



Ethnomedicine of Traditional Medicinal Plants in Several Sub-Districts of North Buton Regency, Southeast Sulawesi, Indonesia

Fitriani Rasyid* Lucky Andiska, Mus Ifaya, Rosdarni

¹Department of Pharmacy, Faculty of Science and Technology, Mandala Waluya University, Kendari, Southeast Sulawesi, Indonesia

Received: 24/02/2026

Accepted: 16/04/2026

Published: 30/06/2026

*Corresponding Author E-mail: zulfikar19345@gmail.com

ABSTRACT

The utilization of natural materials such as plants as medicinal substances is called ethnomedicine. Ethnomedicine is a method to document medicinal knowledge of local communities so that it can be scientifically recorded. This study aimed to identify plant species, plant parts used, medicinal properties, processing methods, and traditional medicine use by communities in several sub-districts of North Buton Regency. A quantitative approach with descriptive data presentation and snowball sampling technique was employed. Data collection included interviews, observation, and documentation from 51 informants (battra) in Kulisusu, West Kulisusu, and North Kulisusu Sub-Districts. Results revealed 86 plant species from 40 families used for treating communicable and non-communicable diseases. The most common plant part was leaves (65.1%), predominant processing method was boiling (55.8%), and the primary route of administration was oral (69.7%). Turmeric (*Curcuma longa* L.) had the highest citation frequency (64.7%), while gastric disorders (maag) were the most commonly treated condition (58.8%). Malvaceae was the dominant plant family (9.3%). Conservation of medicinal plants and development of special processing methods are recommended for sustainable utilization.

Keywords: Citation Frequency, Ethnomedicine, Medicinal Plants, North Buton Regency, Snowball Sampling

I. INTRODUCTION

Indonesia is recognized as the country with the second largest biodiversity after Brazil, stretching from Sabang to Merauke. Indonesia contains approximately 30,000 plant species, of which around 7,500 are classified as medicinal plants. Indonesia is also rich in ethnicity, with more than 370 ethnic groups, each carrying traditional knowledge passed down through generations regarding the use of plants for health maintenance and disease treatment (Syamsuri et al., 2023).

Ethnomedicine is a field of study aimed at exploring the local knowledge of an ethnic group in maintaining health and extracting chemical compounds contained in natural materials. It serves as a method to document medicinal knowledge from local communities in a scientifically valid manner, and constitutes a step toward natural resource conservation (Suwardi et al., 2020). Conducting ethnomedicine research is important to provide insights into potential new drugs, understand local health knowledge, and support natural resource conservation efforts (Silalahi et al., 2018).

North Buton Regency, with an area of 1,923.03 km² comprising six sub-districts, is a region that still retains strong traditional cultural practices. The community continues to utilize plants, particularly for traditional medicine, supported by a still relatively intact level of biodiversity (Tan et al., 2022). Based on preliminary interviews, communities in Kulisusu, West Kulisusu, and North Kulisusu Sub-Districts still primarily rely on medicinal plants as their first option for treating various diseases. This is driven by belief in the safety and fewer side effects of herbal medicines, and the intergenerational transmission of traditional knowledge from previous generations (Sumayyah & Salsabila, 2017).

Previous ethnomedicinal research in Southeast Sulawesi includes studies on the Tolaki tribe in Puundoho (Alang et al., 2021) and the Muna tribe in Oe Nsuli Village (Kasmawati et al., 2019). However, no specific ethnomedicine study on traditional medicinal plants in several sub-districts of North Buton Regency has previously been conducted. This study therefore aims to document plant species, plant parts used, medicinal properties, dominant plant families, citation frequencies, and processing and administration methods of traditional medicines by the community in Kulisusu, West Kulisusu, and North Kulisusu Sub-Districts of North Buton Regency.

Ethnomedicine is a branch of medical anthropology that studies the traditional medical practices and beliefs of various ethnic groups. It is defined as the study and comparison of traditional medicine based on bioactive natural product discovery and their utilization in traditional healing systems (Bhasin, 2007). In Indonesia, ethnomedicine has become an important tool for documenting the traditional ecological knowledge of local communities regarding medicinal plant use and serves a dual function of scientific documentation and conservation.

2.2. Traditional Medicinal Plants

Medicinal plants, known as *biofarmaka*, are plant types that have functions and efficacy as medicines used for healing or preventing various diseases. These plants contain active substances or have synergistic effects from various compounds with therapeutic properties (Departemen Kesehatan RI, 1983). The use of plants as traditional medicine can involve oral, topical, or compress application. A key characteristic of traditional medicinal knowledge is that it is strongly influenced by local culture, tradition, and ecological factors (Maharani et al., 2021).

2.3. Citation Frequency Analysis

Citation frequency (FC) is a quantitative method used to measure the frequency of use of medicinal plants within a community. The formula is: $FC (\%) = (N/T) \times 100$, where N is the number of respondents citing a particular plant species, and T is the total number of respondents (Saranani et al., 2021). Plants with a high citation frequency are considered to have high cultural significance and perceived efficacy within the community, and often become priority candidates for further pharmacological investigation.

2.4. Plant Family Distribution in Ethnomedicinal Studies

The distribution of medicinal plant families provides valuable insights into the phytochemical richness of a region's flora. Certain plant families such as Malvaceae, Asteraceae, Lamiaceae, Fabaceae, and Zingiberaceae consistently appear in ethnomedicinal studies across tropical regions due to their known richness in secondary metabolites including flavonoids, alkaloids, saponins, tannins, and terpenoids (Silalahi et al., 2018). Documenting family-level diversity helps establish links between traditional use patterns and modern pharmacognosy.

II. RESEARCH METHOD

This study employed a quantitative approach with descriptive data presentation methods. The research was conducted from March to June 2024 in Kulisusu, West Kulisusu, and North Kulisusu Sub-Districts, North Buton Regency, Southeast Sulawesi. The snowball sampling technique was applied to identify key informants (*battr*) who were knowledgeable about traditional medicinal plant use (Sugiyono, 2007).

The population consisted of 90 traditional healers (*battr*) across villages and *kelurahan* in North Buton Regency. The sample comprised 51 *battr* from Kulisusu (16 villages, 7 *kelurahan*), West Kulisusu (14 villages), and North Kulisusu (14 villages). Data collection used four techniques: (1) Informant identification through village leaders and community figures; (2) Structured interviews about local plant names, parts used, medicinal properties, and processing/administration methods; (3) Field observation; and (4) Documentation using cameras.

Data analysis was performed inductively using both qualitative (descriptive) and quantitative approaches. Quantitative analysis calculated the citation frequency ($FC\% = (N/T) \times 100$, where N = number of respondents citing a plant species and T = total respondents. Plant family proportions were similarly calculated as: $Family\% = (Number\ of\ species\ in\ family / Total\ species) \times 100$. This research adhered to four ethical principles: respect for human dignity, privacy and confidentiality, justice and inclusiveness, and balancing harms and benefits (Nursalam, 2011).

III. RESEARCH RESULT AND DISCUSSION

3.1. Research Result

3.1.1. Characteristics of Informants

A total of 51 traditional healers (*battr*) participated as informants in this study. Table 4.1 shows the distribution by gender, Table 4.2 by age group, and Table 4.3 by occupation.

Table 3.1. Distribution of Informants by Gender

Gender	Number (n)	Percentage (%)
Female	39	76.4
Male	12	23.5
Total	51	100

Source: Primary data, processed June 2024

Table 3.2. Distribution of Informants by Age Group

Age Group (years)	Number (n)	Percentage (%)
31–40	2	3.9
41–50	12	23.5
51–60	15	29.4

Age Group (years)	Number (n)	Percentage (%)
61–70	13	25.4
71–80	7	13.7
>80	2	3.9
Total	51	100

Source: Primary data, processed June 2024

Table 3.3. Distribution of Informants by Occupation

Occupation	Number (n)	Percentage (%)
Farmer (Petani)	18	35.2
Trader (Pedagang)	7	13.7
Self-employed (Wiraswasta)	4	7.8
Fisherman (Pelaut)	3	5.8
Civil Servant (PNS)	2	3.9
Other (Lainnya)	17	33.3
Total	51	100

Source: Primary data, processed June 2024

3.1.2. Plant Parts, Processing Methods, and Routes of Administration

Table 3.4. Plant Parts Used for Traditional Medicine

Plant Part	Number of Species	Percentage (%)
Leaves (Daun)	56	65.1
Herb (Herba)	7	8.1
Rhizome (Rimpang)	5	5.8
Stem (Batang)	4	4.6
Fruit (Buah)	4	4.6
Root (Akar)	3	3.4
Latex/Sap (Getah)	3	3.4
Flower (Bunga)	2	2.3
Bulb (Umbi)	2	2.3
Seed (Biji)	1	1.1
Bark (Kulit kayu)	1	1.1
Total	86*	100

*Percentages calculated based on number of plant species per part type ($N = 86$). Some species may utilize multiple parts.

Source: Primary data, processed June 2024

Table 3.5. Processing Methods of Traditional Medicinal Plants

Processing Method	Number of Plants	Percentage (%)
Boiling (Direbus)	48	55.8
Squeezing (Diremas)	13	15.1
Pounding (Ditumbuk)	8	9.3
Grating (Diparut)	4	4.6
Pressing (Diperas)	4	4.6

Processing Method	Number of Plants	Percentage (%)
Peeling (Dikupas)	4	4.6
Dropping (Ditetaskan)	3	3.4
Rubbing (Digosok)	2	2.3
Scraping (Dikerok)	2	2.3
Picking (Dipetik)	2	2.3
Burning (Dibakar)	1	1.1
Cutting (Dipotong)	1	1.1
Frying (Digoreng)	1	1.1
Soaking (Direndam)	1	1.1

Note: Percentages are relative to total species ($N = 86$). Some species employ more than one processing method; thus total may exceed 100%.

Source: Primary data, processed June 2024

Table 3.6. Routes of Administration of Traditional Medicines

Route of Administration	Number of Plants	Percentage (%)
Oral / Drinking (Diminum)	60	69.7
Topical / Applying (Dioles)	11	12.7
Compress (Ditempel)	8	9.3
Dropping (Ditetaskan)	4	4.6
Eating directly (Dimakan)	3	3.4
Inserting (Dimasukkan)	2	2.3
Chewing (Dikunyah)	1	1.1
Rubbing (Digosok)	1	1.1
Washing (Dibasuhkan)	1	1.1

Note: Percentages are relative to total species ($N = 86$). Some species have multiple routes of administration; thus total may exceed 100%.

Source: Primary data, processed June 2024

3.1.3. Plant Family Distribution

The 86 medicinal plant species identified belong to 40 plant families. Table 4.7 presents the ten dominant families, which together represent 56.4% of all medicinal species documented.

Table 3.7. Ten Dominant Plant Families Used in Traditional Medicine

Plant Family	Number of Species	Percentage (%)
Malvaceae	8	9.3
Asteraceae	7	8.1
Lamiaceae	5	5.8
Euphorbiaceae	5	5.8
Fabaceae	5	5.8
Acanthaceae	4	4.6
Zingiberaceae	4	4.6
Solanaceae	4	4.6
Arecaceae	4	4.6
Verbenaceae	3	3.4

Plant Family	Number of Species	Percentage (%)
Other (30 families)	37	43.0
Total	86	100

Source: Primary data, processed June 2024

3.1.4. Citation Frequency of Most Commonly Used Plants

Citation frequency (FC) was calculated for all 86 species. Table 4.8 presents the ten most frequently cited medicinal plants, representing those with the highest community use value in the study area.

Table 3.8. Top 10 Most Frequently Cited Medicinal Plants

Common Name	Scientific Name	N (out of 51)	FC (%)
Turmeric (Kunyit)	Curcuma longa L.	33	64.7
Soursop (Sirsak)	Annona muricata L.	25	49.0
Kirinyuh (Daun kirinyuh)	Eupatorium odoratum	23	45.1
Cocor bebek	Kalanchoe pinnata	19	37.2
Papaya (Pepaya)	Carica papaya L.	18	35.2
Guava (Jambu batu)	Psidium guajava L.	17	33.3
Sweet basil (Selasih mekah)	Ocimum gratissimum L.	17	33.3
Cashew (Jambu mete)	Anacardium occidentale L.	17	33.3
Forest basil (Kemangi hutan)	Ocimum sp.	15	29.4
Spurge (Patikan kebo)	Euphorbia hirta L.	14	27.4

Source: Primary data, processed June 2024. FC = Citation Frequency; N = number of respondents citing the plant.

3.1.5. Diseases Most Commonly Treated by Battra

Citation frequency for disease categories was also calculated. Table 4.9 shows the most commonly treated conditions, calculated as the proportion of informants who identified that disease as one they treat with traditional plants.

Table 3.9. Diseases Most Commonly Treated by Traditional Healers (Battra)

Disease	N (out of 51)	FC (%)	Category
Gastric disorder (Maag)	30	58.8	Non-communicable
Hypertension (Hipertensi)	25	49.0	Non-communicable
Fever (Demam)	24	47.1	Communicable / NCD
Abdominal pain (Sakit perut)	20	39.2	Non-communicable
Cough (Batuk)	10	19.6	Communicable
Kidney disease (Ginjal)	8	15.7	Non-communicable
External wound (Luka luar)	7	13.7	Injury
Diabetes (Diabetes)	6	11.8	Non-communicable
Measles (Sarampa)	5	9.8	Communicable

Source: Primary data, processed June 2024. FC = Citation Frequency; N = number of informants treating that disease.

3.2. Discussion

3.2.1. Characteristics of Informants and Relevance to Ethnomedicinal Knowledge

The majority of informants (Battra) were female (76.4%), consistent with findings from other ethnomedicinal studies in Indonesia that show women are often the primary holders and practitioners of traditional medicinal plant knowledge within households and communities (Saputri et al., 2022). The age range of informants spanned 31 years to over 80 years, with the largest group being 51–60 years (29.4%), followed by 61–70 years (25.4%). This age distribution reflects the pattern observed across ethnomedicinal studies that traditional knowledge is predominantly concentrated in older community members, indicating a significant risk of knowledge loss as younger generations increasingly turn to modern medicine.

Regarding occupation, farmers (petani) constituted the majority of informants (35.2%), followed by the "other" category (33.3%) which includes housewives and traditional fishers. Civil servants (PNS) were the fewest (3.9%). This occupational pattern is ecologically significant: farmers and community members with occupations directly tied to the land have greater daily access to and familiarity with local plant diversity, which reinforces their role as primary custodians of ethnomedicinal knowledge. In contrast, the limited representation of civil servants suggests that modernized occupations correlate with reduced reliance on traditional plant-based medicine.

3.2.2. Dominant Plant Families and Their Pharmacological Significance

Malvaceae was the most dominant family, comprising 8 species (9.3%). This family is well known for its rich content of mucilages, flavonoids, and phenolic compounds, which confer anti-inflammatory, antipyretic, and wound-healing properties — consistent with the conditions treated by Malvaceae species in this study, including fever and skin disorders. Asteraceae ranked second with 7 species (8.1%), a family consistently dominant in global ethnomedicinal surveys due to its high diversity and widespread distribution of species with sesquiterpene lactones, flavonoids, and essential oils with antimicrobial and anti-inflammatory activity.

Lamiaceae, Euphorbiaceae, and Fabaceae each contributed 5 species (5.8% each). Lamiaceae species are rich in aromatic volatile oils and phenolic diterpenes. Euphorbiaceae species contain alkaloids, terpenoids, and flavonoids associated with wound-healing, antidiabetic, and antipyretic effects — consistent with patikan kebo (*Euphorbia hirta* L., FC = 27.4%) being widely cited for cough treatment. Fabaceae is globally one of the most widely used medicinal plant families owing to its production of tannins, saponins, and flavonoids. Zingiberaceae (4 species, 4.6%) is pharmacologically important for its curcuminoids and gingerols; notably, turmeric (*Curcuma longa* L.) from this family recorded the highest citation frequency in this study (FC = 64.7%).

The dominance of these plant families mirrors findings from ethnomedicinal studies across other regions of Southeast Sulawesi (Kasmawati et al., 2019; Tahoangako et al., 2023) and reflects the close relationship between plant family diversity, ecological availability, and cultural utility in tropical Indonesia.

3.2.3. Most Frequently Used Plants and Their Ethnopharmacological Basis

Turmeric (*Curcuma longa* L.) recorded the highest citation frequency at 64.7% (n = 33 out of 51 informants), primarily used for treating gastric disorders (maag). The main bioactive compound curcumin confers gastroprotective effects by inhibiting gastric mucosal cell damage and preventing significant gastric scoring (Putra et al., 2022; Santoso, 2017). The widespread citation of turmeric is consistent with its cultural familiarity as both a culinary spice and traditional medicine across Indonesian ethnic groups.

Soursop (*Annona muricata* L.) ranked second (FC = 49.0%), predominantly used for hypertension. Research indicates that soursop leaves contain potassium ions that reduce blood pressure via vasodilation, diuretic effects, modulation of the renin-angiotensin system, and regulation of peripheral nervous activity (Swastini, 2021). Kirinyuh (*Eupatorium odoratum*, FC = 45.1%) was widely cited for wound treatment; the leaves are squeezed and applied directly to wounds, with flavonoids and tannins providing antimicrobial and hemostatic effects.

Cocor bebek (*Kalanchoe pinnata*, FC = 37.2%) was commonly used for fever reduction through topical compress application. Its flavonoid content inhibits cyclooxygenase-2 (COX-2), thereby reducing prostaglandin synthesis — the primary mediator of fever (Purwitasari, 2017). *Euphorbia hirta* L. (patikan kebo, FC = 27.4%) was commonly used for cough; it contains tannin, flavonoids, and triterpenoids with antiseptic, anti-inflammatory, antifungal, and antibacterial properties (Assidqi & Tjahjaningsih, 2012).

3.2.4. Disease Categories Treated by Traditional Medicine

Analysis of the disease-based citation frequency reveals that gastric disorders (maag) was the most commonly treated condition (FC = 58.8%), followed by hypertension (49.0%), fever (47.1%), and abdominal pain (39.2%). This pattern indicates that traditional medicine use in North Buton Regency is predominantly oriented toward non-communicable diseases (NCDs), which aligns with the broader epidemiological transition occurring in rural Indonesia where NCDs such as hypertension, diabetes, and gastric conditions are increasingly prevalent.

Of the total conditions documented in this study, non-communicable diseases — including hypertension, diabetes, kidney disease, rheumatism, gout, cholesterol, cancer, and gastric disorders — were more frequently treated with traditional plants than communicable diseases such as malaria, tuberculosis, measles, and scabies. This dominance of NCDs in the citation pattern likely reflects both the higher prevalence of NCDs in the community and the perceived efficacy of herbal treatments for chronic conditions, where patients engage in long-term self-medication rather than relying solely on formal healthcare.

The relatively lower citation frequency for communicable diseases (e.g., cough 19.6%, measles 9.8%) may reflect a gradual shift toward modern healthcare for acute infections, while chronic non-communicable conditions remain more strongly associated with traditional herbal treatment. This finding has important implications for public health planning and the integration of traditional medicine into primary healthcare services in rural regions.

3.2.5. Plant Parts, Processing Methods, and Routes of Administration

Leaves were the most utilized plant part (65.1%), which is consistent with findings across tropical ethnomedicinal studies. According to Silalahi et al. (2018), leaves are the easiest plant organ to obtain, and their parenchymal cell anatomy supports active production of secondary metabolites including flavonoids, terpenoids, and phenolics. Chekole et al. (2017) further confirmed that leaf predominance in traditional medicine is attributable to ease of processing, high secondary metabolite content, and year-round availability.

Boiling (direbus) was the dominant processing method (55.8%). This method is preferred because it effectively extracts active compounds from plant tissues, reduces bitterness, eliminates pathogenic microorganisms through heat,

and produces a standardized liquid preparation that is straightforward to administer. The prevalence of boiling as the primary preparation method is directly linked to the predominance of oral administration (69.7%) as the primary route of use. Topical application (12.7%) and compress use (9.3%) accounted for the remaining external methods (Lestari et al., 2019).

3.2.6. Preservation of Ethnomedicinal Knowledge

The concentration of ethnomedicinal knowledge among older informants (the majority aged 51–70 years) signals an urgent knowledge erosion risk. As older traditional healers pass away without documented succession, irreplaceable ethnomedicinal knowledge — representing generations of empirical plant-based medicine experience — is permanently lost. This phenomenon has been observed across Indonesian ethnic groups, where urbanization, modernization of healthcare, and generational disinterest are accelerating knowledge loss (Kristiyanto et al., 2020).

The high diversity of plant species (86 species from 40 families) and the breadth of conditions treated (41 diseases) documented in this study reinforce the scientific value of this ethnomedicinal inventory. Several of the highly cited plants, including *Curcuma longa*, *Annona muricata*, *Kalanchoe pinnata*, and *Euphorbia hirta*, have established pharmacological evidence supporting their traditional use, confirming the efficacy of intergenerational knowledge. These plants represent priority species for conservation and further pharmacological research. Formal documentation, community-based conservation programs, and integration of ethnomedicinal knowledge into local health curricula are urgently needed to preserve this cultural heritage.

IV. CONCLUSION AND SUGGESTIONS

4.1. Conclusion

Based on the results of this study, the following conclusions are drawn:

1. A total of 86 plant species from 40 families are utilized as medicine by the community in Kulisusu, West Kulisusu, and North Kulisusu Sub-Districts of North Buton Regency. Malvaceae (9.3%) and Asteraceae (8.1%) were the dominant families.
2. The most commonly utilized plant part was leaves (65.1%), followed by herb (8.1%), rhizome (5.8%), stem and fruit (4.6% each).
3. The highest citation frequency was recorded for turmeric (*Curcuma longa* L., FC = 64.7%), followed by soursop (*Annona muricata* L., FC = 49.0%) and kirinyuh (*Eupatorium odoratum*, FC = 45.1%).
4. Gastric disorders (maag) were the most commonly treated condition (FC = 58.8%), followed by hypertension (49.0%) and fever (47.1%). Non-communicable diseases dominated over communicable diseases in treatment frequency.
5. The predominant processing method was boiling (55.8%) and the primary route of administration was oral consumption (69.7%).
6. Traditional medicinal knowledge was concentrated among older informants (51–70 years), indicating an urgent need for systematic documentation and conservation.

4.2. Suggestions

1. Conservation programs for medicinal plants should be established to ensure their sustainable availability for continued utilization by the community.
2. Special processing and storage techniques should be developed so that medicinal plant species can be utilized over longer periods without loss of potency.
3. Further pharmacological and clinical studies are recommended for the highest-cited plants (particularly *Curcuma longa*, *Annona muricata*, and *Kalanchoe pinnata*) to scientifically validate their traditional therapeutic claims.
4. Formal ethnomedicinal documentation programs involving the community and educational institutions are urgently needed to prevent the loss of traditional knowledge from older generations.

REFERENCES

- Alang, H., & Hastuti, M. S. Y. (2021). Inventarisasi tumbuhan obat sebagai upaya swamedikasi oleh masyarakat suku Tolaki Desa Puundoho, Kabupaten Kolaka Utara, Sulawesi Tenggara. *Jurnal Ilmiah Farmasi*, 17(1), 19–33.
- Andika, A., Arianto, W., Susatya, A., Endarwati, & Ningsih. (2021). Kajian etnomedisin tumbuhan obat suku Lintang di Desa Rantau Kasai Kecamatan Lintang Kanan Kabupaten Empat Lawang Provinsi Sumatera Selatan. *Journal of Global Forest and Environmental Science*, 1(1), 69–77.
- Arafah, N., Usdinawati, Z., & De, L. (2022). Etnomedisin masyarakat Desa Roda dalam pemanfaatan tumbuhan obat di Taman Suaka Margasatwa Tanjung Amolengo. *Jurnal Kehutanan Indonesia*, 3(1), 63–80.
- Assidqi, K., & Tjahjaningsih, W. (2012). Potensi ekstrak daun patikan kebo (*Euphorbia hirta*). *Jurnal Biosains*, 1(2), 113–124.
- Badan Pusat Statistik. (2019). Kecamatan Kulisusu Barat Dalam Angka. BPS Kabupaten Buton Utara.
- Badan Pusat Statistik. (2019). Kecamatan Kulisusu Dalam Angka. BPS Kabupaten Buton Utara.
- Badan Pusat Statistik. (2019). Kecamatan Kulisusu Utara Dalam Angka. BPS Kabupaten Buton Utara.
- Badan Pusat Statistik. (2020). Statistik Kabupaten Buton Utara 2020. Badan Pusat Statistik.
- Bhasin, V. (2007). Medical anthropology: A review. *Ethno-Med*, 1(1), 1–20.
- Departemen Kesehatan RI. (1983). Pemanfaatan tanaman obat. Direktorat Jenderal Pengawasan Obat dan Makanan.
- Falyauma, N., Syarifuddin, A., & Hidayat, I. W. (2022). Kajian etnomedisin dan pemanfaatan tanaman obat pada desa terpilih Kecamatan Secang Kabupaten Magelang. *Jurnal Farmasi Klinik Dan Sains*, 2(1), 74. <https://doi.org/10.26753/jfks.v2i1.760>

- Kasmawati, H., Ihsan, S., & Suprianti, R. (2019). Kajian etnomedisin tumbuhan obat tradisional suku Muna Desa Oe Nsuli Kecamatan Kabangka Kabupaten Muna Sulawesi Tenggara. *Pharmauho*, 5(1), 5–8. <https://doi.org/10.33772/pharmauho.v5i1.8997>
- Kristiyanto, J., Mamosey, W. E., & Damis, M. (2020). Budaya pengobatan etnomedisin di Desa Porelea Kecamatan Pipikoro Kabupaten Sigi Sulawesi Tengah. *Jurnal Holistik*, 13(1), 1–15.
- Lestari, et al. (2019). Kajian etnobotani tumbuhan obat dan cara pengolahannya. *Jurnal Biologi Tropis*, 19(2), 214–225.
- Maharani, D. A., Prayogo, H., & Dirhamsyah, M. (2021). Etnozoologi masyarakat Dayak Banyadu untuk obat-obatan di Desa Engkadu Kecamatan Ngabang Kabupaten Landak. *Jurnal Hutan Lestari*, 9(1), 135–144.
- Mustapa, K., Rizky, A., & Jura, M. R. (2017). Pengaruh ekstrak tanaman putri malu (*Mimosa pudica* Linn) terhadap penurunan kadar glukosa darah mencit (*Mus musculus*). *Jurnal Akademika Kimia*, 6(1), 7.
- Nursalam. (2011). Konsep dan penerapan metodologi penelitian ilmu keperawatan. Salemba Medika.
- Permana, M. G., Asih, I. S., Ambaroh, J., & Safitri, N. A. (2022). Kajian etnomedisin tanaman obat Indonesia. *Jurnal Pembelajaran Biologi*, 9(2), 92–98.
- Purwitasari, H. (2017). Efek antipiretik kombinasi ekstrak daun cocor bebek (*Kalanchoe pinnata* L.) dan ekstrak daun tembelekan (*Lantana camara* L.). *Jurnal Farmasi*, 3, 43–48.
- Putra, A. D., Rijal, S., Wello, E. A., Yuniarti, L., & Murfat, Z. (2022). Pengaruh ekstrak kunyit terhadap kadar pH lambung tikus yang di induksi etanol absolut. *Fakumi Medical Journal*, 2(10), 711–717. <https://doi.org/10.33096/fmj.v2i10.131>
- Romadhonsyah, F., Puspitasari, P. D., Harimurti, S. M., & Nugraha, A. T. (2023). Studi etnomedisin pada masyarakat di Kampung Demi, Kabupaten Bantul, Yogyakarta. *Jurnal Ilmiah Ibnu Sina*, 8(2), 286–296.
- Santoso, J. (2017). Efektivitas infusa rimpang kunyit (*Curcuma domestica* Val.) sebagai gastroprotektor pada tikus dengan model tukak lambung. *Jurnal Permata Indonesia*, 8(1), 34–44.
- Saputri, D. A., Millah, A. U., Winandari, O. P., Pawhestri, S. W., & Baika, F. D. (2022). Etnomedisin pada pengobatan tradisional masyarakat suku Jawa di Kecamatan Buay Madang Timur Kabupaten OKU Timur Sumatera Selatan. *Jurnal Medika Malahayati*, 6(1), 265–275.
- Saranani, et al. (2021). Kajian etnomedisin tumbuhan obat di Kabupaten Konawe Selatan. *Jurnal Farmasi Universitas Halu Oleo*, 8(2), 30–42.
- Satyaningtjas, A. S., et al. (2023). Potensi daun kumis kucing dalam meningkatkan hematopoiesis pada kondisi kerusakan ginjal. *Jurnal Biologi Terapan*, 11(3), 189–195.
- Silalahi, M., Nisyawati, N., Walujo, E. B., & Mustaqim, W. (2018). Ethnomedicine of medicinal plants by Batak Phakpak subethnic in the Surung Mersada Village, Phakpak Bharat District, North Sumatera. *Jurnal Ilmu Dasar*, 19(2), 77. <https://doi.org/10.19184/jid.v19i2.7017>
- Sugiyono. (2007). Metode penelitian kuantitatif, kualitatif, dan R&D. Alfabeta.
- Sumayyah, S., & Salsabila, N. (2017). Khasiat obat tradisional. *Majalah Farmasetika*, 2(5), 2003–2006.
- Supriani, Sari, W. Y., & Ramadhan, M. F. (2022). Studi etnomedisin tumbuhan berkhasiat obat pada masyarakat Desa Karangjengkol di masa pandemi Covid-19. *Jurnal Farmasetis*, 11(3), 189–194.
- Suwardi, A. B., Navia, Z. I., Harmawan, T., Syamsuardi, & Mukhtar, E. (2020). Ethnobotany and conservation of indigenous edible fruit plants in south Aceh, Indonesia. *Biodiversitas*, 21(5), 1850–1860. <https://doi.org/10.13057/biodiv/d210511>
- Swastini, N. (2021). Efektivitas daun sirsak (*Annona muricata* Linn) terhadap penurunan tekanan darah pada hipertensi. *Jurnal Ilmiah Kesehatan Sandi Husada*, 10(2), 413–415. <https://doi.org/10.35816/jiskh.v10i2.618>
- Syamsuri, S., Hafsa, H., & Alang, H. (2023). Nilai ekonomi tumbuhan (kajian etnomedisin) oleh masyarakat adat Mandar di Kecamatan Luyo, Kabupaten Polewali Mandar. *Bio-Lectura*, 10(1), 1–10. <https://doi.org/10.31849/bl.v10i1.12662>
- Tahoangako, S. S., Santosa, D., & Fakhrudin, N. (2023). Kajian pemanfaatan tumbuhan obat oleh masyarakat Desa Uelawu Kabupaten Konawe Sulawesi Tenggara. *Jurnal Biologi Tropis*, 19(3), 441–448.
- Tan, A. Y., Syamsiah, & Hiola, S. F. (2022). Etnobotani tumbuhan obat masyarakat etnis Buton di Kota Baubau, Provinsi Sulawesi Tenggara. *Jurnal Biotek*, 10(1), 1–35.
- Wijaya, G. A., Nurjannah, N., Rezeki, J. T. S., Fijannah, R. R., & Navia, Z. I. (2023). Investigasi etnomedisin pada masyarakat Desa Blang Pase, Kota Langsa, Aceh. *Jurnal Jeumpa*, 10(1), 127–137. <https://doi.org/10.33059/jj.v10i1.6690>