 species), stems (8 species), roots (6 species), stem (8 species), seeds (3 species), twig (1 species), and latex (1 species). The processing of medicinal plants is carried out traditionally using methods such as boiling, pounding, and brewing to treat a variety of internal and external ailments. The results of this research are expected to serve as initial data in the search for medicine.

Conflict of interest. The authors declare that there is no conflict of interest.

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