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Phytochemical screening and antibacterial activity of medicinal plants used by the *Suku Anak Dalam* community in Jambi Province, Indonesia

Santi Perawati[1], Nurul Kamilah Sadli[1], Marizky Pondawinata[1], Rina Oktaria[2], Ayu Ulil Fauziah[3], Ririn Zahra Khairunnisa[1], Farras Alta Zafira[1], Desi Sagita[4]

[1] Department of Pharmacy Faculty of Medicine and Health Sciences Universitas Jambi, 36361, Jambi, Indonesia
[2] Department of Nursing Program Faculty of Medicine and Health Sciences Universitas Jambi, 36361, Jambi, Indonesia
[3] Department of Pharmacy Sekolah Tinggi Ilmu Kesehatan Harapan Ibu Jambi, 36122, Jambi, Indonesia
[4] Department of Pharmacy Adiwangsa University, 36138, Jambi, Indonesia

*Coressponding Authors: santiperawati@unja.ac.id

Abstract

Background: Medicinal plants remain an essential component of traditional health practices among the Suku Anak Dalam (SAD) community in Jambi Province, Indonesia. Limited access to healthcare facilities and frequent infections drive the continued reliance on plant-based therapies. Scientific validation of these traditional uses is required to support their potential pharmacological value. **Objective:** This study aimed to investigate the secondary metabolite content and antibacterial activity of selected medicinal plants traditionally used by the SAD. **Methods:** Ten plant species were collected from SAD communities in Batanghari and Tebo districts. Extracts were prepared using the decoction method. Phytochemical screening was conducted to identify secondary metabolites, and antibacterial activity was evaluated using the disc diffusion method against *Staphylococcus aureus* at concentrations of 100 ppm, 500 ppm, and 1000 ppm. **Results:** Most extracts contained bioactive secondary metabolites, particularly flavonoids, saponins, and tannins. Antibacterial assays demonstrated inhibition zones ranging from 5–10 mm at 1000 ppm, categorized as moderate activity against *S. aureus*. The limited activity was likely due to the simplicity of the decoction method, which may have restricted the optimal recovery of active compounds. **Conclusion:** SAD medicinal plants are potential sources of bioactive metabolites, although their antibacterial effects were moderate under the extraction conditions applied. Further studies using selective extraction techniques and organic solvents are recommended to optimize metabolite recovery and provide more comprehensive insights into their pharmacological potential.

Keywords: Suku Anak Dalam; traditional medicinal plants; ethnopharmacology; secondary metabolites; antibacterial activity; *Staphylococcus aureus*.

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INTRODUCTION

Traditional medicine has played an important role in human health care for centuries and continues to serve as a primary therapeutic option in many regions of the world. Approximately 80% of the global population relies, at least in part, on medicinal plants for their health needs, particularly in rural and resource-limited communities. This long-standing practice highlights the importance of ethnopharmacological research in validating the safety and efficacy of traditional remedies(1).

Indonesia, known as one of the world's biodiversity hotspots, harbors an extensive variety of flora with potential pharmacological applications. Many of these plant species have been used empirically by local communities for the treatment of common ailments such as fever, wounds, infections, and skin diseases. Despite their long history of use, scientific evidence supporting the bioactivity of these traditional plants remains limited and fragmented(2,3).

In Jambi Province, the Suku Anak Dalam (SAD) community, also referred to as "Orang Rimba," represents one of the indigenous groups that continues to depend heavily on forest resources for survival. For this community, medicinal plants constitute a critical component of daily health care because access to modern health services is minimal. Consequently, ethnobotanical knowledge is preserved and passed down orally through generations (4–6).

The SAD community employs a wide range of plant species for the treatment of infectious diseases, including those caused by bacterial pathogens. Among these, skin infections are commonly addressed with herbal preparations derived from leaves, bark, or roots. However, only a limited number of these plants have been evaluated through systematic phytochemical and microbiological studies(5).

Phytochemical screening serves as a valuable preliminary approach to identify the presence of bioactive metabolites, such as alkaloids, flavonoids, tannins, terpenoids, and saponins, which are known to contribute to antimicrobial activity. Such compounds have been widely reported to interfere with bacterial growth through mechanisms such as cell wall disruption, enzyme inhibition, and oxidative stress induction (7–9).

Staphylococcus aureus is one of the most common bacterial pathogens responsible for skin and soft tissue infections. Increasing resistance of *S. aureus* to conventional antibiotics has generated considerable concern in public health. Hence, the search for alternative antimicrobial agents derived from natural products has gained renewed interest in recent years (10).

Previous studies on Indonesian medicinal plants have revealed promising antibacterial potential, yet variations in extraction methods, solvent polarity, and plant part selection significantly influence the observed outcomes. Decoction, a method commonly practiced in traditional settings, is simple and practical but may not always yield optimal concentrations of bioactive compounds. This underlines the importance of correlating traditional preparation techniques with scientific evaluation(11–13).

Considering the reliance of the SAD community on herbal medicine, it is crucial to bridge indigenous knowledge with pharmacological evidence. Scientific investigation not only validates traditional practices but also supports the preservation of local wisdom and sustainable use of biodiversity. Furthermore, documenting the pharmacological properties of SAD medicinal plants may contribute to the discovery of novel therapeutic agents(2).

Based on these considerations, this study aimed to evaluate the phytochemical constituents and antibacterial activity of medicinal plants traditionally used by the Suku Anak Dalam in Jambi Province. By employing phytochemical screening and

antibacterial assays against *Staphylococcus aureus*, this research sought to provide preliminary evidence of the pharmacological potential of these plants and to establish a foundation for future in-depth studies.

METHODS

Study area and plant collection

Medicinal plants traditionally used by the *Suku Anak Dalam* (SAD) community were collected from two major forest areas located in Batanghari and Tebo districts, Jambi Province, Indonesia. The selection of plant species was based on ethnobotanical information obtained through interviews with local healers (*dukun*). Ten species frequently used in the treatment of skin infections and wounds were selected for further analysis. The collected specimens were identified and authenticated at the Taxonomy Laboratory of Biology, Faculty of Mathematics and Natural Sciences, Padjadjaran University. Voucher specimens were deposited in the institutional herbarium for reference.

Preparation of plant extracts

Each plant sample was cleaned, air-dried at room temperature, and ground into a fine powder. Extraction was performed using the decoction method, which reflects the traditional preparation technique of the SAD community. Approximately 50 grams of powdered sample were boiled in 500 mL of distilled water for 30 minutes. The resulting decoction was filtered through Whatman No. 1 filter paper. The crude extract was stored at 4°C until further analysis (8).

Phytochemical screening

Preliminary phytochemical screening was conducted to detect the presence of major classes of secondary metabolites, including alkaloids, flavonoids, saponins, tannins, terpenoids, and phenolics. Standard qualitative procedures were applied following Harborne (1998) and Evans (2009) with minor modifications. Changes in color or precipitate formation were recorded as positive indications of each metabolite group (14).

Test microorganism and culture conditions

The antibacterial activity was evaluated against *Staphylococcus aureus* ATCC 25923, a Gram-positive bacterium commonly associated with skin infections. The bacterial strain was obtained from the Microbiology Laboratory, Faculty of Pharmacy, Padjadjaran University. The culture was maintained on nutrient agar slants at 4°C and subcultured before use.

Antibacterial assay

Antibacterial activity was assessed using the disc diffusion method according to the Clinical and Laboratory Standards Institute (CLSI) guidelines with slight modifications. Sterile paper discs (6 mm diameter) were impregnated with 20 µL of each extract at concentrations of 100 ppm, 500 ppm, and 1000 ppm. The discs were placed on Mueller-Hinton agar plates inoculated with *S. aureus* suspension equivalent to 0.5 McFarland standard (approximately 1×10^8 CFU/mL). The plates were incubated at 37°C for 24 hours. The diameter of the inhibition zone around each disc was measured in millimeters. Chloramphenicol (30 µg/disc) served as the positive control, while distilled water was used as the negative control (10,15).

Statistical analysis

All experiments were performed in triplicate. The inhibition zones were expressed as mean ± standard deviation (SD). Antibacterial activity was categorized as weak (≤5 mm), moderate (6–10 mm), or strong (>10 mm) based on the diameter of inhibition zones. Descriptive statistical analysis was conducted to interpret the qualitative and quantitative data obtained from phytochemical and antibacterial evaluations (16).

RESULTS

Phytochemical screening

Qualitative phytochemical screening of the ten traditional medicinal plants used by the Suku Anak Dalam revealed a broadly similar secondary-metabolite profile across species. Alkaloids, flavonoids, steroids and phenolic compounds were detected in most samples; saponins and tannins were present in several species (Table 1). The presence of these classes was consistent with traditional use and provided a biochemical basis for the biological activities tested.

Antibacterial activity

All crude decoction extracts produced measurable zones of inhibition against the test bacteria but were classified as moderate activity, with mean inhibition-zone diameters consistently in the 5–10 mm range for the three tested dilutions (D1–D3). By contrast, the positive control (K^+) produced very large inhibition zones (19–24 mm), indicating strong antibacterial potency for the reference antibiotic. Representative mean inhibition values for the decoction extracts were: Arcangelisia flava (D1–D3 mean 6.56–8.89 mm), Stachytarpheta jamaicensis (6.19–6.69 mm), Bauhinia variegata (5.04–6.03 mm), and Garcinia sp. (8.04–10.90 mm). No activity was observed in negative controls (K^-).

Table 1. Phytochemical screening of traditional medicinal plants

No.	Traditional medical plants	Secondary metabolites							
		Alkaloid			Flavonoids	Steroids	Saponin	Phenolic	Tannin
		Mayer	Wagner	Dragendorff					
1.	Akar Kuning (*Arcangelisia flava* (L.) Merr)	+	+	+	+	+	+	-	-
2.	Dedaup (*Bauhinia variegata* L.)	-	-	+	+	-	+	+	-
3.	Mampot (*Garcinia sp)*	-	-	-	+	+	-	+	-
4.	Maribungan (*Calleryaatropurpurea* (Wall.) Schot)	-	-	-	+	+	+	-	-
5.	Mejan (*Alyxiastellata*Roem. &Schult)	-	-	+	+	-	-	-	-
6.	Melati (*Jasminum sambac*(L.) Aiton)	-	+	+	+	+	+	-	-
7.	Pecut Kuda (*Stachytarphetajamaicensis* (L.) Vahl)	+	+	-	+	-	+	+	-
8.	Pendungurat (*Arcangelisiagusanlung* H.S.La)	-	+	+	+	-	+	-	-
9.	Penyegar (*Dioscorea transversa* R.Br)	-	-	+	+	-	+	-	-
10.	Selusuh (*Luvungaeleutherandra*Dalzell)	+	+	-	+	+	+	-	-

Tabel 2. Antibacteria activity of traditional medical plants

No	Traditional Medical Plants	Group	Antibacterial activity inhibition zone value per repetition (mm)			Average (mm)	± Standard deviation	Antibacterial activity category
			1	2	3			
1	Akar kuning	K-	0	0	0	0	±0	none
	(*Arcangelisia flava* (L.) Merr)	K+	24,01	20,06	20,55	21,54	±2,15	very strong
		D1	6,07	7,07	6,55	6,56	±0,50	moderate
		D2	8,02	8,26	8,03	8,1	±0,13	moderate
		D3	9,08	8,56	9,05	8,89	±0,29	moderate
2	Bungo Bejuntai/Pecut Kuda	K-	0	0	0	0	±0	none
	(*Stachytarpheta jamaicensis* (L.) Vahl)	K+	23,05	20,09	20,59	21,24	±1,58	very strong
		D1	6,03	6,01	6,54	6,19	±0,30	moderate
		D2	6,08	6,55	6,06	6,23	±0,27	moderate
		D3	7,52	6,52	6,05	6,69	±0,75	moderate
3	Dedaup	K-	0	0	0	0	±0	none
	(*Bauhinia variegata* L.)	K+	23,51	24,03	24,04	23,86	±0,30	very strong
		D1	5,06	5,04	5,02	5,04	±0,02	moderate
		D2	5,56	5	5,08	5,21	±0,30	moderate
		D3	6	6,04	6,07	6,03	±0,03	moderate
4	Mampot	K-	0	0	0	0	±0	none
	(*Garcinia sp*)	K+	22,06	21,56	20,02	21,21	±1,06	very strong
		D1	8,09	8,02	8,02	8,04	±0,04	moderate
		D2	10,09	10,08	10,06	10,07	±0,01	moderate
		D3	10,96	10,98	10,86	10,9	±0,06	moderate
5	Maribungan	K-	0	0	0	0	±0	Tidak ada
	(*Callerya atropurpurea* (Wall.) Schot)	K+	21,54	21,58	19,09	20,74	±1,42	strong
		D1	5,08	5,05	5,09	5,07	±0,02	moderate
		D2	5,55	5,53	5,59	5,55	±0,03	moderate
		D3	6,06	6,06	6,04	6,05	±0,01	moderate
6	Mejan	K-	0	0	0	0	±0	none
	(*Alyxia stellata* Roem. & Schult)	K+	19,59	18,09	21,06	19,58	±1,49	strong
		D1	6,06	6,56	6,08	6,23	±0,28	moderate
		D2	8,02	8,09	8,56	8,22	±0,29	moderate

No	Traditional Medical Plants	Group	Antibacterial activity inhibition zone value per repetition (mm)			Average (mm)	± Standard deviation	Antibacterial activity category
			1	2	3			
		D3	10,04	10,07	10,07	10,06	±0,01	moderate
7	Melati Hutan	K-	0	0	0	0	±0	none
	(*Jasminum sambac* (L.) Aiton)	K+	22,05	22,55	22,09	22,23	±0,28	very strong
		D1	7,07	7,02	7,52	7,2	±0,27	moderate
		D2	8,09	8,55	8,08	8,24	±0,26	moderate
		D3	8,58	9,07	9,07	8,9	±0,28	moderate
8	Pendung urat	K-	0	0	0	0	±0	none
	(*Arcangelisia gusanlung* H.S.La)	K+	19,01	23,57	22,03	21,53	±2,32	very strong
		D1	5,35	5,25	5,3	5,3	±0,05	moderate
		D2	6,04	5,89	5,9	5,94	±0,08	moderate
		D3	6,16	6,18	6,1	6,14	±0,04	moderate
9	Penyegar	K-	0	0	0	0	±0	none
	(*Dioscorea transversa* R.Br)	K+	22,56	21,53	18,04	20,71	±2,37	strong
		D1	7,03	7,06	7,53	7,2	±0,28	moderate
		D2	8,06	8,56	8,05	8,22	±0,29	moderate
		D3	9,02	9	9,05	9,02	±0,02	moderate
10	Selusuh	K-	0	0	0	0	±0	none
	(*Luvunga eleutherandra* Dalzell)	K+	20,52	22,07	20,58	21,05	±0,88	very strong
		D1	9,03	8,57	9,03	8,87	±0,26	moderate
		D2	9,17	9,18	9,16	9,17	±0,01	moderate
		D3	10,09	10	10,05	10,04	±0,04	moderate

Information:
K- : Negative control using aquadest
K+: Positive control using Chloramphenicol disk
D1 : Decoction preparation (100 ppm)
D2 : Decoction preparation (500 ppm)
D3 : Decoction preparation (1000 ppm)

Statistical analysis

The result of the antibacterial activity test for a decoction concentration of 1000 ppm were continued for statistical testing. The following statistical analysis results are shown in the table below.

Table 3. Statistical analysis for normality test results of antibacterial activity from 1000 ppm each medical plants with Shapirowilk

Traditional medical plants	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Akar kuning	,175	3	.	1,000	3	,989
Bungo bejuntai	,260	3	.	,958	3	,608
Dedaup	,375	3	.	,773	3	,052
Mampot	,373	3	.	,779	3	,065
Maribungan	,385	3	.	,750	3	,000
Mejan	,385	3	.	,750	3	,000
Melati hutan	,255	3	.	,962	3	,627
Pendungurat	,378	3	.	,766	3	,036
Penyegar	,385	3	.	,750	3	,000
Selusuh	,372	3	.	,782	3	,071

Table 4. Analysis by kruskal-wallis result

Test Statistics[a,b]	
	Inhibition Zone
Kruskal-Wallis H	19,479
Df	9
Asymp. Sig.	,021
Kruskal-Wallis H	19,479

According to the kruskal–wallis test results, the p-value was less than 0.05, confirming that the inhibition zone diameters differed significantly among extracts at the 1.000 ppm concentration for each plant species. The kruskal–wallis test was applied in this study because the antibacterial activity data, expressed as inhibition zone diametes did not meet the assumptions required for parametric analysis such as ANOVA. Preliminary normality tests using Shapiro–Wilk indicated that the data were not normally distributed, and the sample sizes for each treatment group were relatively small (n=3).

Additionally, the variance among groups was not homogeneous, as often occurs with biological data derived from plant extracts. Under such conditions, the Kruskal–Wallis test provides a more reliable alternative to one-way ANOVA because it does not assume a normal distribution or equality of variances (17). This non-parametric test ranks all the observations from all groups together and then compares the median ranks among the groups. It evaluates whether at least one of the groups differs significantly from the others in terms of their central tendency (median). Therefore, it is particularly suitable for evaluating biological or pharmacological data that show variability, non-linearity, or skewness, as often seen in inhibition zone assays (17).

In the context of this study, the kruskal–wallis test was used to determine whether the differences in antibacterial activity among various plant extracts and concentrations were statistically significant. Because the inhibition zones measured from the diffusion assay represent ordinal rather than truly continuous data, ranking-based analysis offers a more accurate interpretation of treatment effects.

DISCUSSION

The study confirmed that the ten traditional medicinal plants from the Suku Anak Dalam contain various bioactive secondary metabolites, including alkaloids, flavonoids, steroids, and phenolics. All extracts exhibited moderate antibacterial activity, validating their ethnomedicinal use and demonstrating their pharmacological potential. Further fractionation, compound identification, and cytotoxicity testing are recommended to explore and develop these plants as sources of novel bioactive agents.

Phytochemical screening of ten traditional medicinal plants used by the Suku Anak Dalam community revealed the widespread presence of bioactive secondary metabolites, including alkaloids, flavonoids, steroids, saponins, phenolics, and tannins. These classes of compounds are well known for their therapeutic potential, particularly in antimicrobial, antioxidant, and anti-inflammatory activities (18,19). The detection of multiple metabolites in most plant species indicates a complex chemical defense system evolved to protect plants from microbial pathogens and environmental stressors. The presence of multiple secondary metabolites, particularly alkaloids, flavonoids, phenolics, and steroids, provides a biochemical rationale for the observed antibacterial activity. These compounds are known for their bioactive roles, such as membrane disruption(9), enzyme inhibition(25), and interference with bacterial cell walls(25,28).

Among the screened plants, *Arcangelisia flava* (Akar Kuning) demonstrated the richest phytochemical profile, containing alkaloids, flavonoids, steroids, saponins, phenolics, and tannins. The abundant alkaloid and phenolic contents may explain its moderate antibacterial activity, as both compound groups have been associated with inhibition of bacterial enzymes and disruption of cell membrane integrity(20,21). Similarly, *Stachytarpheta jamaicensis* (Pecut Kuda) and *Luvunga eleutherandra* (Selusuh) also exhibited multiple classes of secondary metabolites, suggesting their potential as sources of broad-spectrum antimicrobial agents(10,18,22).

In contrast, *Bauhinia variegata* (Dedaup) and *Garcinia* sp. (Mampot) showed selective metabolite composition, with notable absence of alkaloids but presence of steroids and saponins. This may indicate that their antibacterial mechanism relies more on membrane-disruptive or surfactant-like properties of saponins rather than enzyme inhibition typically mediated by alkaloids (15,23). The variability in metabolite distribution across species highlights the diversity of biosynthetic pathways adapted by different taxa to ecological niches.

The antibacterial assay demonstrated that all plant extracts exhibited moderate inhibition zones (5–10 mm), with no sample exceeding 11 mm in average diameter. According to the interpretive criteria by CLSI 2018 (24), such results can be categorized as moderate or intermediate antibacterial activity. The most promising results were recorded for *Garcinia* sp. and *L. eleutherandra*, which achieved inhibition zones up to 10.9 mm, suggesting the potential presence of lipophilic antimicrobial compounds such as xanthones or coumarins, typically found in the Clusiaceae and Rutaceae families(8,22).

Interestingly, extracts from *A. flava*, *S. jamaicensis*, and *Jasminum sambac* also demonstrated moderate inhibitory effects, even though their phytochemical

compositions differ significantly. This observation suggests that antibacterial activity is likely a synergistic effect of multiple metabolite classes rather than the dominance of a single compound(18,21,25,26). The presence of both polar (flavonoids, phenolics) and nonpolar (steroids, terpenoids) constituents may enhance cell wall penetration and target multiple bacterial pathways simultaneously.

All plant extracts were inactive against bacteria in the negative control (K–), confirming that the inhibitory zones observed were not due to solvent effects but rather to the intrinsic bioactivity of the extracts. The positive control (K+), using a standard antibiotic, produced zones exceeding 20 mm, as expected for a potent antibacterial agent. This validates the methodology and supports the reliability of the comparative antibacterial assessment.

The moderate activity observed may be attributed to the crude nature of the extracts used in this study. Crude extracts contain a mixture of active and inactive compounds that can interfere with each other's efficacy (Parekh & Chanda, 2007). Fractionation and purification of the active components could significantly enhance antibacterial potency, as reported in similar studies involving *Arcangelisia flava* and *Garcinia mangostana*(15,27).

Furthermore, the presence of phenolic and flavonoid compounds across several samples supports their antibacterial contribution through oxidative stress induction and protein precipitation mechanisms (23). These compounds are known to inhibit bacterial DNA gyrase and other essential enzymes, which may explain the broad but moderate inhibition seen in multiple extracts.

From an ethnopharmacological perspective, the findings scientifically validate traditional use of these plants by the Suku Anak Dalam community for treating infections and wounds. The moderate antibacterial activity, although not comparable to synthetic antibiotics, provides a pharmacological basis for their folk medicinal applications and encourages further investigation into their bioactive constituents.

In summary, the phytochemical screening and antibacterial results collectively suggest that *A. flava*, *Garcinia* sp., and *L. eleutherandra* are promising candidates for further isolation and structural elucidation studies. Future research should focus on bioassay-guided fractionation, determination of minimum inhibitory concentration (MIC), and mechanism-of-action studies to identify specific antibacterial agents responsible for the observed effects.

CONCLUSIONS

The study confirmed that the ten traditional medicinal plants from the Suku Anak Dalam contain various bioactive secondary metabolites, including alkaloids, flavonoids, steroids, and phenolics. All extracts exhibited moderate antibacterial activity, validating their ethnomedicinal use and demonstrating their pharmacological potential. Further fractionation, compound identification, and cytotoxicity testing are recommended to explore and develop these plants as sources of novel bioactive agents.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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DECLARATION OF ARTIFICIAL INTELLIGENCE USE

We hereby confirm that no artificial intelligence (AI) tools or methodologies were utilized at any stage of this study, including during data collection, analysis, visualization or manuscript preparation. All work presented in this study was conducted manually by the authors without the assistance of AI-based tools or systems.

REFERENCES

[1] Amin MR, Perawati S, Sutrisno D. Etnofarmasi Pada Suku Anak Dalam di Desa Pauh Menang Kecamatan Pamenang. JHTM.2020;6(1).
[2] Adlu AM, Perawati S, Anggresani L. Etnofarmasi Suku Anak Dalam (SAD) Dusun Pasir Putih Desa Dwi Karya Bhakti Rantau Keloyang, Kecamatan Pelepat, Kabupaten Bungo, Provinsi Jambi. JHTM.2020;6(1).
[3] Andriani L, Perawati S, Awaliatuwelda. Studi Etnofarmasi Tumbuhan Jernang Pada Suku Anak Dalam Di Desa Muara Kilis. Farmasains J.Ilmu Kefarmasian. 2021 Apr 29;8(1):15–21.
[4] Perawati S, Ofiana A, Sutrisno D, Hamidatul S, Putra RY, Hartesi B, et al. Kajian Potensi Bahan Alam Pada Suku Anak Dalam (Sad) Di Desa Pemayongan Kecamatan Sumay Kabupaten Tebo Provinsi Jambi Sebagai Kandidat Obat. J.Khazanah Intelektual. 2023 July;7(2):1698-1716.
[5] Asridawati I, Perawati S, Yulianis Y. Studi Etnofarmasi pada Suku Anak Dalam (SAD) di Desa Semambu Kecamatan Sumay Kabupaten Tebo Provinsi Jambi.J Pharm Indones. 2020 July 31;17(1):172.
[6] Siregar MRA, Perawati S, Andriani L. Etnofarmakognosi Pada Suku Anak Dalam Di Desa Hajran Kecamatan Bathin Xxiv Kabupaten Batanghari. JHTM. 2020;6(1).
[7] Sanguansermsri D, Sanguansermsri P, Buaban K, Choommongkol V, Akekawatchai C, Charoensri N, et al. Antibacterial activity of Dioscorea bulbifera Linn. extract and its active component flavanthrinin against skin-associated bacteria. BMC Complement Med Ther. 2024 May 2;24(1):180.
[8] Department of Applied Microbiology and Brewing, Nnamdi Azikiwe University, P.M.B. 5025, Awka, Anambra State, Nigeria., Uba BO, Department of Microbiology, Faculty of Natural Sciences, Chukwuemeka Odumegwu Ojukwu University, Anambra State, Nigeria., et al. Assessment of the Phytochemical and Antibacterial Profiles of Aqueous and Ethanolic Extracts of Garcinia Kola Seed. IPS J Drug Discov Res Rev. 2025 Oct 6;3(2):51–6.
[9] Sitthan VK, Abdallah MS, Nallappan M, Choi SH, Paik JH, Go R. Antioxidant and Antibacterial Activity of Different Solvent Extracts of Leaves and Stem of Alyxia reinwardtii Blume. Malays Appl Biol. 2023 Dec 30;52(6):67–80.
[10] Utami JP, Diana S, Arifin R, Taufiqurrahman I, Nugraha KA, Sari MW, et al. Antibacterial activity of Stachytarpheta jamaicensis (L.) Vahl roots extract on some bacteria proteins: An in silico and in vitro study. J Pharm Pharmacogn Res. 2022 Nov 1;10(6):1087–102.
[11] Wen G, Chen S, Fan L, Zeng L, Xu B. The complete chloroplast genome of Arcangelisia gusanlung H.S.Lo (Menispermaceae), an important traditional medicine from South China. Mitochondrial DNA Part B. 2021 Nov 2;6(11):3269–70.
[12] Tsurayya DA, Saleh DA, Renaldi DR, Rizka DR, Widyaningyas R, Yasa A, et al. Herbal medicines sold in Wonosobo Traditional Markets. Asian J Ethnobiol. 2025;8(1).

[13] Kusyanti T, Wirakusumah FF, Rinawan FR, Muhith A, Purbasari A, Mawardi F, et al. Technology-Based (Mhealth) and Standard/Traditional Maternal Care for Pregnant Woman: A Systematic Literature Review. Healthcare. 2022 July 12;10(7):1287.
[14] Kamal Y, Khan T, Haq I, Zahra SS, Asim MH, Shahzadi I, et al. Phytochemical and biological attributes of Bauhinia variegata L. (Caesalpiniaceae). Braz J Biol. 2022;82:e257990.
[15] Izma H, Rizki MI, Anwar K, Anggraeni D, Rahmatullah SW, Putra AMP, et al. Antibacterial Activity of Ethanol Extract, n-Hexane and Ethyl Acetate Fraction of Mundar (Garcinia forbesii) Pericarp. JOPS J Pharm Sci. 2023 June 30;6(2):112–21.
[16] Bahry SS, Susilowati A, Pangastuti A. Characterization and antibacterial activity of biosynthesized silver nanoparticles using Stachytarpheta jamaicensis leaf extract as bioreduction. Indones J Biotechnol. 2025 Mar 29;30(1):1.
[17] Cahyaningrum PL, Sudaryati NLG, Bogoriani NW, Asih IARA, Adnyana IMDM, Jenar PD. Phytochemical Profiling, Antibacterial Properties and Toxicity of Amla Fruit Tea (Phyllanthus emblica L.): An In Vitro and In Silico Study. J. Multidiscip. Appl. Nat. Sci.. 2025 Jul. 25;5(3):799-822.
[18] Khummueng W, Rakhman SA, Utaipan T, Boonyanuphong P, Chunglok W. Phytochemicals, Antioxidant and Cytotoxicity of Stachytarpheta jamaicensis (L.) Vahl Extracts. Thaksin University Journal. 2020;23(2):45-54.
[19] Sam SM, Wahua C. Phytochemical And Micro Anatomical Studies on Leaf, Stem and Petiole of Two Species of Dioscorea (Dioscorea alata L. and Dioscorea bulbifera L.). J Appl Sci Environ Manag. 1970 Jan 1;26(3):467–74.
[20] Hendra R, Agustha A, Frimayanti N, Abdulah R, n Yuda Teruna H. Antifungal Potential of Secondary Metabolites Derived from Arcangelisia flava (L.) Merr.: An Analysis of In Silico Enzymatic Inhibition and In Vitro Efficacy against Candida Species. Molecules. 2024; 29(10):1-13.
[21] Hujjatusnaini N, Amin AM, Widyadana RI, Annisa N, Mila N, Aín LN. Antagonism Testing On An Ethanol Extract Preparation Of Yellow Root Sticks (Arcangelisia flava L. Merr) TOWARD Yersinia enterocolitica AND Salmonella typhi BACTERIA. J Pendidik Mat Dan IPA. 2024 May 25;15(2):143.
[22] Ling KH, Wang Y, Poon WS, Shaw PC, But PPH. The Relationship of Fagaropsis and Luvunga in Rutaceae. Taiwania. 2009;54(4):338-342.
[23] Filho ACPDM. Physicochemical evaluation and antioxidant and antifungal activities of essential oils from Bauhinia forficata Link. and Bauhinia variegata L. flowers. Rev Agroecol No Semiárido. 2020 June 27;4(1):1.
[24] Weinstein MP, Lewis JS. The Clinical and Laboratory Standards Institute Subcommittee on Antimicrobial Susceptibility Testing: Background, Organization, Functions, and Processes. Kraft CS, editor. J Clin Microbiol. 2020 Feb 24;58(3):e01864-19.
[25] Sugitha SKJ, Venkatesan R, Latha RG, Vetcher AA, Al-Asbahi BA, Kim SC. A Study on the Antibacterial, Antispasmodic, Antipyretic, and Anti-Inflammatory Activity of ZnO Nanoparticles Using Leaf Extract from Jasminum sambac (L. Aiton). Molecules. 2024 Mar 25;29(7):1464.
[26] Rizal SS, Wan Abdul Razak WR. Antimicrobial Properties of Jasminum sambac Linn Leave Extract on Selected Oral Associated Pathogen. AUIQ Complement Biol Syst. 2024 Sept 24;1(2):11–20.
[27] Diliarosta S, Sudarmin S S, Efendi A, Dillasamola D, Oktomalioputri B, Ramadhani R. Reconstruction and Scientific Explanation of Akar Kuning (Arcangelisia flava Merr.) From West Sumatra as Ethnomedicine and Source of Science Learning. Pharmacogn J. 2021 Jan 8;13(1):206–11.
[28] Charoenying P, Laosinwattana C, Chotsaeng N. Antioxidant and Antibacterial Activities of Jasminum officinale L. f. var. grandiflorum (L.) Kob. Leaf Extracts. Curr Appl Sci Technol. 2024 Apr 30;e0259588.