

Ethnobotanical Evaluation of Medicinal Plants of High Cultural Value among the Moronene Indigenous People in Rawa Aopa Watumohai National Park, Indonesia

Ricky Astawan^{1*}, Ervizal Amzu², Syamsul Hidayat³

¹Department of Forest Resource Conservation and Ecotourism, Faculty of Forestry and Environment, IPB University, Academic Ring Road, Campus IPB Dramaga, Bogor, Indonesia 16680

²Department of Forest Resource Conservation and Ecotourism, Faculty of Forestry and Environment, IPB University, Academic Ring Road, Campus IPB Dramaga, Bogor, Indonesia 16680

³National Research and Innovative Agency. Jl. M.H. Thamrin No. 8, Central Jakarta 10340, Jakarta, Indonesia

Email: astawanricky99@gmail.com

Artikel diterima : 15 November 2025. Revisi diterima : 25 February 2026.

ABSTRACT

The use of traditional medicinal plants is local knowledge that has been passed down from generation to generation by indigenous peoples to maintain health and meet food needs. The Moronene indigenous community still maintains the use of plants as traditional medicine and a source of local food. This study aims to identify the types of plants used by the Moronene indigenous community and to determine their development potential. The research method used was semi-structured interviews with key informants consisting of traditional healers (sando), traditional leaders, and local communities who have knowledge about the use of medicinal plants. The results showed that there are 57 types of plants used by the community as traditional medicines. Based on IC, UVs, and ICS analyses, 10 types of plants were found to have high potential for further development. In addition, there are four groups of plants that are often used together in traditional medicine practices, namely the first group consisting of *M. calabura* and *A. muricata*; the second group consisting of *Z. officinale*, *K. galanga*, *C. longa*, and *E. hemisphaerica*; the third group consisting of *E. hirta*, *S. acuta*, and *P. amarus*; and the fourth group consisting of *O. aristatus* and *S. crispus*. In addition to being used as medicine, 21 types of plants are also used as local food ingredients, and two types of plants are used as natural colourings in beverages. The results of this study show that the medicinal plants used by the community not only have traditional health benefits, but also have the potential to be developed into innovative products such as herbal medicines, herbal teas and topical medicines. It is hoped that this development will support the economic independence of the community while preserving local knowledge in a sustainable manner.

Key words: Ethnobotany, Local wisdom, Moronene tribe, and Medicinal plants

ABSTRAK

Pemanfaatan tumbuhan obat tradisional merupakan pengetahuan lokal yang diwariskan secara turun-temurun oleh masyarakat adat untuk menjaga kesehatan dan memenuhi kebutuhan pangan. Masyarakat adat Suku Moronene masih mempertahankan pemanfaatan tumbuhan sebagai obat tradisional dan sumber pangan lokal. Penelitian ini bertujuan untuk mengidentifikasi jenis-jenis tumbuhan yang dimanfaatkan oleh masyarakat adat Suku Moronene serta mengetahui potensi pengembangannya. Metode penelitian yang digunakan adalah wawancara semi terstruktur kepada informan kunci yang terdiri atas tabib (sando), ketua adat, dan masyarakat setempat yang memiliki pengetahuan tentang pemanfaatan tumbuhan obat. Hasil penelitian menunjukkan bahwa terdapat 57 jenis tumbuhan yang dimanfaatkan oleh masyarakat sebagai obat tradisional. Berdasarkan analisis IC, UVs, dan ICS, ditemukan 10 jenis tumbuhan yang memiliki potensi tinggi untuk dikembangkan lebih lanjut. Selain itu, terdapat empat kelompok tumbuhan yang sering digunakan secara bersamaan dalam praktik pengobatan tradisional, yaitu kelompok pertama *M. calabura* dan *A. muricata*; kelompok kedua *Z. officinale*, *K. galanga*, *C. longa*, dan *E. hemisphaerica*; kelompok ketiga *E. hirta*, *S. acuta*, dan *P. amarus*; serta kelompok keempat *O. aristatus* dan *S. crispus*. Selain sebagai obat, sebanyak 21 jenis tumbuhan juga dimanfaatkan sebagai bahan pangan lokal, serta dua jenis tumbuhan digunakan sebagai pewarna alami pada minuman. Hasil penelitian ini menunjukkan bahwa tumbuhan obat yang dimanfaatkan masyarakat tidak hanya memiliki nilai kesehatan secara tradisional, tetapi juga berpotensi untuk dikembangkan menjadi produk inovatif seperti jamu, teh herbal, dan obat luar. Pengembangan tersebut diharapkan dapat mendukung kemandirian ekonomi masyarakat sekaligus melestarikan pengetahuan lokal secara berkelanjutan.

Kata kunci: Etnobotani, Kearifan lokal, Suku moronene, dan Tumbuhan obat

INTRODUCTION

Rawa Aopa Watumohai National Park (TNRAW) is a national park located in Southeast Sulawesi. Within the national park, there is an indigenous Moronene tribe that has lived there long before the area was designated as a national park conservation area. The indigenous Moronene tribe lives there by utilizing various plants for health and as a source of local food. Plants have a close relationship with human life, and the reciprocal relationship between humans and plants is very clear, in other words, ethnobotany. Ethnobotany is a discipline related to human interactions in the use of plants (Chandra and Rawat 2015). Meanwhile, Ijaz *et al.* (2016), define ethnobotany as the interaction between plants and humans in space and time. Ethnobotany can be summarized as humans, plants, interactions, and utilization (Ijaz *et al.* 2017). Thus, ethnobotany is the knowledge and concepts developed by cultures in utilizing plants (Albuquerque *et al.* 2018). Ethnobotany began to be recognized as an academic and research activity in the second half of the 20th century (Jain 2020). Ethnobotany is the science that studies the interaction between humans and plants in terms of utilizations (Sulaiman 2025). Ethnobotany is the relationship between humans and plants based on local knowledge or knowledge that has been passed down from generation to generation to preserve traditions (Melese *et al.* 2025).

Forest plants that are used as medicines are divided into 3 groups, namely traditional medicinal plants, modern medicinal plants, and medicinal plants that have the potential to be used by the surrounding community (Rubiah *et al.* 2015). Traditional utilization of medicinal plants is a characteristic of indigenous peoples. Many communities utilised plants and rely on traditional knowledge (Kayani *et al.* 2015). Plants have long played a very important role in human life (Faruque *et al.* 2018). Plants are essential to human life (Coelho *et al.* 2020). Plants are central to human life, not only as food, but are powerful in culture and as natural medicines (Schaal 2019). Plants have been found since prehistoric times and used as traditional medicine (Awuchi and Godswill 2019). Plants are a very valuable resource (Chen *et al.* 2016). Plants are an important element in medicine (Kayser 2018). 40% of medicinal plants are in clinical use (Newman and Cragg 2016). More than 21,000 plants are used as medicines (Renjana and Nikmatullah 2021). The utilization of plants as medicine needs to pay attention to the conservation status of these plants. So that the plant does not

experience extinction, and the plant is still preserved for sustainable use.

The Moronene indigenous people who live in the Rawa Aopa Watumohai National Park Conservation Area are people who have lived in the area for a long time, long before the area was designated as a conservation area by the government. The Moronene tribe was the first migrant tribe in Southeast Sulawesi before the arrival of the Tolaki tribe (Hafid *et al.* 2020). The social and cultural life of the Moronene indigenous people is governed by customary laws and customary institutions that regulate their lives (Jabalnur *et al.* 2019). The Moronene indigenous people have sovereignty over land and resources (Nur *et al.* 2019). The life of the Moronene indigenous people is very harmonious with the forest, the forest in question is a forest with rich biodiversity (Basri *et al.* 2024). In the life of the Moronene indigenous people, they divide four forest zones, namely Inalahipue (rainforest), Inalahi Popalia (sacred forest), Inombo (production forest), and Lueno (forest/wildlife habitat) (Limba *et al.* 2017). The Moronene indigenous people utilised the forest area as their place of life, they understand better how to utilised and manage the forest sustainably. Moronene indigenous people utilised the resources in the forest, especially the diversity of plants that are used as medicine and food for their lives. They utilised forest areas based on customary rules so that the sustainability of the place where they live is maintained and its use is sustainable. The way of managing forest areas has been passed down from generation to generation by their ancestors. Because they consider the forest as sacred if it is managed by not complying with customary rules. Therefore, it is necessary to explore to see what medicinal plants are used and see the conservation status of the plants they use.

METHODS

Research Location

This research was conducted from January to February 2023 in the Moronene tribal village, Rawa Aopa Watumohai National Park, Lantari Jaya sub-district, Bombana district, Southeast Sulawesi. This location is directly adjacent to Tatange Village, Tinanggea District, South Konawe Regency. The detailed research location can be seen in (Figure 1). Bombana Regency, precisely in Lantari Jaya sub-district, is home to the Moronene indigenous community (Limba *et al.* 2017). The Moronene indigenous community is an indigenous community

native to Southeast Sulawesi that inhabits conservation areas (Darmayani *et al.* 2021).

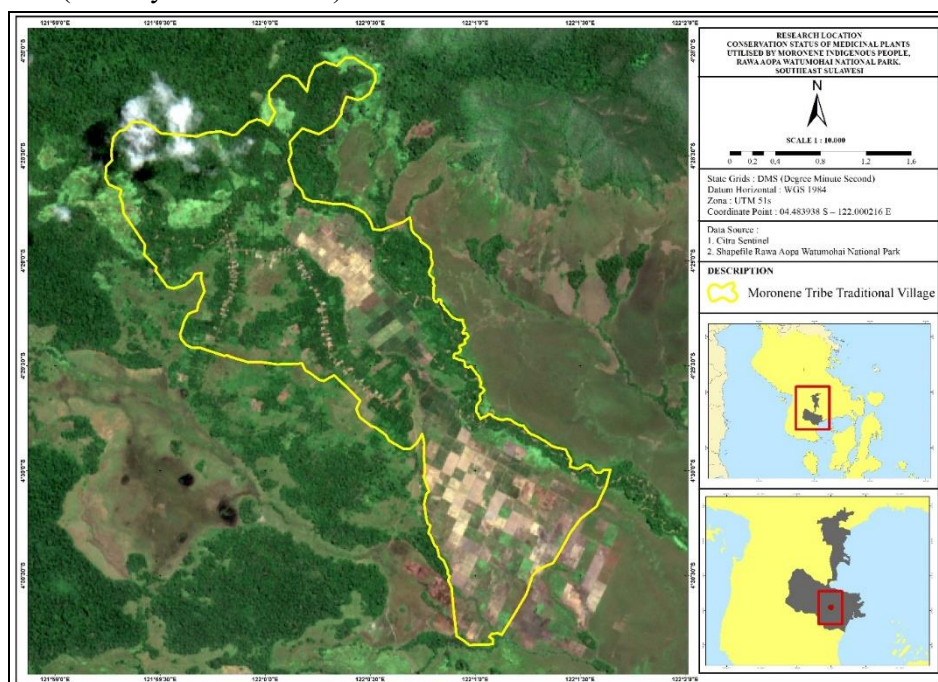


Figure 1. The research location is in the Moronene Customary Village of the Rawa Aopa Watumohai National Park Area.

Data collection

Introduction to the utilization of medicinal plants based on the knowledge of healers (sando)

Ethnobotanical data collection on medicinal plants was conducted through semi-structured interviews with informants. Informants in this study included traditional healers (sando), traditional leaders, and local residents who use plants for medicinal purposes. Sando act as traditional doctors who have knowledge passed down from generation to generation, enabling them to treat various diseases and prevent illness using plants believed to have medicinal properties. Informants in this study were selected using purposive sampling. In data collection, consensus indices, cultural importance indices, and usage value indices were conducted through semi-structured interviews with key persons and people who use plants as medicine. There were a total of 32 informants, consisting of 1 healer, 1 traditional leader, and 30 community members. There were 7 male respondents and 25 female respondents.

Data Analysis

The data analysis used in this study includes Index Consensus (IC), Use Value (UV), and Index of Cultural Significance (ICS). These three parameters are important instruments in

ethnobotanical studies that not only serve to identify the types of plants utilised by the community, but also to evaluate the extent of the importance of a species in the cultural, economic and health context of local communities.

Index Consensus

Index Consensus is an index of the level of trust in a plant is the percentage ratio between the respondent's suggestion to use the same plant species for a particular type of use with the number of respondents who mention various types of use (Friedman *et al.* 1986).

$$IC = \frac{Np}{N} \times 100\%$$

Description:

IC : Level of confidence in a plant
Np : Number of respondents who mentioned a species for a particular type of use
N : Number of respondents who mentioned a species for all types of use

Use Value

The use value index of medicinal plants describes the level of use value of plant species in treating a disease (Kurniawan and Jadid 2015). The target in the interview for the use value index to find out how important a plant is in people's lives is the healer (*sando*) (in terms of the health sector of the

Moronene indigenous people) and people who use medicinal plants.

$$UVs \frac{\sum UVis}{ni}$$

Description:

- Uvs : Species Use Value
- UVis : Number of users of a particular species
- ni : Total number of respondents interviewed

Index of Cultural Significance

Index of Cultural Significance of medicinal plant utilization, which is a value that indicates the level

$$ICS = (q_1 \times i_1 \times e_1)n_1 + (q_2 \times i_2 \times e_2)n_2 + \dots + (q_n \times i_n \times e_n)n_n$$

Description:

- ICS : Index of Cultural Significance
- q : Quality value, calculated by giving a score or quality value of a species

of cultural closeness of an ethnic group to the utilization of a plant species. This value is calculated using the index of cultural significance/ICS value (Turner 1988).

$$ICS = \sum (q \times i \times e)$$

Some parts of medicinal plants have multiple uses and not just one part can be used. Therefore, the Index of Cultural Significance formula will change:

- i : Intensity value, which describes the intensity of utilization of the plant species
- e : Exclusivity value

Table 1. Categories of cultural significance index according to Turner (1988)

Score ICS	Categories	Code
<100	Very High	VH
50-99	High	H
20-49	Medium	M
5-19	Low	L
1-4	Very Low	VL

RESULTS AND DISCUSSION

Identification of Medicinal Plants used Based on Interview Results

The identification results show that the Moronene indigenous people utilise 57 species of medicinal plants from 27 families. These various species are utilised traditionally as part of local knowledge that has been passed down from generation to generation. Most of these medicinal plants are obtained directly from various natural and

artificial ecosystems, such as primary and secondary forests, gardens, grasslands, gardens, and river banks, which reflect the closeness of the community to the surrounding natural resources. In terms of habitus, the most widely used plants consist of various growth forms, namely shrubs, trees, shrubs, lianas, and herbs. This diversity of forms indicates the high ecological adaptation and diversity of medicinal functions of each species. This information is important for the preservation of ethnobotanical knowledge and the development of local biopharmaceutical potential.

Table 2. Fifty-seven plants utilised

No	Local Name	Latin Name	Family
1	Agel	<i>Corypha utan</i> Lam.	<i>Arecaceae</i>
2	Akar Kuning	<i>Arcangelisia flava</i> Merr	<i>Menispermaceae</i>
3	Bajakah	<i>Spatholobus littoralis</i> (Hassk).	<i>Fabaceae</i>
4	Bambu	<i>Schizostachyum brachycladum</i> (Kurz ex Munro)	<i>Poaceae</i>
5	Belimbing Wuluh	<i>Averhoa bilimbi</i> L	<i>Oxalidaceae</i>
6	Bunga Dara	<i>Jatropha multifida</i> L	<i>Euphorbiaceae</i>
7	Cakokak	<i>Solanum torvum</i> Buch-Ham	<i>Solanaceae</i>
8	Daun Katuk	<i>Sauropus androgynus</i> (L.) Merr	<i>Phyllanthaceae</i>
9	Gamal	<i>Gliricidia sepium</i> (Jacq.)	<i>Fabaceae</i>
10	Gersen	<i>Muntingia calabura</i> L	<i>Muntingiaceae</i>
11	Jahe	<i>Zingiber officinale</i> Roscoe	<i>Zingiberaceae</i>
12	Jambu Biji	<i>Psidium guajava</i> L	<i>Myrtaceae</i>
13	Jambu Menté	<i>Anacardium occidentale</i> L	<i>Anacardiaceae</i>

No	Local Name	Latin Name	Family
14	Jati Lokal	<i>Tectona grandis</i> L.f	Lamiaceae
15	Jonghe	<i>Cacalia sonchifolia</i> Forssk	Asteraceae
16	Coklat	<i>Theobroma cacao</i> L	Malvaceae
17	Kapati-pati Merah	<i>Euphorbia hirta</i> L	Euphorbiaceae
18	Kapati-pati Putih	<i>Sida acuta</i> Burm.f.	Malvaceae
19	Kapuk	<i>Ceiba pentandra</i> L	Malvaceae
20	Kateba	<i>Gynura perocumbents</i> (Blume) Miq	Asteraceae
21	Kelor	<i>Moringa oleifera</i> L	Moringaceae
22	Kencur	<i>Kaempferia galanga</i> L	Zingiberaceae
23	Kokabu	<i>Neolamarckia macrophylla</i> (Roxb.) Bosser	Rubiaceae
24	Komba-komba	<i>Chromolaena odorata</i> (L.) R.M.King & H.Rob	Asteraceae
25	Kopi	<i>Coffea</i> sp	Rubiaceae
26	Kumis Kucing	<i>Orthosiphon aristatus</i> var. <i>aristatus</i>	Lamiaceae
27	Kunyit	<i>Curcuma longa</i> L	Zingiberaceae
28	Lengkuas	<i>Etlingeria hemisphaerica</i> (Blume) R.M.Sm	Zingiberaceae
29	Libonu	<i>Ficus septica</i> Burm.fil	Moraceae
30	Lonkida	<i>Nauclea orientalis</i> Herb.Madr	Rubiaceae
31	Meniran	<i>Phyllanthus urinaria</i> L	Phyllanthaceae
32	Merica	<i>Piper nigrum</i> L	Piperaceae
33	O'liku	<i>Alpinia galanga</i> (L.) Willd	Zingiberaceae
34	Okra	<i>Abelmoschus esculentus</i> (L.) Moench	Malvaceae
35	Paku Hata	<i>Lygodium circinnatum</i> (Burm.fil.) Sw	Schizaeaceae
36	Pandan Hutan	<i>Pandanus sarasinorum</i> Warb	Pandanaceae
37	Pepaya	<i>Carica papaya</i> L	Caricaceae
38	Pecah Beling	<i>Strobilanthes apoensis</i> (Elmer) Merr	Acanthaceae
39	Pinang/Wua	<i>Areca cathechu</i> Burm.f	Arecaceae
40	Putri Malu	<i>Mimosa pudica</i> Linn	Fabaceae
41	Rotan/O'uwe	<i>Calamus zollingeri</i> Beccari	Arecaceae
42	Ruruhi	<i>Syzygium polycephalum</i> (Miq.) Merr	Myrtaceae
43	Sagu/Tawaro	<i>Metroxylon sagu</i> Rottb	Arecaceae
44	Serai	<i>Cymbopogon citratus</i> (DC.) Stapf	Poaceae
45	Singkong/Wanggole	<i>Manihot esculenta</i> Crantz	Euphorbiaceae
46	Singi	<i>Dillenia serrata</i> Thunb	Dilleniaceae
47	Sirih	<i>Piper betle</i> L	Piperaceae
48	Sirsak	<i>Annona muricata</i> L	Annonaceae
49	Sukun	<i>Artocarpus altilis</i> (Parkinson) Fosberg	Moraceae
50	Tameau Langgai	<i>Physalis angulate</i> L.	Solanaceae
51	Tawaoloho	<i>Spondias mombin</i> L	Anacardiaceae
52	Tembeleka	<i>Lantana camara</i> L	Verbenaceae
53	Tahongai/Tokulo	<i>Kleinhovia hospita</i> L	Malvaceae
54	Tombira	<i>Clerodendron paniculatum</i> L	Lamiaceae
55	Tulasi Dahu	<i>Lantana viburnoides</i> (Forssk.)	Verbenaceae
56	Uwikoro	<i>Dioscorea hispida</i> Dennst	Descoreaceae
57	Wualae	<i>Etlingeria elatior</i> (Jack) R.M.Sm	Zingiberaceae

Potential Medicinal Plants to be Featured Products Based on IC, UVs, and ICS

Potential Medicinal Plants for Development

Potential medicinal plants are all plant parts that can be utilised. Medicinal plants contribute to health services, as a livelihood, and make one of the non-timber forest products (Larsen *et al.* 2005).

Medicinal plants are utilised by communities in yards and forests to support community welfare (Yang *et al.* 2014). Forest medicinal plants are traditional herbal medicine ingredients that use raw materials directly from nature (Sudarmin and Asyhar 2012). From the calculation of Index Consensus, Use Value, and Index of Cultural Significance, there are 10 medicinal plants that can be developed.

Table 3. Ten plants that have the potential to be developed

No.	Name Plants	Latin Name	IC	UVs	ICS
1	Akar Kuning	<i>Arcangelisia flava</i>	0,31	0,38	60
2	Bajakah	<i>Spatholobus littoralis</i>	0,22	0,44	56
3	Bunga Darah	<i>Jatropha multifida</i>	0,16	0,16	60
4	Jambu Biji	<i>Psidium guajava</i>	0,16	0,16	54
5	Komba-komba	<i>Chromolaena odorata</i>	0,47	0,50	30
6	Kumis Kucing	<i>Orthosiphon aristatus</i>	0,28	0,28	15
7	Kunyit	<i>Curcuma longa</i>	0,16	0,22	36
8	Putri Malu	<i>Mimosa pudica</i>	0,16	0,16	30
9	Sagu	<i>Metroxylon sagu</i>	0,16	0,16	74
10	Tawaoloho	<i>Spondias mombin</i>	0,16	0,25	54

Based on the results of the analysis using three ethnobotanical indicators, namely Index Consensus, Use Value, and Index of Cultural Significance, there are ten species of medicinal plants that can be used as recommendations for development by the Moronene indigenous people. These plants are *Arcangelisia flava*, *Spatholobus littoralis*, *Jatropha multifida*, *Psidium guajava*, *Chromolaena odorata*, *Orthosiphon aristatus*, *Curcuma longa*, *Mimosa pudica*, *Metroxylon sago*, and *Spondias mombin*.

These ten species were selected because they have high Consensus Index, Use Value, and Index of Cultural Significance values, indicating that the plants are not only frequently used and widely known, but also considered culturally and functionally important by the community. In addition, these plants have diverse pharmacological properties, both for the treatment of internal diseases (such as indigestion, fever, high blood pressure, and diabetes) and external diseases (such as wounds, skin infections, and inflammation). The development and conservation of these plants can be directed towards sustainable cultivation, and community-based utilisation. This is expected to strengthen the health independence of indigenous communities while supporting the conservation of local knowledge and biodiversity in the Rawa Aopa Watumohai National Park area.

Recommendations for the Development of Medicinal Plants of the Moronene Tribe

Based on the results of ethnobotanical studies conducted in the Traditional Zone of Rawa Aopa Watumohai National Park, the indigenous people of the Moronene Tribe have rich local knowledge regarding the use of medicinal plants. The identification of species that have high Index Consensus, Use Value, and Index of Cultural Significance values indicates great potential to be developed as part of a sustainable and community-based traditional health system.

Some of the medicinal plants recommended for further development include *Arcangelisia flava*,

Spatholobus littoralis, *Jatropha multifida*, *Psidium guajava*, *Chromolaena odorata*, *Orthosiphon aristatus*, *Curcuma longa*, *Mimosa pudica*, *Metroxylon sago*, and *Spondias mombin*. These species were selected because they fulfil three main criteria: high utilization by indigenous peoples, secondary metabolites with pharmacological properties, and ecological suitability to local habitats in traditional zones (altitude >200m above sea level and temperature 27-30°C). Recommended Development Strategies: community-based cultivation, indigenous capacity building, documentation and further studies.

The development of medicinal plants not only provides health and economic benefits, but also strengthens the cultural identity of the Moronene indigenous people. With a participatory approach and based on local wisdom, this effort can be part of a biodiversity conservation strategy that is in line with sustainable management of conservation areas.

The contribution of the Rawa Aopa Watumohai National Park is needed to equip the Moronene indigenous people to develop medicinal plants that can be developed into products that have high economic value. However, there has been no monitoring related to marketing carried out by the Aopa Watumohai Swamp National Park as the party responsible for improving micro, small and medium enterprises (MSMEs) in the Moronene tribe's indigenous territory. Currently, the Moronene indigenous people produce only one type of plant, namely bajaka wood.

Plants that can be used as potions, beverage dyes, and food ingredients

The Moronene tribe has knowledge of plants that can be used as potions, beverage dyes, and food ingredients. There are several medicinal plants that can be mixed with other medicinal plants from the interview results. Traditional knowledge of

indigenous peoples is important to maintain biodiversity from damage (Hidayat *et al.* 2023). It is

necessary to recommend the types of plants that are used to cure diseases.

Table 4. Plants that can be used as ingredients from interviews with the Moronene Indigenous People

No.	Name Plants	Latin Name	Efficacy
1	Kersen	<i>Muntingia calabura</i>	Diabetes, and high blood pressure
	Sirsak	<i>Annona muricata</i>	
	Jahe	<i>Zingiber officinale</i>	
2	Kencur	<i>Kaempferia galanga</i>	Cough
	Kunyit	<i>Curcuma longa</i>	
	Lengkuas	<i>Etingera hemisphaerica</i>	
	Serai	<i>Cymbopogon citratus</i>	
3	Kapati-pati Merah	<i>Euphorbia hirta</i>	Diabetes, high blood pressure, and rheumatism
	Kapati-pati Putih	<i>Sida acuta</i>	
	Meniran	<i>Phyllanthus amarus</i>	
4	Kumis Kucing	<i>Orthosiphon aristatus</i>	Back pain
	Pecah Beling	<i>Strobilanthes crispus</i>	

From the results of interviews in the community, there are 4 groups of plants that can be used as ingredients or plants that can be used simultaneously. The first group is *Muntingia calabura* and *Annona muricata*, group 2 *Zingiber officinale*, *Kaempferia galanga*, *Curcuma longa*, *Etingera hemisphaerica*, group 3 *Euphorbia hirta*, *Sida acuta*, and *Phyllanthus amarus*. Meanwhile, group 4 is *Orthosiphon aristatus*, and *Strobilanthes crispus*.

Muntingia calabura Diabetes, Rheumatism, Blood pressure, Cholesterol and Gout. While *Annona muricata* is useful for blood pressure and cholesterol (Fadhil *et al.* 2024). *Zingiber officinale* can cure high blood pressure, cough, weakness, and headache (Jalaluddin *et al.* 2025). *Kaempferia galanga* cough, nausea, swelling, ulcers, and poisoning (Mudaningrat and Nada 202; Wibowo *et al.* 2025). *Curcuma longa* is useful for inflammation (Siregar *et al.* 2025). *Etingera hemisphaerica* is

useful for treating bacteria (Sarianti *et al.* 2025). *Cymbopogon citratus* to treat bacteria (Desniarti *et al.* 2025).

Euphorbia hirta can be used to treat diabetes (Ani *et al.* 2018). In addition, *Euphorbia hirta* is a plant that can treat cancer (Kalaivani *et al.* 2023). *Sida acuta* can treat liver disease (Assam *et al.* 2010). Treating liver disease (Hanifa and Widyaningsih 2020). *Phyllanthus amarus* or better known as meniran has benefits for treating liver, kidney, and skin infections (Pandapotan *et al.* 2025).

The *Orthosiphon aristatus* plant is a plant that is very widely used by the community in general, the plant is used by the community to treat lumbago (Kuvaini *et al.* 2020). Meanwhile, the *Strobilanthes crispus* plant is used as one of them for lumbago (Rizal *et al.* 2021). Therefore, all parts of the *Orthosiphon aristatus* plant, and *Strobilanthes crispus* can be utilised (Haris *et al.* 2022).

Tabel 5. Interview results of plants that can be used as medicine and food ingredients

No.	Name Plants	Latin Name	Part Utilised
1	Agel/Lanu	<i>Corypha utan</i>	Umbut
2	Belimbing Wuluh	<i>Averhoa bilimbi</i>	Fruit
3	Cakokak	<i>Solanum torvum</i>	Fruit
4	Daun Katuk	<i>Sauropus androgynus</i>	Leaf
5	Jahe	<i>Zingiber officinale</i>	Rhizome
6	Kelor	<i>Moringa oleifera</i>	Leaf, and Fruit
7	Kencur	<i>Kaempferia galanga</i>	Rhizome
8	Kunyit	<i>Curcuma longa</i>	Rhizome
9	Lengkuas	<i>Etingera hemisphaerica</i>	Rhizome
10	Merica	<i>Piper nigrum</i>	Seed
11	O'liku	<i>Alpinia galanga</i>	Rhizome

No.	Name Plants	Latin Name	Part Utilised
12	Okra	<i>Abelmoschus esculentus</i>	Fruit
13	Pepaya	<i>Carica papaya</i>	Fruit, Flower, and Leaf
14	Sagu	<i>Metroxylon sagu</i>	Umbut, and Patih
15	Serai	<i>Cymbopogon citratus</i>	Leaf
16	Singkong	<i>Manihot esculenta</i>	Tuber
17	Sukun	<i>Artocarpus altilis</i>	Fruit
18	Tawaoloho	<i>Spondias mombin</i>	Fruit, and Leaf
19	Tokulo/Tahongai	<i>Kleinhovia hospita</i>	Leaf
20	Uwikoro	<i>Dioscorea hispida</i>	Tuber
21	Wualae	<i>Etligeria elatior</i>	Rhizome

The results of interviews with the indigenous people of the Moronene Tribe, there are 21 species of plants that have the function of being a medicine and food used by the community. Medicinal plants and food utilised by the Moronene indigenous people are all plants known by the community (Setiawan and Qiptiyah 2014). Medicinal plants used are plants that are believed to cure diseases (Abdiyani 2008). Food ingredients referred to in this study are staple foods, additional foods, seasonings or spices used by the Moronene indigenous people. Food ingredients can be divided into 3 parts, namely as a source of carbohydrates and vegetables (Setiawan and Qiptiyah 2014).

Medicinal plants used as a mixture in food are *Curcuma longa*, *Alpinia galanga*, *Etligeria hemisphaerica*, *Piper nigrum*, *Cymbopogon*

citratus, *Kaempferia galanga*, *Spondias mombin*, and *Zingiber officinale*. Plants used as sources of carbohydrates are *Dioscorea hispida*, *Manihot esculenta*, and *Metroxylon sagu*. Plants used as vegetables are *Kleinhovia hospita*, *Manihot esculenta*, *Metroxylon sagu*, *Carica papaya*, *Abelmoschus esculentus*, *Moringa oleifera*, *Sauropus androgynus*, and *Solanum torvum*. Meanwhile, plants utilised for their fruits are *Etligeria elatior*, *Spondias mombin*, *Artocarpus altilis*, and *Carica papaya*. This shows that the resources in the research location are very abundant and very young to be found and utilised by the Moronene indigenous people. With the abundance of resources utilised by indigenous people, the community will not go out to look for other resources.

Table 6. Plants that can be used as beverage colourants

No	Name Plants	Latin Name
1	Akar Kuning	<i>Arcangelisia flava</i>
2	Bajakah	<i>Spatholobus littoralis</i>

Arcangelisia flava and *Spatholobus littoralis* are not only used as medicines but also as beverage dyes by the Moronene indigenous people. *Arcangelisia flava* is believed to be a medicine for fever (Setyowati and Wardah 2007). Fever (Rachmawati and Ulfa 2018). Fever / heat (Hadriyati et al. 2020). Fever (Hardiati et al. 2023). *Spatholobus littoralis* can reduce high blood pressure because it contains secondary metabolites (Azzahra et al. 2022). *Spatholobus littoralis* is a medicine for people with high blood pressure (Ridho 2023).

Rawa Aopa Watumohai National Park and the Moronene indigenous people can develop the plant species listed in (tables 3) by collaborating. Where the Aopa Watumohai Swamp National Park is looking for a market for plant products produced by indigenous peoples. While indigenous communities produce plants in the form of products that are ready for sale. There are species that have a dual role,

namely as medicinal plants and as food plants that are used by the Moronene indigenous people. With the cooperation between the Aopa Watumohai Swamp National Park and the Moronene indigenous community, it can increase community income in the field of medicinal and food plant utilization.

CONCLUSION

Based on the research results, the most significant finding was the identification of 57 types of medicinal plants used by the Moronene indigenous community, with 10 leading species based on IC, UVs, and ICS analyses, as well as the grouping of four synergistic plant combinations in traditional medicine practices. The species with the highest ICS value is *Metroxylon sagu* (ICS = 74), followed by *Arcangelisia flava* and *Jatropha multifida* (ICS = 60). Concrete conservation implications include: (1) establishing special zoning for the protection of plant collection areas based on customary systems; (2) community-based cultivation of species with

high economic value; (3) strengthening the capacity of sando through the documentation of traditional knowledge; (4) collaboration between the National Park and the community in the development of herbal products; and (5) monitoring of critical species populations involving local participation.

ACKNOWLEDGEMENTS

We would like to thank the Rawa Aopa Watumohai National Park, and the Moronene Indigenous Community for allowing us to conduct research in the area.

REFERENSI

- Abdiyani, S. (2008). Keanekaragaman jenis tumbuhan bawah berkhasiat obat di Dataran Tinggi Dieng. *Jurnal Penelitian Hutan dan Konservasi Alam*, 5(1), 79–92. <https://doi.org/10.20886/jphka.2008.5.1.79-92>
- Albuquerque, U. P., Ramos, M. A., Júnior, W. S. F., & Medeiros, P. M. de. (2018). *Botany for beginners* (Vol. 35). [Penerbit tidak disebutkan].
- Ani, N., Rohyani, I. S., & Ustadz, M. (2018). Pengetahuan masyarakat tentang jenis tumbuhan obat di kawasan Taman Wisata Alam Madapangga Sumbawa [Community knowledge of the medicinal plant types in Natural Tourism Area of Madapangga Sumbawa]. *Jurnal Pijar MIPA*, 13(2), 1–23. <https://doi.org/10.29303/jpm.v13i2.751>
- Assam, A. J. P., Dzoyem, J. P., Pieme, C. A., & Penlap, V. B. (2010). In vitro antibacterial activity and acute toxicity studies of aqueous-methanol extract of *Sida rhombifolia* Linn. (Malvaceae). *BMC Complementary and Alternative Medicine*, 10, 1–7. <https://doi.org/10.1186/1472-6882-10-40>
- Awuchi, G. C. (2019). Medicinal plants: The medical, food, and nutritional biochemistry and uses. *International Journal of Advanced Academic Research | Sciences, Technology and Engineering*, 5(11), 220–241.
- Azzahra, A., Farhani, N., Syahfitri, W., & Pasaribu, S. F. (2022). Potensi kandungan flavonoid dalam kayu bajakah sebagai antidiabetes. *Jurnal Pendidikan Tambusai*, 6(2), 14345–14350. <https://www.jptam.org/index.php/jptam/article/view/4708>
- Balick, M. J., & Cox, P. A. (2020). *Plants, people, and culture*. [Penerbit tidak disebutkan].
- Basri, Ferdinan, A., Powatu, H., Chalid, A., Sakakibara, M., & Ayumar, A. (2024). Traditional ecological knowledge of the Moronene tribe: Insights into forest conservation practice in Bombana Area, Southeast Sulawesi. *IOP Conference Series: Earth and Environmental Science*, 1388(1), 012008. <https://doi.org/10.1088/1755-1315/1388/1/012008>
- Chen, S.-L., Yu, H., Luo, H.-M., Wu, Q., Li, C.-F., & Steinmetz, A. (2016). Conservation and sustainable use of medicinal plants: Problems, progress, and prospects. *Chinese Medicine (United Kingdom)*, 11(1), 1–10. <https://doi.org/10.1186/s13020-016-0108-7>
- Coelho, N., Gonçalves, S., & Romano, A. (2020). Endemic plant species conservation: Biotechnological approaches. *Plants*, 9(3), 345. <https://doi.org/10.3390/plants9030345>
- Darmayani, S., Alaydrus, S., Yunus, R., Yuniarty, T., Dewi, N. P., Rosanty, A., & Supiati. (2021). Antibacterial activities test of ethanol extracts of kundur fruit (*Benincasa hispida* Thunb. Cogn) on *Salmonella typhi* bacteria. *Journal of Physics: Conference Series*, 1899(1), 012028. <https://doi.org/10.1088/1742-6596/1899/1/012028>
- Desniarti, Tambunan, M. S., Perangin-angin, M. B., Pasaribu, M. V., Damanik, N. F., Aulia, N. I., Sari, P., & Pahlevi, P. (2025). Serenova Liquid: Pembuatan sabun cuci piring dengan ekstrak serai di Yayasan Al-Kahfi Medan. *Amaliah: Jurnal Pengabdian Kepada Masyarakat*, 9(1), 293–299. <https://doi.org/10.32696/ajpkm.v9i1.4859>
- Fadhil, A. R., Sinthary, V., & Rijai, L. (2024). Studi etnofarmasi tumbuhan berkhasiat obat di Kecamatan Duampanua Kabupaten Pinrang Sulawesi Selatan. *Jurnal Mandala Pharmacoon Indonesia*, 10(1), 80–103. <https://doi.org/10.35311/jmpi.v10i1.502>
- Faruque, M. O., Uddin, S. B., Barlow, J. W., Hu, S., Dong, S., Cai, Q., Li, X., & Hu, X. (2018). Quantitative ethnobotany of medicinal plants used by indigenous communities in the Bandarban district of Bangladesh. *Frontiers in Pharmacology*, 9, 1–12. <https://doi.org/10.3389/fphar.2018.00040>
- Friedman, J., Yaniv, Z., Dafni, A., & Palewitch, D. (1986). A preliminary classification of the healing potential of medicinal plants, based on a rational analysis of an ethnopharmacological field survey among Bedouins in the Negev Desert, Israel. *Journal of Ethnopharmacology*, 16(2–3), 275–287. [https://doi.org/10.1016/0378-8741\(86\)90094-](https://doi.org/10.1016/0378-8741(86)90094-)

- Hadriyati, A., Andriani, M., & Anggeliapriatiwi. (2020). Ethnobotany study in Hope Forest for children in nine village Bungku Village, Bajubang Batanghari District, Jambi Province. *Journal of Healthcare Technology and Medicine*, 6(2), 861–871.
- Hafid, A., Kersadi, Akhmad, Syukur, M., & Ramly. (2020). The existence of Moronene indigenous peoples in Hukaea Laea Village, Bombana Regency, Indonesia. *International Journal of Innovation, Creativity and Change*, 14(1), 288–306.
- Hanifa, N. I., & Widyaningsih, W. (2020). Efek hepatoprotektif ekstrak etanol daun sidaguri (*Sida rhombifolia*) terhadap aktivitas alkaline fosfatase serum tikus yang diinduksi karbon tetraklorida. *Acta Pharmaceutica Indonesia*, 8(2), 45–52. <https://doi.org/10.20884/1.api.2020.8.2.2929>
- Hardiati, L., Ratnasari, D., & Handayani, R. P. (2023). Pembuatan teh herbal akar kayu kuning (*Arcangelica flava* (L.) Merr) dengan penambahan daun stevia (*Stevia rebaudiana*) sebagai pemanis alami untuk memelihara kesehatan penderita diabetes. *Jurnal Holistic Health Science*, 15(1), 16. <https://doi.org/10.52689/higea.v15i1.478>
- Haris, A., Arisanty, & Prayitno, S. (2022). Formulasi dan uji efek penyembuhan luka bakar sediaan gel ekstrak daun kedondong hutan (*Spondias pinnata* L) kombinasi dengan madu terhadap kelinci (*Oryctolagus cuniculus*). *Fito Medica: Journal of Pharmaceutical Sciences*, 14(1), 48–55.
- Hidayat, M., Taher, T., & Murniati, N. (2023). Etnobotani tumbuhan obat masyarakat adat Kesultanan Ternate di Kelurahan Foramadiah sebagai pengembang bahan ajar berbasis kearifan lokal. *Diklabio: Jurnal Pendidikan dan Pembelajaran Biologi*, 7(2), 250–259. <https://doi.org/10.33369/diklabio.7.2.250-259>
- Ijaz, F., Iqbal, Z., Rahman, I. U., Alam, J., Khan, S. M., Shah, G. M., Khan, K., & Afzal, A. (2016). Investigation of traditional medicinal floral knowledge of Sarban Hills, Abbottabad, KP, Pakistan. *Journal of Ethnopharmacology*, 179, 208–233. <https://doi.org/10.1016/j.jep.2015.12.050>
- Ijaz, F., Iqbal, Z., Rahman, I. U., Ali, N., & Afzal, M. (2017). People-plants interaction and its uses: A science of four words “Ethnobotany.” *Alternative & Integrative Medicine*, 6(1), 1000235. <https://doi.org/10.4172/2327-5162.1000235>
- Jabalnur, Heryanti, Safiuddin, S., & Intan, N. (2019). The role of customary law community of Moronene Hukaea Laea in managing ulayat forests in the Rawa Aopa Watumohai conservation area. *Journal of Law, Policy and Globalization*, 90, 37–43. <https://doi.org/10.7176/jlpg/90-06>
- Jain, A. K. (2020). The genesis and journey of ethnobotany: From ancient to modern. *Ethnobotany: An International Journal of Social Ethnobotany*, 32, 1–9.
- Jalaluddin, Husnah, Sakdiah, Rahmi, N., Nashrillah, Aliasuddin, & Adam, M. (2025). Manfaat jahe bagi penderita hipertensi dan ekonomi masyarakat. *Jurnal Pengabdian Aceh*, 5(2), 126–133.
- Kalaivani, S., Jayanthi, S., Revathi, K., & Chandrasekaran, R. (2023). An approach of *Euphorbia hirta* extract on wound healing activity in albino rats. *Biological Forum – An International Journal*, 15(5), 1512–1515.
- Kayani, S., Ahmad, M., Sultana, S., Shinwari, Z. K., Zafar, M., Yaseen, G., Hussain, M., & Bibi, T. (2015). Ethnobotany of medicinal plants among the communities of Alpine and Sub-alpine regions of Pakistan. *Journal of Ethnopharmacology*, 164, 186–202. <https://doi.org/10.1016/j.jep.2015.02.004>
- Kayser, O. (2018). Ethnobotany and medicinal plant biotechnology: From tradition to modern aspects of drug development. *Planta Medica*, 84(12–13), 834–838. <https://doi.org/10.1055/a-0631-3876>
- Kurniawan, E., & Jadid, N. (2015). Nilai guna spesies tanaman sebagai obat tradisional oleh masyarakat Tengger di Desa Probolinggo–Jawa Timur. *Jurnal Sains dan Seni ITS*, 4(1), 1–4. <https://doi.org/10.12962/j.23373520.v4i1.8582>
- Kuvaini, A., Yuliyanto, & Bahtiar. (2020). Studi etnobotani tumbuhan obat oleh masyarakat perkebunan kelapa sawit dalam mendukung pengelolaan perkebunan yang berkelanjutan (Studi kasus di Perkebunan PT. Unggul Widya Teknologi Lestari). *Jurnal Citra Widya Edukasi*, 12(2), 71–84.
- Larsen, H. O., Smith, P. D., & Olsen, C. S. (2005). Nepal’s conservation policy options for commercial medicinal plant harvesting: Stakeholder views. *Oryx*, 39(4), 435–441. <https://doi.org/10.1017/S0030605305001079>
- Limba, R. S., Lio, A., & Husain, Y. S. (2017). Shifting cultivation system of indigenous Moronene as forest conservation on local wisdom principles in Indonesia. *Journal of Sustainable Development*, 10(4), 121–129.

- <https://doi.org/10.5539/jsd.v10n4p121>
- Melese, D., Asnakew, M., Getachew, S., & Awoke, A. (2025). Traditionally used phytomedicines and their associated threats in Bitu district, southwestern Ethiopia. *Journal of Ethnobiology and Ethnomedicine*, 21(1), 1–31. <https://doi.org/10.1186/s13002-025-00753-9>
- Mudaningrat, A., & Nada, S. (2021). Pengaruh konsentrasi zat pengatur tumbuh dalam kandungan air kelapa terhadap pertumbuhan tanaman jahe (*Zingiber officinale*) dan tanaman kencur (*Kaempferia galanga* L.). *Prosiding Semnas Biologi*, 9, 1–9.
- Newman, D. J., & Cragg, G. M. (2016). Natural products as sources of new drugs from 1981 to 2014. *Journal of Natural Products*, 79(3), 629–661. <https://doi.org/10.1021/acs.jnatprod.5b01055>
- Nur, J., Patittingi, F., Asalle, & Ssaad. (2019). Environmental rights of the indigenous peoples of Moronene Hukaea Laea in the national park conservation area. *IOP Conference Series: Earth and Environmental Science*, 343(1), 012065. <https://doi.org/10.1088/1755-1315/343/1/012065>
- Pandapotan, H., Fitriani, H., Hayati, F., & Syukri, Y. (2025). A systematic narrative review: Kajian farmakologi dan toksikologi meniran (*Phyllanthus niruri* L.). *Media Farmasi*, 21(1), 1–10. <https://doi.org/10.32382/mf.v21i1.1317>
- Rachmawati, E., & Ulfa, E. U. (2018). Uji toksisitas subkronik ekstrak kayu kuning (*Arcangelisia flava* Merr) terhadap hepar dan ginjal [Subchronic toxicity test of yellow root extract (*Arcangelisia flava* Merr) on hepar and renal]. *Global Medical & Health Communication*, 6(1), 1–6. <https://doi.org/10.29313/gmhc.v6i1.2203>
- Renjana, E., & Nikmatullah, M. (2021). Studi potensi obat koleksi tumbuhan paku Kebun Raya Purwodadi [Study of drugs potential of fern collections at Purwodadi Botanic Gardens]. *Jurnal Penelitian Kehutanan Wallacea*, 10(2), 199–209. <https://doi.org/10.18330/jwallacea.2021.vol10iss2pp199>
- Ridho, F. M. (2023). Mechanism of alkaloids and flavonoids in bajakah (*Uncaria nervosa* Elmer) as antidiabetic agents. *Jurnal Ilmu Medis Indonesia (JIMI)*, 3(1), 9–16. <https://doi.org/10.35912/jimi.v3i1.2296>
- Rizal, S., Kartika, T., & Septia, G. A. (2021). Studi etnobotani tumbuhan obat di desa Pagar Ruyung Kecamatan Kota Agung Kabupaten Lahat Sumatera Selatan. *Sainmatika: Jurnal Ilmiah Matematika dan Ilmu Pengetahuan Alam*, 18(2), 222. <https://doi.org/10.31851/sainmatika.v18i2.6618>
- Rubiah, Djufri, & Muhibbuddin. (2015). Kajian etnobotani tumbuhan obat penyakit kulit pada masyarakat Kabupaten Pidie. *Jurnal Biologi Edukasi*, 7(1), 5–24.
- Sarianti, W. N. E., Ardiani, & Widiatmojo, H. (2025). Pengaruh ekstrak rimpang lengkuas merah (*Alpinia purpurata*) terhadap pertumbuhan bakteri *Aeromonas salmonicida*. *Jurnal Sains Akuakultur Tropis*, 9(1), 90–96. <https://doi.org/10.14710/sat.v9i1.26309>
- Schaal, B. (2019). Plants and people: Our shared history and future. *Plants, People, Planet*, 1(1), 14–19. <https://doi.org/10.1002/ppp3.12>
- Setiawan, H., & Qiptiyah, M. (2014). Kajian etnobotani masyarakat adat suku Moronene di Taman Nasional Rawa Aopa Watumohai [The ethnobotany study of Moronene ethnic community in Rawa Aopa Watumohai National Park]. *Jurnal Penelitian Kehutanan Wallacea*, 3(2), 107–117. <https://doi.org/10.18330/jwallacea.2014.vol3iss2pp107-117>
- Setyowati, F. M., & Wardah. (2007). Keanekaragaman tumbuhan obat masyarakat Talang Mamak di sekitar Taman Nasional Bukit Tigapuluh, Riau [Diversity of medicinal plant by Talang Mamak tribe in surrounding of Bukit Tiga Puluh National Park, Riau]. *Biodiversitas*, 8(3), 228–232. <https://doi.org/10.13057/biodiv/d080313>
- Siregar, S., Fernenda, L., & Hasan, N. (2025). Sosialisasi pemberdayaan masyarakat dalam pemanfaatan jahe dan kunyit sebagai pencegahan dan pengobatan infeksi pernapasan. *Jurnal Pengabdian, Inovasi dan Teknologi Kepada Masyarakat*, 5(1), 152–160. <https://doi.org/10.58794/jdt.v5i1.1337>
- Sudarmin, & Asyhar, R. (2012). Transformasi pengetahuan sains tradisional menjadi sains ilmiah dalam proses produksi jamu tradisional [Transformation of traditional knowledge into scientific knowledge of traditional herbal medicine production process]. *Edu-Sains*, 1(1), 1–7.
- Sulaiman, N. (2025). Botanical Ethnoknowledge Index: A new quantitative assessment method for cross-cultural analysis. *Journal of Ethnobiology and Ethnomedicine*, 21(1), 1–7. <https://doi.org/10.1186/s13002-025-00772-6>
- Turner, N. J. (1988). “The importance of a rose”:

Evaluating the cultural significance of plants in Thompson and Lillooet Interior Salish. *American Anthropologist*, 90(2), 272–290. <https://doi.org/10.1525/aa.1988.90.2.02a00020>

Wibowo, D., Ta'tia, M. I., Afifah, H. N., Purwati, A. D., Maulana, I., Putri, E. A., Damayanti, V.,

Fitriana, V., Nugroho, M. A., Rahmawati, Q. S., et al. (2025). Penyuluhan pembuatan serbuk jamu beras kencur pada ibu-ibu RW.03 Desa Sumub Lor Sragi Pekalongan. *KOMUNITA: Jurnal Pengabdian dan Pemberdayaan Masyarakat*, 4(1), 59–64. <https://doi.org/10.60004/komunita.v4i1.114>