



The Diversity Species of Medicinal Plants in The Martelu Purba Nature Reserve, North Sumatra

Ridahati Rambey^{1,2*}, Jelly Permana Purba¹, Ahmad Baiquni Rangkuti^{1,2}, Arida Susilowati^{1,2}, and Onrizal¹

¹Faculty of Forestry, Universitas Sumatera Utara, Jalan Kampus 2 USU Bekala, Kecamatan Pancur Batu, Kabupaten Deli Serdang, Sumatera Utara 20353, Indonesia

²JATI- Sumatran Forestry Analysis Study Center, Jalan Kampus 2 USU Bekala, Kecamatan Pancur Batu, Kabupaten Deli Serdang, Sumatera Utara 20353, Indonesia

Abstract. Indonesia was known as a country that has high biodiversity, some of them are various types of medicinal plants. Since the first, Indonesian people have used medicinal plants in traditional medicine. This research was conducted in the Martelu Purba Nature Reserve (MPNR), Purba District, Simalungun Regency, North Sumatra. MPNR is a nature reserve consisting of high biodiversity, some of them are medicinal plants. However, the information on medicinal plants in this area is rarely documented even though they have a meaningful contribution as traditional medical treatments for indigenous communities. This study aims to identify all plant species found in the MPNR. This method of research was carried out by exploring key informants, namely the manager of the nature reserve and the local community. Determination of the number of respondents is done by the snowball sampling method. The results showed that there were 44 species of medicinal plants found in the MPNR consisting of 33 families, where the most families were from the *Arecaceae* family, which was 17.24%. Based on habitus, medicinal plants found in MPNR consist of 20 tree species (45.45%), 13 herb species (29.54%), 5 palm species (11.36%), 4 shrub species (9.09%), and 2 species from epiphytes (4.54%). Based on the intended use of medicinal plants used as fever, cough, diarrhea, diabetes, wounds, asthma, malaria, and others. Based on the part of the plant that has been used, 19 species from leaves (42.22%), 7 species from fruit/seed (15.90%), 6 species from all plant parts (13.63%), 5 species from bark (11.36%), 2 species from roots (4.54%), 1 species from resin (9.09%), 1 species from the flower (9.09%), 1 species from bark and seeds (9.09%), 1 species from wood (9.09%), and 1 species from bark and leaves (9.09%). Medicinal plant species found in the MPNR must be conserved to maintain their sustainability and can be used sustainably.

Keyword: Diversity, Martelu Purba, Medicinal Plant, Nature Reserve, Utilization

Received 19 October 2021 | Revised 04 August 2022 | Accepted 26 August 2022

1 Introduction

Indonesia is one of the countries with the highest biodiversity in the world. Indonesia is a country that has high biodiversity, both flora and fauna. Biodiversity in the form of flora and

*Corresponding author at: Faculty of Forestry, Universitas Sumatera Utara, Jalan Kampus 2 USU Bekala, Kecamatan Pancur Batu, Kabupaten Deli Serdang, Sumatera Utara 20353, Indonesia

E-mail address: ridahati.rambey@usu.ac.id

fauna, one of which is in the MPNR. MPNR is a nature reserve that has a fairly high diversity of plant species, one of which is medicinal plants. Many plants have not been identified optimally. It is important to research medicinal plants in the MPNR to record the potential of these medicinal plant species.

Medicinal plants have been known to many people and have been used by many Indonesians since ancient times until now. Many medicinal plants are obtained from the wild, for example in the forest. According to [1], medicinal plants are still widely used in traditional Indonesian medicines. This traditional Indonesian medicines are still widely used today, both in urban and rural areas and also among all social classes. Some areas that have local wisdom about the use of medicinal plants from various tribes need to be documented.

The active compound in most medicinal plants has a direct therapeutic effect or an indirect effect. Inside the body of this plant, certain materials are produced and stored referred to as the active compound (substance), which has physiological effects on living organisms medicinal plants are used for treatment because it has certain properties, including synergistic action. [2]. Traditional medicinal practices in Asia have existed from time immemorial; classical examples are Ayurveda in Himalaya, Jamu in Indonesia, Traditional Chinese Medicine in China, Sowa Rigpa in Bhutan, Kampo in Japan, Thai medicine in Thailand, and Herbal Medicine in Bangladesh [3]. In some areas, at this time the use of traditional plants has begun to be abandoned and depends on chemical drugs, but the people around the MPNR continue to use plants for health needs. Therefore, it is important to document the types of medicinal plants around the MPNR as data input for science. The purpose of this study was to identify the types of medicinal plants found in the MPNR, to find out the benefit of medicinal plant species, to know the parts of the plants used, and to know how to process these medicinal plants.

2 Research Method

This research was conducted in the MPNR, North Sumatera, Indonesia in 2018 (Figure 1). The research method was carried out by direct plants of medicinal plants in the forest guided by the staff of the MPNR, and interviews with local communities on the species of plants used as medicine by the community. The research method used is snowball sampling [4] by interviewing key informants in the community. Species identification was carried out by recording all species found in the MPNR [5,6,7]. Interviews were conducted to determine the types of medicinal plants used, utilization, parts used, habitus, and processing of medicinal plants. Identifying plants at the observation site is carried out directly in the field, scientific references with the help of finding species of local guides.

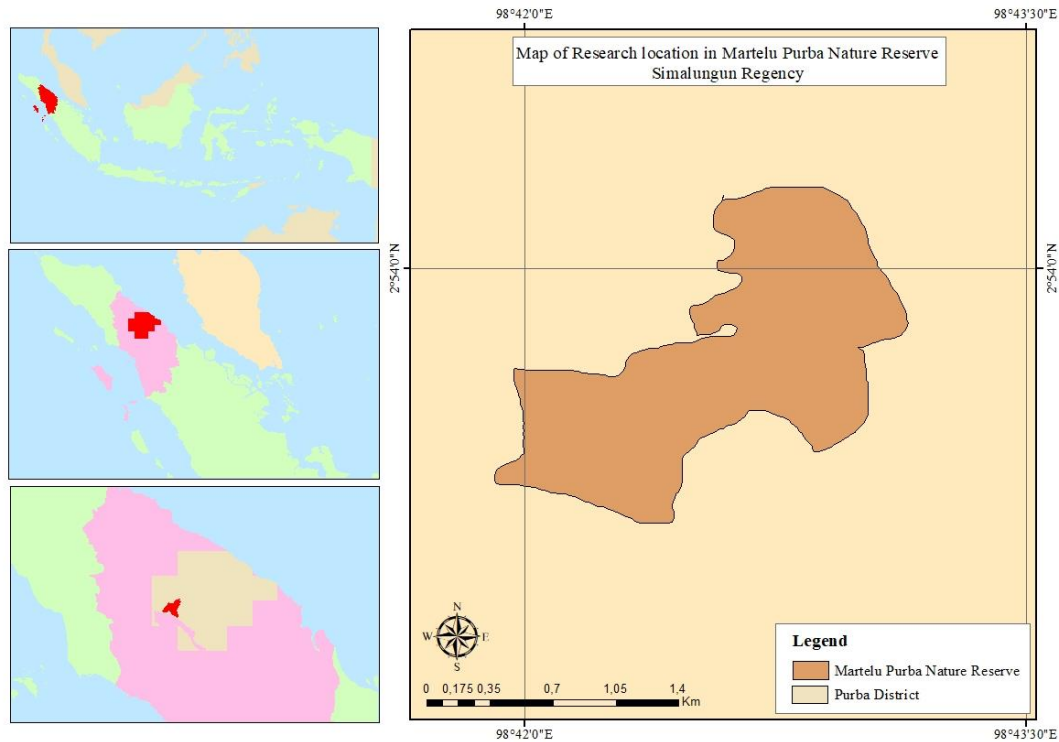


Figure 1. Map of research location

3. Results and Discussion

The results showed that there were 44 types of medicinal plants found in the MPNR consisting of 33 families, where the most families were from the *Arecaceae* family, which was 17.24%. Based on habitus, medicinal plants found in MPNR consist of 20 tree species (45.45%), 13 herb species (29.54%), 5 palm species (11.36%), 4 shrub species (9.09 %), and 2 species from epiphytes (4,54%). Based on the intended use of medicinal plants used as fever, cough, diarrhea, diabetes, wounds, asthma, malaria, and others.

Based on [8] from Batu Katak village, The Langkat Regency community suggested that there were 34 species of medicinal plants used by the community as traditional medicine. According to [9], based on the results of research in the Western Himalayan Palas Valley, Indus Kohistan, Pakistan there are 65 medicinal plant species of 57 genera belonging to 40 families. According to [10], revealed 134 species of medicinal plants from 53 families were found in eight districts in West Kalimantan. Eleven plant species have been reported to have a species UV. *Zingiber officinale* is the species most often used to treat bone injuries [10]. Compared to the research conducted by [11], 174 types of medicinal plants are classified into 45 different families, including 35 dicots and 9 monocots. The plant is mainly distributed in the parts of the Varzob and Ramit gorges, which is located near the capital city of the Republic of Tajikistan – Dushanbe city and is the natural buffer zone.

Based on the part of a plant that has been used in MPNR, 19 species from leaves (42.22%), 7 species from fruit/seed (15.90%), 6 species from all plant parts (13.63%), 5 species from bark (11.36%), 2 species from roots (4.54%), 1 species from resin (9.09%), 1 species from the flower (9.09%), 1 species from bark and seeds (9.09%), 1 species from wood (9.09%), and 1 species from bark and leaves (9.09%). Based on [12] among 65 species, the main parts were leaves (15) followed by fruits (12), stem (6), and berries (1), used as medicine. While 13 rhizome plant species are medicinally important, 4 from the root, 4 from seed, 4 from bark, and 1 each from resin.

Table 1 Diversity type, utilization, part of used, habitus, processing method medicinal plant in the MPNR, North Sumatera Indonesia

| No | Local name | Scientific name | Family | Utilization | Part of used | Habitus | Processing method |
|----|-------------------|---------------------------------|---------------|--|------------------------|-----------|---------------------------|
| 1 | Palem / demban | <i>Cyrtostachys lakka</i> | Arecaceae | Diarrhea | Fruit | Palm | Eating with betel |
| 2 | Pinang hutan | <i>Pinanga kuhlii</i> | Arecaceae | Dysentery and Injure | Root | Palm | Boiled |
| 3 | Aren | <i>Arenga pinnata</i> | Arecaceae | Inflammatory, Sprue, for breastfeeding mothers | Flower | Palm | Drink and eat directly |
| 4 | Salak | <i>Salacca zalacca</i> | Arecaceae | Bioethanol, Diabetes | Fruit | Palm | Boiled skin |
| 5 | Rotan | <i>Calamus axillaris</i> | Arecaceae | Gonorrhea Medicine | Fruit | Palm | Blend and drink |
| 6 | Daun kepala tupai | <i>Drynario aquercifolia</i> | Polypodiaceae | Anti bacterial TBC, Fever | All parts of the plant | Herb | Undergrowth |
| 7 | Paku sisik naga | <i>Pyrrosia piloselloides</i> | Polypodiaceae | Cancer Cure, Thrush | All parts of the plant | Epiphytes | Mashed and then boiled |
| 8 | Sabal | <i>Cinnamomum inners</i> | Lauraceae | anti-bacteria | Leaf | Tree | Boiled and drink |
| 9 | Pulutan | <i>Urena lobata</i> | Malvaceae | Injure, Fever | Leaf | Herb | Boil and rub on the wound |
| 10 | Balangkoras | <i>Pterospermum acerifolium</i> | Malvaceae | Antiseptic | Leaf | Shrub | mashed |
| 11 | Rajama-tan | <i>Leen angulate</i> | Malvaceae | Injure, Fever | Bark | Tree | Mashed and then boiled |
| 12 | Longa begu | <i>Clibadium surinamense</i> | Asteraceae | Injure, Diarrhea | Leaf | Herb | Boil and rub on the wound |
| 13 | Sambung nyawa | <i>Gynura procumbens</i> | Asteraceae | Diabetes Medicine | All parts of the plant | Herb | Boiled and drink |
| 14 | - | <i>Mussaenda</i> sp | Rubiaceae | Fever, Cough | Leaf | Shrub | Be drunk |
| 15 | Kopi | <i>Coffea Arabica</i> | Rubiaceae | Antidiabetic | Fruit | Shrub | Brewed |
| 16 | Nangka | <i>Artocarpus integer</i> | Moraceae | Malaria | Bark, seed | Tree | Eat directly |
| 17 | Beringin | <i>Ficus benjamina</i> | Moraceae | As medicinal Plant | Leaf | Tree | Boiled and drink |
| 18 | Simartolu | <i>Schima</i> sp. | Theaceae | Natural Dyes | Bark | Tree | Boiled and drink |
| 19 | Modang | <i>Litsea</i> sp | Lauraceae | Diarrhea, asthma, demam | Bark and leaf | Tree | Dried and brewed |
| 20 | Kayu manis | <i>Cinnamomum verum</i> | Lauraceae | Diabetes | Bark | Tree | Dried and brewed |

| No | Local name | Scientific name | Family | Utilization | Part of used | Habitus | Processing method |
|----|--------------------|----------------------------------|------------------|-------------------------------------|------------------------|-----------|--------------------------------|
| 21 | Sitarak | <i>Macaranga tanarius</i> | Euphorbia-ceae | Sore Throat | Leaf | Herb | Boil and drink |
| 22 | Sikam | <i>Bischofia javanica</i> | Euphorbia-ceae | Injure, Diarrhea, and Stomach Acid. | Bark | Tree | Dried and brewed and the drink |
| 23 | Senduduk | <i>Melastoma candidum</i> | Melastomataceae | Diarrhea | Leaf | Herb | Boil and drink |
| 24 | Daun bungkus | <i>Smilax rotundifolia</i> | Smilacaceae | Overcoming Barren | All parts of the plant | Herb | Be drink |
| 25 | Sungkit | <i>Curculigo latifolia</i> | Hipoksida-ceae | Fever | Leaf | Herb | Boiled and drink |
| 26 | Jati | <i>Tectona grandis</i> | Lamiaceae | Asthma, wound | Leaf | Tree | Boiled and drink |
| 27 | Rau | <i>Dracontome-lum sp</i> | Anacardia-ceae | Diarrhea | Bark | Tree | Pounded and Boiled |
| 28 | Petai cina | <i>Leucaena Leucocephala</i> | Fabaceae | Worm medicine, Skin medicine | Fruit | Tree | Eat directly |
| 29 | Hoting bunga | <i>Quercus sp.</i> | Fagaceae | diabetes, toothache | Fruit | Tree | Boiled and drink |
| 30 | Hanawe | <i>Eugenia longiflora</i> | Myrtaceae | anti-inflammatory | Leaf | Tree | Boiled and drink |
| 31 | Arang/gerung-gang | <i>Cratoxylon formosum</i> | Hyperica-ceae | Diarrhea | Leaf | Tree | Boiled and drink |
| 32 | Makadamia | <i>Macadamia hildebrandii</i> | Proteaceae | Antioksidan | Fruit | Tree | Boiled and drink |
| 33 | Mayang | <i>Madhuca cuneata</i> | Sapotaceae | antioksidan | Leaf | Tree | Boiled and drink |
| 34 | Dap-Dap | <i>Fagara rhetsa</i> | Rutaceae | antiseptic | Wood | Tree | Boiled and drink |
| 35 | Hulasar | <i>Altingia excelsa</i> | Altingiaceae | Cough | Leaf | Tree | Boiled and eat directly |
| 36 | Keme-nyan | <i>Styrax benzoin</i> | Styracaceae | Traditional medicine | Resin | Tree | Burned |
| 37 | Kecom-brang | <i>Etlingera elatior</i> | Zingibera-ceae | Wound medicine | All parts of the plant | Herb | Boiled and drink |
| 38 | Pakis Jantan | <i>Dryopteris felix</i> | Dryopterida-ceae | Nosebleeds, bleeding | Leaf | Herb | Boiled and drink |
| 39 | Pandan duri | <i>Pandanus tecrorius</i> | Pandanaceae | Tuberculosis, boils, antibacterial | Root | Herb | Boiled and drink |
| 40 | Pakis | <i>Pteridium aquilinum</i> | Dennstaedtiaceae | Antioksidan | Leaf | Herb | Boiled and drink |
| 41 | - | <i>Davalia sp</i> | Davalliaceae | Antioksidan | Leaf | Herb | Boiled and drink |
| 42 | Sungkit | <i>Curculigo latifolia</i> | Hypoxidaceae | Kidney disease | All parts of the plant | Herb | Boiled and drink |
| 43 | Paku sarang burung | <i>Asplenium nidus</i> | Aspleniaceae | Swelling medicine | Leaf | Epiphytes | Boiled and drink |
| 44 | Simar leuleu | <i>Vaccinium varingiaefolium</i> | Ericaceae | Fever | Leaf | Shurb | Boil and eat directly |

Based on the results of research that the use of medicinal plants, among others, are boiled and then drunk, mashed and then affixed to the sick, and can also be consumed directly. Medicinal plants are plants in which one or all parts of the plant contain active substances that are beneficial for health that can be used as a cure for diseases. The plant parts in question are

leaves, fruit, flowers, roots, rhizomes, stems (skin), and sap (resin). According to [7] people who consume it directly orally use it indirectly by rubbing and pasting.

According to [12], explained in general, the raw materials for traditional medicines are in the form of fresh plant materials, and the handling is only by pounding, brewing, burning, or boiling. The use of medicinal plants as medicine can be drunk, taped, and inhaled. So using can fulfill the working concept of cell receptors in receiving chemical compounds or stimuli [12].

3 Conclusions

This study concluded there were 44 medicinal plants species consisting of 33 families, consisting of 20 trees, (45.45%), 13 herb species (29.54%), 5 palm species (11.36%), 4 shrub species (9.09 %), and 2 species from epiphytes (4,54%). The majority of medicinal plants were dominated by trees. The utilization of medicinal plants was used for fever, cough, diarrhea, diabetes, wounds, asthma, malaria, and others.

REFERENCES

- [1] Cahyaningsih R, Brehm JM, Maxted N. 2021. *Setting the priority medicinal plants for conservation in Indonesia. Genetic Resources and Crop Evolution (2021)*
- [2] Kia FJ, Lorigooini Z, Khoei HA. 2018. *Medicinal plants: Past history and future perspective. Journal of HerbMed Pharmacology. 7(1): 1-7*
- [3] Astutik S, Pretzsch J, and Kimengsi JN. 2019. Asian Medicinal Plants' Production and Utilization Potentials: A Review. *J Sustainability 1, 5483*
- [4] Rangkuti F., *SWOT Analysis of Techniques for Dissecting Business Cases*, Jakarta, PT Gramedia Pustaka Utama, 2006.
- [5] Gebre T, Chinthapalli B. Ethnobotanical Study of the Traditional Use and maintenance of Medicinal Plants by the People of Aleta-Chuko Woreda, South Ethiopia. *Phcogj.com Pharmacogn J. 2021;13(5): 1097-1108.*
- [6] Ramli MR, Milow P, Malek S. 2021. Diversity and traditional knowledge of medicinal plants in home gardens of Kampung Masjid Ijok, Perak, Malaysia. *Biodiversitas 22:2458-2465*
- [7] Ifandi S, Jumari J, Suedy SWA. 2016. Knowledge Understanding and Utilization of Medicinal Plants by Local Community Tompu District of Kaili, Sigi Biromaru, Central Sulawesi. *Biosaintifika: Journal of Biology & Biology Education 8(1), 1-11*
- [8] Rambey R, Ras S, Ardi R, Siddik R and Sentosa E., "Diversity of medicinal plants in Batu Katak Village, Gunung Leuser National Park, Indonesia," *IOP Conference Series: Earth and Environmental Science*, vol. 454, p 12083. 2020.
- [9] Islam M, Ahmad I, Akhtar N, Alam J, Razzaq A, Mohammad K, Mahmood T, Khan F U, Khan W M and Ahmad I., "Medicinal plants resources of Western Himalayan Palas

- Valley, Indus Kohistan, Pakistan: Their uses and degrees of risk of extinction,” *Saudi J. Biol. Sci.* vol. 28, pp. 3076–3093. 2021.
- [10] Mustofa F I, Rahmawati N and Saryanto S. “Ethnomedicine Of Medicinal Plants Used By Traditional Healers To Facilitate Bone Injury In West Kalimantan, Indonesia,” *J. Tumbuh. Obat Indones.*, vol. 14, pp. 36–54. 2021.
- [11] Sattarov DS, Vyshegurov SKH and Galeev RR. 2020. Monitoring the species diversity of medicinal plants typical for the south slope of Hissar Ridge, Tajikistan. *Agronomy Research* 18(2), 543–553. <https://doi.org/10.15159/AR.20.145>
- [12] Lestari E., “Conventional Techniques for Using Medicinal Plants in the Takisung Estuary Area,” *J Hum.* vol. 2, pp. 1–11. 2016.