

Indigenous Knowledge of Medicinal Plants by Dayak Community in Mandomai Village, Central Kalimantan, Indonesia

Nurul Qamariah*, Dewi Sari Mulia, Denny Fakhri

Nurul Qamariah*, Dewi Sari Mulia, Denny Fakhri

Department of Pharmacy, Universitas Muhammadiyah Palangkaraya, Palangka Raya, Central Kalimantan, INDONESIA.

Correspondence

Nurul Qamariah

Department of Pharmacy, Universitas Muhammadiyah Palangkaraya, Palangka Raya, Central Kalimantan, INDONESIA.

E-mail: n_qiyu@rocketmail.com

History

- Submission Date: 25-10-2019;
- Review completed: 06-12-2019;
- Accepted Date: 02-01-2020.

DOI : 10.5530/pj.2020.12.60

Article Available online

<http://www.phcogj.com/v12/i2>

Copyright

© 2020 Phcogj.Com. This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International license.

ABSTRACT

Introduction: Dayak community has a long history of using medicinal plants as traditional medicine. But this knowledge is conveyed verbally without any written documentation. Therefore, this study aim is to preserve Dayak's knowledge about medicinal plants in Mandomai village. **Methods:** To collect the information, a survey was conducted in January 2019. *Snowball* sampling method was utilized to select 11 informants. Data were collected using structured interviews to gather information about local names, part of plants, the benefit of plants and how the plants are used. **Results:** The result showed that 55 species of medicinal plants used by the Dayak community in Mandomai as traditional medicine. However, only 48 species were identified, while 7 others were still in the process of being identified. The most widely used part of the plants is the leaves. Before being used as traditional medicine, medicinal plants are processed first. Some plants are ground and used immediately, while some are boiled or soaked in warm water. **Conclusion:** This documentation provides a catalog of medicinal plants used by Dayak community for the education of future indigenous knowledge

Key words: Dayak community, Indigenous knowledge, Medicinal plants, Central Kalimantan.

INTRODUCTION

Central Kalimantan is the second largest province in Indonesia. Originally inhabited by the Dayak, it is now home to 10 million inhabitants with a variety of culture. By the decline of the indigenous Dayak tribes, the local culture has become the local wisdom of the local Dayak tribe slowly but surely has diminished. The Dayak community has cultures, traditions, and biodiversity that offer unique opportunities for researchers to explore it. They have a long history of traditional/herbal medicine practices that also relate to cultural values and beliefs which is widely accepted by Indonesian.^{1,2}

The traditional treatment of Dayak community is a form of knowledge that is used in the utilization of plants to treat various diseases and also for beauty care. But unfortunately, knowledge about traditional medicinal plants has been handed down for generations orally, without written documentation. Moreover, in the inheriting process, the species used was only mentioned by local names, or even only by mentioning the specific characteristics of the species. Thus, it feared to be eroded as loss of natural habitat and extinction of medicinal plants, especially crops due to tropical forest exploitation and excessive land conversion or even caused by piracy of bio-piracy.^{3,4} Therefore, it is necessary to collect the information and to document the traditional knowledge about the medicinal plant by Dayak Community in Central Borneo, so it can contribute as basic information for ethnopharmacology in developing technology for the utilization of medicinal plants.

MATERIALS AND METHODS

Study sites

The research was conducted in Mandomai Village, West Kapuas Sub-District, Kapuas Regency.

Data collection technique

Data were collected using structured interviews to gather information about local names, part of plants, the benefit of plants and how the plants are used.

Informants selection

Informants were selected using *snowball sampling* method. Informants were determined based on information from the informants in Mandomai village. The number of informants consisted of 2 (two) shaman and 9 (nine) family heads.

RESULTS AND DISCUSSION

There were 55 (fifty five) species of medicinal plants used by the Dayak community in Mandomai as traditional medicine as presented in Table 1.

Until now the Dayak community in Mandomai, Kapuas Regency, Central Kalimantan still uses plants that grow in the yard, and those that grow wildly in the forest as a traditional medicine to treat various diseases. The traditional knowledge possessed by the community is influenced by their culture, environmental conditions, cultural transformation, technological intervention and interaction among people in the community.⁵

Information from interviews with several informants from the Dayak community showed 55 types of medicinal plants used by shamans in Mandomai as traditional medicines. However, only 48 species were

Cite this article: Qamariah N, Mulia DS, Fakhri D. Indigenous Knowledge of Medicinal Plants by Dayak Community in Mandomai Village, Central Kalimantan, Indonesia. *Pharmacogn J.* 2020;12(2):386-90.

Table 1: Medicinal Plants Used by Dayak Community.

| No | Local Name | Scientific Name | Plant part | Use | Procedure |
|----|-------------------|------------------------------------|-------------|--|--|
| 1 | Laos | <i>Alpinia galanga</i> | Stem | Phlegm | Pound, eat |
| 2 | Jambu jalak | <i>Anacardium occidentale</i> | Roots | Postpartum recovery | Boil in water, drink |
| 3 | Nangka belanda | <i>Annona muricata</i> L | Leaves | Bloated, Cholesterol | Pound, rub to stomach |
| 4 | Pinang | <i>Areca catechu</i> | Roots | Back pain | Boil in water, drink |
| 5 | Belimbing tunjuk | <i>Averrhoa bilimbi</i> L | Roots | Postpartum recovery | Boil in water, drink |
| 6 | Belimbing tunjuk | <i>Averrhoa bilimbi</i> L | Fruit | High blood pressure and diabetes | Boil in water, drink or eat directly |
| 7 | Kastela | <i>Carica papaya</i> L | Roots | Prostate | Boil in water, drink |
| 8 | Gelinggang | <i>Cassia alata</i> L | Leaves | Phlegm, ringworm and itching on the skin | Pound, apply to body parts |
| | | | Roots | Beriberi | Boil in water, drink |
| 9 | Tapak dara | <i>Catharanthus roseus</i> | Leaves | High blood pressure | Boil in water, drink |
| 10 | Jeruk nipis | <i>Citrus aurantifolia</i> S. | Fruit | Fungal infection | Pound, paste to body parts |
| 11 | Kopi | <i>Coffea</i> spp. | Roots | Fever | Boil or soak in hot water, drink |
| 12 | Sambang | <i>Coleus blumei</i> benth | Whole plant | Postpartum bleeding | Boil in water, drink |
| 13 | Temulawak | <i>Curcuma zanthorrhiza</i> | Rhizome | Bloated | Grated, strain, take the juice, drink |
| 14 | Janar putih | <i>Curcuma zedoaria</i> Rosc | Rhizome | Ulcer | Boil in water, drink |
| 15 | Janar | <i>Curcumae domesticae</i> | Tuber | Ulcer | Grated, strain, take the juice, drink |
| 16 | Serai | <i>Cymbopogon nardus</i> | Roots | Bad body odor | Soak in hot water, drink |
| | | | Stem | Head ache | Pound, smear to scalp |
| 17 | Simpur | <i>Dilenia eximia</i> | Leaves | Mild eye irritation | Soak in hot water, let it cool, and drop the solution into the eye |
| 18 | Kayu raja | <i>Excoecaria cochinchinensi</i> L | Roots | Kidney disease | Boil in water, drink |
| 19 | Manggis | <i>Garcinia mangostana</i> | Rind | Hemorrhoid | Boil in water, drink |
| 20 | Kacapiring | <i>Gardenia jasminoides</i> | Leaves | Fever, high blood pressure | Boil in water, drink |
| | | | Leaves | High blood pressure | Boil in water, drink |
| 21 | Kambang bahandang | <i>Hibiscus rosa-sinensis</i> | Leaves | Fever | Mash, add a little water, rub on the scalp |
| 22 | Alang alang | <i>Imperata cylindrica</i> Raeusch | Roots | Kidney disease | Boil in water, drink |
| 23 | Ubi jalar | <i>Ipomoea batatas</i> L | Tuber | Boils | Pound, wipe on body parts |
| 24 | Pohon Betadin | <i>Jatropha multifida</i> Linn | Leaves | Wound | Crushed, mashed and affixed to the wound |
| 25 | Jarak pagar | <i>Jatropha curcas</i> L | Leaves | Stomach ache | Boil in water, drink |
| 26 | Kencur | <i>Kaempferia galanga</i> L | Rhizome | Stomach ache | Boil in water, drink |
| 27 | Waluh putih | <i>Lagenaria siceraria</i> | Fruit | Typhoid | Mash, take the juice, drink |
| 28 | Rumbia | <i>Metroxylon sagu</i> Rottb | Roots | Stomach ache | Boil in water, drink |
| 29 | Mengkudu | <i>Morinda citrifolia</i> | Fruit | High blood pressure | Mash, take the juice, drink |
| 30 | Halaban/ kalapapa | <i>Mussaenda frondosa</i> L | Roots | Kidney disease and rheumatic | Boil in water, drink |
| | | | Leaves | High blood pressure | Boil in water, drink |
| 31 | Kumis kucing | <i>Orthosiphon aritus</i> | Roots | Kidney disease | Boil in water, drink |
| | | | Whole plant | High blood pressure | Boil in water, drink |
| 32 | Kemot | <i>Passiflora faetida</i> L | Leaves | Hematemesis | Boil in water, drink |
| | | | Roots | Shortness of breath | Boil in water, drink |
| 33 | Sungkai | <i>Peronema canescens</i> Jack | Leaves | Health supplement | Boil in water, drink |
| 34 | Uru handalai | <i>Phyllanthus niruri</i> L | Leaves | Cholesterol | Boil in water, drink |
| 35 | Sirih | <i>Piper betle</i> L | Leaves | Nosebleed | Roll, put to nostrils |
| 36 | Sirih merah | <i>Piper ornatum</i> | Leaves | High blood pressure and diabetes | Boil in water, drink |
| 37 | Bluntas | <i>Pluchea indica</i> | Leaves | High blood pressure | Boil in water, drink |
| 38 | Jambu biji | <i>Psidium guajava</i> | Leaves | Stomach ache | Boil in water, drink |

| No | Local Name | Scientific Name | Plant part | Use | Procedure | |
|----|------------------|------------------------------|-------------|----------------------------------|--|----------------------|
| 39 | Karamunting | <i>Rhodomyrtus tomentosa</i> | Roots | Rheumatic | Boil in water, drink | |
| 40 | Sentol | <i>Sandoricum koetjape</i> | Leaves | Stomach ache | Soak in warm water, drink | |
| 41 | Keji beling | <i>Sericocalyx crispus</i> L | Whole plant | High blood pressure | Boil in water, drink | |
| | | | Leaves | High blood pressure | Boil in water, drink | |
| 42 | Terong susu | <i>Solanum mammosum</i> | Roots | Breast cancer | Boil in water, drink | |
| 43 | Terong pipit | <i>Solanum torvum</i> | Roots | Joint pain | Boil in water, drink | |
| 44 | Mahoni | <i>Swietenia mahagoni</i> L | Seed | High blood pressure | Boil in water, drink | |
| 45 | Jambu danum | <i>Syzygium samarangense</i> | Leaves | Aches and pains | Pound, paste to body parts | |
| 46 | Daun salam | <i>Syzygium polyanthum</i> | Leaves | High blood pressure | Boil in water, drink | |
| 47 | Penawar sampai | <i>Tinospora crispa</i> L | Stem | High blood pressure | Dried, mashed, made capsules | |
| 48 | Jahe | <i>Zingiber officinale</i> | Rosc | Tuber | Blood circulation | Boil in water, drink |
| 49 | Lancar kuning | Unknown | Leaves | Jaundice | Mash and made into powder, drrink | |
| 50 | Sawang papas | Unknown | Leaves | Improve eyesight | Crushed, mashed, rubbed into the eyelids | |
| 51 | Katipi | Unknown | Roots | Berberi | Boil in water, drink | |
| 52 | Halalang | Unknown | Roots | Postpartum bleeding | Boil in water, drink | |
| 53 | Kelaru | Unknown | Tuber | Gout and back pain | Boil in water, drink | |
| 54 | Tagentu | Unknown | Leaves | Wound | Pound, paste to the wound | |
| 55 | Teh cina/ Dekain | Unknown | Leaves | High blood pressure, cholesterol | Boil in water, drink | |

identified, while 7 others were unidentified this plant is a rare plant that is rarely found, so the collection of plant specimens for the scientific name determination process is difficult to obtain. Based on Table 1, it appears that most medicinal plants recorded as a high blood pressure reducer. Plants are usually collected from the forest around where they live or from the yard. According to the shamans, knowledge about the use of plants is obtained from ancestors obtained from generation to generation. This knowledge is conveyed verbally only to be agreed upon which is conveyed to encourage the spirit of traditional rituals.

Parts of plants used in general are fruit, leaves, rhizome, rind, roots, stem, and seed. Some of the plants used the whole plant as a medicine. Leaves and roots parts is the most widely used by Dayak people in Mandomai. But based on the results of the interviews, the shamans discussed how they began to reduce the use of plant parts such as roots, rhizomes, tubers and bark as medicine to maintain the existence of these plants and prefer to use the leaf part only because they believe by using these parts, plants will not die, because the leaves will grow back to be used for continuous use, and it will be less destructive for the plants. It also because secondary metabolites from the leaves can exhibit toxic, repellent and/or anti-nutritional effect on the herbivores (Figure 1).^{6,7}

Before being used as traditional medicine, medicinal plants are processed first. Some plants are ground and used immediately, while some are boiled or soaked in warm water first. This might be related to the heat resistance of the secondary metabolites contained in these plants. In accordance with the theory that the choice of secondary extraction methods from plants must consider whether secondary metabolites are resistant to heating or not.^{8,9} The most common mode of administration is the oral route (drinking and eating) while the ocularly and nasally is the least used mode of administration. Majority of medicinal preparation are taken orally (83%). The other routes of administration are cutaneously (13%) which includes rubbing and topical application, nasal application (2%) and (2%) by ocular route (Figure 2).

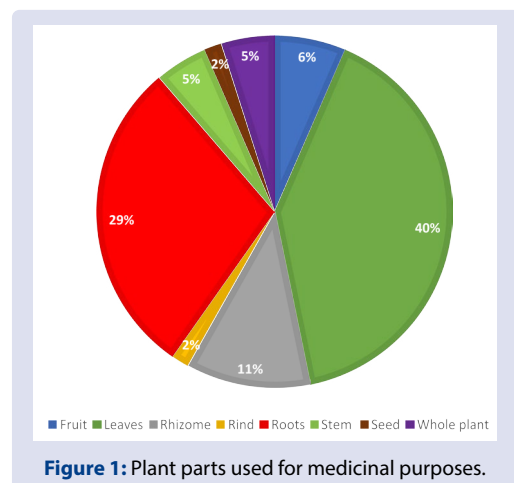


Figure 1: Plant parts used for medicinal purposes.

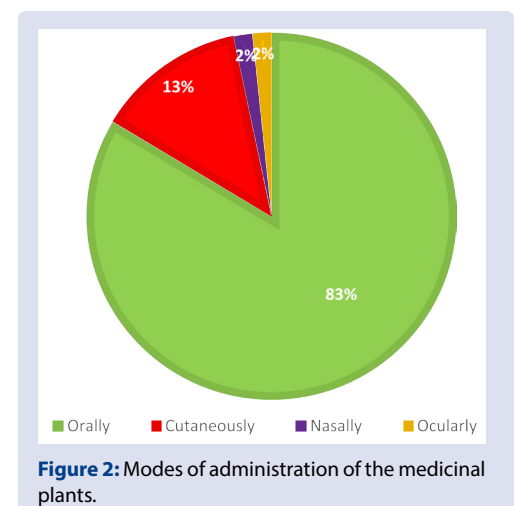


Figure 2: Modes of administration of the medicinal plants.

ACKNOWLEDGEMENTS

We would like to thank Ministry of Research, Technology, and Higher Education of the Republic of Indonesia through Directorate of Research and Community Services for fund assistance. We would like to thanks to (i) Chairman of Universitas Muhammadiyah Palangkaraya, (ii) Mandomai Village Chief, (iii) community leaders and all informants who have provided assistance related to all research activities conducted in Mandomai Village, Kapuas District, Central Kalimantan, Indonesia.

AUTHOR CONTRIBUTIONS

Nurul Qamariah as conceived, designed the analysis, performed the analysis, and wrote the manuscript.

Dewi Sari Mulia as analyzer.

Denny Fakhrizal as collector of the data.

CONFLICTS OF INTEREST

Declared none.

REFERENCES

1. Setyawan AD. Review: Biodiversity conservation strategy in a native perspective; case study of shifting cultivation at the Dayaks of Kalimantan. *Nusantara Bioscience*. 2010;2(2):97-108.
2. Roslinda E. Dayak Desa forest land use system as social capital to acquire forest management rights in West Kalimantan, Indonesia. *Biodiversitas*. 2016;17(1):177-84.
3. Moeliono M, Wollenberg E, Limberg G. eds., Decentralized forest governance: politics, the economy and the struggle for control of forest in Borneo, Indonesia: CIFOR (Center for International Forestry Research), 2019.
4. Bappenas. Indonesia Biodiversity Strategy and Action Plan 2015-2020, IBSAP Dokumen Nasional, Jakarta: BAPPENAS, 2016.
5. Supiandi MI, Mahanal S, Zubaidah SJH, Ege B. Ethnobotany of traditional medicinal plants used by Dayak Desa Community in Sintang, West Kalimantan, Indonesia. *Biodiversitas Journal of Biological Diversity*. 2019;20(5):1264-70.
6. Ourlad AGT, Marlon LCC, Hanna HTE, Elena MR. Ethnobotanical Survey of Medicinal Plants used by Ayta Communities in Dinalupihan, Bataan, Philippines. *Pharmacogn J*. 2018;10(5):859-70.
7. War AR, Paulraj MG, Ahmad T, Buhroo AA, Hussain B, Ignacimuthu S, *et al*. Mechanisms of plant defense against insect herbivores. *Plant Signal Behav*. 2012;7(10):1306-20.
8. Hamzari. Identifikasi tanaman obat-obatan yang dimanfaatkan oleh masyarakat sekitar hutan Tabo-tabo. *Jurnal Hutan dan Masyarakat*. 2008;3(2):111-234.
9. Harborne JB. *Phytochemical Methods Guides in Modern Ways to Analyze Plants*, Bandung: Institut Teknologi Bandung, 1987.

GRAPHICAL ABSTRACT

INDIGENOUS KNOWLEDGE OF MEDICINAL PLANTS BY DAYAK COMMUNITY IN MANDOMAI VILLAGE, CENTRAL KALIMANTAN, INDONESIA

NURUL QAMARIAH, DEWI SARI MULIA, DENNY FAKHRIZAL

DAYAK INTRODUCTION

Dayak community has a long history of using medicinal plants as traditional medicine. But this knowledge is conveyed verbally without any written documentation. Therefore, this study aim is to preserve Dayak's knowledge about medicinal plants in Mandomai village



METHODS SURVEY

Survey in January 2019. Snowball sampling → 11 informants. Data information about local names, part of plants, the benefit of plants and how the plants are used.

55 SPECIES RESULTS

The result showed that 55 species of medicinal plants used. However, only 48 species were identified, while 77 others were still in the process of being identified.



CONCLUSION DOCUMENTATION

This documentation provides a catalog of medicinal plants used by Dayak community for the education of future indigenous knowledge



ABOUT AUTHORS



Name: **Nurul Qamariah**

Position: Lecturer

Highest Academic Qualification: Master of Science

Education Institution: Indonesia University, Indonesia

Biography

Nurul was born in Palangka Raya, Indonesia. Nurul was graduated from Department of Pharmacy, Indonesia University (UI, 2014). In 2014 she joined as a lecturer in Pharmacy Department, Muhammadiyah University of Palangkaraya. She teaches Pharmacognosy, Phytochemistry, Organic Chemistry, Basic Chemistry, and Formulation of Traditional Medicine Preparations. During the past four years, Nurul has conducted several scientific studies, as well as the publication of scientific works. Her research is focused on the development of traditional medicine from plants.



Name: **Dewi Sari Mulia**

Position: Lecturer

Highest Academic Qualification: Master of Science

Education Institution: Setia Budi Surakarta University, Indonesia

Biography

Dewi was born in Palangka Raya, Indonesia. She was graduated from Department of Pharmacy, Setia Budi Surakarta (2011). In 2015 she joined as a lecturer in Pharmacy Department, Muhammadiyah University of Palangkaraya. She teaches Pharmacy Management and Pharmacy Communication. During the past five years, Dewi has conducted several scientific studies, as well as the publication of scientific works. Her research is focused on the pharmacy management.



Name: **Denny Fakhrial**

Position: Student

Highest Academic Qualification: Professional bachelor

Education Institution: Muhammadiyah University of Palangkaraya, Indonesia

Biography

Denny was graduated from Department of Pharmacy, Muhammadiyah University of Palangkaraya (2019) and continue his study at Borneo Lestari (2019).

Cite this article: Qamariah N, Mulia DS, Fakhrial D. Indigenous Knowledge of Medicinal Plants by Dayak Community in Mandomai Village, Central Kalimantan, Indonesia. *Pharmacog J.* 2020;12(2):386-90.